Notice is hereby given that an Extraordinary Meeting of the Finance and Assurance Committee will be held on:

Date:	**Monday, 15 February 2021**
Time:	**1pm**
Meeting Room:	**Council Chamber**
Venue:	**Level 2 20 Don Street Invercargill**

Extraordinary Finance and Assurance Committee Agenda
OPEN

MEMBERSHIP

Chairperson	Bruce Robertson
	Mayor Gary Tong
Deputy Chairperson	Ebel Kremer
Councillors	Don Byars
	John Douglas
	Paul Duffy
	Julie Keast

IN ATTENDANCE

Chief Financial Officer	Anne Robson
Committee Advisor	Fiona Dunlop

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Full agendas are available on Council's Website
www.southlanddc.govt.nz

Terms of Reference – Finance and Assurance Committee

TYPE OF COMMITTEE	Council standing committee
RESPONSIBLE TO	Council
SUBCOMMITTEES	None
LEGISLATIVE BASIS	Committee constituted by Council as per schedule 7, clause 30 (1)(a), LGA 2002. Committee delegated powers by Council as per schedule 7, clause 32, LGA 2002.
MEMBERSHIP	Mayor, three councillors and one external appointee
FREQUENCY OF MEETINGS	Quarterly or as required
QUORUM	Three members
SCOPE OF ACTIVITIES	The Finance and Assurance Committee is responsible for: • ensuring that Council has appropriate financial, risk management and internal control systems in place that provide: - an overview of the financial and non-financial performance of the organisation - effective management of potential opportunities and adverse effects - reasonable assurance as to the integrity and reliability of Council's financial and non-financial reporting. • exercising active oversight of information technology systems • exercising active oversight of Council's health and safety policies, processes, compliance, results and frameworks • relationships with external, internal auditors, banking institutions and insurance brokers. The Finance and Assurance Committee will monitor and assess the following: • the financial and non-financial performance of Council against budgeted and forecasted outcomes • consideration of forecasted changes to financial outcomes • Council's compliance with legislative requirements • Council's risk management framework • Council's control framework • Council's compliance with its treasury responsibilities • Council's compliance with its Fraud Policy.
DELEGATIONS	The Finance and Assurance Committee shall have the following delegated powers and be accountable to Council for the exercising of these powers. In exercising the delegated powers, the Finance and Assurance Committee will operate within:

	• policies, plans, standards or guidelines that have been established and approved by Council • the overall priorities of Council • the needs of the local communities • the approved budgets for the activity. The Finance and Assurance Committee will have responsibility and delegated authority in the following areas: **Financial and Performance Monitoring** a) monitoring financial performance to budgets b) monitoring service level performance to key performance indicators. **Internal Control Framework** a) reviewing whether Council's approach to maintaining an effective internal control framework is sound and effective b) reviewing whether Council has taken steps to embed a culture that is committed to probity and ethical behaviour c) reviewing whether there are appropriate systems, processes and controls in place to prevent, detect and effectively investigate fraud. **Internal Reporting** a) to consider the processes for ensuring the completeness and quality of financial and operational information being provided to Council b) to seek advice periodically from internal and external auditors regarding the completeness and quality of financial and operational information that is provided to the Council. **External Reporting and Accountability** a) agreeing the appropriateness of Council's existing accounting policies and principles and any proposed change b) enquiring of internal and external auditors for any information that affects the quality and clarity of Council's financial statements and statements of service performance, and assess whether appropriate action has been taken by management in response to the above c) satisfying itself that the financial statements and statements of service performance are supported by appropriate management signoff on the statements and on the adequacy of the systems of internal control (ie letters of representation), and recommend signing of the financial statements by the chief executive/mayor and adoption of the Annual Report, Annual Plans, Long Term Plans **Risk Management** a) reviewing whether Council has in place a current, comprehensive and effective risk management framework and associated procedures for effective identification and management of the Council's significant risks

	b) considering whether appropriate action is being taken to mitigate Council's significant risks. **Health and Safety** a) review, monitor and make recommendations to Council on the organisations health and safety risk management framework and policies to ensure that the organisation has clearly set out its commitments to manage health and safety matters effectively. b) review and make recommendations for Council approval on strategies for achieving health and safety objectives c) review and recommend for Council approval targets for health and safety performance and assess performance against those targets d) monitor the organisation's compliance with health and safety policies and relevant applicable law e) ensure that the systems used to identify and manage health and safety risks are fit for purpose, being effectively implemented, regularly reviewed and continuously improved. This includes ensuring that Council is properly and regularly informed and updated on matters relating to health and safety risks f) seek assurance that the organisation is effectively structured to manage health and safety risks, including having competent workers, adequate communication procedures and proper documentation g) review health and safety related incidents and consider appropriate actions to minimise the risk of recurrence h) make recommendations to Council regarding the appropriateness of resources available for operating the health and safety management systems and programmes i) any other duties and responsibilities which have been assigned to it from time to time by Council. **Internal Audit** a) approve appointment of the internal auditor, internal audit engagement letter and letter of understanding b) reviewing and approving the internal audit coverage and annual work plans, ensuring these plans are based on Council's risk profile c) reviewing the adequacy of management's implementation of internal audit recommendations d) reviewing the internal audit charter to ensure appropriate organisational structures, authority, access, independence, resourcing and reporting arrangements are in place.

	External Audit a) confirming the terms of the engagement, including the nature and scope of the audit, timetable and fees, with the external auditor at the start of each audit b) receiving the external audit report(s) and review action(s) to be taken by management on significant issues and audit recommendations raised within c) enquiring of management and the independent auditor about significant business, political, financial and control risks or exposure to such risks. **Compliance with Legislation, Standards and Best Practice Guidelines** a) reviewing the effectiveness of the system for monitoring Council's compliance with laws (including governance legislation, regulations and associated government policies), with Council's own standards, and best practice guidelines as applicable b) conducting and monitoring special investigations, in accordance with Council policy, and reporting the findings to Council c) monitoring the performance of Council organisations, in accordance with the Local Government Act. **Business Case Review** a) review of the business case of work, services, supplies, where the value of these or the project exceeds $2 million or the value over the term of the contract exceeds $2 million. **Insurance** a) consider Council's insurance requirements, considering its risk profile b) approving the annual insurance renewal requirements **Treasury** a) oversee the treasury function of Council ensuring compliance with the relevant Council policies and plans b) ensuring compliance with the requirements of Council's trust deeds are met c) recommend to Council treasury policies. **Fraud Policy** a) receive and consider reports relating to the investigation of suspected fraud b) monitor the implementation of the Fraud Policy. **Power to Recommend** The Finance and Assurance Committee is responsible for considering and making recommendations to Council regarding: a) policies relating to risk management, rating, loans, funding and purchasing

	b) accounting treatments, changes in generally accepted accounting practice, and new accounting and reporting requirements c) the approval of financial and non-financial performance statements including adoption of the Annual Report, Annual Plans and Long Term Plans. The Finance and Assurance Committee is responsible for considering and making recommendations to the Services and Assets Committee on business cases completed under the 'Power to Act' section above.
FINANCIAL DELEGATIONS	Council authorises the following delegated authority of financial powers to Council committees in regard to matters within each committee's jurisdiction. **Contract Acceptance:** • accept or decline any contract for the purchase of goods, services, capital works or other assets where the total value of the lump sum contract does not exceed the sum allocated in the Long Term Plan/Annual Plan and the contract relates to an activity that is within the scope of activities relating to the work of the Finance and Assurance Committee • accept or decline any contract for the disposal of goods, plant or other assets other than property or land that is provided for in the Long Term Plan **Budget Reallocation**. The committee is authorised to reallocate funds from one existing budget item to another. Reallocation of this kind must not impact on current or future levels of service and must be: • funded by way of savings on existing budget items • within the jurisdiction of the committee • consistent with the Revenue and Financing Policy.
LIMITS TO DELEGATIONS	Matters that must be processed by way of recommendation to Council include: • amendment to fees and charges relating to all activities • powers that cannot be delegated to committees as per the Local Government Act 2002 and sections 2.4 and 2.5 of this manual. Delegated authority is within the financial limits in section 9 of this manual.
RELATIONSHIPS WITH OTHER PARTIES	The committee shall maintain relationships with each of the nine community boards. Professional advisors to the committee shall be invited to attend all meetings of the committee including: • external auditor • internal auditor/risk advisor (if appointed) • chief financial officer.

	At each meeting, the chairperson will provide the external auditor and the internal auditor/risk advisor (if appointed) with an opportunity to discuss any matters with the committee without management being present. The chairperson shall request the chief executive and staff in attendance to leave the meeting for the duration of the discussion. The chairperson will provide minutes for that part of the meeting. The chief executive and the chief financial officer shall be responsible for drawing to the committee's immediate attention any material matter that relates to the financial condition of Council, material breakdown in internal controls and any material event of fraud. The committee shall provide guidance and feedback to Council on financial performance, risk and compliance issues. The committee will report to Council as it deems appropriate but no less than twice a year.
CONTACT WITH MEDIA	The committee chairperson is the authorised spokesperson for the committee in all matters where the committee has authority or a particular interest. Committee members, including the chairperson, do not have delegated authority to speak to the media and/or outside agencies on behalf of Council on matters outside of the committee's delegations. The chief financial officer will manage the formal communications between the committee and its constituents and for the committee in the exercise of its business. Correspondence with central government, other local government agencies or other official agencies will only take place through Council staff and will be undertaken under the name of Southland District Council.

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1 Apologies

At the close of the agenda no apologies had been received.

2 Leave of absence

At the close of the agenda no requests for leave of absence had been received.

3 Conflict of Interest

Committee Members are reminded of the need to be vigilant to stand aside from decision-making when a conflict arises between their role as a member and any private or other external interest they might have.

4 Public Forum

Notification to speak is required by 12noon at least one clear day before the meeting. Further information is available on www.southlanddc.govt.nz or phoning 0800 732 732.

5 Extraordinary/Urgent Items

To consider, and if thought fit, to pass a resolution to permit the committee to consider any further items which do not appear on the Agenda of this meeting and/or the meeting to be held with the public excluded.

Such resolution is required to be made pursuant to Section 46A(7) of the Local Government Official Information and Meetings Act 1987, and the Chairperson must advise:

(i) the reason why the item was not on the Agenda, and

(ii) the reason why the discussion of this item cannot be delayed until a subsequent meeting.

Section 46A(7A) of the Local Government Official Information and Meetings Act 1987 (as amended) states:

"Where an item is not on the agenda for a meeting,-

(a) that item may be discussed at that meeting if-

  (i) that item is a minor matter relating to the general business of the local authority; and

  (ii) the presiding member explains at the beginning of the meeting, at a time when it is open to the public, that the item will be discussed at the meeting; but

(b) no resolution, decision or recommendation may be made in respect of that item except to refer that item to a subsequent meeting of the local authority for further discussion."

Long Term Plan 2031 - Confirmation of Significant Forecasting Assumptions

Record No: R/20/10/63837
Author: Jason Domigan, Corporate Performance Lead
Approved by: Rex Capil, Group Manager Community and Futures

☐ Decision ☒ Recommendation ☐ Information

Purpose

1 To provide updated significant forecasting assumptions to the Finance and Assurance Committee for endorsement to inform the continued development of the Long Term Plan 2031 process.

Executive Summary

2 The significant forecasting assumptions create the foundation for building key strategies and policies in the Long Term Plan. They assist staff in planning, and elected members with making decisions on investment, levels of service, projects, grants and other key components of the Long Term Plan 2031.

3 Assumptions use the best available information at the time to ensure that a robust plan is developed for the following 10 years and can help address uncertainties of the future.

4 The process of developing the assumptions has involved examining key data sources such as the BERL reports for the region, recent climate change reports and inflationary increases on costs. Staff have used these data sources to determine the proposed significant forecasting assumptions.

5 A number of additional financial assumptions have been updated/added since the version that was presented to Finance and Assurance Committee on 13 December 2019 and confirmed by Council on 27 February 2020 and the Community and Strategy Committee 10 June 2020, including:

- level of service
- three waters reforms
- Covid-19
- price level changes
- cost estimates
- vested assets
- forestry assets
- emission trading scheme
- investment in other entities
- funding of future replacement of significant assets
- subsidies for roading
- sources of funds
- return on investment
- interest rate on borrowing
- Local Government Funding Agency guarantee, and
- external borrowing.

6 Any changes to the assumptions from what was confirmed by Council in February 2020 are noted in red text in Attachment A. Any text highlighted in yellow in Attachment A has been updated since the version that was discussed at the committee workshop on 15 December 2020.

7 Staff will ensure that if any new information arises that may impact the significant forecasting assumptions, these will be updated and presented to Council prior to the adoption of the Long Term Plan 2031.

8 Staff recommend that the Finance and Assurance Committee endorse the updated significant forecasting assumptions to inform the ongoing development of the Long Term Plan 2031.

Recommendation

That Finance and Assurance Committee:

a) Receives the report titled "Long Term Plan 2031 - Confirmation of Significant Forecasting Assumptions" dated 10 February 2021.

b) Determines that this matter or decision be recognised as not significant in terms of Section 76 of the Local Government Act 2002.

c) Determines that it has complied with the decision-making provisions of the Local Government Act 2002 to the extent necessary in relation to this decision; and in accordance with Section 79 of the Act determines that it does not require further information, further assessment of options or further analysis of costs and benefits or advantages and disadvantages prior to making a decision on this matter.

d) Endorses the updated significant forecasting assumptions to be used in the development of the Long Term Plan 2031.

e) Notes that any new information arising that may impact the significant forecasting assumptions will be updated and presented to Council prior to the adoption of the Long Term Plan 2031.

Background

Long Term Plan

9 The Long Term Plan sets out Council's plan for the next 10 years. It's an opportunity to plan for the outcomes we want for our community, how these contribute to Councils strategic direction, the costs to achieve these outcomes, how they will be paid for and how we will measure our performance in achieving them.

10 Every three years Council reviews the Long Term Plan to ensure that the work Council undertakes is still relevant and accurate, and seeks feedback from residents, ratepayers and other stakeholders throughout this process.

Significant Forecasting Assumptions

11 Significant forecasting assumptions are the building blocks of the Long Term Plan strategies, policies and activity management plans and provide a baseline of 'assumptions' to develop plans for long term planning.

12 In preparing forecasts, both financial and non-financial, assumptions can address uncertainties of the future. This provides an understanding of the basis from which financial information has been prepared, a way to explain differences that will likely occur between actual results and what was forecast, and ensuring that risks and challenges faced by Council in the future have been appropriately identified and assessed.

13 The identified assumptions include the following strategic issues:

- demographics
- tourism
- climate change
- significant, unplanned adverse events
- environmental standards, resource consents and land use
- general economic growth trends
- level of service
- technology
- resource constraints

14 Throughout 2020, two key national issues have emerged and advice from SOLGM has resulted in two additional strategic issues being added to the assumptions. They are the three waters reforms and Covid-19. There is also a minor update to the climate change assumption to reflect changes through the LTP development process.

15 Additionally, there are a number of key financial assumptions.

16 The assumptions where compiled using a range of information from Business and Economic Research Limited (BERL) reports for the region, recent climate change reports (ie NIWA report for Southland), emergency management reports, regional development tourism information, national technology predictions, and inflationary increases on costs.

17 When drafting the proposed assumptions, staff have considered the methodology of prior Long Term Plan assumptions, guidance from SOLGM and the office of the auditor general along with discussions held with Council.

18 The full forecasting assumptions have been included with this report as Attachment A. Any changes from the version presented to Council in February 2020 are noted in red text (and discussed below). Any text highlighted in yellow has been updated since the version that was discussed at the committee workshop on 15 December 2020.

Issues

19 The significant forecasting assumptions have been created by staff using information from BERL regarding population projections for Southland, recent climate change reports for the area, the Water and Land Plan, and Emergency Management data for Southland.

20 Where the assumptions are financial in nature, the approach has been to keep a similar methodology as with the previous Long Term Plan where appropriate to ensure a level of consistency.

21 Where a financial assumption has a high level of uncertainty, information will be included in the table to quantify the financial impact of this once the Long Term Plan financial information has been finalised for the consultation document.

22 With population and land-use assumptions, these continue to be based on information on the BERL reports for the district. BERL used census data from 2013 as a baseline and projected this forward from 2013 to 2043 based on low, medium and high growth scenarios. There is a delay in Statistics NZ releasing updated census data which may impact the certainty of these projections.

23 Staff have assessed figures with 2018 census data released to date in population projections, and these remain consistent with BERL's initial projections.

24 The additional strategic assumptions have been prepared on advice received from SOLGM and have been highlighted as areas of focus for Audit NZ as part of their review process.

Level of Service

25 This assumption has been updated to reference to the recent announcements around the three waters reform, and the assumption that Council will continue to deliver these activities for the term of the plan. Accordingly, the level of uncertainty has increased from low to moderate.

Three Waters Reforms

26 This assumption has been added as the government and representatives of the local government sector (working through the Joint Central/Local Government Three Waters Steering Committee) continue to develop the policy framework for guiding the reform process. The proposed water reform is a high impact assumption for almost all territorial authorities, especially if the reforms result in assets being transferred to any new water service entities.

Covid-19

27 The Covid-19 pandemic has created a lot of change and economic uncertainty nationwide in the past year. In Southland district, Fiordland has been impacted most by the closure of New Zealand's borders as international tourists are its main source of income. The assumption has been derived on the basis that overall the Southland economy has coped reasonably well but our communities in high tourism areas such as Fiordland have been hit especially hard.

28 The following key financial assumptions have been amended in Attachment A from what was previously considered by Council as a result of new information once the draft LTP budgets were established, in conjunction with a review of other Councils' key financial assumptions.

Price Level Changes

29 BERL published their price level indices in October 2020. A table has been included as Appendix 1 of attachment A, outlining the inflation rates that Council are using for the various expenditure categories.

30 We note that as a result of the Covid-19 pandemic and its impact on the economy, BERL provided forecast cost adjustors for 3 scenarios:

1. stalled rebuild – where GDP and employment grow more slowly
2. mid scenario – considered to be likely outcome relevant to most regions of New Zealand
3. faster rebuild – where GDP and employment grow more rapidly

31 BERL provided detail of each of these scenarios and guidance to councils to assist them with deciding the most appropriate scenario costs adjustors, depending on their local economy. Factors considered in determining the appropriate scenario included:

- economy's overreliance on tourism/retail
- stable/sound infrastructure or planned significant infrastructure upgrades
- population age/growth
- proportion of employment in local and central government/knowledge-based employment/agriculture

32 Based on this guidance, Council staff consider the "mid-scenario" to be most the appropriate cost adjustors for the LTP 2031.

Cost Estimates

33 The initial assumption was that contract renewals in the ten-year period excluded any significant variations other than inflation. However, upon reviewing the budgets for the ten years, it has become apparent that there have been allowances made in the forecasts for increases in contract renewals in water, wastewater, waste management and community facilities.

- water and wastewater include an increase for the renewal of the operations and maintenance contract
- waste management includes an increase in the waste disposal costs, and an increase for the waste disposal contract
- community facilities have increased contract forecasts based on indicative pricing received via direct negotiations

34 The assumption has been amended to specify these exceptions.

Vested Assets

35 This is a new assumption which stipulates that Council are not forecasting any significant vested assets for the term of the plan.

Forestry Assets

36 This is a new assumption which outlines that Council plan to revalue their forestry assets annually and that the impact of operational results may impact rates requirements.

Emission Trading scheme

37 This assumption confirms the number and value of emission trading units Council has at 30 June 2020 and that it does not forecast a change in either over the 10-year period of the plan.

Investments in Other Entities

38 This assumption confirms that Council plan to retain its investment in the various other entities, joint ventures and associates and the only level of return forecast from these investments is a $20,000 annual dividend.

Funding of Future Replacement of Significant Assets

39 This assumption stipulates that Council are proposing to continue with the incremental phasing in of funding of depreciation for the following asset classes: roading, water, wastewater, council buildings, information technology, wheelie bins, public toilets and solid waste. 70% of

depreciation will be funded in 2021/2022, 80% in 2022/2023, 90% in 2023/2024 and 100% in the remaining years of the plan for all asset classes except water and wastewater.

40 Water and wastewater depreciation will be funded 65% in 2021/2022, 70% in 2022/2023, 75% in 2023/2024, 80% in 2024/2025, 85% in 2025/2026, 90% in 2026/2027, 95% in 2027/2028 and 100% in the remaining years of the plan.

Subsidies for Roading

41 On 25 August 2020, Waka Kotahi NZ Transport Agency advised that Council's level of financial assistance for roading will increase by 1% to 52% for the three years commencing 2021/2022. This level has been assumed for the duration of the plan and the assumption updated accordingly.

Sources of Funds

42 This new assumption recognises the risk that Council may not achieve its forecast level of funding from sources including fees and charges, grants, subsidies and borrowings, and the consequential impact that this may have on rates.

Return on Investment

43 This assumption has been developed on the basis that reserve funds will be invested externally and provide a net return of 4.4% per annum for the life of the plan. This rate was provided by an external investment advisor on the basis of a balanced managed fund, which proposes to spread the investment 50/50 in income and growth assets.

44 Interest received on investments will be allocated to interest on reserves and offset rates ($750,000 per annum).

45 Interest on reserves will be allocated at 4.4% on restricted reserves, and 2% on the strategic asset reserve and all local reserves. District reserves will not have interest allocated. Any surplus/shortfall in interest will be managed from the district operations reserve.

Interest Rate on Borrowing

46 Council have indicated a desire to move to borrowing from the Local Government Funding Agency (LGFA) in order to achieve a lower cost of debt. Staff anticipate that the necessary documentation and consultation will be complete by 1 July 2021 and therefore the assumption included for the LTP of 2%, is based on current LGFA long term fixed rates for up to 17 years (current maximum term). Staff note that there is volatility in this rate, however anticipate that this will be able to be managed by borrowing over various terms to achieve an overall average rate of 2%. Staff will keep a continual watch on the movements in the LGFA and notify Council if this assumption needs to change. It is important to note that the local community board rates have been discussed and set based on an interest rate of 2% on borrowings.

Local Government Funding Agency (LGFA) Guarantee

47 Further to the discussion above regarding Council's move to borrowing from LGFA, one of the requirements of the LGFA to achieve a lower interest rate is the provision of a guarantee. Council would guarantee the obligations of the LGFA and the other participating local authorities in the event of default. An assumption has been included to outline that Council do not anticipate any default and therefore have not included anything in its forecasts.

External Borrowing

48 Council's LTP has been developed on the basis that all external borrowing will be sourced from LGFA and taken out for a term beyond the LTP. The terms of LGFA borrowing is that it is interest only, therefore Council have planned to accumulate loan repayments in a restricted reserve until it is required to be repaid at the end of the loan term. As noted above currently the maximum LGFA term for borrowing is 17 years.

Legal and Statutory Requirements

49 Council is required to produce a Long Term Plan every three years in accordance with the Local Government Act 2002 (the act), and it must cover a period of not less than 10 financial years.

50 The significant forecasting assumptions are a legislative requirement. Part 17 of Schedule 10 in the Local Government Act 2002 states:

A long-term plan must clearly identify—

a. all the significant forecasting assumptions and risks underlying the financial estimates:
b. without limiting the generality of paragraph (a), the following assumptions on which the financial estimates are based:
   i. the assumptions of the local authority concerning the life cycle of significant assets; and
   ii. the assumptions of the local authority concerning sources of funds for the future replacement of significant assets:
c. in any case where significant forecasting assumptions involve a high level of uncertainty,—
   i. the fact of that uncertainty; and
   ii. an estimate of the potential effects of that uncertainty on the financial estimates provided.

Community Views

51 The information included in this report will be made publicly available on Council's website during the public consultation period as supporting documents to the draft consultation document. As a result of submissions received, Council may decide to amend any of the supporting information documents when it adopts the Long Term Plan in June 2021.

Costs and Funding

52 There are no direct cost or funding considerations related to the development of the significant forecasting assumptions outside of current allocated budgets.

Policy Implications

53 The significant forecasting assumptions create the building blocks that are used in the financial and infrastructure strategies.

54 Significant forecasting assumptions are also incorporated into the development of the activity management plans so that consistency is applied across Council in consideration to the future delivery of Council activities and how they will be managed. The activity management plans provide the levels of service and the key performance indicators for the Long Term Plan.

Analysis

Options Considered

55 There are three options to be considered in this report:

- option 1: recommend the updated significant forecasting assumptions be endorsed by the committee to be used in the Long Term Plan 2031
- option 2: recommend the updated significant forecasting assumptions be endorsed by the committee to be used in the Long Term Plan 2031 subject to amendments made by the committee
- option 3: do not endorse the significant forecasting assumptions as presented.

Analysis of Options

Option 1 – recommend the updated significant forecasting assumptions be endorsed by the committee to be used in the Long Term Plan 2031

Advantages	*Disadvantages*
• the development of key Long Term Plan strategies and policies will continue on track as identified within the project plan. • Council will be on track to meet its requirements under Section 10 part 17 of the LGA (2002)	• if the assumptions are endorsed by councillors and later amended, then this may result in late changes to the key strategies and activity management plans after they have been developed. This could result in late changes to the Long Term Plan and potentially impact the timeframe for adoption

Option 2 – recommend the updated significant forecasting assumptions be endorsed by the Committee to be used in the Long Term Plan 2031 subject to amendments made by the committee

Advantages	*Disadvantages*
• the committee would get the additional information before endorsing the assumptions. • Council will be on track to meet its requirements under Section 10 part 17 of the LGA (2002)	• depending on the variations to the assumptions, the development of the key Long Term Plan strategies and policies may be delayed while staff make the amendments to the assumptions.

Option 3 – do not endorse the significant forecasting assumptions as presented

Advantages	*Disadvantages*
• further discussion can occur prior to the assumptions being incorporated into the key strategies and policies.	• the development of the key Long Term Plan strategies and policies may be delayed until the committee determines the next steps for updating the significant forecasting assumptions. • staff will not be able to confidently progress the development of the Long Term Plan process without updated forecasted assumptions.

Assessment of Significance

56 Staff determine that endorsing the significant forecasting assumptions is not considered significant in relation to Council's Significance and Engagement Policy.

57 The implications of the significant forecasting assumptions will be significant to the public when they are incorporated into the Long Term Plan. Once the implications are considered and incorporated it will become part of the formal consultation for the Long Term Plan 2031 in March 2021.

Recommended Option

58 Staff recommend option 1, recommend the updated significant forecasting assumptions be endorsed by the committee to be used in the Long Term Plan 2031.

Next Steps

59 If the committee endorse the significant forecasting assumptions, staff will continue developing the Long Term Plan 2031.

60 The significant forecasting assumptions will be presented to Council in March 2021 as part of the Long Term Plan 2031 process and will be included in the supporting documentation for public consultation.

Attachments

A Draft Significant Forecasting Assumptions - February 2021 ⇩

Significant Forecasting Assumptions

Key Strategic Assumptions

'what' **strategic issue**	*'so what'* **Assumption for the LTP**	***Level of Uncertainty***	***Risk if the assumption is incorrect***	*'now what'* **Application in the LTP Strategies and Policies**
Demographics: • **population -** population growth affects the demand for Council's services and infrastructure, as well as the ability to cover the cost of services and infrastructure. • **ageing -** a significantly ageing population has implications for the viability and wellbeing of communities within the District. • **immigration -** The District's population is growing at a slower rate than New Zealand population as a whole is growing, which is partly due to the Southland District having a lower rate of	The estimated resident population of the District in 2017 was 30,300. This is projected to grow to 36,700 by 2043 (source: BERL Detailed Southland population projections). Te Anau and Winton will see the largest growth in total population between 2013 and 2043, with each township growing by between 400 and 500 people. Monowai, Nightcaps, Riversdale, Tokanui, and Otautau are projected to either maintain their 2013 population through to 2043 or see a small decline. The population projections show that between 2013 and 2043 all townships will see an increase in people aged over 65. In addition, a number of townships will see a decline in those aged under 15 and people aged 15 to 64 years of age. There is projected to be a significant tightening of the labour market between 2018 and 2033, to a point where demand for labour demand exceeds the entire population aged from 15 to 64 years old (BERL Stage 3	Very low	**LOW** The population growth rate may be significantly different than that assumed. Proportion of the population over 65 of age may vary from the prediction. Economic growth in the District may be held back due to labour shortages.	

R/21/2/5200

'what' strategic issue	'so what' Assumption for the LTP	Level of Uncertainty	Risk if the assumption is incorrect	'now what' Application in the LTP Strategies and Policies
international immigration.	report). The rate of volunteering is also expected to decrease.			
Tourism Provision of appropriate visitor infrastructure and increase range of tourism related opportunities.	There will increased impacts on services such as libraries and public toilets which can be met within the scope of the planned infrastructure upgrades within this LTP. Alternatively, environmental quality and the visitor experience in parts of the District declines due to lack of appropriate infrastructure. Whilst Milford Sound is one of NZ's most important attractions, currently the local economy does not harness the full potential from the flow of visitors to this location. Visitor numbers to Milford Sound have almost doubled in the past 5 years from 556,000 in 2014 to 932,000 in 2018. The assumption is that these numbers will continue to increase. The increase in visitors to Stewart Island/Rakiura will put corresponding pressure on jetties and infrastructure on the Island. The ongoing impact of Covid-19 on tourism has created significant uncertainty in the sector and the wider business sector as whole. The biggest impact will be as a result of the border closure effectively ceasing international tourism overnight. Given the	High	**MEDIUM** There may be a need to accelerate infrastructure upgrades.	*Continuing support for regional development initiatives.*

R/21/2/5200

'what' **strategic issue**	*'so what'* **Assumption for the LTP**	***Level of Uncertainty***	***Risk if the assumption is incorrect***	*'now what'* **Application in the LTP Strategies and Policies**
	global impact of Covid-19 this may be in place for some time to come.			
Climate change Planning may not adequately account for climate change impacts.	Sea level rise progressively impacts low lying coastal areas affecting ecology and settlements. Water availability in some areas becomes scarce, extreme weather events are larger and more frequent, communities become more resilient to climate change. Transition to a low carbon future Changes and associated impacts such as risk based insurance will influence investment in built development (ie. coastal and flood plain development) and types of farming. Climate change will have a significant impact on the coastal settlements within Southland District. It is known that areas of Colac Bay, Orepuki, Fortrose and Stewart Island/Rakiura are subject to coastal processes that are causing erosion resulting in loss of land and council roading infrastructure. Sea level rise is expected to be between 0.2-0.3 m above present levels by 2040 and increasing to 0.4-0.9 m by 2090. The projected Southland temperature changes increase with time and emission scenario. Future annual average warming spans a wide range: 0.5-1°C by 2040, and 0.7-3°C by 2090.	Low	**MEDIUM** A 2018 NIWA report projects increases for all of Southland in sea level, temperature, overall precipitation and the frequency of dry days. There is an increasing likelihood of sea surge, coastal inundation, drought and large severe weather events.	*Update with what Council is doing in the short term and through the LTP* *LIDAR flights are currently being undertaken and is expected to be completed within 12 months depending on weather. Once the data outlined above has been captured, LIDAR modelling will be undertaken to enable the flood modelling to be run.* *There is proposed funding outlined in the LTP for a specific role within the Policy Planning team to lead the next stage of our climate change analysis.*

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'what' strategic issue	'so what' Assumption for the LTP	Level of Uncertainty	Risk if the assumption is incorrect	'now what' Application in the LTP Strategies and Policies
	Floods are expected to become larger across the District. The central-northern part of the Southland Region is projected to experience the largest increases in drought. The occurrence of heat waves will double by 2040.			
Significant, unplanned adverse events Significant earthquakes, flooding, tsunami and other hazards outside of expected risk assessments. Assume that none of these events will occur but we need to be prepared.	Borrowing 'headroom' to fund Council's share of a rebuild in relation to a 'maximum probable loss' scenario is provided for within Council's Financial Strategy. There will be community disruption and displacement as well as localised infrastructure and facilities damage. The next severe earthquake on the Alpine Fault is likely to occur within the lifetime of most of us or our children. We are assuming that it will not occur within the ten years covered by this LTP. Under almost every climate change scenario, storms and therefore flooding will become more frequent and intense and communities will feel the effects more regularly and intensively. It is assumed that these events can be managed within current budgets.	Low	**HIGH** Work to date has shown that a major alpine fault movement would have significant consequences for Southland communities and district infrastructure. Other than planning around the initial response phase no other planning has been undertaken to assess the potential impact on council infrastructure	*All of these natural disasters highlight the importance of robust emergency management systems and Business Continuity Planning (BCP). These include:* *-Alpine Fault Magnitude 8; a South Island wide project to save lives by planning and preparing a coordinated response across the South Island after a severe earthquake on the Alpine Fault.* *-Environment Southland's flood warning system and Group Tsunami Plan* *- Emergency Management Southland*

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'what' **strategic issue**	*'so what'* **Assumption for the LTP**	***Level of Uncertainty***	***Risk if the assumption is incorrect***	*'now what'* **Application in the LTP Strategies and Policies**
				Any new development should be undertaken with a view to mitigating exposure to natural disasters.
Environmental standards, resource consents and land use Council may be required to undertake significant capital works in relation to drinking, stormwater and wastewater.	Changing delivery models and increasing standards impacts Council's regulatory, monitoring and infrastructure requirements. This poses uncertainty to service delivery in this area. There will be a change to the regulatory standards for drinking water and a new regulatory agency has been fomed Allowance has been made for meeting the expected new standards. It is assumed that Council will continue to be responsible for the delivery of its existing range of water, wastewater and stormwater services. The Proposed Water and Land Plan for Southland and the Freshwater National Policy Statement will have a continuing impact on the regulatory environment for agricultural land use. This may alter the way that investment decisions are made and therefore the land use changes that will occur. Land use changes as a result of climate change (e.g. flood plain zone changes). The amendment to the Climate Change Response (Zero Carbon) Bill may alter the delivery of Council activities. This may	Low	**LOW** Highly likely to be large scale changes to national requirements and how drinking, storm and waste water are managed.	*New and revised consenting requirements set by Land and Water Plan are reflected in the proposed works programme. Council will continue to work closely with ES and other relevant agencies that may be formed in the future.* *Asset management plans are updated.*

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'what' **strategic issue**	*'so what'* **Assumption for the LTP**	***Level of Uncertainty***	***Risk if the assumption is incorrect***	*'now what'* **Application in the LTP Strategies and Policies**
	impact land use and transport across the District.			
General economic growth trends Long term economic growth may not continue to be consistent with trends. Potential for significant downturn in global dairy prices as well as other primary sector goods. Changes to the primary sector occurring at a faster rate than businesses in the District (automation, niche products, synthetic alternatives to meat and milk products, etc).	The economy maintains current prospects. The median personal income in the Southland District is growing at a faster rate than the median income across NZ. There is an enduring trend that local businesses in the District hire smaller numbers of people (compared the rest of New Zealand). Home ownership rates in the District are falling. Half of the businesses operating in Southland District are in the primary sector. 98% of these primary sector businesses operate in the industries of agriculture or forestry (BERL – Compendium Report 2018). BERL estimate that 18.3% of total employment (measured in Full-time Equivalents) in the District is in dairy farming.	Moderate	**LOW** If there is a persistent downturn in economic prospects may mean the District is not able to sustain continued growth in income. Ratepayers are unable or unwilling to support maintaining Council levels of service. Dependency on primary sector and dairy farming in particular makes some communities vulnerable to a decline in global dairy prices or a major livestock disease outbreak. It is unlikely that there will be major changes in current land use patterns and economic activity across the district as a whole which will lead to significant change in	

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'what' **strategic issue**	*'so what'* **Assumption for the LTP**	***Level of Uncertainty***	***Risk if the assumption is incorrect***	*'now what'* **Application in the LTP Strategies and Policies**
			demand for current Council services.	
Level of service New/amended legislation or government policy comes into force that has a significant impact on Council to respond or impact on cost to administer by Council; or results in a change to the services delivered by the Council.	It is assumed there will be no major legislative changes or change in government policy that will significantly impact Council aside from the legislative changes identified under the Environmental Standards, Resource Consents and Land Use assumption. Given the recent three waters reform announcements, this plan assumes the delivery of the three waters activities will remain with Council at the same level of service as currently provided.	Moderate	**MEDIUM** Legislative or government policy changes are expected to have a medium effect on Council's finances and/or levels of service.	
Technology Changes in technology will impact the delivery of our key activities.	It is assumed there will be increased access to fibre connectivity will mean more use of online digital services. There may be less demand for face-to-face customer service as technology provide alternative methods for answering questions and resolving issues. It is assumed automated technology and artificial intelligence alters the way that council delivers its service. Chorus will have rolled out full internet connectivity throughout the district by the end of 2021.	Low	**LOW** There is a low consequence due to council being able to react to changes prior to them negatively impacting levels of service or customer expectations.	
Resource Constraints Ability to find procure contractors and resources will	It is assumed that due to increased work across the district (e.g. Invercargill city centre development, Dunedin Hospital build, etc)	Moderate	**MEDIUM** Resource constraints may disrupt delivery of	

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'what' strategic issue	'so what' Assumption for the LTP	Level of Uncertainty	Risk if the assumption is incorrect	'now what' Application in the LTP Strategies and Policies
be diminished due to other work underway across the district. 40% of the Southland District Council workforce are born between 1943 and 1966 and are likely to retire in the next 10 years. This may result in the loss of staff resource and knowledge to deliver projects.	there will be a shortage of workers and resources across the lower South Island. The retirement of the ageing workforce of Southland District Council will impact the delivery of the LTP work programme.		the Long Term Plan work programme and meeting the established levels of service.	
Three Waters Reforms In July 2020 the government released its three waters reform, a three-year programme to change the way drinking water, wastewater and stormwater are delivered to improve public health, environmental and economic outcomes.	An overarching regulator, Taumata Arowai, will oversee the sector, and is proposing a small number of larger regional entities providing these services rather than the 67 individual councils that currently do. At the same time, a multi-million-dollar stimulus funding package was announced to maintain and improve three waters infrastructure and support the introduction of the reform programme. Funding has been given to councils that agreed to participate in the programme's first stage, including Southland District Council. Our share is being used to carry out pipe replacement and improve treatment across the District as well as carry out condition assessments of sewerage and stormwater assets. There is still a lot of information to come about what the reforms mean for Southland	High	Low By assuming that Council will continue to manage the assets over the life of this plan, any changes is how these services are provided in the medium to long term are minimised by this assumption.	*The community will need three waters services whether the council delivers them or not. These activities are reflected in the financial; strategy and the infrastructure strategy and other information that is included in the CD and supporting information. The purpose of this is to present the community with as a complete and accurate a set of information on the medium-term and long-term.*

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'what' **strategic issue**	*'so what'* **Assumption for the LTP**	***Level of Uncertainty***	***Risk if the assumption is incorrect***	*'now what'* **Application in the LTP Strategies and Policies**
	before we have to decide whether to opt in or out of the process later this year. It is assumed that the council will deliver these services over the life of the LTP.			
Covid-19 The Covid-19 pandemic has created a lot of change and economic uncertainty nationwide in the past year. In Southland District, Fiordland has been impacted most by the closure of New Zealand's borders as international tourists are its main source of income. This affects more than just tourism businesses – it has brought financial hardship to the whole community. Domestic visitors have had a cushioning effect on other destinations such as Stewart Island/Rakiura and the Catlins.	The Southland economy has weathered the storm relatively well because of its base of food production. It is assumed that this should continue as long as international exports continue and we're able to receive imported components like pipes for our own capital works. Given that much of this plan is about investing in infrastructure to maintain our services over the long term, that work still needs to progress despite Covid-19.	High	**Moderate** Council may need to prioritise works should economic conditions worsen and affect your capacity to pay rates.	*Council is consulting over changes to its rates remission and postponement policy to have greater flexibility to provide relief from rates during unexpected events.*

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Key Financial Assumptions

Financial issue/risk	Assumption for the LTP	Level of Uncertainty	Risk if the assumption is incorrect
Price level changes Inflation may vary significantly than that allowed for in the Long Term Plan.	Inflation is included using projections prepared by Business and Economic Research Limited (BERL), which are based on October 2020 published values, as summarised in Appendix 1.	Low	**MEDIUM** Inflation is affected by external economic factors and therefore actual inflation increases will vary from those used in developing this plan. The result of any variation (up or down) will result in a higher or lower rates requirement, and may therefore also impact on the levels of service, particularly in relation to roading, water, wastewater and stormwater.
Cost estimates Cost of operating and maintenance contracts as well as major capital works costs may vary significantly from costs estimated in this plan	When contracts are renewed there are no significant variations allowed for and any annual cost adjustment is in line with the relevant BERL inflation percentage, except for the specific matters listed below: Water – based on inflation, except for a potential increase in the renewal of the operations and maintenance contract. Wastewater – based on inflation, except for a potential increase in the renewal of the operations and maintenance contract as well as additional allowance for any new/upgraded schemes (Te Anau and Winton).	Low	**MEDIUM** Greater than anticipated cost increases, especially in construction, capital works and contracting rates, increase the overall cost of the capital and maintenance programs, in turn having an impact on debt servicing costs and rates.

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Financial issue/risk	Assumption for the LTP	Level of Uncertainty	Risk if the assumption is incorrect
	Waste management - based on inflation, except for a potential increase in waste disposal costs to recover waste disposal levy increases, as well as a potential increase for the waste disposal contract. Community facilities – mowing and other contract increases are based on approved contracts. Where new contracts are not currently in place at September 2020, the prices received through the direct negotiation process have been used which include a level of increase in addition to inflation.		
Useful lives of significant assets The useful life of assets determines when an asset is expected to be renewed and the calculation of depreciation. This will impact on the timing of replacements and the amount of rates collected for funding depreciations.	That the useful life of significant assets will be the same as set out in the accounting policies of Council.	High	**MEDIUM** The timing of renewal projects is inaccurate and will need to be completed earlier/later as required. This will change the timing of funding requirement as shown in Council's revenue and financing policy (including rates). The amount of depreciation being inaccurate will impact on either over/under collecting rates in the relevant years due to the funding of depreciation. The financial impact of a 1% change in depreciation would result in a change in depreciation of $272,126 in 2021/2022 to $382,440 in 2030/2031.

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Financial issue/risk	Assumption for the LTP	*Level of Uncertainty*	*Risk if the assumption is incorrect*
Vested assets Vested assets are assets that are gifted/donated to Council and as a result associated operating costs and future asset replacement costs become the responsibility of Council.	No significant vested assets are forecast across the 10 years of this plan.	Moderate	**MEDIUM** The level of vested assets fluctuates from year to year and is unpredictable. Historical levels have not been material. The recognition of vested assets is non-cash in nature and therefore have no effect on rates. However receipt of any vested assets will increase depreciation and operating costs in future years and therefore may also result in additional rates.
Infrastructural asset revaluation Asset revaluation may be higher or lower than estimated.	In the LTP, Council has revalued its significant infrastructural assets on a yearly basis in line with the relevant BERL inflation rate taking into account planned additions.	Very high	**HIGH** If price level changes are greater or lesser, depreciation and the funding of depreciation, could be under or overstated.high (virtually certain to be wrong). The financial impact of a 1% change in the water depreciation would result in a change in depreciation of $18,719 in 2021/2022 to $27,380 in 2030/2031. The financial impact of a 1% change in the wastewater depreciation would result in a change in depreciation of $27,065 in 2021/2022 to $44,431 in 2030/2031. The financial impact of a 1% change in the roading depreciation would result in a change in depreciation of $194,134 in 2021/2022 to $263,356 in 2030/2031.
Forestry assets Fluctuations in the forestry asset revaluation and returns.	Council has forecast the revaluation of forestry assets and operating results on a yearly basis taking into account planned harvesting and replanting.	Moderate	**MEDIUM** The recognition of forestry assets is non-cash in nature and therefore has no effect on rates.

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Financial issue/risk	Assumption for the LTP	Level of Uncertainty	Risk if the assumption is incorrect
			However fluctuations in operating results may impact rates.
Emission Trading Scheme Fluctuation in the value of Council's investment in emission trading units.	Council will retain its investment in the Emission Trading Scheme (105,632 units) at a value of $32.10 per unit across the 10 years of the plan.	Moderate	**LOW** Emission trading unit holdings and value increases/decreases over the life of the plan. This movement is a non-cash impact and therefore no impact on rates.
Investments in other entities Fluctuation in the value of Council's investment in other entities, joint ventures and associates. This includes Milford Sound Tourism Ltd, Civic Assurance, WasteNet, Southland Regional Development Agency, Emergency Management Southland and Southland Regional Heritage Committee.	Council will retain its investment in these entities and associates at the current level and will assume an annual dividend across the 10 years of the plan where there is a history of dividends. No income from associates is forecast.	Moderate	**LOW** Investment value increases/decreases over the life of the plan. This movement is a non-cash impact and therefore no impact on rates. If dividends received differ from forecast this may either impact rates.
Funding of future replacement of significant assets Due to the large amount of ageing infrastructure, funding renewals through reserves or loans is inconsistent with good practice. In the 2015-2025 LTP Council commenced a phasing in depreciation funding to build up funds for replacement of assets whilst maintaining affordable rates increases.	We have assumed that Council will continue to incrementally increase funding depreciation of the following assets classes: roading, water, wastewater, council buildings, information technology, wheelie bins, public toilets and solid waste. Funding depreciation of these activities (except water and wastewater) will be phased over the next 10 years as follows: 2021/2022 70% 2022/2023 80%	Low	**MEDIUM** The level of depreciation being funded is inaccurate and will result in either over/under collecting rates in the relevant years. Additionally any shortfalls will need to be funded by other sources (such as rates, reserves or loans) which may also result in additional rates.

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Financial issue/risk	Assumption for the LTP	Level of Uncertainty	Risk if the assumption is incorrect
	2023/2024 90% 2024/2025 onwards 100% Funding depreciation of water and wastewater activities will be phased over the next 10 years as follows: 2021/2022 65% 2022/2023 70% 2023/2024 75% 2024/2025 80% 2025/2026 85% 2026/2027 90% 2027/2028 95% 2028/2029 onwards 100% Motor vehicles and SIESA assets are funded 100% for the 10 years of the plan.		
Subsidies for roading Sufficient funds may not be available to pay for the planned capital projects and operational/maintenance costs.	It is assumed that Waka Kotahi NZ Transport Agency (NZTA) will meet our requested funding requirements on a 3 yearly cycle. It is assumed that the level of financial assistance received from NZTA will be 52% for the period of the LTP. Funding assistance for large capital transport works would be achieved on a case by case basis with NZTA. NZTA funding will be awarded for 3 year periods and that the following 7	Very low	**LOW** There is a risk that sufficient funds will not be available to pay for the planned capital projects. For example, because the community considers that required rates are not affordable.

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Financial issue/risk	Assumption for the LTP	Level of Uncertainty	Risk if the assumption is incorrect
	years will be funded in a similar manner.		
Sources of funds That sources of funds are not achievable.	Sources of funds (being user fees/charges, grants, subsidies and borrowings) for both operating and capital expenditure are obtained in accordance with the Revenue and Financing Policy.	Low	**MEDIUM** If revenue sources are not achievable, the levels of service may be reduced or an alternate funding source required. Alternate funding sources may result in additional rates.
Return on investment/reserves Return on investments may vary from the amount included in the ten year plan.	Return on financial investments has been calculated at 5.5% per annum, for funds invested externally for the life of the plan. This is on the basis of a balanced managed fund with approximately 50/50 investment in income and growth assets. Fund administration costs associated with these investments are calculated at 1.10% per annum and are deducted from the fund capital. The first $750,000 of return on investments is used to offset rates requirements. Interest on reserves is allocated as follows: Restricted reserves 4.4% per annum Local reserves 2.0% per annum Strategic asset reserve 2.0%	Moderate	**MEDIUM** A decrease in investment interest rates may require Council to collect more rates to cover the shortfall of interest used to offset rates.

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Financial issue/risk	*Assumption for the LTP*	*Level of Uncertainty*	*Risk if the assumption is incorrect*
Interest rates on borrowing The interest rates paid on borrowing will vary over the 10 year period.	Interest on new and existing internal and external borrowings is allowed for at 2.0% per annum over the term of the borrowing.	Moderate	**MEDIUM** An increase in interest rates may require Council to collect more rates to cover the additional interest payments.
Local Government Funding Agency (LGFA) Guarantee Each of the shareholders of the LGFA is a party to a Deed of Guarantee, whereby the parties to the deed guarantee the obligations of the LGFA and the guarantee obligations of the other participating local authorities to the LGFA, in the event of default.	Council believe that the risk of the guarantee being called on and any financial loss arising from the guarantee is low and therefore nothing has been included in the forecasts for the term of the plan.	Low	**LOW** In the event of a default, Council will be required to pay a proportion of the amount owing. The proportion to be paid by each respective guarantor is set in relation to each guarantors' relative rates income.
External borrowing All external borrowing will be sourced from LGFA.	The borrowings are interest only. Repayments collected from rates will be held in a restricted reserve until the end of the loan term. The term of all borrowings are planned to exceed the term of the LTP.	Low	**Medium** In the event that Council are unable to borrow from LGFA, Council may be required to borrow from other external lenders with the risk of higher interest rates and different repayment terms.

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	Uncertainty Description	Description	Likelihood of the risk occurring if the assumption is incorrect
Assumption	Very high uncertainty	A very low level of information/confidence in the assumption	Highly likely
	High uncertainty	A poor level of information/confidence in the assumption	Likely
	Moderate uncertainty	A moderate level of information/confidence in the assumption	Possible
	Low uncertainty	A good level of information/confidence in the assumption	Unlikely
	Very low uncertainty	A very good level of information/confidence in the assumption	Rare

Likelihood	**Consequence**				
	Insignificant	**Minor**	**Moderate**	**Major**	**Catastrophic**
Highly likely	Low	Medium	High	Very High	Very High
Likely	Low	Medium	High	Very High	Very High
Possible	Low	Medium	Medium	High	Very High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

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Risk thresholds

	Insignificant	Minor	Moderate	Major	Catastrophic
Strategic	No significant adverse public comment No impact on achievement of LTP objectives Key stakeholder relationships unaffected	Adverse comment in local or social media Letters to CEO, complaints to Crs May slow achievement of LTP objectives Minor impact on key stakeholder relationships	National media coverage Will impact achievement of one or more LTP objectives Negative impact on key stakeholder relationships	National media coverage 2-3 days Will significantly impact the achievement of multiple LTP objectives Significant impact on multiple key stakeholder relationships	Coverage in national media 3+ days Commission of Inquiry/ Parliamentary questions Stakeholder relations irreparably damaged Cannot deliver on most LTP objectives
Operational	No loss of operational capability Minimal change to service levels Minimal loss of internal capacity	Loss of operational capability in some areas Some disruption to service levels Internal capacity lost for up to 1 week	Serious loss of operational capability for over 6 weeks and/or Disruption to service levels for 4-6 weeks Loss of internal capacity 1-3 weeks	Serious loss of operational capability for over 8 weeks and major disruption to service levels and/or Loss of internal capacity 4-6 weeks	Serious loss of operational capability for 3-4 mths and serious disruption to service levels and Loss of internal capacity for more than 6 weeks
Financial	No impact on financial targets	Up to 1% impact on financial targets	Up to 5% impact on financial targets	Up to 10% impact on financial targets	More than 10% impact on financial targets

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Appendix 1: BERL inflation rates for Long Term Plan 2031

Year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31
Property maintenance	2.90%	2.50%	2.50%	2.50%	2.50%	2.60%	2.70%	2.70%	2.60%
Roading	3.10%	3.00%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%
Property capital	3.00%	2.60%	2.60%	2.70%	2.60%	2.80%	2.80%	2.90%	2.70%
Energy	2.90%	2.50%	2.50%	2.50%	2.50%	2.60%	2.70%	2.70%	2.60%
Water	3.50%	2.60%	2.70%	2.90%	2.80%	3.20%	3.30%	3.40%	3.10%
Other	2.90%	2.50%	2.50%	2.60%	2.50%	2.60%	2.70%	2.70%	2.60%
Staff costs	2.40%	1.50%	1.70%	2.00%	2.20%	2.30%	2.40%	2.60%	2.70%

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Draft Activity Management Plans (AMPs) 2021-2031

Record No: R/21/2/5199
Author: Jason Domigan, Corporate Performance Lead
Approved by: Rex Capil, Group Manager Community and Futures

☐ Decision ☒ Recommendation ☐ Information

Purpose

1 This report seeks the Finance and Assurance Committee's endorsement to release the key activity management plans which underpin the Long Term Plan 2021-2031 to Audit NZ.

Executive Summary

2 Activity managers have been preparing draft activity management plans (AMPs). These documents are designed to inform and summarise the activity information, forecasts and underlying information being prepared for the Long Term Plan 2021-2031 (LTP).

3 The AMPs for all 13 Council activities will be presented to Council for confirmation at its meeting in March 2021. The Finance and Assurance Committee are asked to review the Transport, Water Supply, Wastewater and Stormwater AMPs ahead of them being reviewed by Audit NZ.

4 While the AMPs are presented, they will not be finalised until the LTP is adopted in June 2021. As such, the AMPs will continue to be updated to remain in line with future decisions Council makes regarding the LTP both ahead of the adoption of the LTP Consultation Document in March and as a result of the LTP consultation, hearings and deliberations process.

Recommendation

That the Finance and Assurance Committee:

a) Receives the report titled "Draft Activity Management Plans (AMPs) 2021-2031" dated 10 February 2021.

b) Determines that this matter or decision be recognised as not significant in terms of Section 76 of the Local Government Act 2002.

c) Determines that it has complied with the decision-making provisions of the Local Government Act 2002 to the extent necessary in relation to this decision; and in accordance with Section 79 of the act determines that it does not require further information, further assessment of options or further analysis of costs and benefits or advantages and disadvantages prior to making a decision on this matter.

d) Endorse the release of the Transport, Wastewater, Water Supply, and Stormwater Activity Management Plans to Audit NZ which underpin the Long Term Plan 2021-2031.

Background

5 Activity managers have prepared draft activity management plans as supporting documents that underpin the LTP. These plans take into account the revised strategic framework and activity groups confirmed by Council in 2020, as well as additional knowledge about the activities and operating environment that has been gained since the 2018 versions were developed for the current LTP.

6 The AMPs also consider discussions held with Councillors during workshops over the past six months. Many of the projects and budgets forming part of the activity management plans were discussed with the Community Boards and Water Supply Subcommittees at their direction setting meetings held in November and December 2020. As a result of these meetings, some amendments were made to the AMPs and associated budgets.

7 While the Finance and Assurance Committee is being asked to review the activity management plans today, these continue to be living documents and will need to be updated to reflect any future decisions Council makes regarding the LTP. The primary audience for each AMP is the activity manager and their staff.

8 Where any sections of the AMPs are yet to be finalised (e.g. confirmed levels of services and key performance indicators), this has been indicated in the AMP document.

9 These versions of the plans will be used to inform the Consultation Document for the draft LTP and will be reviewed by Audit NZ as part of their audit of the underlying information informing the LTP.

10 The following activity management plans are circulated with this report as they are the key AMPS of focus for Audit NZ in carrying out their review.

- transport activity management plan
- water supply activity management plan
- wastewater activity management plan
- stormwater activity management plan

The remaining AMPs are being finalised and will be presented to Council in March 2021.

Issues

11 Each AMP outlines the key issues related to the activity in the "Key Issues" section. The AMPs underpin the future planning for Council's various activities for the next ten years.

12 Any changes to the information resulting from Council's finalisation of the draft LTP over the coming months will be updated in the AMPs prior to the release of the LTP Consultation Document and again as part of the adoption of the final LTP in June 2021.

13 As such the documents are not final until the final LTP has been adopted.

14 The following provides a brief summary of the key issues explained in more detail in the AMPs.

Transport (Attachment A)

15 Councils key issue is the impact its ageing road and bridge infrastructure is having on access, safety and economic growth. As a rural Council, the transport network is vital to economic growth and connectivity.

16 Posted bridges are constraining appropriate access which is increasing road safety risk and inhibiting and reducing economic productivity.

17 Increasing number of seal layers is leading to smooth and unsafe roads resulting in increasing investment to maintain safe levels of service.

Water Supply (Attachment B)

18 The key issues relating to the water supply AMP are:

- fluoridation of water supplies
- strategic direction / industry management
- ongoing contractual arrangements
- regulatory requirements
- incomplete asset data knowledge
- ageing infrastructure
- impacts of climate change

Waste Water (Attachment C)

19 The key issues relating to the waste water AMP are:

- proposed Water and Land Plan for Southland
- upcoming capital work in declining communities
- ageing infrastructure
- impacts of climate change
- strategic direction
- incomplete asset data knowledge

Stormwater (Attachment D)

20 The key issues relating to the stormwater AMP are:

- compliance with requirements of discharge consents
- understanding the implications of the Proposed Land and Water Plan for Southland
- impacts of climate change
- ageing infrastructure
- ongoing funding and affordability of the activity
- strategic direction
- incomplete asset data knowledge
- stormwater discharge quality

Factors to Consider

Legal and Statutory Requirements

21 It is not a legal requirement for Council to formally adopt the AMPs. However, the plans help to inform how the LTP is prepared and in particular, provide additional detail about how the Council has developed its LTP for the activity and associated financial forecasts.

22 Certain sections of the Local Government Act 2002 also have a strong link to the forecasts in the AMPs around statements of service provision, capital expenditure (renewals, levels of service, demand) and assumptions.

Community Views

23 No specific community consultation has been carried out in preparing the AMPs. Community boards and water supply committees have been involved in the development process through their direction setting meetings in November 2020. The documents have been prepared using the information that staff already have about community expectations and past consultation.

24 The community will be able to review and comment on the AMPs as a supporting document for the LTP Consultation Document. Any feedback on these documents as a result will be considered as part of the consultation process with any changes to the AMPs to be made as part of the adoption of the final LTP in June 2021.

Costs and Funding

25 The AMPs contain details of the financial information related to the activities for the next ten years. This information has been used in preparing budgets for the LTP which Council has considering through the LTP budget process. Any changes to budgets made as part of the LTP will need to be updated in the AMPs prior to adoption of the LTP Consultation Document in March and final LTP in June 2021.

Policy Implications

26 There are no specific policy implications of the AMPs. Any policies affected by the AMPs will be approved by Council as part of the LTP decision-making process.

Analysis

Options Considered

27 Option 1 – review the activity management plans and release to Audit NZ.

28 Option 2 – do not release the Activity management plans to audit.

Analysis of Options

Option 1 – Review the activity management plans and release to Audit NZ.

Advantages	*Disadvantages*
• The documents can be used to support the Consultation Document and LTP activity information • The documents can be used to assist Audit NZ to assess the quality of the information and assumptions underlying the forecast information in the Consultation Document and LTP	• None identified

Option 2 – Do not release the Activity management plans to audit.

Advantages	*Disadvantages*
• Allow staff to focus on the preparation of the LTP Consultation Document	• The documents would not be available to interested parties to help them find more detail about the activity and how the LTP forecasts have been prepared. • Audit NZ may be unable to fully report on the quality of the information and assumptions underlying the forecast information in the Consultation Document and LTP

Assessment of Significance

29 While the AMPs contain matters with a high degree of importance under the Council's Significance and Engagement Policy, all these matters will be consulted on through the LTP consultation process in 2021.

Recommended Option

30 That the Council review the activity management plans (attached to this report) and release to Audit NZ.

Next Steps

31 The AMPs will be provided to the auditors as part of their audit process for the LTP.

32 Any changes resulting from the finalisation of budgets and/or performance framework will be updated in the AMPs prior to Council's adoption of the Consultation Document in March 2021.

33 Any changes resulting from the consultation process for the LTP will be updated in the AMPs in June 2021.

Attachments

A	Draft Transport AMP as at 15 February 2021 ⇩
B	Draft Water Supply AMP as at 15 February 2021 ⇩
C	Draft Wastewater AMP as at 15 February 2021 ⇩
D	Draft Stormwater AMP as at 15 February 2021 ⇩

SOUTHLAND DISTRICT COUNCIL

Transport

2021-2031 Activity Management Plan

Southland District Council
Te Rohe Pōtae o Murihiku

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Table of Contents

Quality Assurance Statement

Draft AMP Template			
Southland District Council	Version:	1	Record No:
15 Forth Street	Status:	Draft	
Invercargill 9840	Project Manager:		
Telephone	Prepared By:	Roy Clearwater	
0800 732 732	Reviewed By:	Hartley Hare	
Fax	Approved for issue:		
0800 732 329			

Executive Summary

The Services Provided – What we do

The Council is the Road Controlling Authority (RCA) under the Local Government Act 1974, with responsibility for all local roads in the Southland District Council area. The Activity Management Plan identifies strategic issues, risk and the need for the necessary investment.

This plan has been developed to align with the Council's Roading Policy, the Regional Land Transport Plan, and Government Policy Statement on Land Transport. It is based on the best available knowledge and information at the time of writing the plan.

Council's transport network includes roads, streets, footpaths, and bridges across the District, except State Highways, which are owned and managed by Waka Kotahi New Zealand Transport Agency (Waka Kotahi) and National Parks roads, which are owned and managed by the Department of Conservation.

In addition to road transport, Council as part of it's transport activity also manages Around The Mountain Cycle trail and the Te Anau Manapouri Airport as part of its transport activity.

Population Served (2017 Estimate)	**30,300**
Length of Roads:	
Sealed (km)	1,991
Unsealed (km)	2,978
Total (km)	4,969
Footpaths (km)	210
Bridges (no) Including cycle way bridges	882
Stock Underpasses (no.)	239
Street lights (no.)	2,739
Estimated distance travelled on the network each year (million km)	286
Book Value 2019/2020 ($M) including land value	1,808

Table 0-1: Key Network Statistics as at September 2020.

Table 0-1 provides and overview of the districts key transport infrastructure.

What We Aim To Achieve

The transport infrastructure and services are there to facilitate transportation movement for all modes of transport across the district and within communities. Services can be as simple as cleaning signs to undertaking full road or bridge reconstruction in order to maintain road user safety, access and economic growth. Section 7 covers the work undertaken and services provided in more detail.

Table 0-2 below presents the performance management framework for the activity. Council continually focuses on optimising asset maintenance and performance to appropriate levels of services which provide the best value outcome for its customers. Council will continue to seek improvements in the efficiency and effectiveness of programming and managing maintenance and renewal activities on the network, as well as controlling the use of the network to minimise undue damage to it. Council also intends to increase investment in critical asset renewals such as bridges, along with increasing the emphasis on safety to ensure it is high profile in all activities to help achieve the goal of a 40% reduction in death and serious injuries by 2030.

Council will continue to compare current Levels of Service (Table 4.4) with Road Efficiency Groups, One Network Roading Classification (ONRC) Performance Measures Tool over the 2021-2031 period, and evaluate any gaps between current Levels of Service and the ONRC measures. During the 2021-24 period Council is planning on transition to the One Network Framework which is the next iteration of the ONRC.

How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 24-31)**
TRANSPORT: What LoS we provide	**LoS 19: Our transport network provides for safe, comfortable and efficient travel**				
KPI 16.1: Condition of the sealed road network – The average quality of ride on sealed local road network measured by smooth travel exposure	99%	Smooth Travel Exposure[1] ≥ 97%	Smooth Travel Exposure ≥ 97%	Smooth Travel Exposure[1] ≥ 97%	Smooth Travel Exposure[1] ≥ 95%
KPI 16.2: Percentage of gravel road tests where road roughness[3] meets acceptable standards	88%	≥85%	≥85%	≥85%	≥85%
KPI 16.3: Maintenance of a sealed road network – The percentage of sealed local road network that is resurfaced	6.92%	6.5% (equates to ≥870,000 m^2 per annum)	6.5% (equates to ≥870,000 m^2 per annum)	6.5% (equates to ≥870,000 m^2 per annum)	6.5% (equates to ≥870,000 m^2 per annum)
KPI 16.4: Response to service request – The percentage of customer service requests responded to within required timeframes[2]	83%	≥90%	≥90%	≥90%	≥90%
KPI 17.1: Road Safety – The from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number.	20	Reduction of 1 from prior year	Reduction of 1 from prior year	Reduction of 1 from prior year	Reduction of 1 from prior year
KPI 18.1: Percentage of footpaths in reasonable or better condition[4] (MM 4: footpath condition)	96.3%	≥70%	≥70%	≥70%	≥70%
KPI XX: Around the mountain cycle trail has Great Ride status	New measure	Retain accreditation	Retain accreditation	Retain accreditation	Retain accreditation
KPI XX: CAA compliance requirements for Part 139 certification is maintained	New measure	Retain accreditation	Retain accreditation	Retain accreditation	Retain accreditation

1 - Smooth travel exposure is an Index that determines the proportion of travel on sealed roads which are smoother than a defined threshold.

*2 - Timeframes for responding to requests related to roads and footpaths vary from 24 hours to up 60 days depending on the urgency and risk associated with the request. Overall around 80% of the Council's requests for service have a target timeframe of 10 days or less. The Transport AMP includes more detail about the individual request types and timeframes (refer **Error! Reference source not found.**).*

3 - Road roughness is measured by RoadRoid testing.

4 - Footpaths are assessed and given a condition rating that uses a visual rating scale of 1-5 where 1 is the highest (3 is reasonable). The percentage is calculated according to the length of the network that meets or exceeds the average of all condition ratings.

Table 0-1: Roads and Footpaths: Performance Management Framework

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Key Issues, Options and Implications

Councils key issue is the impact its ageing road and bridge infrastructure is having on access, safety and economic growth. As a rural Council, the transport network is vital to economic growth and provides the life blood of Southland economy.

Key Issues / Problem	Options	Implications
Posted bridges are inhibiting appropriate access which is increasing road safety risk and inhibiting and reducing economic productivity	Implement a replacement programme which focuses on the bridges which create the greatest hardship. In the short term bridges will still need to be posted or closed in for the short term where suitable alternative access is available.	Without suitable access for heavy vehicles such as milk tankers and logging trucks economic growth will continue to be negatively impacted. Restricted bridges also reduce accessibility for emergency services.
Increasing number of seal layers is leading to smooth and unsafe roads resulting in increasing investment to maintain safe levels of service	Bring resurfacing treatments forward or longer term consider thin granular overlays to cover up the old seal. Water cut the most at risk section of roads such as curves and breaking zones. Reduce speed limits to mitigate the risk of associated with roads with insufficient skid resistance.	Sealed roads will become flush (smooth) and result in unsafe road services. Seal lives are reaching the point where it is not economically sustainable to continue re-sealing the road. With small number of pavement renewals over past 10 years, it is no longer sustainable to continue with this level of investment if current levels of service are to be maintained. Based on the age of the network and number of sealed layers the problem is only going to get worse. Temporary measures such as reduction in speed limit for extended periods of time will impact on economic growth and safety.

Table 0-2: Key Issues Options and Implications

Other key Issues are:

- Uncertain levels of confidence for the understanding and quality of predictive information with some asset types such as culverts (data integrity).
- Customers don't have a good understanding of the current Levels of Service meaning they may have unrealistic expectations for future network Levels of Service.
- Heavier and more frequent heavy vehicle movement primarily driven by Forestry plantation age.
- Resources to transition to NZTA's One Network Framework.

The above issues align with the Government Policy Statement which lists out the Strategic priorities as;

- Safety – Developing a Safety System where no-one is killed or seriously injured
- Better Travel Options – Providing people with better travel options to access social and economic opportunities
- Improving Freight Connections – Improving freight connections for economic development

- Climate Change – Developing a low carbon transport system that supports emission reductions while improving safety and inclusive access

Council's planned responses to these issues and focuses are:

- Increase pavement rehabilitation investment
- Increase investment in bridge renewals
- Where investment levels are not suitable prioritisation of renewal investment applying the One Network Roading Classification and then deferring some low volume road renewals (80/20 principle) which have lower levels of traffic
- Applying the 'bridge matrix' to the network which utilise ONRC and alternative detour options to help priorities bridge replacement with those which have no alternative access or those bridges which would require excessive long detours.
- Prioritise improvement spending on safety enhancements in area's such as safer speed around school, seal and shoulder widening, delineation, clear zones, intersection and curve improvements, and crash barriers.
- Reviewing maintenance intervention strategy to insurance maintenance practise continue to remain fit for purpose.
- Taking more but managed risk in decision making
- Remain flexible, agile and responsive to change.
- Selecting and implement procurement strategies that leverage industry expertise and knowledge such as design and build.

Demand Management Strategies

Currently the physical capacity of the roading network does not generally cause a constraint in the use of the roading network or cause congestion issues. However, the number and location of restricted bridges restricts access and creates road safety risk as not all road users adhere to restrictions (as at 1 July 2020 there were 76 posted bridges).

The widths of some roads do cause safety and maintenance concerns, and pavement strength is a constraint, in that while all pavements are regarded as capable of carrying Class 1 loads, many suffer significantly under these loads. In addition, there are some restrictions on the weight or speed of heavy vehicles crossing particular bridges

Councils network is open to 50 Max uses except where this is restricted by bridge capacity. With the introduction of 50 Max Heavy transport operators are now seeking to run even heaver High Performance Motor Vehicles (HPMV's) outside of 50Max. Allowing even heavier vehicles on the network will cause more rapid damage to the network.

Council understands the potential economic opportunities by allowing heavier vehicles on its network but with a large network and low rate payer base, the associated risks to Southland's network versus maximising the economic return for its road users requires careful consideration.

Asset Management Strategies / Lifecycle Asset Management

To achieve Councils intentions, the general asset management strategy is to maintain the asset to a level fir for purpose through appropriately funded and priorities operation and capital works programmes based on asset aged, condition and performance. Tools such as dTIMS and Juno viewer are some of the tools utilise to help with this division making process.

The key focus for 2021-23 period is to increase bridge replacement and sealed road rehabilitation investment. Generally all other investments levels are focused on maintaining existing levels of services

Over the next 3 years the focus will continue to be on asset data improvement particularly around number and condition of culverts around the district.

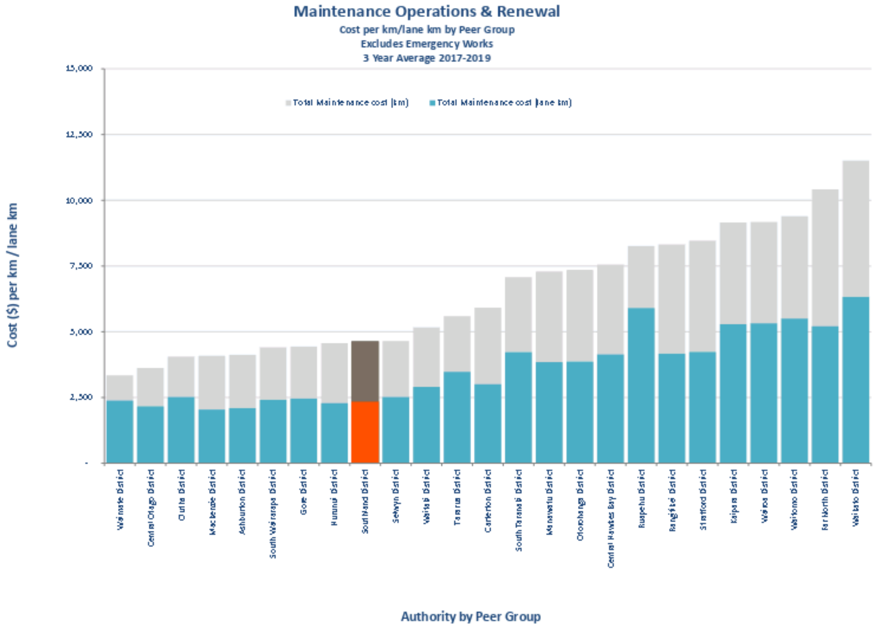
Financial Summary

This AMP proposes budgets in the long term planned which are not developed around increasing levels of services. Other than where specifically identified similar level of investment to 2018-21 are proposed, but unlike previous funding cycles allowance has been made for cost increases and inflation with a focus retaining existing levels of service particularly key assets of bridges and sealed roads.

This budget should enable Council to be able to implement its proposed responses to the key issues and challenges. Waka Kothi funding contribution will play a key role in how Council's strategic approach is fully implemented.

It is projected that there will continue to be a renewal 'bow wave' in future years, particularly around sealed road renewals. Questions will need to be continually raised on how Council funds this or reduces the Levels of Service (LOS).

The two tables below provide an overview of Councils historic expenditure including a comparison to that of its peer groups.



Roading	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($ 000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	283	275	293	989	1,021	1,061	1,078	1,104	1,145	1,144	1,180	1,231	1,223
Targeted rates	14535	14,420	14,516	13,411	15,172	17,457	18,298	20,234	22,300	23,358	24,694	25,538	26,365	28,739
Subsidies and grants for operating purposes	6,509	8,009	6,656	6,509	6,900	6,934	7,279	7,348	7,705	7,780	8,160	8,237	8,640	8,721
Fees and charges	71	62	63	68	40	42	44	74	79	78	80	82	84	86
Internal charges and overheads applied	199	456	505	641	346	317	300	288	285	286	288	289	291	292
Local authorities fuel tax, fines, infingement fees, and other receipts	1,195	921	982	991	1,042	1,054	1,084	1,106	1,127	1,147	1,170	1,194	1,218	1,242
Total operating funding	**22,510**	**24,152**	**22,996**	**21,913**	**24,490**	**26,835**	**28,066**	**30,129**	**32,602**	**33,795**	**35,535**	**36,521**	**37,829**	**40,273**
Applications of operating funding														
Payments to staff and suppliers	12235	12,928	14,147	14,099	14,190	14,292	15,019	15,126	15,904	16,067	16,758	16,956	17,722	17,836
Finance costs	-	-	-	-	240	250	267	264	264	268	266	262	259	253
Internal charges and overheads applied	1,425	1,053	1,203	1,770	2,300	2,359	2,456	2,528	2,575	2,653	2,683	2,760	2,864	2,879
Other operating funding applications	78	103	526	337	226	231	235	240	244	249	253	258	264	269
Total applications of operating funding	**13,738**	**14,084**	**15,876**	**16,206**	**16,957**	**17,143**	**17,977**	**18,158**	**18,987**	**19,236**	**19,961**	**20,236**	**21,108**	**21,286**
Surplus (deficit) of operating funding	**8,772**	**10,068**	**7,120**	**5,707**	**7,533**	**9,693**	**10,089**	**11,971**	**13,615**	**14,559**	**15,575**	**16,285**	**16,720**	**18,987**
Sources of capital funding														
Subsidies and grants for capital purposes	12714	8,405	7,420	8,911	10,385	11,670	11,847	13,291	14,571	15,480	16556	17,303	17,741	20,157
Development and financial contributions	-	12	-	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	7,993	-391	351	1,226	1,059	1,359	447	590	879	664	581	683	578	1,627
Gross proceeds from sale of assets	26	23	-	-	-	47	10	10	30	-	53	11	11	34
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**20,733**	**8,050**	**7,770**	**10,137**	**11,443**	**13,086**	**12,304**	**13,891**	**15,479**	**16,144**	**17,189**	**17,997**	**18,330**	**21,228**
Applications of capital funding														
Capital expenditure														
- to meet additional demand	910	302	19	-	-	-	-	-	-	-	-	-	-	-
- to improve the level of service	9,876	2,673	1,024	2,179	2,230	3,073	2,408	2,530	2,639	2,741	2,735	2,859	2,849	2,988
- to replace existing assets	14055	15,071	14,076	15,310	19,153	20,594	20,643	23,330	26,080	27,407	29,617	30,812	31,595	36,637
Increase (decrease) in reserves	4,664	55	(237)	-1,645	-2,372	-868	-651	-6	362	540	395	591	585	592
Increase (decrease) in investments	(0)	18	8	0	(35)	(21)	(7)	8	14	15	17	19	21	28
Total applications of capital funding	**29,505**	**18,118**	**14,890**	**15,844**	**18,976**	**22,778**	**22,393**	**25,862**	**29,094**	**30,703**	**32,764**	**34,282**	**35,050**	**40,215**
Surplus (deficit) of capital funding	**(8,772)**	**(10,068)**	**(7,120)**	**(5,707)**	**(7,533)**	**(9,693)**	**(10,089)**	**(11,971)**	**(13,615)**	**(14,559)**	**(15,575)**	**(16,285)**	**(16,720)**	**(18,987)**
Funding balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Purpose of the Activity Management Plan

This activity management plan (AMP) describes the strategies and works programmes for the transport activity so as to meet the objective of delivering the required level of service for Southland District. It will be reviewed every three years. This AMP informs the Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity
- the strategic context for the activity, the key activity management strategies and policies adopted within this environment and the main issues identified for the activity
- a statement of the intended levels of service and performance targets.

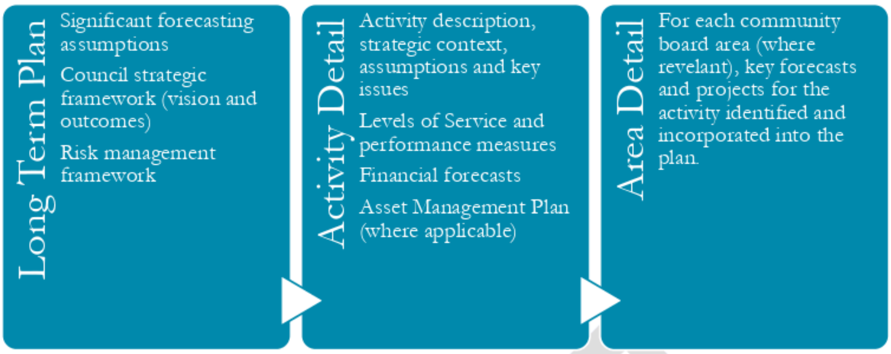
Plan Limitations

Currently the Transport AMP has a status of Core-Intermediate as per the International Infrastructure Management Manual. The goal is for continues improvement including investment in key areas of data deficiency along with modelling should see the AMP status increasing to at least intermediate in the coming years.

The degree of confidence in the AMP forecast is limited due to the impact that external factors can have on the asset such as traffic types and pattern. Beyond 10 years the confidence levels reduce and even more so after 20 years.

Plan Framework

The AMP framework is illustrated in below. The strategic context, significant forecasting assumptions and any activity-specific issues are documented in the main body of this plan. Information on locally funded activities and services are included in the appendices to this plan.



Activity Description

What we do

Council owns and manages transportation services and assets to enable safe transportation in the district but this excludes State Highways within the Southland District.

Council has the second largest transport network of any territorial authority in the country and services range from keeping roads free from debris, grading of gravel roads to more major works such as bridge replacements and road renewals.

The roading network is a crucial infrastructure for the District as it contributes to Southland's economic development and allows people to access their homes, schools, social centres and recreational areas in their communities.

In addition to roads, streets and bridges council also manages Around the Mountain Cycle trail and the Te Anau Manapouri Airport.

The table below provides a summary of the activity. Section 5 covers each transportation sub asset activity in more detail.

Population Served (2017 Estimate)	30,300
Length of Roads:	
Sealed (km)	1,991
Unsealed (km)	2,978
Total (km)	4,969
Footpaths (km)	210

Bridges (no) including cycle trail bridges	882
Stock Underpasses (no.)	239
Street lights (no.)	2739
Estimated distance travelled on the network each year (million km)	286
Book Value 2019/2020 ($M) including land value	1,802

Key Network Statistics as at September 2020

Why we do it

Council's roads and footpaths provide its communities with a safe and integrated corridor for goods and services to move throughout the District. This activity supports people's ability to live, work and travel safely throughout Southland.

Strategic Considerations

Strategic framework

Council has adopted a strategic framework that identifies where Council wants to be in the future (vision) and the outcomes it aims to achieve to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions (community outcomes). The framework also outlines how it will achieve these (mission and approach) along with the key challenge it faces in doing so and its resulting strategic priorities.

STRATEGIC FRAMEWORK COMPONENT	PROPOSED 2021-2031 STRATEGIC FRAMEWORK
MISSION	Working together for a better Southland
VISION	"Southland – one community offering endless opportunities"
COMMUNITY OUTCOMES	Kaitiakitanga for future generations
	Inclusive connected communities
	A diverse economy creating healthy and affordable lifestyles
	Empowered communities with the right tools to deliver the best outcomes
STRATEGIC PRIORITIES	Improve how we work to build resilience
	Provision of appropriate infrastructure and services
	Better preparing our communities and Council for future changes
	Support healthy environments and sustainable communities

Figure 0-6: Strategic Framework

The framework guides staff and informs future planning and policy direction and forms the basis for the performance framework. The table below outlines how the transport activity contributes to the Council's community outcomes using a benefits mapping diagram. The full levels of service and performance management framework is presented in a further section later in the document.

Community Outcomes (and community board outcomes where applicable

The Council has adopted a Strategic Framework that identifies where the Council wants to be in the future (vision) and the outcomes it aims to achieve to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions (community outcomes).

Outcomes	Activity Contribution	Outcome Objective	Benefit	Levels of Service (LoS) and Key Performance Indicators (KPI)	
				LoS 16: Our transport network provides for safe, comfortable and efficient travel	
Inclusive, connected communities	*Roads, footpaths and cycle trails provide people with access to their land, homes, schools, social centres and recreational areas.* *They also help achieve an integrated, safe, responsive and sustainable land transport system.* *Road safety improvements and initiatives also help to reduce the social impact of road fatalities and injuries.*	1a. People have everything they need to live, work, play and visit	Convenient and efficient travel	KPI 16.1: **Condition of the sealed road network** – The average quality of ride on sealed local road network measured by smooth travel exposure.	KPI 16.2: Percentage of gravel road tests where road roughness[3] meets acceptable standards
			A more reliable transportation network	KPI 16.3: **Maintenance of a sealed local road network** - The percentage of sealed local road network that is resurfaced	
			Improved social wellbeing and connectedness	KPI 16.4: **Response to service requests** – The percentage of customer service requests relating to roads and footpaths to which the Council responds within the required timeframes[2]	
			People can travel more safety around Southland	KPI 17.1: **Road Safety** – The change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number	
			Healthier, more active communities	KPI 18.1: **Footpath condition** – The percentage of footpaths in reasonable or better condition[4]	
A diverse economy creating healthy and affordable lifestyles	*Roads contribute to economic development by providing a corridor for the efficient movement of goods and services.*	2b. Consider social, cultural and economic wellbeing	Supporting industry through connections and access	KPI xx: Around the Mountains cycle trail has Great ride status	KPI xx: CAA compliance requirements for Part 139 certification is maintained
			Enabling tourism and economic develop in Southland		

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			Roading network deliver value for money	
Kaitiakitanga for future generations		1a. People have everything they need to live, work, play and visit		
Empowered communities with the right tools to deliver the best outcomes		2b. Consider social, cultural and economic wellbeing		

STRATEGIC PRIORITIES ▸ CONTRIBUTION AREA ▾	1. IMPROVE HOW WE WORK TO BUILD RESILIENCE	2. PROVIDE APPROPRIATE INFRASTRUCTURE/SERVICES	3. BETTER PREPARING OUR COMMUNITIES AND COUNCIL FOR FUTURE CHANGES	4. SUPPORT HEALTHY ENVIRONMENTS AND SUSTAINABLE COMMUNITIES
WHAT WILL BE DONE IN THE LONG-TERM (NEXT 10 YEARS)	Regulatory requirements and services delivered by Council: - encourage compliance - are user friendly - are cost effective; and - achieve the regulatory objectives	Ensure those roads which provide the economic backbone of the district are maintained to the required LOS	Further understand implications of community futures work on renewal strategy	Regulatory requirements and services delivered by Council: - encourage compliance - are user friendly - are cost effective; and achieve the regulatory objectives
WHAT WILL BE DONE IN THE SHORT-TERM (NEXT 3 YEARS)	Continue to improves systems and procedures around data capture, management and storage.	Understand implications of the draft Proposed Water and Land Plan and how this impact on the service we provide	Expand on work carried out on Bridges and Pavements lifecycles to cover other key assets	Provide and connected and integrated network that is safe for all user

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STRATEGIC PRIORITIES ▸ CONTRIBUTION AREA ▾	1. IMPROVE HOW WE WORK TO BUILD RESILIENCE	2. PROVIDE APPROPRIATE INFRASTRUCTURE/SERVICES	3. BETTER PREPARING OUR COMMUNITIES AND COUNCIL FOR FUTURE CHANGES	4. SUPPORT HEALTHY ENVIRONMENTS AND SUSTAINABLE COMMUNITIES
	Improve Traffic Management and Corridor Management integration and management. Understand implications of climate changes to our communities and how this will impact on the service we deliver.	Understand the implication of the One Network Framework on Customer Levels of Services	such as road culverts and kerb and channel	
KEY ACTIONS AND PROJECTS	Improve asset data as identified in the AMP and Asset Valuation Report. Improve or implement systems to better manage temporary traffic management process to meet changing needs including approvals	Review implication of the migration to a One Network Road Framework by 2024 and establish any potential gaps.	Gaps in service will help identify key priority areas and projects.	None identified specifically
RELATED STRATEGIES / PLANS / POLICIES	Review Roading Policy and Procedures along with Roading Bylaw to ensure relevance and effectives.		Continue to participate with the Road Efficiency Group	None identified specifically

Strategic Context

The purpose of the Southland District Council Long Term Plan 2031 is to:

- provide a long term focus for Council decisions and activities
- provide an opportunity for community participation in planning for the future
- define the community outcomes desired for the district
- describe the activities undertaken by Council
- provide integrated decision-making between Council and the community
- provide a basis for performance measurement of Council.

Strategic direction setting encompasses Council's high-level goals, particularly the vision for the District, what the outcomes for the community may be, and what the strategic priorities will be for delivering work to the community.

Representation Framework

Community representation was amended prior to the 2018 triennial elections. There are now nine community boards that provide representation across the district. These are:

Ardlussa	Fiordland	Northern	Oraka Aparima	Oreti
Stewart Island/Rakiura	Tuatapere Te Waewae	Waihopai Toetoe	Wallace Takitimu	

It is important that Council is seen as a leader in service delivery across the District and through this AMP, will ensure its transport services are fit purpose, in appropriate locations and managed cost effectively. Doing so enables Council to provide and deliver quality, professional services to the ratepayer.

Council aims to have a high level of engagement with its customers and elected members to ensure that the minimum levels of service set out in this document represent their expectations.

At the time of writing the AMP, Community Boards were still in the process of developing community plans that may identify transport improvement projects across the district.

Key Risks, Issues and Assumptions for the Activity

There are factors outside of Council's control that can change having an impact on Council's ability to do what it planned. Sometimes the impact can be significant. There is always uncertainty in any planning process but the key to good quality planning is to make clear assumptions to help address this uncertainty. Key risks and assumptions that relate to this activity are:

- Natural hazard events continue at the current rate and there is no catastrophic event
- Waka Kotahi continues to provide a similar level of funding assistance in the future

- Waka Kotahi will meet Council funding requirements.
- The Government Policy Statement on transportation does not change the priorities as defined in this document
- Technology does not significantly change the current transportation model

Community Board Assumptions

Community Boards will be able to appropriately fund maintenance and renewal of assets for locally funded transport activities.

Regulatory Considerations

Legislation / Regulation / Planning Documents	How it affects levels of service and performance standards Outline any changes (implemented or pending) which is impacting the activity and describe how
Building Act 2004	Requires building consent for building, construction, alteration or demolition.
	Building certificate (code compliance) issued on completion of works for new or upgraded building.
	Building Warrant of Fitness required annually.
	Produce Project Information Memoranda (PIM's) which may include details of access restrictions, approvals, leases, plans, relevant records, notices, correspondence etc.
	Changes: None of Note
Bylaws	Local regulations enacted under the Local Government Act (LGA) 2002. A range of provisions are possible to protect public safety, minimise nuisance etc.
	Changes: None
Civil Defence Emergency Management Act 2002	Requires lifeline utilities to function at the fullest possible extent during and after an emergency and to have plans for such functioning (Business Continuity Plans - BCP's).
	Changes: None of Note
Code of Practice for Working on the Road	Covers management requirements and protocols for road authorities and utility operators working in road corridors.
	Changes: Changes to qualification will see greater level of training and competency assessments over the next 3 years
District Plan	Sets rules for District Council activities.
	Changes: None of Note

Government Policy Statement on Land Transport	Provides guidance on Government's three year direction for land transport. Changes: Safety continues to be a key focus area. The key priorities are covered off in the body of the AMP.
Health and Safety at Work Act 2015	Requires the provision of safe work places for all activities by local authority staff and contractors, and maintenance of an audit trail to demonstrate compliance. Changes: None of Note.
Land Transport Management Amendment Act 2008	It also provides a legislative framework for the Waka Kotahi New Zealand Transportation Agency (Waka Kotahi), and also includes requirements for other RCAs (eg procurement procedures, financial assistance, etc.) and Regional Councils (eg Regional Land Transport Strategies). Changes: None of Note at the time of preparing the AMP
NZTA Manuals and Standards	For example, Economic Evaluation Manual, Planning, Programme and Funding Manual. Changes: Changes in funding limits to low cost low risk which funds majority of Councils improvement projects. The new limit per project is set to increase to $2M. A new bridge replacement category has also been established.
Local Government Act 1974 (retained sections)	Provides for the formation, management, stopping, closing and control of roads, limited access roads and provision for public safety. Changes: None of Note
Local Government Act 2002 (LGA 2002)	Provides the power of general competence for a local authority to undertake any business or activity given certain provisos. Provides for the setting of Bylaws. Details requirements for information provision in the LTP. Changes: None of Note
Long Term Plan	Agreement between Community and Council as to the direction the public wishes their TA to take. Changes: None of Note for Transport Activity
Infrastructure Strategy	Controls aspects of road and traffic operations, including Traffic Regulations, Bylaws and enforcement. Changes: Bridge Renewals and Seal Layer instability are the key transport issues identified.
Financial Strategy	Controls aspects of road and traffic operations, including Traffic Regulations, Bylaws and enforcement. Changes: None of Note
Public Works Act 1981	Allows compulsory land acquisition. Changes: None

Regional Land Transport Strategy	Sets overarching framework for land transport in region. Changes: None of Note
Resource Management Act 1991	Establishes a planning framework covering land designation processes, requirements for resource consents for activities which affect the environment. Requires compliance with District Plan and Regional Plans. Enables financial contributions to be required from developers as a condition of resource consent for specified purposes. Changes: None of Note
Standards produced by Standards Association of New Zealand (SANZ)	Range of standards covering required or recommended practice. For example, NZS 4404 Code of Practice for Urban Land Subdivision provides a range of roading standards. Changes: No
Other Standards, Guidelines and Specifications	Wide range, many of which are included in NZTA Standards and Guidelines. Examples included, NAASRA/Austroads guidelines and standards, Geometric Design Manual, Pavement Design, Manual of Traffic Signs and Markings etc. Changes: These are currently under review
Telecommunications Act 2001, Electricity Act 1992, Gas Act 1992, Railway Safety and Corridor Management Act 1996	Provide utilities operators and other with powers to use road corridors. Changes: None of Note
Transport Act 1962	Controls aspects of road and traffic operations, including Traffic Regulations, Bylaws and enforcement. Changes: None of Note

Demand Management Strategies

Given that changing demand is primarily driven by changing land use, this is a potential key means of managing future demand. However, the predominantly low population and rural nature of Southland has meant that to date there has been very little requirement for land use control beyond that associated with agricultural sector.

There are one or two exceptions to this, primarily Te Anau and Manapouri, but also potentially Winton. Consideration of demand management for these towns primarily relates to ensuring development is appropriate to the function rather than limiting traffic growth per se. However, there is still a need to ensure that land use planning continues to consider impacts on road networks as part of the overall scheme.

Key Projects

There are no major capital improvement projects planned during the period. The majority of work planned is related to renewal of assets particularly bridges, sealed roads and footpaths.

There may be specific projects that will arise during the period of the plan as an outcome of future planning outcomes and including those done carried out by local Community Boards.

Other Considerations for the Activity

In the coming years consideration is will be required around how the transport network and activates positivity contributes in helping achieve the outcome of Climate Change Reponses (Zero Carbon) Amendment Act

Our Levels of Service

Levels of Service, Performance Measures and Targets

Levels of service (LOS), performance measures and targets form the performance framework for the activity detailing what the Council will provide, and to what level or standard:

LOS are the outputs that are expected to be generated by the activity. They demonstrate the value being provided to the community or reflect how the public use or experience the service. A key objective of activity planning is to match the level of service provided with agreed expectations of customers and their willingness to pay for that level of service.

Performance measures are quantifiable means for determining whether a LOS has been delivered.

Performance targets are the desired levels of performance against the performance measures.

The levels of service provide the basis for the management strategies and works programmes identified in the AMP. By clarifying and defining the levels of service for the activity (and associated assets), Council can then identify and cost future operations, maintenance, renewal and development works required of the activity (and associated assets) to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

Details the levels of service, performance measures and performance targets for the Transport activity. The italicised/grey measures are monitored for internal management/self-assessment purposes and as such are not reported publicly in the LTP. The table sets out the Council's current performance and the targets it aims to achieve within the next three years and by the end of the next 10 year period.

Funding constraints, both local and national over the past 10 years, have resulted in a generally 'flat-lined' programme. This approach is unsustainable to maintain current levels of services as a result increased investment is required from 2021 from both Council and Waka Kotahi (2021-24 funding still needs to be approved).

Any reduction in funding from what is required will certainly require a reduction in the amount of work to be delivered, which will in turn result in a decline in levels of service and satisfaction over time.

All possible avenues for minimising LOS decline are being examined in order to ensure that optimum value for money is achieved for the community.

How we measure performance	Current Performance (19/20)	Future Performance Targets			
		Yr 1 (21/22)	Yr 2 (22/23)	Yr 3 (23/24)	Yr 4-10 24-31)
TRANSPORT: What LoS we provide	**LoS 19: Our transport network provides for safe, comfortable and efficient travel**				
KPI 16.1: Condition of the sealed road network – The average quality of ride on sealed local road network measured by smooth travel exposure	99%	Smooth Travel Exposure[1] ≥ 97%	Smooth Travel Exposure ≥ 97%	Smooth Travel Exposure[1] ≥ 97%	Smooth Travel Exposure[1] ≥ 95%
KPI 16.2: Percentage of gravel road tests where road roughness[3] meets acceptable standards	88%	≥85%	≥85%	≥85%	≥85%
KPI 16.3: Maintenance of a sealed road network – The percentage of sealed local road network that is resurfaced	6.92%	6.5% (equates to ≥870,000 m^2 per annum)	6.5% (equates to ≥870,000 m^2 per annum)	6.5% (equates to ≥870,000 m^2 per annum)	6.5% (equates to ≥870,000 m^2 per annum)
KPI 16.4: Response to service request – The percentage of customer service requests responded to within required timeframes[2]	83%	≥90%	≥90%	≥90%	≥90%
KPI 17.1: Road Safety – The from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number.	20	Reduction of 1 from prior year	Reduction of 1 from prior year	Reduction of 1 from prior year	Reduction of 1 from prior year
KPI 18.1: Percentage of footpaths in reasonable or better condition[4] (MM 4: footpath condition)	96.3%	≥70%	≥70%	≥70%	≥70%
KPI XX: Around the mountain cycle trail has Great Ride status	New measure	Retain accreditation	Retain accreditation	Retain accreditation	Retain accreditation
KPI XX: CAA compliance requirements for Part 139 certification is maintained	New measure	Retain accreditation	Retain accreditation	Retain accreditation	Retain accreditation

1 - Smooth travel exposure is an Index that determines the proportion of travel on sealed roads which are smoother than a defined threshold.

2 - Timeframes for responding to requests related to roads and footpaths vary from 24 hours to up 60 days depending on the urgency and risk associated with the request. Overall around 80% of the Council's requests for service have a target timeframe of 10 days or less. The Transport AMP includes more detail about the individual request types and timeframes (refer **Error! Reference source not found.***).*

3 - Road roughness is measured by RoadRoid testing.

4 - Footpaths are assessed and given a condition rating that uses a visual rating scale of 1-5 where 1 is the highest (3 is reasonable). The percentage is calculated according to the length of the network that meets or exceeds the average of all condition ratings.

Table 0-1: Transport: Performance Management Framework

Plans Programmed to meet the Level of Service

Section 5 cover the plans, strategy and financial requirements for respective sub level activates to achieve levels of service outcomes.

Activity and Asset Management

Overview of Management

Lifecycle asset management means considering all asset management options and strategies to deliver the agreed level of service and to inform decision-making for asset renewal, replacement, upgrade and disposal. Effective lifecycle planning is about making the right investment at the right time to ensure that the asset delivers the desired level of service over its full-expected life, at the minimum total cost. This section explains the approach for:

- Providing new or upgraded assets to improve service levels, providing for growth and demand
- Operating and maintaining assets
- Renewing or replacing assets
- Disposing of assets at the end of their useful life.

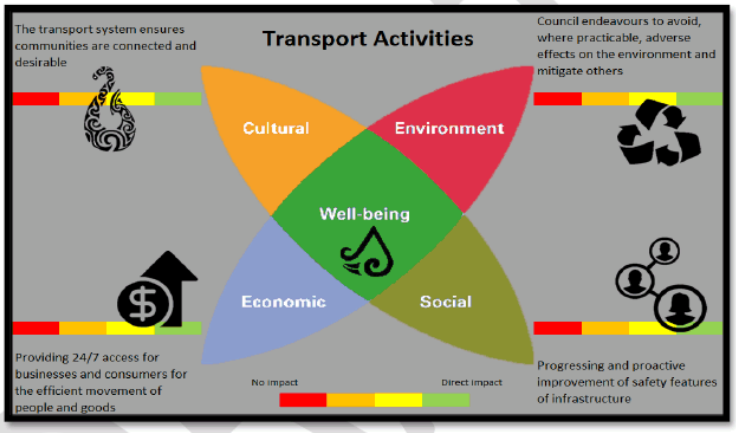

FIGURE 1: IMPACT TRANSPORT ACTIVITIES HAVE ON THE FOUR WELL-BEING AREAS

Typically there are three issues identified in renewing and maintaining transportation infrastructure as outlined in the table below:

Issue	Options	Outcomes
Unit Rate Increases	Status Quo	Less work done Increased backlog Lower LOS
	Rationalise Assets	Increased travel Economy impact Sustainability
	Increase budget to offset unit rate rise	Increased Cost Declining LOS
	Increase budget to match asset need	Increased Cost Maintain LOS
Unbalanced Network	Status Quo	Less work done Increased backlog Lower LOS
	Equal Work Effort	All roads including high classification roads will have a declining LOS
	Hierarchy Focus	Low Classification roads will have a much lower LOS to fund high classification roads
	Increase Budget	Increased Cost Balance between rationalisation and maintaining LOS
Constrained Funding	Status Quo	Less work done Increased backlog Lower LOS
	Rationalise Assets	Increased travel Economy impact Sustainability
	Increased Maintenance	Reduction in renewals Long term lower LOS
	Increased Renewals	Reduction in maintenance Short term lower LOS

TABLE X: PRIMARY ISSUES RELATING TO MAINTAINING EXISTING LEVELS OF SERVICE ACROSS TRANSPORTATION ACTIVITIES

Unit Rate Increases

The cost of carrying out activities is expected to increase at inflationary rates and this is allowed for during long term planning. However there are a number of factors (eg bitumen index, market competitiveness etc) that influence unit rates beyond inflation that has a massive effect on the size of work programme Councils roading team can deliver For example; the market average rate for road rehabilitations in Southland has increased exponentially over the last funding cycle (≈$75,000.00/km increase). In order to combat some of these uncontrollable variable rates; smarter procurement methods will be investigated.

Unbalanced Network

The 80:20 principle has been applied for a number of years now where the majority of investment is focused on higher classification roads (ONRC Primary and Secondary Collector roads). This has been used successfully 'short term' to distribute constrained funds where the majority of road users will benefit; however this is not a long term sustainable solution as extent of network infrastructure reaches end of life.

Constrained Funding

Budgets historically have, and most likely will continue to be constrained and therefore smarter asset management principles need to be applied. This will consider all options when maintaining assets to end of life to ensure a fit for purpose network that is in line with the 4 well-being areas can be achieved with a balance of long term sustainability.

Asset Management Systems

The key asset management system for the transportation team is the Road Assessment and Maintenance Management (RAMM) software. This is the database that holds almost of all Councils transportation assets and considered to be the single point of truth.

RAMM is used as a robust asset database with the ability to perform assessments, asset valuations, forward works programming, inspections and much more.

Complimentary tools such as dTIMS and Juno Viewer are also utilised.

Asset Management Hierarchy

The One Network Road Classification (ONRC) is a classification system, which divides New Zealand's roads into six categories based on how busy they are, whether they connect to important destinations, or are the only route available:

- National (N/A to SDC)
- Arterial (N/A to SDC)
- Regional
- Primary collector
- Secondary collector
- Access (including low volume access)

The ONRC is the primary tool developed through REG to enable operational and culture change in road activity management. It facilitates a customer-focused, business case approach to budget bids for the National Land Transport Programme.

Using the ONRC, local authorities and NZ Transport Agency can compare the state of roads across the country, and direct investment where it is needed most. Road users will see an increase in the quality of some roads, and a decrease in others that have been over-specified in the past. Overall, New Zealanders will get the right level of road infrastructure where it is needed, determined by a robust, impartial, nationally consistent tool – the ONRC.

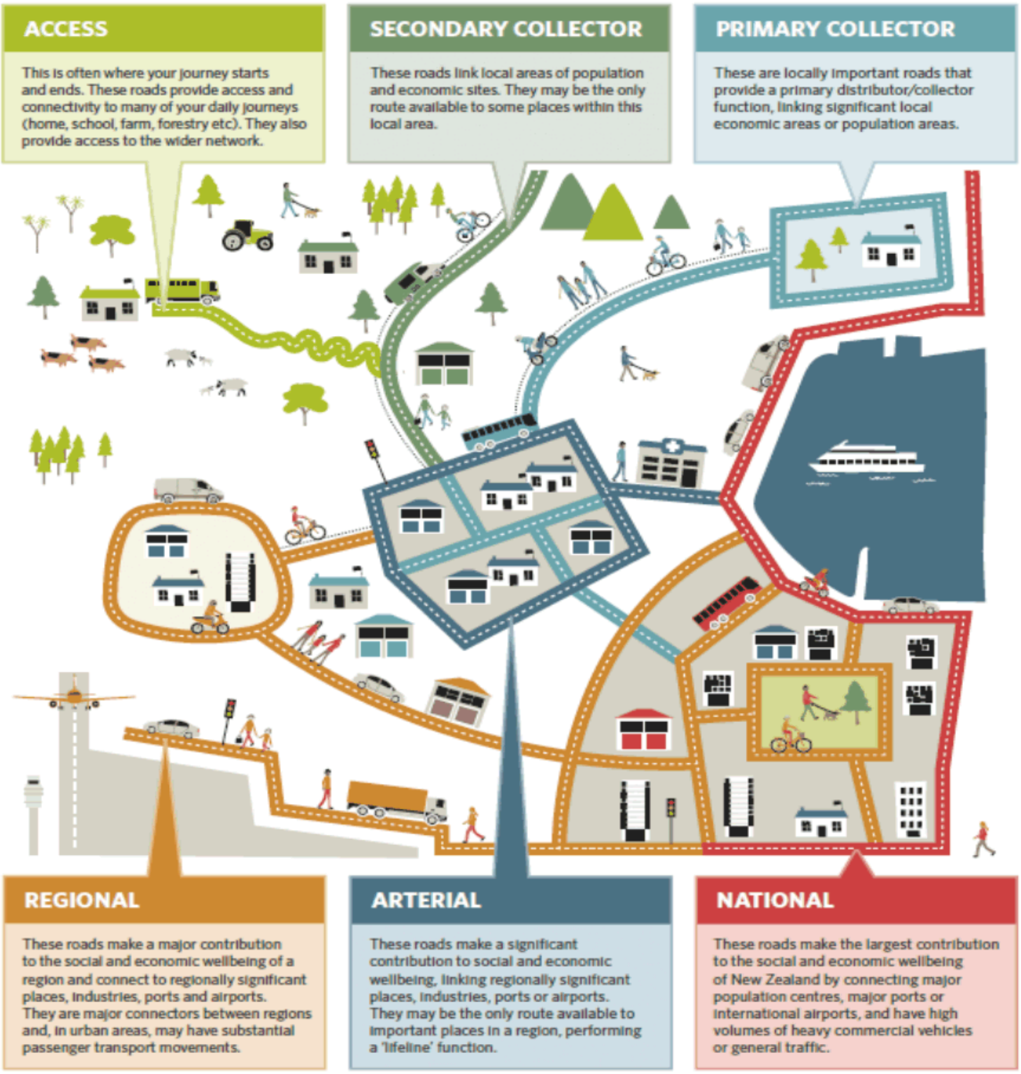

FIGURE 2: NZTA ONRC CLASSIFICATIONS

The ONRC is currently being enhanced to better include people that are walking, riding a bike or taking public transport. It will also reflect that transport corridors are not just for travelling through. They are also places where people stop, socialise, enjoy and do business.

The ONRC tool has been utilised throughout this AMP to determine and prioritise the levels of service and activities that Councils provides.

More information on ONRC can be found at:

https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/projects/onrc

Community Board Area Context

Community boards will be engaged with where appropriate around levels of service or projects within their relevant regions. For most transportation projects; strict Waka Kotahi requirements need to be adhered to meet funding obligations and therefore while communities will be kept up to date with what is occurring and planned; they will not be directly involved in determining the works programmes.

However; both footpaths and streetlighting activity areas are a bit different as they do have a local funding component and therefore the level of engagement with community boards will be more intricate.

Footpaths

A level of service for footpaths has been defined which best replicates what Council already has plus some improvements. This has then been applied across the district to identify potentially gaps or improvement opportunities within each township. These lists of improvements will be consulted with the relevant community boards to agree the priorities and set budgets. See footpath section of AMP for more detail.

Streetlights

Existing streetlight infrastructure has been spatially mapped to identify areas that do not meet best practise guidelines to come up with improvement (level of service) programmes. Areas that do not meet best practise will be consulted with the relevant community boards to agree the priorities and set budgets. See streetlighting section of AMP for more detail.

Asset Management Improvement

Future improvement opportunities have been identified in each of the activity types outlined in subsequent sections. However the key improvement projects that Councils transportation team will work on over the next three years are:

Activity	Project
Data Input	Refine RAMM data inputs particularly around culverts and unsealed road maintenance
Spatial Interface	There is an opportunity for future improvement to refine this data into a more dynamic spatial interface to utilise both RAMM inventory data and the condition data to identify renewal programmes and level of service deficits
Review Pavement Layer Data	Carry out core samples to gain knowledge of bitumen to stone ratio for areas that Council hold little data.

Sealed Roads

Overview

The Districts sealed surfaced roads constitute 40% (approx. 2000km) of the road network and carry 85% of the traffic volume. Of the 284 million vehicle kilometers travelled (VKT) on the SDC network around 70% of the VKT's are traveled on the Primary and Secondary Collector roads. These Primary and Secondary Collector road account for around 20% (approx. 1000km) of the SDC network. The objective of the sealed roads is to provide all-weather travel for all types of vehicles however under intense or extreme weather events access may not always be possible.

Council currently has the following amount of sealed Urban and Rural roads by ONRC category:

ONRC CATEGORY	URBAN RURAL	TYPE	LENGTH (KM)	AREA (M2)
ACCESS	RURAL	THIN SURFACED FLEXIBLE	744.1	4,565,000
ACCESS	RURAL	BRIDGE	0.9	3,000
ACCESS	URBAN	THIN SURFACED FLEXIBLE	42.1	344,000
LOW VOLUME	RURAL	THIN SURFACED FLEXIBLE	33.5	193,000
LOW VOLUME	RURAL	BRIDGE	0.4	0
LOW VOLUME	URBAN	THIN SURFACED FLEXIBLE	107.5	689,000
LOW VOLUME	URBAN	CONCRETE	0.1	1,000
PRIMARY COLLECTOR	RURAL	THIN SURFACED FLEXIBLE	81.7	659,000
PRIMARY COLLECTOR	RURAL	BRIDGE	0.3	2,000
PRIMARY COLLECTOR	URBAN	THIN SURFACED FLEXIBLE	8.3	103,000
SECONDARY COLLECTOR	RURAL	THIN SURFACED FLEXIBLE	922.2	6,422,000
SECONDARY COLLECTOR	RURAL	BRIDGE	2.1	13,000
SECONDARY COLLECTOR	URBAN	THIN SURFACED FLEXIBLE	47.3	437,000
SECONDARY COLLECTOR	URBAN	BRIDGE	0.1	1,000
TOTALS			1990.8	13,432,000

TABLE 1: SDC NETWORK BREAK DOWN BY ONRC CATEGORY

ONRC	RURAL DESIGN WIDTH (M)	% COMPLIANCE WITH DESIGN WIDTH	KM OF COMPLIANT RURAL SEALED ROADS	KM OF NON COMPLIANT RURAL SEALED ROADS	RURAL LENGTH (KM)
PRIMARY COLLECTOR	7.5	93.5%	76.7	5.3	82.0
SECONDARY COLLECTOR	7.0	51.8%	479.9	446.8	926.6
ACCESS	6.5	30.3%	226.3	520.0	746.3
LOW VOLUME	6.0	49.2%	16.6	17.2	33.8
TOTALS		44.7%	799.6	989.3	1788.9

TABLE 2: ONRC HIERARCHIES AND THEIR TARGET MINIMUM DESIGN WIDTHS

Average Annual Daily Traffic (AADT)

The traffic volumes on the sealed roads range from the lower end of the scale (sealed urban cul-de-sacs) to the upper limit on SDC's busiest urban and rural roads. See the table below for the range of AADT's by ONRC and Urban Rural break down.

ONRC CATEGORY	URBAN RURAL	MINIMUM AADT	MAXIMUM AADT
LOW VOLUME	RURAL	5	50
ACCESS	RURAL	20	210
SECONDARY COLLECTOR	RURAL	120	995
PRIMARY COLLECTOR	RURAL	300	2400
LOW VOLUME	URBAN	10	195
ACCESS	URBAN	70	880
SECONDARY COLLECTOR	URBAN	240	2200
PRIMARY COLLECTOR	URBAN	980	4900

TBALE 3: AADT RANGE BY ONRC CLASSIFICATIONS

Asset Condition

The failure modes of bituminous pavements include shallow shear failure, roughness, rutting, cracking, stripping, ravelling, loss of surface texture and skid resistance, flushing, edge break and potholes. Most of these can now be detected by high speed data collection, in particular roughness, rutting, loss of surface texture, skid resistance and flushing. This information will be used in order to model and predict the renewals of our sealed road pavements as per subsequent sections of this document.

Level of Service

Intervention Matrix for Sealed Rural Roads

The cost to maintain and renew approximately 2000km of network is unsustainable long term without significant increased investment and we are starting to see the implications of this occurring as we reach the end of useful lives on a number of assets including sealed pavements.

An intervention matrix has been developed to provide fit for purpose interventions to help invest limited budgets in the most appropriate locations. See below the matrix which is to be applied to the rural network only. Urban environments will be treated as per the status quo i.e. renewal when at end of life

ONRC		Unsealed	Rural Sealed Roads		
Classification	Ideal Width		Under Width	Seal Layer Instability	Pavement End of Life
Low Volume	6.00m	Maintain as Gravel	Revert to Gravel	Revert to Gravel	Revert to Gravel
Access (<100vpd)	6.50m	Maintain as Gravel	Revert to Gravel	Revert to Gravel	Revert to Gravel
Access (>100vpd)	6.50m	BCR for Seal	BCR for Widening	BCR for Rehab vs Unsealed	BCR for Rehab vs Unsealed
Secondary Collector	7.00m	Seal/Rehab	Widen pre Reseal/Rehab	Rehab	Rehab
Primary Collector	7.50m	Seal/Rehab	Widen pre Reseal/Rehab	Rehab	Rehab

TABLE 4 – RURAL ROADS INTERVENTION MATRIX

The matrix is to be used to determine what treatment is to be carried out when rural roads are deemed at end of life or not at desirable standard. The matrix is not a tool to purposely rationalise or lower the level of service currently provided – but is a tool to prioritise investment into the appropriate locations to ensure primary routes and developing areas are maintained appropriately and sustainable long term.

One Network Road Classification (ONRC) hierarchy has been used to split the different levels of service and interventions provided. Access road classification has been further split into two categories (50-100vpd and 100-200vpd). This split is due to the vast range of roads that fall within the Access Roads classification. By splitting the classification either side of 100 vpd will filter out the roads that should be investigated for changing the existing level service (up or down).

Roads that fall in the Access above 100vpd category will be subject to a Benefit to Cost Ratio (BRC) analysis at Councils discretion to determine both what the most appropriate intervention is and also the most economic time to carry out a change in level of service (if any). Only roads that Councils engineers believe may produce a positive BCR will be reviewed (roads that have significant increased maintenance or have changed use and potential economic gains by changing level of service – not just typical rural roads that have 'just' met the 100vpd threshold). Even if a positive BCR can be calculated; this does not guarantee an increase in level of service will be provided any time soon. It will simply mean the section of road has met the first set of criteria and will be prioritised against all other roads in the network that fall into this category. This prioritised list of improvements will form a forward works programme that will be implemented as budget allows.

The roads that are currently under the ONRC desirable width will only be considered for widening if they are >0.5m under width (250mm either side of road).

Existing network statistics applied to Matrix:

ONRC		Unsealed	Rural Sealed Roads		
Classification	Standard Width*		Under Width (>0.5m)	Seal Layer Instability	Pavement End of Life
Low Volume	6.00m	2093km	25km	-	15km
Access (<100vpd)	6.50m	660km	100km	9km	143km
Access (>100vpd)	6.50m	151km	309km	28km	196km
Secondary Collector	7.00m	2km**	523km	74km	280km
Primary Collector	7.50m	-	61km	14km	6km

**Standard width for Rural Sealed Roads only. See unsealed section of AMP for unsealed road widths.*
***This is the OTTA seal section of Haldane Curio Bay Road*

TABLE 5: MATRIX WITH NETWORK STATISTICS APPLIED

The way existing network data has been applied to the matrix above is as follows:

Unsealed: Simply split by ONRC classification
Rural Sealed Under Width: Roads that are ≥0.5m under desirable ONRC width.
Rural Sealed Roads with Sealer Layer Instability: Roads that ALREADY have 6 or more seal layers.
Rural Sealed Roads at end of life: Everything that is currently not under width or 6+ seal layers.

It is worth noting that there is a good chance that seal instability will be an issue prior to pavements reaching end of life for a lot more than what the above table demonstrates – but this is a snap shot of current data and therefore everything that is not 'currently' under width or facing seal stability issues has defaulted to the Pavement end of life column.

Asphalt

Where the matrix has determined the road is to be maintained/renewed as a sealed road – it is assumed that the surfacing type will be a thin flexible chip seal layer. However with increasing volumes of heavy vehicles using Councils network means that some areas (mainly intersections) are requiring additional specific treatments ie Asphalt. Asphalt while it is more expensive (current reseal average cost $5/m2 v $50m2 for Asphalt) does have a longer life and performance is enhanced in these higher stress locations compared to a chip reseal. Council already has approximately 70 areas of asphalt in urban and rural situations across the

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network that covers both intersections and cul-de-sac heads. From a rural perspective, when a site is up for reseal and if there are high stress areas contained within the site; then these areas will be assessed for the option of using Asphalt for increased durability.

Some work has been carried out on compiling a matrix for an initial assessment on the likely hood of Asphalt being an acceptable and an affordable option. This matrix relies on the intersection data in RAMM and the latest traffic estimates for both AADT and percentages of heavy vehicles being up to date. The work to date has highlighted some issues in the intersection data and the current traffic estimates. The current intersection data in some cases implies the intersection is a candidate for Asphalt when in fact the intersection is just a change in Road Name and the heavy vehicle usage is just straight through the intersection with minimal turning heavy vehicles.

An improvement opportunity is to refine the data inputs into an Asphalt intersection decision Matrix over the next 3 years to have a robust set of criteria of when Asphalt is to be used.

Change in Level of Service currently provided as a result of Matrix:

Rural roads to be considered for sealing:

Based on the matrix there are 151km of roads subject to a Benefit to Cost Ratio (BRC) analysis to determine if the next appropriate intervention is seal the road and if so the most economic time to do so. If all 151km was to be sealed then the profile could look like the below:

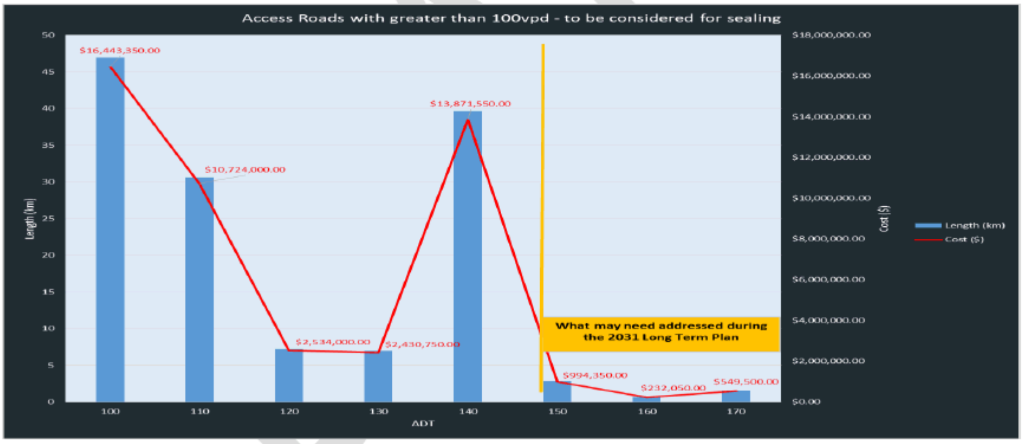

FIGURE 1 – ACCESS ROADS TO BE CONSIDERED FOR SEALING

The above graph shows that we currently have approximately 5km of roads with an ADT greater than 150vpd which are 'likely' to have a positive BCR and also be at the top of the prioritisation list of what would be targeted and budgeted for in the 2031 LTP at a cost of approximately $1.8M.

To seal extension all 151km of Access roads with >100vpd would cost approx. $48M.

Rural roads to be considered for reverting to unsealed pavement:

Based on the matrix there are 292km of rural roads that should be considered for reverting to unsealed pavement due to having less than 100 vehicle movements per day. On top of this there is an additional 533km subject to a Benefit to Cost Ratio (BRC) analysis to determine if the next appropriate intervention is revert the road to gravel when the road reaches the end of its life or rehabilitation.

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Refer to the unsealed roads section of AMP to see profile of roads that could potentially get reverted to gravel at end of life.

Financials based on Matrix impacts of Level of Service:

Existing level of service for all roads: $900M over 70 years or $13M/annum

Apply matrix: $770M over 70 years or $11M/annum **(net saving of $2M per annum)**.

Data Analysis

High speed data (HSD) is collected every two years. Currently Councils HSD is collected by WDM which is the same company that collects the same HSD on the State Highways. This data collection is used to determine the current condition of the sealed network and also determining appropriate interventions/timing. This data includes:

Texture

The HSD texture data has been analysed using the minimum macrotexture requirements as detailed in NZTA T10 Specification: 2013 Specification for state highway skid resistance management.

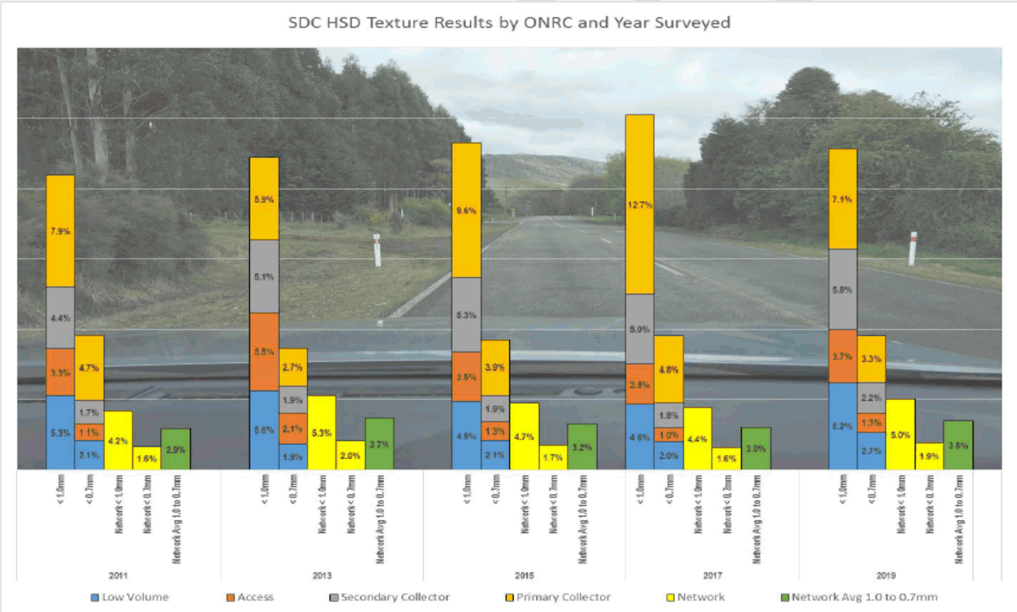

FIGURE 2: TRENDING DISTRIUBUTION PERCENTAGES OF HSD TEXTURE BY ONRC CLASSIFICATION

Skid Resistance

The HSD skid resistance data has been analysed using the minimum skid resistance requirements as detailed in NZTA T10 Specification: 2013 Specification for state highway skid resistance management.

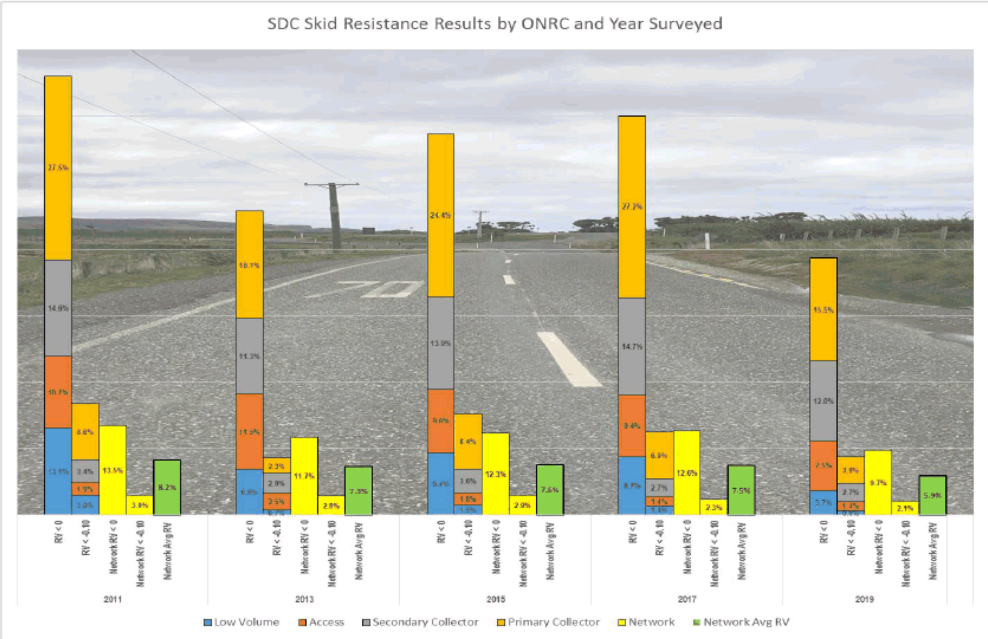

FIGURE 3: TRENDING DISTRIUBUTION PERCENTAGES OF HSD SKID RESITANCE BY ONRC CLASSIFICATION

Asset Performance

The graph below shows the current age make of the top surface by ONRC.

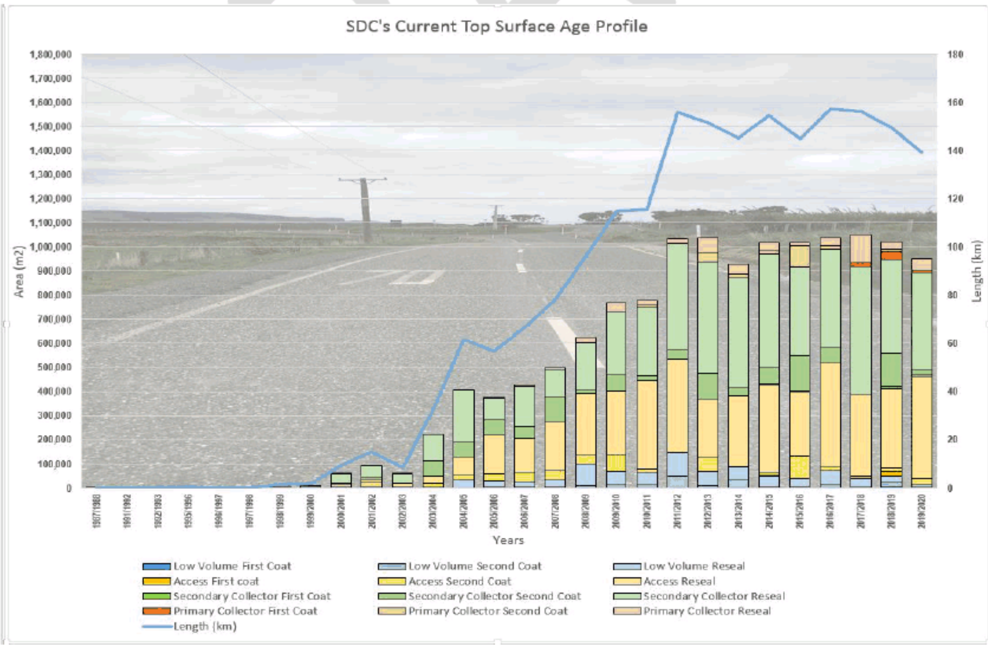

FIGURE 4: COUNCILS CURRENT TOP SURFACE AGE PROFILE

Reseal Programme Size

On the assumption of maintaining Councils current sealed network size; using the average of the last 4 years achieved lives for the 4 ONRC categories, the current amount of reseals generated is 985,000m2 which matches our current KPI of 7.3%.

KPI 16.1: Average quality of ride on sealed local roads. Smooth Travel Exposure >95% from 2021 onwards

KPI 16.2: Percentage of sealed local road network resurfaced. Target of 7.3% or >970,000m2/annum.

WSP's dTIMS report which models deterioration uses all the condition data (HSD, Rating and seal age data) suggests the % of resealing could be around 5.6% as the recommended investment over a 10 year average.

WSP's unedited Juno Viewer which also models deterioration uses all the condition data (HSD and Rating data) the % of resealing could be around 6.2% as the recommended investment over a 10 year average.

The above %'s are both less than our current KPI of 7.3%. There we recommend reducing the target to 6.5% and increase investment into pavement rehabilitations.

Operations and Maintenance

Strategic Planning

The below is the approach Council takes to identifying and programming its forwards works programme for sealed roads:

1. High speed data (HSD) is collected every 2 years by WDM
2. RAMM Rating data is collected every 2 years by Core Services provider
3. Completed reseals and rehabilitation first coat seals added into RAMM yearly. Data is sent from the reseal contractor to Core Services provider to review and format, query and update to load into.
4. Core Services provider carries out Forward Works Programme using Juno Viewer Modelling Software. Juno Viewer is run annually to determine rates of network deterioration and validate and update reseal, rehabilitation sites and update 3 year plan, 10 year outlook of site selections.
5. dTIMS Modelling is also carried out on 3 yearly intervals. The aim of this analysis is to provide evidence-based information to assist in the development of the Transport Management Plan, support the LTP investment submission for pavement and surfacing renewals.
6. Skid Resistance (SCRIM) review/assessment. This exception report determines sites for sealing and water cutting plans for the year.
7. Any not completed sites from the previous season reviewed are added to FWP (if any) to ensure these do not get overlooked.
8. Draft Forward works programs sent to Client for review (this is the next 3 years)
9. Finalised program sent to Maintenance Contractors to programme pre reseal repairs to be carried out prior to follow sealing season and also seek their feedback.
10. Finalised program sent to Reseal Contractor to do seal designs and seek their feedback.
11. Reseal Contractor carries out reseals
12. Rehabilitation programme goes out to open tender.

Maintenance

As soon as the road is constructed and sealed, deterioration starts and eventually the road will need maintenance such as pot holes, edge break, cracking, low texture, low skid resistance etc.

A number of years later a reseal will be required to restore the road to acceptable standards, then ultimately the road will require a rehabilitation and the process starts over again.

The water proofing capabilities of the first coat is not 100% so what is commonly known as a second coat seal is constructed generally within 1 to 2 years after the first coat. This second coat seal improves the water proofing capabilities of the now two seal layers and aims to have a useful life of between 5 and 18 years, depending on the size of the chip used in the second coat seal and the composition and volume of the traffic using these sealed roads.

Following the second coat seals are the reseals which are constructed as the second coats or reseals reach the end of their lives due to a number of factors like age, loss of texture, loss of skid resistance, amount of cracking etc.

Drainage on the sealed network will be carried out by the maintenance contractors during pre-reseal repairs to ensure all drainage is kept to the required standards at least once every seal cycle – see drainage sections of AMP.

Renewals

Resurfacing - Chip seals

Theoretically a sealed road can last indefinitely, provided sufficient investment is made in the form of maintenance repairs. However it will become uneconomical to continue with these and this is ultimately when a renewal is required. Also the continual repairs will lead to a road that no longer providing a comfortable, safe and efficient means of transport therefore no longer fit for purpose.

For sealed roads the main driver for reseals is the deteriorated condition of the seal coat (except for first coats). The seal coat as it ages loses condition via a number of factors such as:

- Age – as the bitumen binder ages it becomes brittle and this leads to cracking (this leads to pot holes and edge break) and loss of the sealing chip (scabbing)

- Texture – traffic use leads to loss of texture as the sealing chip is pushed down through the bitumen binder which leads to wheel path rutting and smoother wheel paths. This loss of texture and rutting leads to when it rains the water does not run off the seal coat as quickly as it should. So instead of vehicle tyres running in contact with the sealing chip, there is less surface area contact with the chip which can leads to a loss of traction.

- Skid resistance – traffic use leads to polishing of the sealing chip via the action of the tyre contact with the sealing chip. This polishing leads to lowering of the skid resistance capabilities of the seal coat, thus making the road less safe.

- Seal layer instability – with the succession of seal coats that are constructed over time, the amount of bitumen versus the amount of sealing chip (binder to stone ration) reaches a point where there is excess binder. The top surface sealing chip texture is then lost more quickly than normal thus leading to a shorter life of the seal coat. As SDC's network gets older the amount of the network with seal layer instability climbs. Currently the way to deal with seal layer instability is to rehabilitate the road.

The renewal strategy is based around the timing of the next reseal to ensure SDC achieves a good economic life for the money invested in the current seal coat. Factors considered prior to any reseal include the texture, skid resistance and scabbing are at levels that require a reseal. Water proofing of any cracked areas is maintained to protect the basecourse layers and also to provide additional water proofing on any repairs that have been carried out prior to the reseal.

Other factors that are considered are the practicalities of sealing, especially in the more remote areas of SDC's network. What this means is, some areas of sealing in these remote areas are packaged with other areas so that we do not have to go back to these remote areas the following year to reseal a relatively small area. This leads to some areas being brought forward and some areas delayed.

Resurfacing – Asphalt

As per the asphalt level of service section above – Council is currently working on a matrix to determine what high stress sites/intersections should be resurfaced with asphalt. In the interim these are assessed case by case when identified in the resurfacing forward works programme and assessed against available budgets.

Resurfacing Forecast

The renewal forecasts have been based on the following two options:

Option 1 - Status quo

This option assumes that SDC continues on as per recent history by rehabbing all the sealed roads as they come due. This will generate additional area due to the new rehabs being wider than the current seal width. Assuming over the next 40 years that the entire network has been rehabbed and all sealed roads are out to the ONRC minimum design widths, there will be an additional 1.1 million m2 of seal. This additional area equates to approximately 28,000m2 per year.

The resealing program continues on at the same KPI of 7.3%. This generates a yearly reseal budget including physical works costs and Engineering fees ($250,000) ranging from $5.5m to $5.8m over the next 10 years. This budget also has a yearly allowance of 3,500m2 of Asphalting for high stress areas.

Option 2 – Adoption of Intervention Matrix

This option includes the implementation of the invention matrix on rural sealed roads. Urban roads are maintained as required.

The effects of the intervention matrix suggest that on the assumption of the proposed changes in level of service over the next 40 years there will be reduction in the total sealed area of around 20,000m2 per year.

From the above data a reseal KPI of 6.5% has been assessed. This 6.5% KPI generates an average yearly reseal budget including physical works costs and Engineering Fees ranging from $4.80million to $4.72million over the next 10 years. This budget also has a yearly allowance of 3,500m2 of Asphalting for high stress areas.

Rehabilitation – Pavement Age

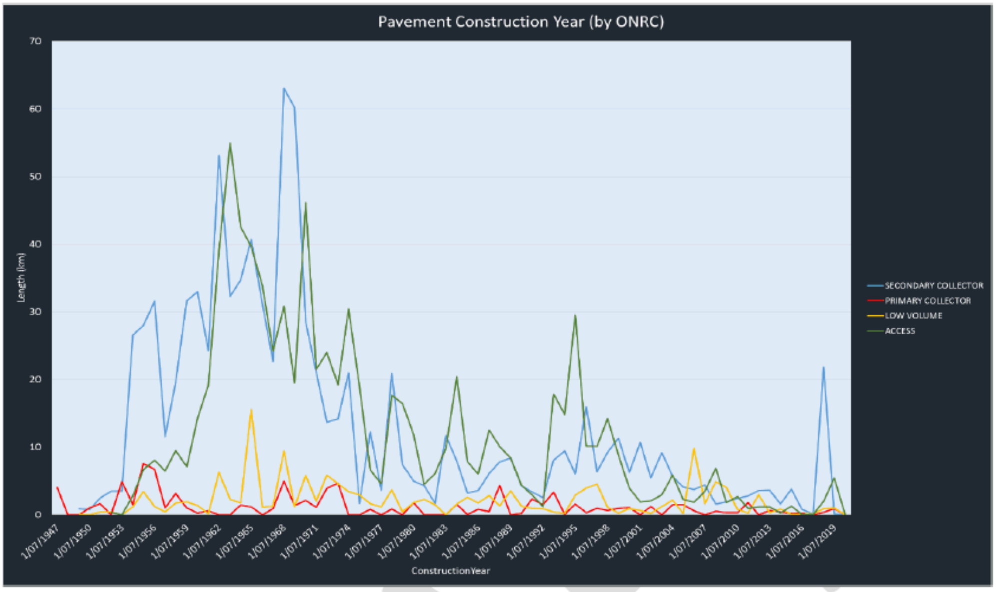

FIGURE 6: PAVEMENT CONSTRUCTION YEAR PER ONRC CLASSIFICATION

As a result of a huge number of roads being construction within a confined timeframe – all prediction modelling suggests that we are going to have a 'bow wave' of rehabilitations to deal with. This leads on to the question of what life can be expected to be achieved from these pavements in order to plan for the bow wave of renewals.

Councils previous Activity Management Plan refers to achieving an average of 70 years out of its pavements before needing an intervention such as a pavement rehabilitation. Whilst this 70 year number is a reasonable assumption; there a couple of points that challenge how realistic this prediction is:

- All new pavements are designed for a 30 year design life. Waka Kotahi requirement.

- All pavement rehabilitations that have been carried out on the Southland District Council network to date have only achieved an average of 38 years (despite what classification/ADT of road). Is this because we can only expect in the realms of 35-45 years out of pavements or could it be that the pavements rehabilitation to date have actually prematurely failed due to other factors such as materials or construction techniques.

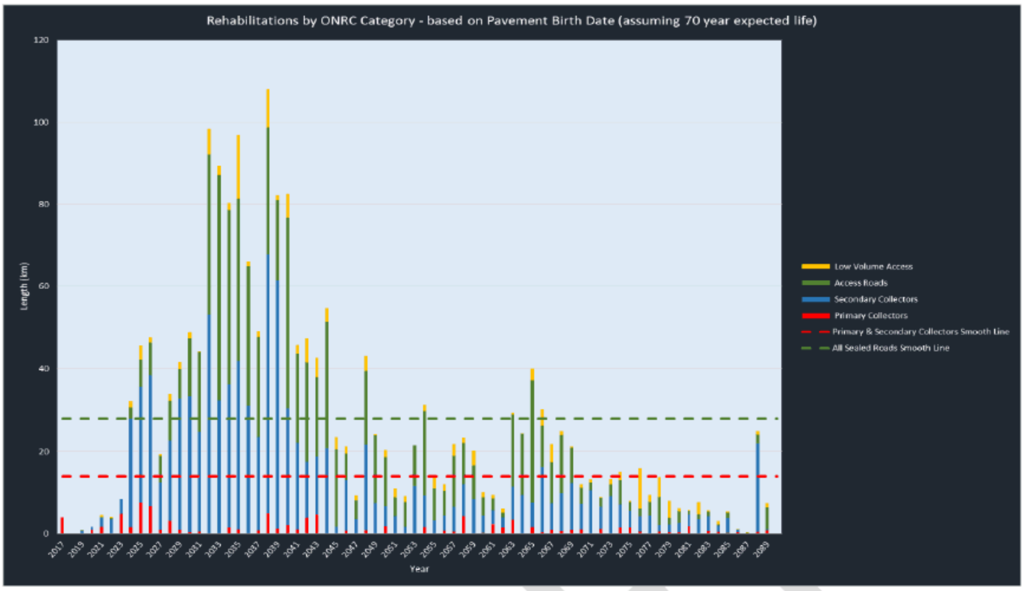

FIGURE 7: RENEWALS PROFILE BASED OFF BIRTH DATE

Based on the fact that the majority of Councils roads were built in the 1960s; it comes as no surprise that the 'bow wave' of renewals peaks approx. 2030 based on a 70 year expected pavement life.

Rehabilitation – Seal layers

As you can see from above section there are lots of questions around what pavement life Council can expect to achieve from its relatively speaking low volume network. What is being observed from the rehabilitations that are being required to date is that it is usually surface layer instability that is driving the need for intervention. If seal layer instability is a real issue; and likely to occur prior to pavement failure; then is a full life cycle of seal the governing factor we need to model our pavements renewals on rather than deeper seated pavement failures.

Typically Council has observed significant surface related failures occurring due to the number of seal layers applied is in the realms of 6 layers plus. Table 6 below shows approximately the number of seal layers Council currently has on its sealed network:

Seal layers	1	2	3	4	5	6	7	8
Low volume	3,748	46,994	55,107	32,128	13,974	1,628	416	-
Access	13,534	114,379	247,379	257,444	155,344	41,240	556	-
Secondary Collector	4,617	195,680	317,086	211,941	112,545	61,406	12,069	909
Primary Collector	6,978	21,591	20,849	6,105	4,115	9,003	4,958	1,037

TABLE 6: LENGTH (KM) OF ROADS PER EACH SEAL LAYER

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In summary Council has approx. 133km of network above 6 seal layers already and 286km with 5-6 seals layers (bordering on the point of instability). Combined this is approximately 20% of Councils sealed network already showing signs of seal instability or not far from it.

Seal layer performance:

As outlined above; there is a number of unknowns around expected average pavement lives for Councils network as a complete life cycle of all assets has yet to be reached and therefore a lot of assumptions are built into modelling predictions. Council does however hold a much more complete set of Seal life actual achieved data which appears to be the governing factor of when a rehabilitation intervention is required and therefore this has been analysed to determine expected lifecycles per ONRC classification as shown in Table 7 below:

Seal Layer	1	2	3	4	5	6	7
Primary Collector	2.2	11.4	11	8.3	12.3	8.6	5.8
Secondary Collector	2.2	11.7	11.6	12.1	10.8	9.3	8.6
Access Road	2.1	12	13.1	12.2	9.8	9.6	7.7*
Low Volume	4.6	14	13.4	13	12.3	8.6	7.0*

*Incomplete data sets as no roads of this low volume has had an 8^{th} coat applied.

TABLE 7: AVERAGE ACHIEVED SEAL LIFE OF EACH SEAL LAYER PER ONRC CLASSIFICATION

In summary the average expected life to be achieved for sealed roads based off seal layer instability per ONCR classification is shown in Table 8 below:

ONRC	Seal layer life cycle (based of actuals):
Primary Collector	60 years
Secondary Collector	66 years
Access Road	67 years
Low Volume Access Road	73 Years

TABLE 8 – AVERAGE ACHIEVED LIFE CYCLE BASED OFF ACTUAL ACHIEVED SEAL LIVES

Rehabilitation Forecast (based on seal layer information):

Utilising the expected seal life data (based on actual achieved seal lives), the extrapolated profile of when all of Councils sealed roads will reach end of life are require rehabilitation due to seal layer instability is shown in figure 8 below:

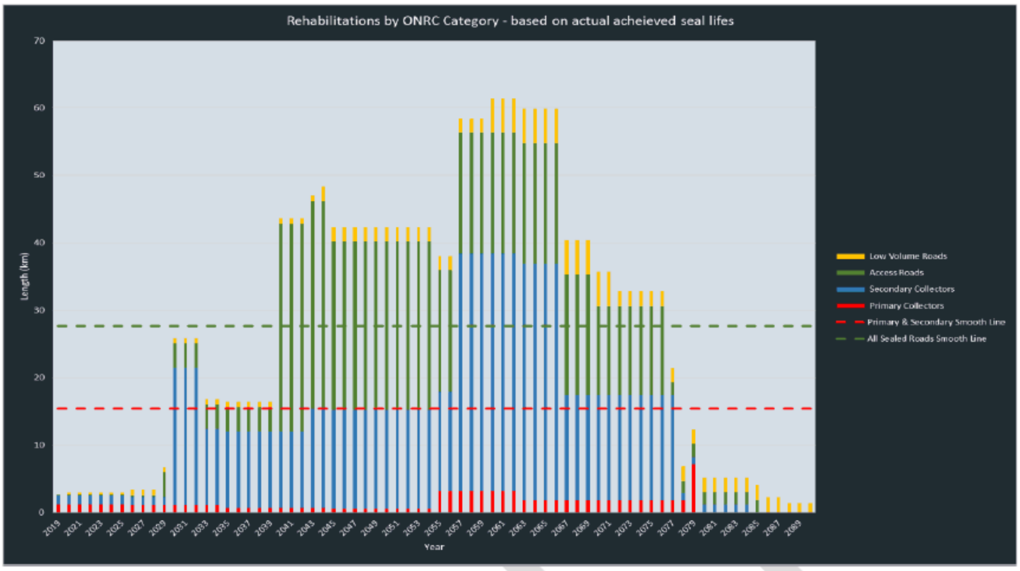


FIGURE 8 – REHABILITATION PROFILE BASED OFF ACTUAL SEAL LIVES ACHIEVED

A shown above the renewals start to increase in 2030 to approx. 16km/annum and then really ramp up in 2040 to 45km/annum plus. This is a significant increase on the 5-10 km rehabilitation packages Council has been achieving over the last few construction seasons. Taking a smooth line approach to avoid the peaks or 'bow wave'; 15kmh/annum of renewals is required effective immediately in order to maintain the existing level of service on Primary and Secondary Collector Roads only. In order to maintain the existing level of service on all sealed roads then Council need to average 28km/annum renewals.

The above graph converted into investment required is shown below in figure 9:

FIGURE 9– INVESTMENT REQUIRED FOR REHABILITATION PROFILE (BASED ON SEAL LIVES)

Taking a smooth line approach to avoid the peaks or 'bow wave'; $7.1M/annum of renewals is required effective immediately in order to maintain the existing level of service on Primary and Secondary Collector

Roads only. In order to maintain the existing level of service on all sealed roads then Council needs to be investing an average of $12.2M/annum. This has been calculated using a rate of $50/m2 plus professional services costs.

Pavement end of life Vs Seal layer instability:

Two approaches for determining a renewal cycle for sealed roads have been outlined above:

- Pavement Age (based on an assumed expected life)
- Seal Layer instability (based on actual achieved seal lives)

The two scenarios combined are showing in figure 10 below:

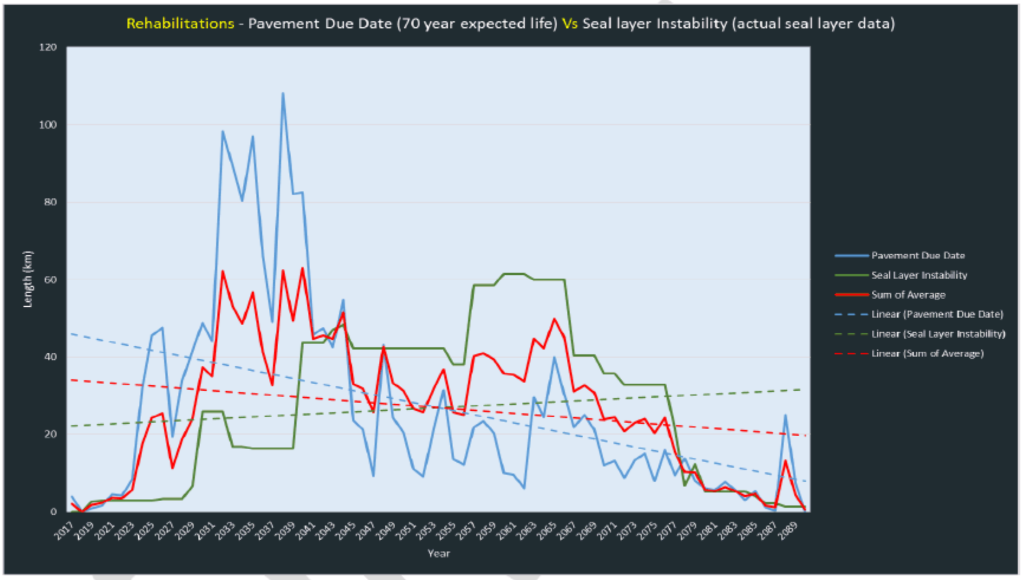


FIGURE 10 – PAVEMENT LIFE VS SEAL LAYER LIFE PROFILE

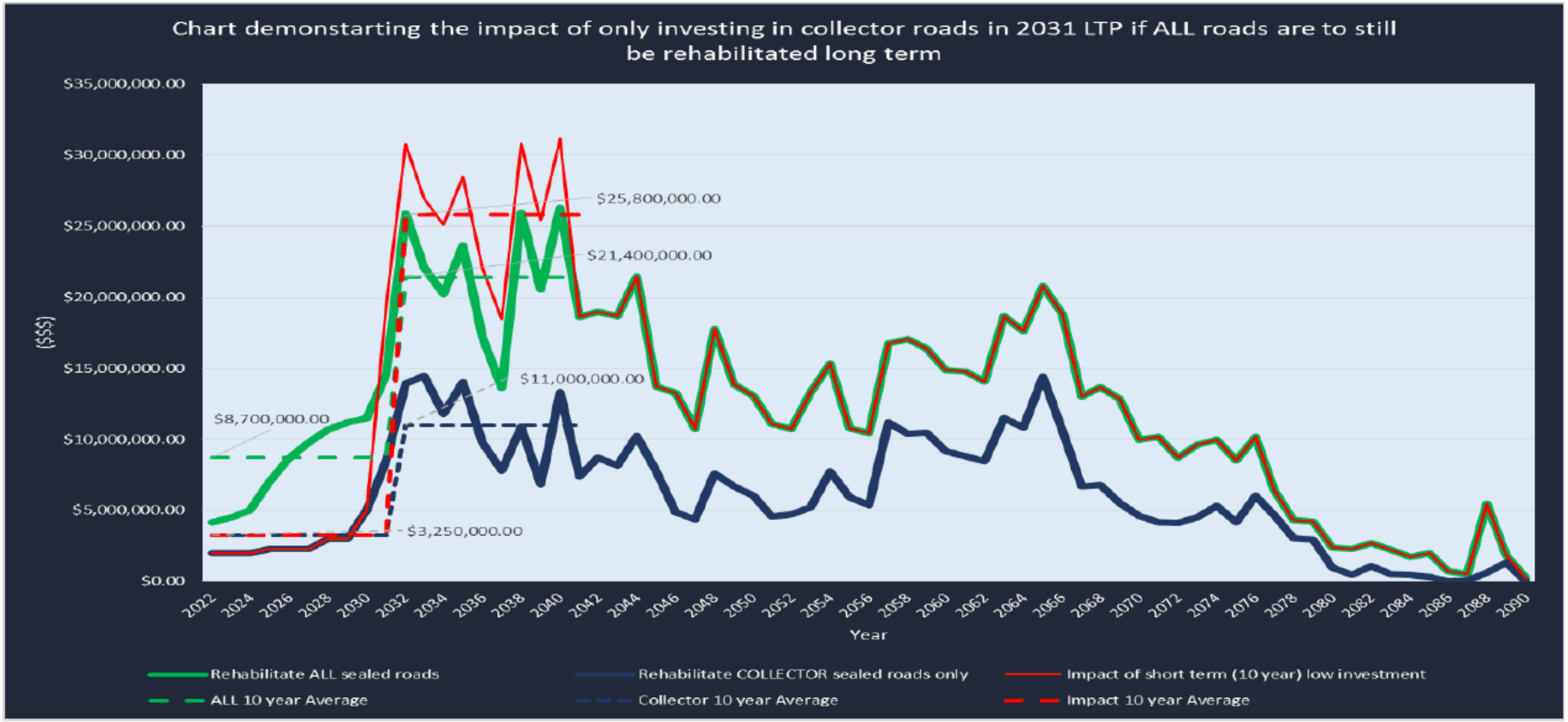
The red line is showing an average between the expected renewal dates between both scenarios (Pavement life vs Seal layer life). The point at which all the linear trend lines meet is probably a reasonable assumption of a good place to base an average renewal programme around assuming the existing level of service is to be maintained for all sealed roads. This is approx. 28km/annum or $12.2M/annum.

dTIMS Performance Modelling:

WSP Opus on behalf of Council prepares a dTIMs performance modelling report for Council to utilise all relevant information held by Council such as RAMM and high speed WDM data to best optimise a forward works programme to maintain the network under a number of different scenarios.

After all the modelled scenarios and analysis had been completed, the recommendation was a budget of $8.442M for pavement renewals (absolute minimum) to maintain Primary & Secondary collectors plus Access road with >100vpd.

Investment vs Impact



Average Investment Required	2031 Long Term Plan	2041 Long Term Plan
Rehabilitate ALL sealed roads	$8.70M/Annum	$21.40M/Annum
Rehabilitate Collector sealed roads only	$3.25M/Annum	$11.00M/Annum
Impact of NOT investing in 'lower' volume roads in 2031 LTP is an ADDITIONAL $4.40M/Annum in 2041 LTP. This is on top of the peak of the 'BOW WAVE'. Reality is that if 'lower' volume roads are not invested in this LTP – the ability to recover and fund at a later date is almost impossible and hence a reduction in level of service (reverting roads to gravel) will be inevitable. We need to be investing at the green line values throughout the		

2031 LTP to avoid reducing levels of service across the sealed road network as the affordability and market capability of carrying out the work required in 2041 LTP is questionable as is without exacerbating the situation.

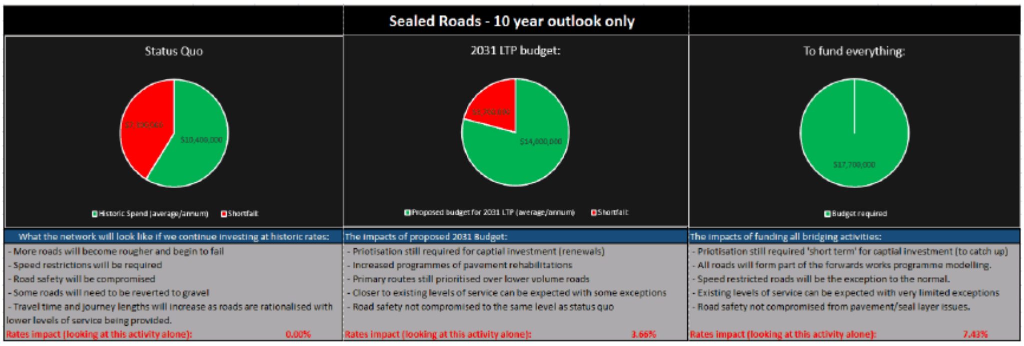


FIGURE 11: INVESTMENT VS IMPACT CHARTS

Future Improvements

Development of Asphalt Matrix to create robust criteria to determine which intersections are to be treated with asphalt when up for renewal.

Carry out core samples to gain knowledge of bitumen to stone ratio for areas that Council hold little data.

Review pavement layer data especially in the old Wallace County area to ensure we end up with as full a history as possible.

Unsealed Roads

Overview

The District's unsealed metal surfaced roads constitute 60% (approx. 3000km) of the road network and carry only 15% of the traffic volume. Nearly 69% of the unsealed roads carry less than 50 vpd. The objective of unsealed roads is to provide all-weather travel for all types of vehicles however under intense or extreme weather events access may not always be possible.

Asset Description

There are approximately 3,000 km of unsealed roads in Southland District.

The unsealed roads, which are spread throughout the District, are generally lower volume roads that provide access from individual properties to collector or arterial roads. They generally have lower speed values than sealed roads, with the aim of providing a suitable surface for the public to travel comfortably at 70 km/hr on straight sections.

The unsealed roads have developed from tracks to roads with the vegetation removed and gravel added to fully constructed gravel roads. This has taken place over the past hundred years with the standards and requirements in terms of width and strength improving over time. The following table describes the standards to which new roads are constructed. They are based on the demands identified for each road and evaluated against the ONRC.

The capacity of the unsealed roads is governed by their widths and strength being suitable for the volume and type of traffic carried. The width has a major effect on safety giving opposing traffic more room to avoid each other. This is particularly important in locations of low visibility around curves or over brows of hills. However regardless of the road width vehicles still tend to drive in the center of the road creating a two-wheel track road rather than a three or four-track road. The strength of the road governs the capacity of the road to carry repeated heavy loads, particularly in wet conditions. This becomes particularly important during logging, quarrying, dairy conversion and other intense carting operations. Capacity of Southland unsealed roads is variable.

Table 1 below shows the ONRC hierarchies for unsealed roads including design target widths:

ONRC	Rural Design Width	% Compliance with Design width	Km of Rural unsealed roads	Km of under width rural unsealed roads
Primary Collector	N/A	N/A	N/A	N/A
Secondary Collector	6.0 – 7.5	100	1.7	0
Access – Rural	5.0 – 7.0	83.1	811.7	137.2
Low Volume – Rural	3.5 – 6.0	94.0	2093.3	124.6

TABLE 1: UNSEALED ROAD WIDTHS - TARGETS

A reasonable level of compliance with the design carriageway widths (based on a combination of 2001, 2003 & 2012 data) and the general lack of concern (as evidenced through complaints) regarding gravel road widths has been used to determine design targets. This recognises that in terms of priorities for expenditure a lower width is acceptable to the general public and specific widening efforts should only take place where specific problems have been identified such as safety concerns.

Average Annual Daily Traffic (AADT)

The traffic volumes on the unsealed roads are generally at the lower end of the scale. These range from 5 to 210 vehicles per day. The only secondary collector 'unsealed road' Council currently has is the Otta seal on Haldane Curio Bay Road (1.7km) with an ADT of 210 vpd.

Asset Condition

The unsealed road asset is in a reasonable but constantly changing condition depending on traffic use, weather, position in its maintenance cycle etc. It needs to be acknowledged that while our gravel roads appear to be in reasonable condition they have been formed by a gradual build-up process rather than constructed. This means that the majority lack structural strength and are susceptible to damage from changes in use.

Roughness is a function of both grading and gravelling. Because of the constantly changing condition a road may meet the required standard the day it is graded and be severely substandard a short time later. The type of gravel and the binding material available will also affect the surface condition, as will the weather. Adding new metal may make the road appear in good condition but be much less satisfactory to drive on, and may even be dangerous on hilly steep sections of the network.

Roadroid (see section below) is used to measure the assets condition at any point in time.

Roadroid

Roadroid is a tool that was developed in Sweden and implemented by Council back in 2015 to measure road roughness via means of a smartphone application. Council adopted this means of measuring the condition of the unsealed network to remove all subjectivity for the test results and to provide consistency. Output from Roadroid is both in terms of International Roughness Index (IRI) and in a more relatable measure of percentage of what is acceptable or not.

Roadroid has been used for the following roughness surveys:

- Alliance contacts 10% monthly auditing
- Response to unsealed road related Requests For Service (RFS)
- District wide annual unsealed network audit

The district wide annual unsealed network audit is typically carried out in November/December months and the score generated is used as evidence for KPI 16.4 in Long Term Plan as per below:

KPI 16.4 Percentage of gravel road tests where road roughness (road roughness measured by Roadroid testing) meets acceptable standards. Target of 85% Good or Satisfactory combined score.

Council has achieved this KPI since its implementation with scores ranging between 87-91% Good or Satisfactory across the board.

Data

Some details of the unsealed road network are held in the RAMM system, mainly inventory data such as the length, width and start and end points of a section of road. Also included are locations of culverts.

Maintenance data including costs is to be captured via RAMM contractor and recorded in the appropriate RAMM tables.

Roadroid data is stored in the Roadroid cloud system and any data can be exported and any time.

Level of Service:

Maintenance:

The level of service provided on all unsealed roads regardless of their ONRC classification is to:

- Comfortably be able traverse them at 70km/h (where the road geometry/layout safely allows)
- Achieve an average score across the entire road (not isolated short sections) of 85% Good or Satisfactory Roadroid score.

Where there are subjective opinions that cannot be agreed between affected residents and Council on being able to "safely traverse the road at 70kmh" – the Roadroid score component above will take president as a non-subjective measure of overall condition of road.

Seal Extensions:

The District has a large proportion of unsealed roads and there is continual pressure to seal them, predominantly by the rural community. Sealing of the roads has significant consequences in the long term because of maintenance and asset deterioration issues.

While there is an ongoing desire from ratepayers for seal extension of their own road or the ones they travel on the most, there is also a realisation that SDC cannot afford to seal all of its roads. A rough order of cost estimate to seal the remaining 3,000 km network of unsealed road is $750M with an increase in long term annual maintenance of $12M pa. Even just sealing a 100 m strip in front of every house on every unsealed road has an estimated rough order of cost of $105M (based on 3,000 properties at $35,000 each) with an increased maintenance cost of $1.2M pa.

The same matrix that is demonstrated in the 'Seal layers and Pavement life' section of this AMP will be used to determine both unsealed roads that potentially could be sealed and also sealed roads that should be reverted back to gravel when they reach end of life as shown below:

The matrix is to be applied to rural roads only. Urban environments will be treated as per the status quo i.e. renewal when at end of life. Primary and Secondary collector roads have been removed as they should all remain as sealed roads.

ONRC		Unsealed	Rural Sealed Roads		
Classification	Width		Under Width	Seal Layer Instability	Pavement End of Life
Low Volume	3.50 - 6.00m	Maintain as Gravel	Revert to Gravel	Revert to Gravel	Revert to Gravel
Access (<100vpd)	5.00 – 7.00m	Maintain as Gravel	Revert to Gravel	Revert to Gravel	Revert to Gravel
Access (>100vpd)	5.00 – 7.00m	BCR for Seal	N/A	BCR for Rehab vs Unsealed	BCR for Rehab vs Unsealed

TABLE 2 – RURAL ROADS INTERVENTION MATRIX

The roads that fall in the Access above 100vpd category will be subject to a Benefit to Cost Ratio (BRC) analysis to determine both what the most appropriate intervention is and also the most economic time to carry out a change in level of service (if any). Even if a positive BCR can be calculated; this does not guarantee an increase in level of service will be provided any time soon. It will simply mean the section of road has met the first set of criteria and will be prioritised against all other roads in the network that fall into this category. This prioritised list of improvements will form a forward works programme that will be implemented as budget allows.

Any roads that are currently sealed and are deemed to be reverted to unsealed; will only occur when seal layer instability occurs or pavement reaches end of life.

ONRC		Unsealed	Rural Sealed Roads		
Classification	Width		Under Width	Seal Layer Instability	Pavement End of Life
Low Volume	3.50 - 6.00m	2093km	25km	-	15km
Access (<100vpd)	5.00 – 7.00m	660km	100km	9km	143km
Access (>100vpd)	5.00 – 7.00m	151km	N/A	28km	196km

TABLE 3 – MATRIX WITH NETWORK STATISTICS APPLIED

Statistics

Based on the matrix there are 292km of rural roads that should be considered for reverting to unsealed pavement due to having less than 100 vehicle movements per day. On top of this there is an additional 533km subject to a Benefit to Cost Ratio (BRC) analysis to determine if the next appropriate intervention is revert the road to gravel when the road reaches the end of its life or rehabilitation. Assuming that half of the 533km subject to BCR are reverted to gravel; this is a total of 558km of sealed roads will be reverted to unsealed when they reach each of life. This is expected to occur over the next 70 years with the peak approx. 2045-2065 as shown on the graph below:

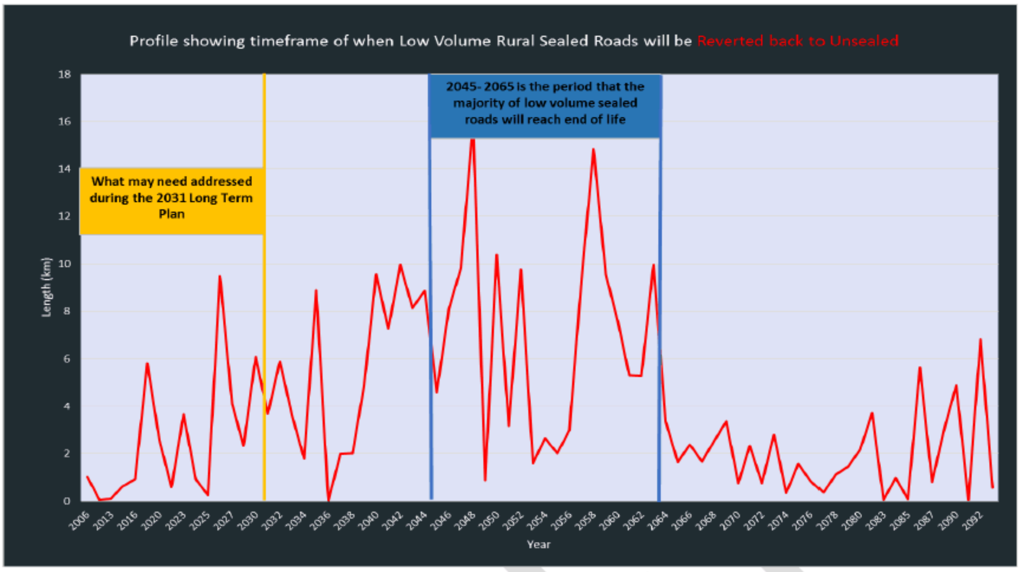


FIGURE 1 – ROADS TO BE CONSIDERED FOR REVERTING TO GRAVEL

The above graph shows that there is approximately 43km of roads that the data shows are already at end of life based on amount of seal layers currently applied or will reach this point within the 2031 LTP.

Based on the matrix there are 151km of roads subject to a Benefit to Cost Ratio (BRC) analysis to determine if the next appropriate intervention is seal the road and if so the most economic time to do so. If all 151km were to be sealed then the net difference to unsealed network size would be 558km-151km = **an increase in the unsealed network of 407km.** This change in network size would occur over the next 70 years with only approximately a 40km increase in unsealed network predicted in the next 10 year window.

Dust Suppressants/Alternative Seal types:

Otta Seals may in the future provide a viable option to full seal extension where dust is the primary reason for public complaint. At roughly $90,000 per kilometer this may be a financially viable option in the future. More data needs to be gathered on the long term life and costs of these before proceeding with more than just trial sites. Council has just one trial site that has reached end of initial life and is now trialing a two coat chip second coat seal over top to see how much extended life can be achieved. This will give an indication of whole of life cost and how it compares to traditional seals.

Council will consider allowing Otta Seals to be used outside resident's houses at their own cost as a substitute to using Waste Oil treatment which is no longer permitted by Environment Southland. While Council will support these applications – there will be a set of criteria that will need to be followed and Council will not contribute towards the cost of such applications as it's not a level of service rated for.

Extent of Network:

The general rule for maintenance of the unsealed network on no-exit roads is to maintain to the last house with the exception of where there is a point of interest (eg. Lakes, rivers, parks etc).

There is an opportunity to investigate whether Council can reduce its maintained unsealed network based on change of land use. It is estimated that approximately 80km of the network may fit this category; however further analysis is required to refine this number.

There are also a number of maintained roads that only service one property (essentially a legal public road serving as a private drive way). It is estimated that there is approximately 100km (based off rapid numbers and carriageway lengths) of network falls within this category; however further analysis is required to refine this number.

A long term strategy may look to stop maintaining some of the above roads and/or divest the road reserve to adjacent property titles. Further work is required in this space and hence no proposal for change is suggested at this point in time.

Operations and Maintenance

For unsealed roads, the top surface is gravel (metal) to provide a suitable wearing surface, the shape provides surface water run-off and the underlying material needs to be resistant to moisture penetration by appropriate material grading.

The surfacing of gravel roads is one of the main areas where contractors are encouraged to produce a stable bound surface. This may be done in a variety of ways including adding clay and silt, (either from the edge of the road or imported), adding well graded metal, stabilising existing material with lime or cement, rolling after laying etc.

The main operating and maintenance activities for unsealed roads are:

- Grading (varies from monthly through to yearly depending on road use), to maintain shape (and therefore drainage) and remove rutting and corrugations. Crossfall should be provided on straight sections of road at approx. 4-5% to avoid potholing down the center of the road.
- Pothole repairs - through grading or filling - if filled the repair material needs to be capable of compaction to ensure it is dense and stable for trafficking while still performing similar to the surrounding pavement.
- Vegetation management, including mowing, noxious plant spraying and overhanging vegetation trimming.
- Condition assessments by maintenance contractors and Council staff with the aid of Roadroid.

Graders are programmed on a general cycle depending on known condition of the road, traffic volumes and ability to maintain condition. A regular inspection is carried out by the grader driver, however a decision on either the need for grading or whether the road is in a fit condition to be graded is made at the time grading is due.

Loose surface build-up is also required to be monitored as the deeper the loose surface the greater the risk of a driver losing control. If it is over 250 mm deep it should be considered for intervention.

Transition areas from sealed to unsealed carriageways also need attention under unsealed maintenance. A smooth transition should be maintained over no less than a 20 metre distance within the unsealed carriageway however this may need to be longer depending on specific site conditions. Meanwhile the sealed section is to be swept and kept clear of the unsealed carriageways aggregate.

As with sealed roads drainage is a major issue. Waterways need to be operating correctly and are not to be blocked with roading aggregates. This includes bridge decks/drainage to be kept clear.

Operations and Maintenance Forecasts

The increases have been aligned with inflated increases due to expectant rises in labour and fuel costs. Costs in this area are predominantly grading making up around 75% of all cost. The majority of other costs associated with unsealed road maintenance are routine maintenance and digouts.

Constraints

- Gravel supply has been a significant expense in maintaining roads in Southland and in particular unsealed roads. Effort has been placed into determining ways of reducing this cost. A potentially significant initial potential saving has been identified by purchasing from alternative suppliers. Residents generally prefer a regular grading cycle, however better and more economic results can potentially be obtained by monitoring quality and increasing or decreasing cycle.
- The remaining life of the network with ongoing maintenance and renewal is indefinite. The formation is assumed not to depreciate as regular maintenance (slip clearing, etc) will allow it to provide service indefinitely. The unsealed pavement structure is assumed to consist of a permanent sub-base layer protected by a maintenance metal layer, which is replenished as required to maintain the overall structural integrity.

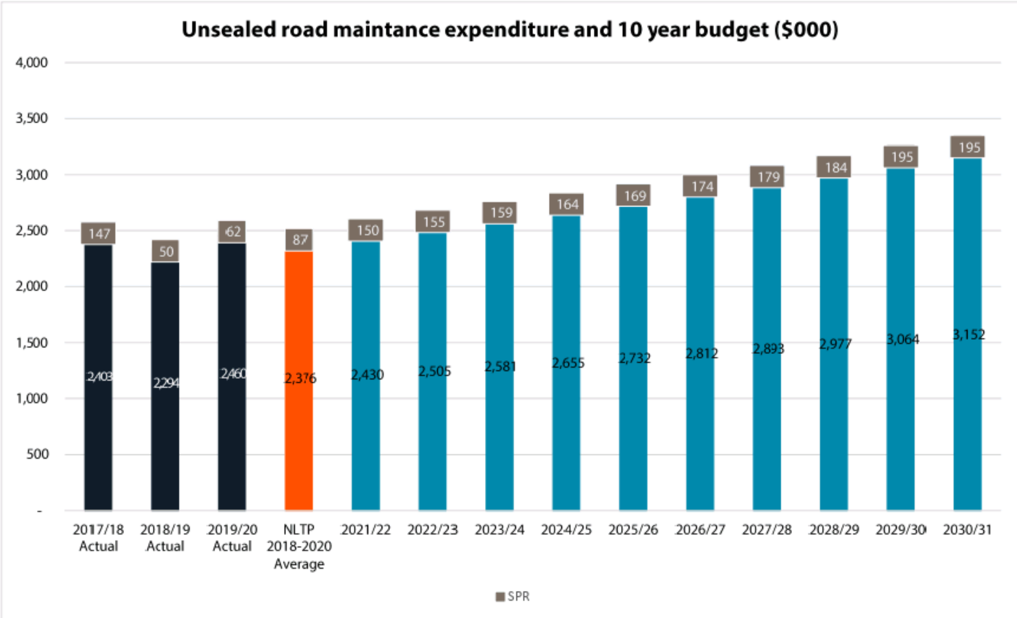


FIGURE X: UNSEALED ROADS OPEX FORECASTS

Renewals

Potentially an unsealed road can last indefinitely, provided sufficient investment is made on the road through its life to keep it in a good state of repair and renewed when required. For roads, the main parameter that signals the need for road renewals is the road condition and increasing maintenance costs to maintain the required LOS. As the road surface deteriorates, it becomes rougher with increased potholing and failures. The renewal strategy is based around measuring and forecasting the deterioration of the roads and scheduling investment in renewals when the level of deterioration becomes unacceptable.

With unsealed roads, deterioration can in some cases be very rapid - i.e. a road which was adequate when used by the occasional heavy vehicle becoming impassable when logging or dairy conversion takes place along it. Renewals for unsealed roads is primarily re-metaling the surface.

Renewal Forecasts

The renewal forecasts have been based on the 2018 - 2021 average expenditure. Council's contractors make use of resources such as the AustRoads formula for calculating the amount of metal to be applied.

Programmes are developed with 2, 4, 8 year cycles and feedback is also sought from Grader drivers as to places with no metal.

Factored into this is the position of gravel pits to align value for money (sometimes better to complete additional roads in a given area due to the location of the gravel source than shifting a crusher and the associated setup costs).

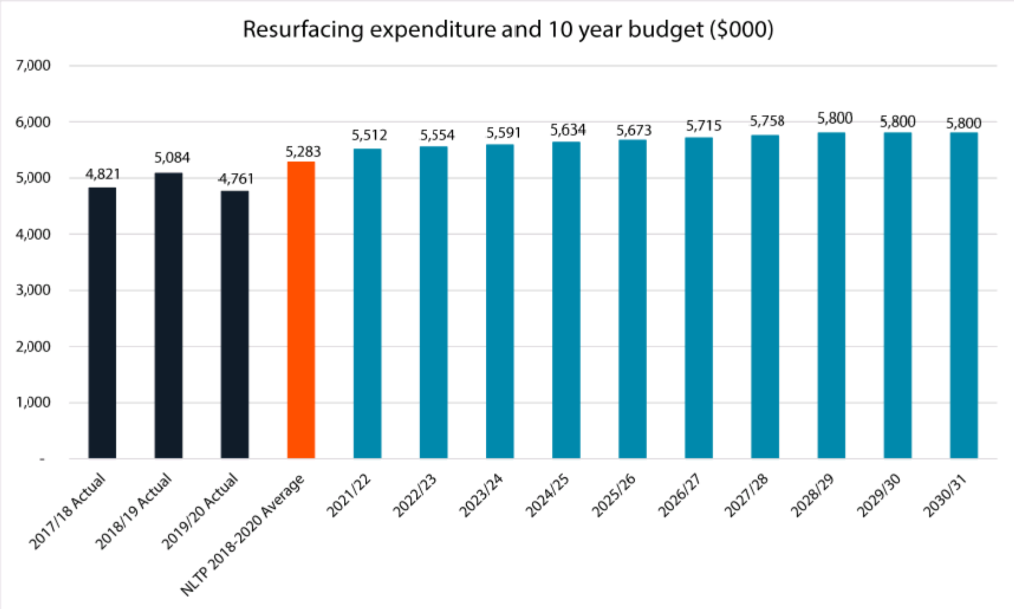


FIGURE X: UNSEALED ROADS RENEWALS FORECAST

Special Purpose Roads

Historically some roads attract 100% Waka Kotahi subsidy because of their national significance in terms of tourism industry, their use, revoked State Highway status and current condition. The Transport Management Act 2003 repealed section 104 of the Transit NZ Act 1999 which related to special purpose roads.

Council currently only has one special purpose unsealed road which is the Lower Hollyford Road. Waka Kotahi at this point are paying the 100% subsidy but this is proposed to end in 2024 where is will be reduced to Councils 52% Funding Assistance Rate (FAR). Council is currently having conversations about what this reduction in funding will mean for the Lower Hollyford Road long term – particularly post it being significantly damaged in the February 2020 flooding event.

The maintenance of special purpose roads includes pavement maintenance, amenity, safety and traffic services. This is covered under the maintenance contracts to the same LOS as other roads with a similar hierarchy. Due to its distance from the rest of the network, the Lower Hollyford Road is maintained by the State Highway maintenance contractor and consultant in the area.

Investment vs Impact

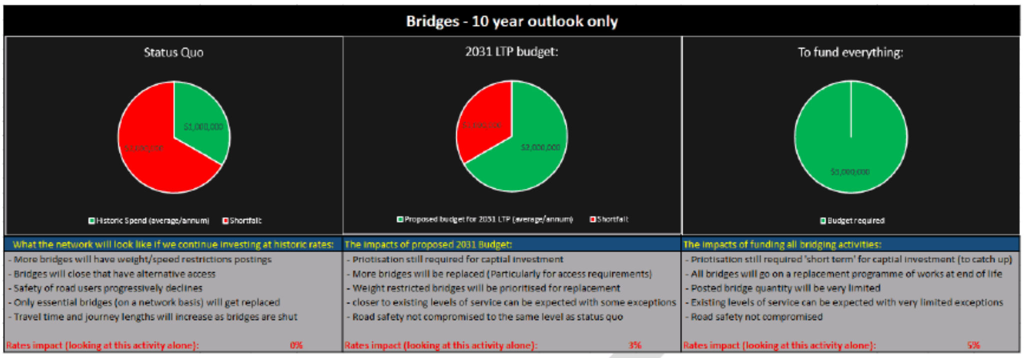


FIGURE 11: INVESTMENT VS IMPACT CHARTS

Future Improvements

- Investigations are required to improve the understanding of the relationship between maintenance techniques and the performance of unsealed roads.
- Little historic data is formally held on the construction and maintenance of the unsealed roads and as such this is an area seen as an opportunity for data capture improvement.
- Further investigate whether stabilising agents produce any economic benefit to the road network. This includes further evaluation of Otta Seals and other agents applied to the road to extend maintenance cycles or dust suppressants
- Carry out a new inventory survey to check gravel road widths against full contract compliance and progress to target widths as existing data varies from 2001-2012.
- Maximise Roadroid data to refine grading cycle frequencies.
- Model unsealed pavements in Juno-viewer and utilise the Roadroid data in this space.
- Further investigate the extent of network data to potentially reduce the maintained unsealed network.

Bridges

Overview

Council has 1081 bridges (including stock underpasses) on the network, or on average one bridge or large culvert for every five kilometres of road. The majority of these structures were built between 1950 and 1970 and therefore a large number a reaching the end of their useful lives over the 2031 Long Term Plan period.

A number of different materials have been used to construct the bridges within the Southland District. Both the oldest and the youngest structure in the network are constructed from concrete. Timber structures have construction dates typically starting in the 1950s.

At the time of producing this report there were 77 posted bridges owned by SDC and the posting limits are due to deterioration in the condition of the main structural members. The majority of the posted bridges are timber structures though some bridges incorporating steel components also have weight restrictions imposed. All of the structures will continue to deteriorate and the number of posted bridges can be expected to increase in future years if the structures are not upgraded or replaced.

Bridge Type	Number	Length (m)
Armco Culvert	48	176

Boundary (Other Council's Responsibility)	7	169
Boundary (SDC Responsibility)	11	176
Box Culvert	138	546
Concrete	433	7495
Concrete Pipe Culvert	16	40
Pedestrian	3	65
Private	1	6
Reinforced Timber	5	89
Steel/Concrete	43	1215
Steel/Timber	51	945
Stock Underpass	239	1034
Suspension	1	62
Timber	78	571
Woodstave Pipe	7	16
Totals	1,081	12,605

TABLE 1: COUNCILS SRUCTURE TYPES/QUANTITIES

SDC also have 40 bridges with a total length of 671m on the Around the Mountain cycle trail. These bridges will be included in the Around the Mountain Cycle trail section

Asset Condition

The Remaining Useful Life (RUL) of each structure is assessed on an ongoing rolling cycle and determined by our professional services provider. The RUL is used as a key input into developing the order in which bridges require attention. Generally, the approach has been to address the highest risk structures first.

Over the last year or two it has become evident that too many bridges are reaching the end of their lives without reaching their expected RUL. Therefore council have decided to look at the 12 year programme (171 structures back in 2018) in entirety rather than in order of estimated RUL. This number quickly grew to 194 when reviewing the remaining timber structures in our network requiring replacement within the next 20-years. Since this initial analysis Council has managed to do 16 structures since 1/7/2019 as follows.

- Replaced with a bridge – 7 (An additional 17 bridges targeted for replacement by 30/6/2021)
- Replaced with a culvert – 3
- Removed bridge and not replaced – 3
- Replaced and divested bridge– 1
- Divested bridge - 2

Therefore the programme of works for treatment in the 2031 Long Term Plan is down from 194 to 161 bridges. Once the current backlog is resolved, our structures network and subsequent replacement programme will reduce significantly and stabilise allowing a period of maintenance and appropriate depreciation funding to manage the workload moving forward.

To replace all 161 structures over the next 10 years would cost a total of $34.0M (2020 Valuation data) or an average of $3.4M per annum. This is significantly more than the existing LTP budget provided of approximately $1M per annum. Therefore a balance of increased investment vs change in level of service is inevitable.

Level of Service

Traditionally renewals have been prioritised based on predominantly condition alone. However, given the scale of renewals required over the coming years and the budget available, it was evident that the Transport team cannot afford to maintain all of its existing structures within the network. In order to prioritise the current available funding it is necessary to prioritise and rationalise existing assets as they reach the end of their useful lives within the current budget period.

The outcome of this work has resulted in the bridge matrix which has been developed as a decision making tool to determine whether a structure should be replaced, divested or removed.

The parameters used in the matrix are NZTA's One Network Road Classification (ONRC) criteria and the available alternative detour lengths as per the below:

NZTA ONRC Classification	Alternative Access Detour Length				
	20+km or No Access	**15-20km**	**10-15km**	**5-10km**	**0-5km**
Primary Collector					
Secondary Collector					
ACCESS					
Low Volume Access (11-50 vpd)					
Low Volume Access (0-10 vpd)					

TABLE 2: BRIDGE REPLACEMENT MATRIX FOR BRIDGES

	REPLACE (OR UPGRADE) BRIDGE
	REPLACE (OR UPGRADE) BRIDGE & CONSIDER DIVESTMENT
	REPLACE (OR UPGRADE) BRIDGE & CONSIDER DIVESTING WITH THIRD PARTY CONTRIBUTION
	CONSIDER REMOVING BRIDGE

The bridge matrix / prioritisation tool was developed to be utilised as a first cut of the forward works programme. The matrix does not take into consideration other structures on the proposed alternative routes. As a result there are potentially structures that cannot be removed, or be divested for legal reasons. Further, in some cases the available detour might not be appropriate.

For the second cut of the programme, each bridge has been reviewed (desktop) one-by-one to determine the flow on effects and whether the matrix recommendation is appropriate. As part of the validation it was considered whether or not the bridge has a detour available, the detour length, ownership of land either side of the bridge, likely forestry or other industry impacts and other social impacts such as tourism.

Through the 2021-2031 LTP it is intended to engage with the community and consult on the levels of services and associated cost implications to determine the parameters utilised in the prioritisation matrix. In particular the focus intends to be around whether the detour routes too long or short, and whether the community is prepared to accept an aggregate level of service reduction (i.e. the removal of some structures), in order to minimise the cost implications of the replacement programme.

Irrespective of whether the community is prepared to rationalise the structures network, there will be a need to prioritise the delivery of the replacement programme. The matrix will generally be utilised to determine the replacement priority. As such, where bridges deteriorate at an accelerated pace, but an acceptable detour is available, it is likely that temporary closure will be the outcome. These closures may remain in place for a number of years pending the priority order of the programme. It is acknowledged that this will be the source of significant frustrations for some communities, however, safety risk and accessibility considerations need to be prioritised.

Bridge Design

Council is open to innovative design solutions and therefore have kept its design requirements quite broad to encourage cost savings while providing fit for purpose solutions.

Typically* bridges will be:

- HN-HO-72 Design Capacity to cater for High Productivity and larger agricultural machinery
- Min of 4.2m between the wheel guards to again cater for larger machinery to safely traverse the bridge.

*While in most cases the above two parameters will be specified for designs; if a cheaper solution can be sought that is still "Fit for Purpose" and the only way to achieve the replacement programme or BCR for replacement; then these will be considered on a case by case scenario.

Bridge Approaches & Safety:

Delineation:

All structures will have bridge width markers installed to denote the pinch point on the road (i.e. the narrowest point that can safety be traversed). These are to be installed as per Manual of Traffic Signs and Markings (MOTSAM) requirements. It has been identified that a lot of the bridge markers have been installed incorrectly on the network and therefore an improvement project is recommended to review and rectify all bridge end marker signs.

All barrier end protections should be delineated with a hazard markers.

All approach signage and markings should be clear and consistent and installed to MOTSAM requirements.

Side protection over the bridge:

These are of varying construction methodologies and are only being updated as bridge renewals occur. These will also be reviewed as part of the audit process but it is unlikely that any major upgrades will occur unless a serious potential safety problem is identified.

The high risk embankment and bridge approach safety database tool has prioritised the higher risk structures that should be considered for NZTA M23 compliant barrier system installation. The highest risk bridges have already had barriers installed over the last 5 year period and additional minor improvement barrier installation projects will be prioritised & programmed for replacement/installation as budgets allow.

Handrails are of varying design configurations and are still being installed on new bridges where side protection is deemed low risk to keep project costs as low as possible. Typically these are in the form of wood or galvanised steel. An improvement opportunity is to have a consistent design for handrails that are modular to allow easy maintenance across the district.

Safety (structural integrity) of the Bridge:

The bridge structures themselves are reviewed through annual inspections by the maintenance contractor, Annual posting reviews and six yearly detailed structural reviews. Through these inspections the structural integrity is monitored and decisions made on postings, repairs or replacements. If funding continues to be constrained, there may be cases in future to continue closing some bridges where alternative routes are available. This will need careful consideration of the effect on the network functionality and economic impacts.

Approach and Deck Sealing:

Bridges approaches and deck sealing will be considered on a case by case situation. There are obvious benefits of sealing the approaches but initial construction and ongoing maintenance costs may outweigh these benefits. It is recognised that the stance taken around which bridges have been sealed historically has been inconsistent and mostly likely as a result of whether there was funding available at the time of bridge renewal/upgrade. There is an opportunity to create a set of predefined parameters for a consistent methodology going forward of when sealing is appropriate and approach lengths etc.

Operations and Maintenance

Structural Inspections

Inspections are carried out in accordance with NZTA S6 Bridge and other Structures inspection Policy.

These are carried out by Councils Structural Services provider and consist of:

- Posted bridge inspections – annually
- Structural bridge inspections – six yearly (but being completed over a 3 year period to gain knowledge of the asset condition sooner)
- Special inspections – as and when required (post flood etc)

Maintenance

Maintenance on structures is carried out through our Alliance style Maintenance Contracts. Every year posted bridge inspections carried out the structural services provider will provide a list of maintenance activities to be completed. This is then prioritised and completed within the recommended timeframes assigned by the structural services provider.

Maintenance contractors are also expected to proactively keep on top of general maintenance such as cleanliness, painting, and clearing of deck drainage.

The Structures maintenance Budget is based on the latest round of structures inspections. Due to the age of some of the bridges in Southland's network, and potentially not enough spent on this activity historically, it has been decided to address the posted bridges which are strategically the most important and highest risk.

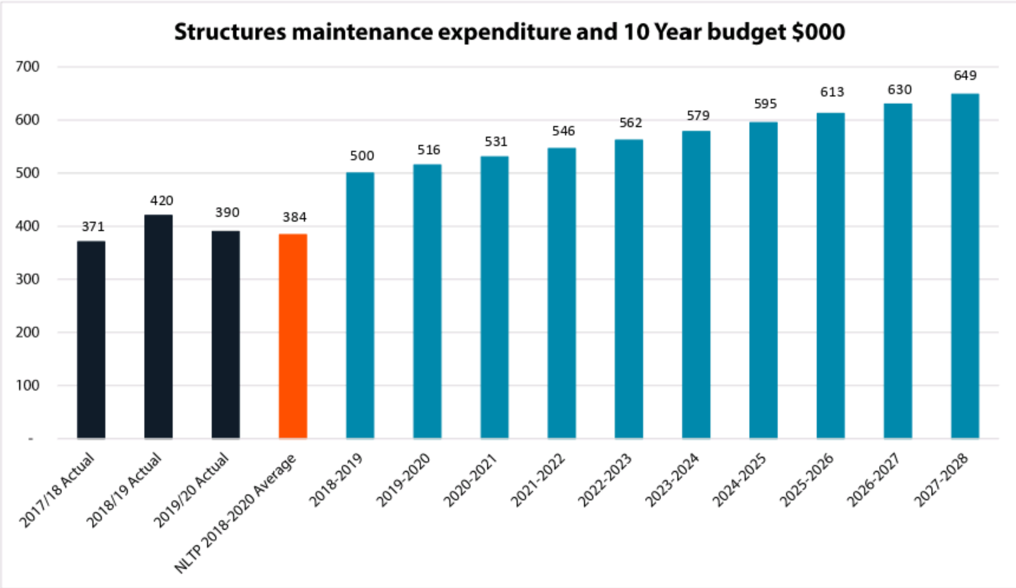


FIGURE 1: BRIDGES/STRUCTURES OPEX FORECASTS

Renewals

A number of factors impact on bridge renewal programmes. Unlike roads, which decline gradually when poorly maintained, a bridge has the potential for a sudden collapse and subsequent catastrophic outcomes, both from a safety and an economic perspective. Not only can it be expensive to replace, but high costs can be incurred by users unable to access the asset, either because of a longer alternative route or because the community is completely cut off.

Apart from an ageing network there are also increased pressures from the increasing number of heavy vehicles on a far greater number of roads. Beef and sheep farming generate heavy traffic at peak times, whereas dairy is up to twice a day, 10 month a year operation. This has been compounded as dairy conversions grow in number. Forestry demand has also noticeable increased in recent years.

Renewals Strategies - Matrix

Based on the large number of renewals required over the next 10 year period; the bridge matrix outlined in level of service section will be utilised as a decision making/prioritisation tool. Irrespective of whether the community is prepared to rationalise the structures network, there will be a need to prioritise the delivery of the replacement programme. The matrix therefore will generally be utilised to determine the replacement priority. As such, where bridges deteriorate at an accelerated pace, but an acceptable detour is available, it is likely that temporary closure will be the outcome. These closures may remain in place for a number of years pending the priority order of the programme. It is acknowledged that this will be the source of significant frustrations for some communities, however, safety risk and accessibility considerations need to be prioritised.

All 839 Waterway Bridges

Council currently has 839 waterway bridges in its Asset Database (this excludes stock underpasses and pedestrian bridges). Utilising the bridge matrix the 839 bridges fit within the matrix as outlined below:

	Alternative Access Detour Length				
ONRC Classification	20+Km or No Access	15-20km	10-15km	5-10km	0-5km
Primary Collector	7	4	4	3	0
Secondary Collector	79	16	40	50	12
Access	140	34	68	62	4
Low Volume Access (11-50 vpd)	114	14	53	60	4
Low Volume Access (0 -10 vpd)	64	1	3	3	0

TABLE 3: BRIDGE MATRIX APPLIED TO ALL WATERWAY BRIDGES

Replace (and retain ownership): 457 Structures
Replace and consider divesting: 128 Structures
Replace and consider divesting with 3rd Party Contribution: 65 Structures
Consider removal: 189 Structures

2031 Long Term Plan Renewals

The 10-year programme based on the 161 bridges is approximately $34M (with an average cost of just over $210K per bridge) which therefore = ~$10.2M required per 3-year cycle to replace all the bridges that are likely to reach their RUL. There is $10.9M allowed in years 1-3; $11.8M in years 4-7 and $12.9M in years 7-9.

To replace all 161 structures over the next 10 years would cost a total of $33,949,344 (2020 Valuation data) or an average of $3,394,934 per annum. The valuation data is typically light compared to market rates and therefore an assumption has been made that the offset of some of the 161 bridges bring able to be upgraded by component replacement rather than full replacement will offset some of this deficit.

From the 161 bridges identified as needing replaced during the 2031 LTP, there are 2 bridges that are valued around $1M each (2020 Valuation data). They are as follows

- The bridge over the Oreti River on Mount Nicholas Rd – Valued at $985,159
- The bridge over the Mataura on Hume Rd – Valued at $1,113,458

Monowai Suspension bridge is the only exception that is going to either need significant upgrade work ($1M+) or replacement in due course. Therefore all of the bridge replacements will fall into the Waka Kotahi Low Cost Low Risk or Bridge Renewal categories in the 2031 LTP period.

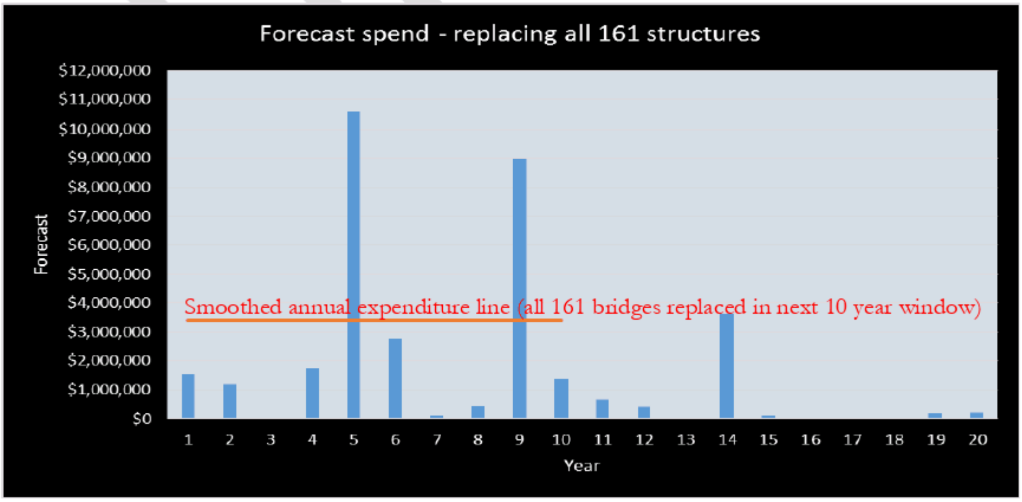


FIGURE 3: 10 YEAR RENEWAL FORECAST CHART

Note the spikes in years 5/9 & 14 - this is not expected to be reality. Based on the uncertainty of remaining useful lives – these structures could need replaced/removed at any stage from now on.

If the matrix was utilised to not only prioritise but also rationalise the bridging assets; it is estimated that this cost would be reduced to approximately $22M over 10 years, or $6.5M per 3-year cycle.

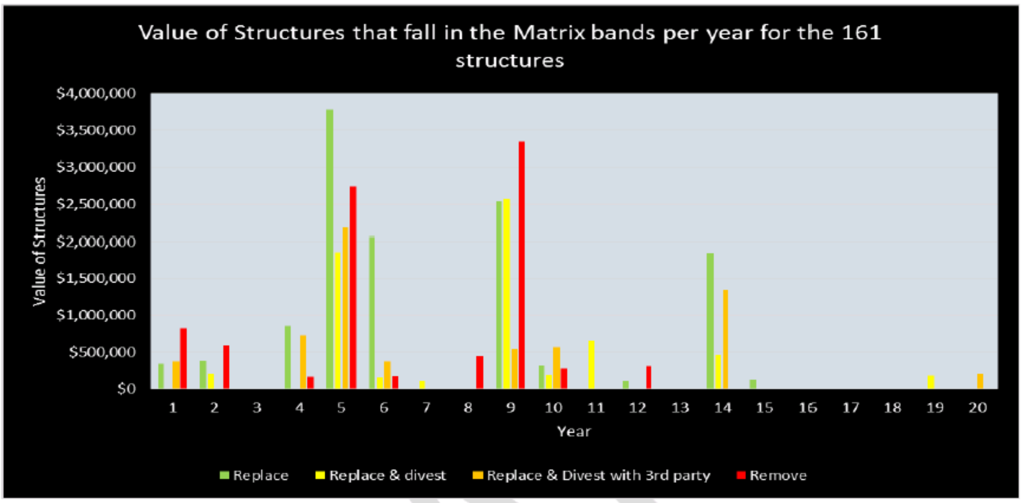
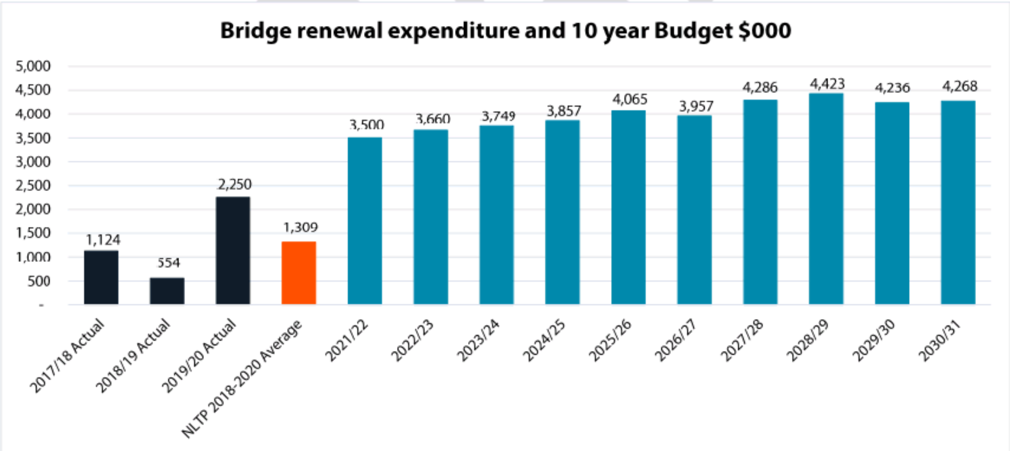


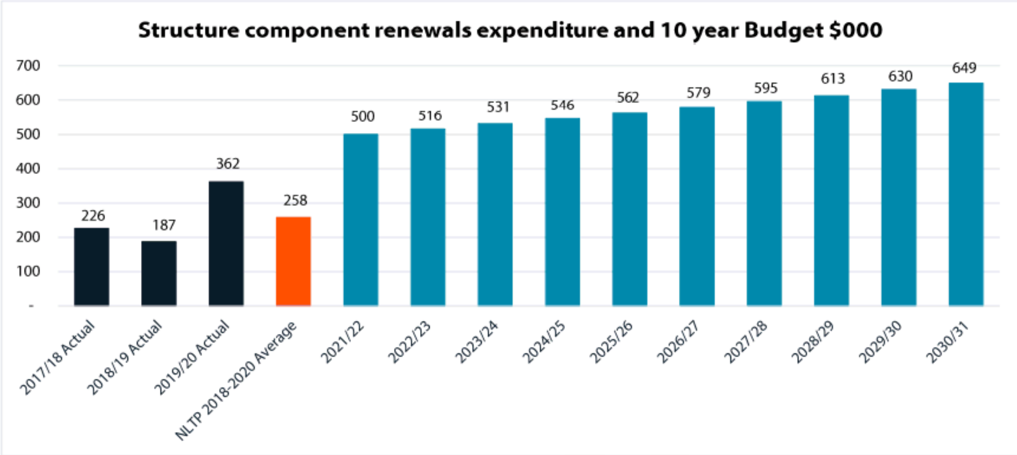
FIGURE 4: RATIONALISED FORECAST BASED ON MATRIX OUTCOMES

The planned expenditure for the 10-year period is:



Structures Component Replacement

The rate of repair and renewal of bridges has been falling behind and increased investment in heavy maintenance/structural renewal will be required in order for the bridge life cycle to be kept at a manageable level. Structural component replacements will be considered prior to any replacement if a positive Net Present Value (NPV) can be achieved when considering whole of life.



The spike in expenditure in 2021/2022 is to reflect a significant upgrade project of the Monwai Suspension Bridge.

FIGURE 2: BRIDGES/STRUCTURES OPEX FORECASTS

Short term, low cost upgrades will also be an option considered to keep structures open and prolong life until a replacement can be programmed. Therefore significant additional investment will be required (at least double) what has been historically budgeted for Structures Component Replacements, over this period to extend asset life and buy time, including dealing with any unpredicted surprises that will come along. However, if the cost of upgrading the structure is significant it may no longer be economic to retain the existing structure and it may be replaced with a new bridge. In the past, structures for replacement have been identified based on passing the Waka Kotahi Benefit/Cost (B/C) criteria for an economic roading facility. When the structure did not produce a high enough B/C ratio to warrant a full replacement, an upgrade would have been further investigated.

Investment vs Impact

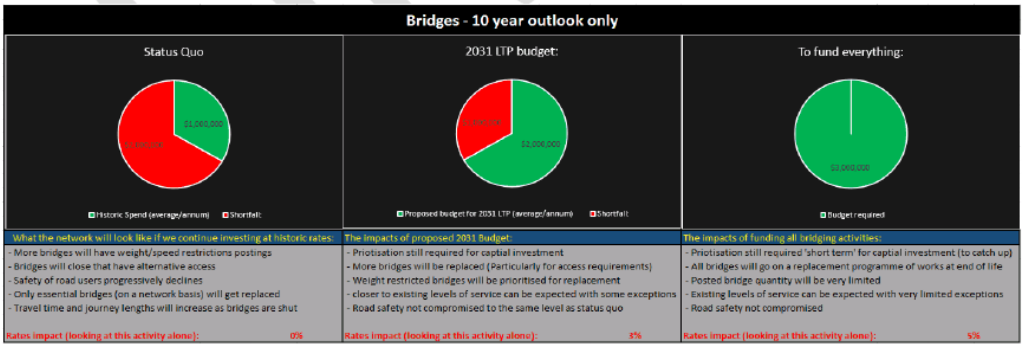


FIGURE 5: INVESTMENT VS IMPACT CHARTS

Future Improvement

- Some structures require more detailed inspection and analysis to determine the extent of deterioration - these need to be identified and inspected. The will increase confidence in expected remaining useful lives and therefore we can have a better understanding of the forward works programme profile.

- Identify and dispose of bridges which are not required, ie those that benefit a single user, or where there are suitable alternatives will be pursued over the next three years. This is an ongoing piece of work that has been commenced.
- Determine a consistent Handrail type/detail to be applied going forward that will be user-friendly to maintain/replace components as required.
- Review all bridge end marker signs around the district and rectify as required to be in accordance with MOSTAM specifications.
- Create a set of criteria to be applied to determine if and the extent of sealing approaches/decks are to be carried out.
- Management of data improvement opportunity. Get all data held into RAMM or another database platform.

Drainage

Overview

Asset Description

Southland District Council has an estimated 30,000 culverts to carry water under the road, primarily constructed of concrete. Box culverts are classified as drainage up to a cross-sectional size of 3.40 m2. Culverts larger than this are classified as bridges. The other major form of drainage is the deep ditches alongside the road to catch the runoff from land other than that in the road reserve (ie public and private properties). They assist in maintaining the road network by containing the large quantities of surface runoff that would otherwise flood the road whenever heavy rain occurred.

Type of Culvert	Quantity in RAMM (m)	Number of	Assumed Quantity (m)	Assumed Number of
Small Culverts typically up to 450mm dia	96,983	8,661	129,300	11,500
Medium culverts typically 451 to 900mm dia	17,976	1,353	24,000	1,700
Large Culverts typically 901 to 2000mm dia	7,181	528	9,500	700
Side Culverts	10,611	833	48,282	16,094
Sumps	n/a	0	n/a	2,852
Subsoil Drains	16,355	137	21,240	178
Soak Pits	n/a	64	n/a	83
Totals		11,576		33,107

TABLE 1: CULVERT DRAINAGE ASSETS

*It is known that there are significantly more culverts round the district than what is currently held in RAMM. This is an improvement project to field validate and update culvert inventory in RAMM.

Type of surface water channel	Length (m)

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Dished Channel (Asphalt)	135
Dished Channel (Concrete)	5,708
Dished Channel (Sealed)	3,314
Kerb & Channel (Concrete)	136,890
Kerb Only (Concrete)	4,613
Mountable Kerb & Channel (Concrete)	35,715
Mountable Kerb Only (Concrete)	636
Other Type	331
SWC (Deep, >200 Below Seal Edge)	2,626,837
SWC (Shallow, <200 Below Seal Edge)	6,342,286
Slot Channel (Concrete)	7

TABLE 2: SURFACE WATER TABLE DRAINAGE ASSETS

Level of Service

Drainage is a critical activity for the transportation team to ensure the success of our roads particularly sealed road pavements. With a number of key infrastructure (Pavements, Bridges etc) nearing end of life – it is crucial to keep water off them to ensure we at least achieve their remaining useful lives without premature failure.

In recent years vegetation such as watercress has increasingly impacted on asset performance during higher rain fall events resulting in blockages and surface flooding.

Road Safety

Not only does drainage play a crucial role in asset preservation; it has a significant role to in providing a safe network for our road users. Surface water on roads can cause loss of traction with potential deadly consequences.

In line with Road to Zero Strategy released in 2019 and the Government Policy Statement strategic principles; investment in ensuring surface water is not an issue leading to access and or safety compromises is a key focus for Council.

Capacity

There have been a number of slips associated with poor drainage in recent years. This may be indicative of the number and quality of existing culverts, surface water drains and ditches which requires review. So not only is there a need to get a better understanding of the existing infrastructure around the district – we need to review whether it is still fit for purpose given the increased frequency and intensity of weather events.

With the assumption of the previous 1 in 100 year event now becoming a 1 in 10 year event – there will be numerous areas around the district that won't be able to cope with these intensities.

There is an opportunity to lidar survey areas of the district that are mostly likely to be affected by larger scale weather events and plan / programme upgrade work.

Operations and Maintenance

Maintenance

Drainage maintenance is primarily carried out by the Alliance Maintenance contractors. However some standalone contracts are let where extent of work is beyond what is allowed for within the alliance contract scope of works. Maintenance activities include but are not limited to:

- Checking that sub-soil drains are operating effectively - as the fine particles get blocked from entering the drain they can reduce its effectiveness or there may be blockages. The solution may be unblocking or replacing the drain.
- Regular checks to ensure culverts are clear from the debris that can build up after storm events.
- Maintaining vegetation and clearing rubbish from side drains, and re-forming where required.
- Keeping kerb and channel systems clean as the gradients may be minimal and small blockages can reduce their effectiveness.
- Clearing sumps (catch pits), which over time can become full of detritus, rubbish and vegetation.

Operations and Maintenance Forecast:

This budget is higher than historic costs but is an area of high priority. Over the past three years there has been an increase in expenditure on drainage in order to maximise pavement life. This investment is planned to continue into the future and is aimed at maximising pavement life of sealed roads.

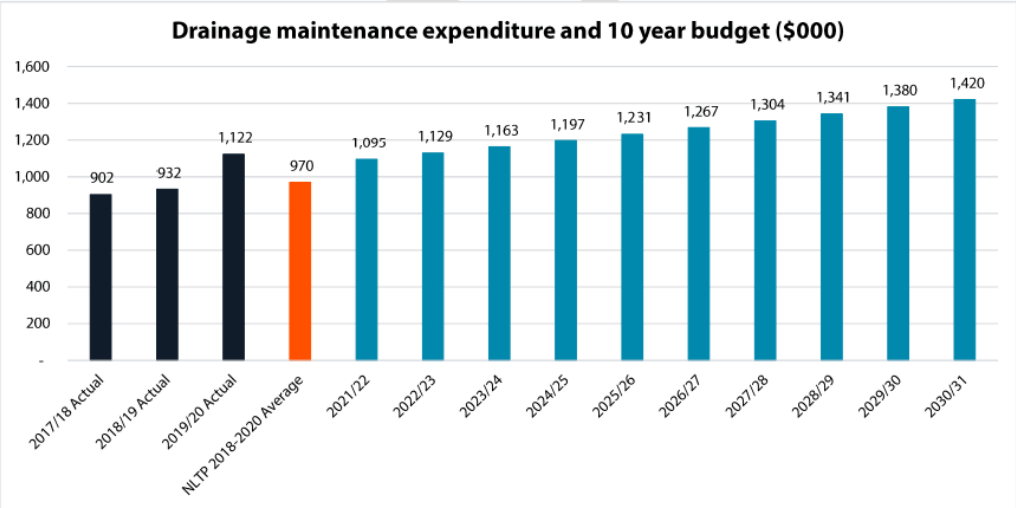

FIGURE 1: DRAINAGE OPEX FORECASTS

Renewals

Renewal Strategies

Kerb and Channel:

Every two years, as part of RAMM condition rating, a condition assessment is carried out on the kerb and channel. Also areas of Kerb and Channel that are adjacent to footpaths are picked up in the annual condition survey of footpath data.

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While we do have the data mentioned above we don't have a robust database of the condition of kerb and channel assets and therefore replacement programmes are more reactive and only programmed for renewal when at end of life and no longer serving its purpose.

There is an opportunity to model some deterioration rates and apply this across the data we do have to better programme and budget kerb and channel renewals.

Culverts

As identified in previous Activity Management Plans we don't have a good inventory of culvert data. Processes council have put in place to improve this going forward are:

- Alliance Maintenance Contractors spending 1 day per fortnight picking up culvert data and deficiencies for all culverts greater than 600mm diameter. Culverts of this size are easier to locate and are more likely to cause severe consequences if one was to fail. It is estimated to take 2-3 years to complete this exercise (started late 2019).
- Less than 600mm diameter culverts to be identified and added to RAMM inventory during pre-reseal repair time when each site has a walkover. This could take up to 14 odd years to get round the sealed network – but these smaller diameter culverts are deemed less risk and will just get replaced on a when required basis until a good database is established.
- There is no formal programme or strategy for culvert renewals on unsealed roads as these will just be treated on an "as required" basis.

Culvert replacement/upgrades works are also undertaken in association with road reconstruction and maintenance projects (pavement rehabilitation, seal widening, reseals, safety projects and redevelopments) where this is deemed appropriate from a whole of life or capacity point of view.

Surface Water Channels

Renewals and LOS drainage expenditure over previous years has not kept pace with the amount of work required. However in 2017 a district rating of the sealed network drainage was under taken to determine deficient areas. From this a three year programme was developed of which all the highest scoring (worst areas) have been completed by 2020. The idea of this programme was to catch up on some drainage works that had fallen behind. Going forward the proposal is to clear out/reshape surface water channels at pre reseal repair time to ensure that the sealed network it's kept on top of at least once every seal life cycle.

Drainage channels on the unsealed network are a bit different. While there is an assertive effort to create and maintain drainage paths to get water off and away from the traversable surface – there is not the same benefits in relation to costs to try preserve the pavement life. This is usually achieved through general shaping while grading the roads unless there is a more significant issue to address.

Renewal Forecasts

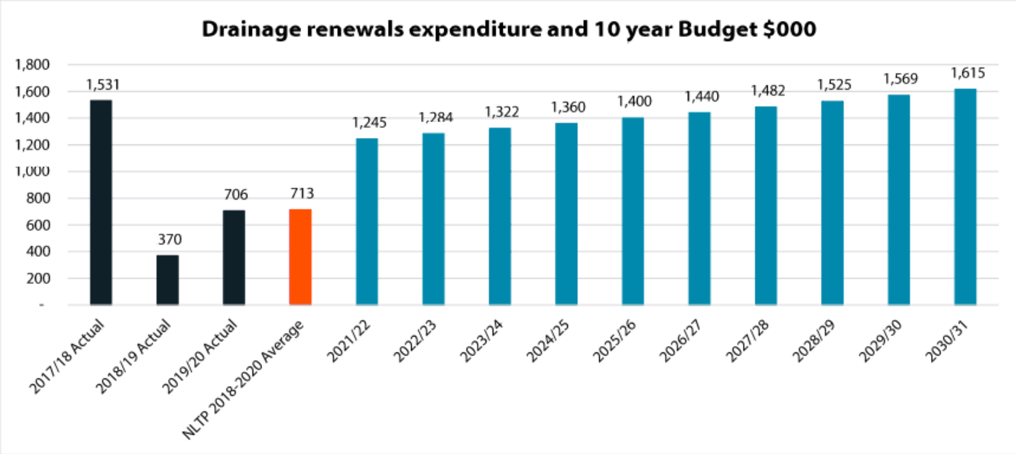


FIGURE 2: DRAINAGE RENEWAL FORECASTS

The renewal programme has a level of service component built into it. With the prediction of having to upgrade the capacity of culverts in vulnerable locations in the near future; increased investment from previous years is inevitable.

Investment Vs Impact

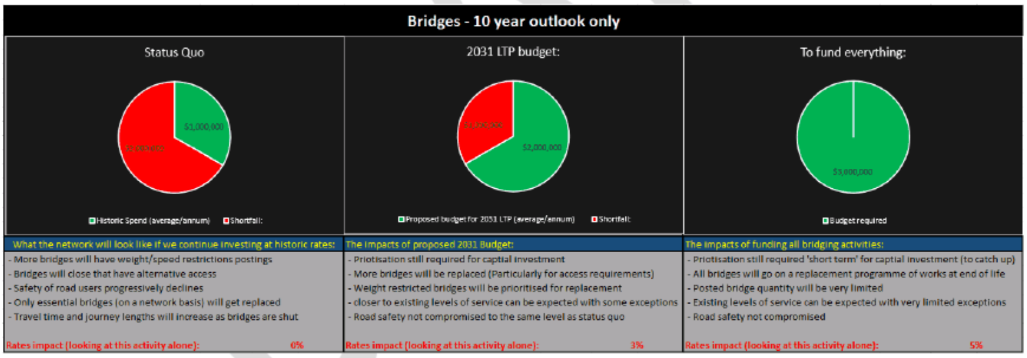


FIGURE 3: INVESTMENT VS IMPACT CHARTS

Future Improvement

- Continue to improve inventory data to understand the asset and be able to programme / budget maintenance and renewals appropriately
- Utilise Kerb and Channel data to model deterioration and create a forward works programme for kerb and channel that's not reactive (similar to what is proposed for footpaths).
- Survey high risk areas that are susceptible to intensified weather events and design appropriate drainage systems based on catchment sizes to ensure people or communities are not cut off during events.

Traffic Services

Overview

Traffic Services as we know it primarily consists of all the Signs and Markings across the district. However other hardware or roadside furniture used for road safety or delineating roads or roadsides could also fit within the Traffic Services banner. One example of this is Streetlights – however as this is a major standalone asset for Council – please refer to section X for this activity.

The signs and markings component typically includes features such as pavement markings, signage (regulatory and warning), marker posts and delineation devices. Each of these provides the road user guidance on the alignment of the road to assist on judging speeds, potential conflicts and vehicle separation. Southland has around 28,000 signs over the entire network, and markings on the majority of the 2,000 km of sealed roads.

Because there are a vast amount of different types of signs and markings; for the purposes of this document the data has been consolidated into categories to give an understanding of the size of this activity.

Signs and Markings:	Quantity:	Units
White Lines (Edge and Center)	3,336.8	Km
Yellow Lines (Center)	417.4	Km
Intersections Marked (limit lines etc)	745	Number
Regulatory Signs	3647	Number
Permanent Warning Signs	8521	Number
Information Signs	5581	Number
All other Permanently Mounted Signs	9718	Number

TABLE 1: PAVEMENT MARKINGS AND SIGNS STATISTICS

There are numerous signs or markings that are on the network and held in the RAMM database that aren't included in the table above – however these are the main categories

Council over the last few years have started trialing some Electronic Active Warning Signs. Below is a table of the current active signs in the Southland District:

Electronic Active Sign:	Quantity:
Active School Sign (Wig Wag)	2
Speed Indication Sign	X
Advance Active Stop Sign	2
Any others?	

TABLE 2: ELECTRONIC ACTIVE SIGNS STATISTICS

Ongoing monitoring of these Electronic Active Signs is occurring to measure how effective they are before implementing any strategies to roll out programmes of installations round the district.

Level of Service

Signs

Location

Signs have been installed over many decades to help guide motorists. Some signs have been installed proactively based on best practice guidelines and some have been installed reactively Once the need for signage has come to our attention post an incident occurring or a customer request for signage.

Numerous reviews have been carried out of the overs to try keep on top of signage that is fit for purpose across the district. It is a fine balance of getting the right amount of signs that people will adhere to and follow versus too many signs that just blend in and become just another piece of roadside furniture.

Key focus for Council when reviewing signs or requests in regards to new signs is having a consistent approach across the district. You should be able to identify the classification of road you are on based on the traffic services around you.

Edge marker posts are typically placed in rural areas on corners to provide the driver an indication of where the road is going. For this to be most effective the driver should be able to clearly see four markers at any one time throughout the curve.

Council's key guiding document for assessing the need for signs including instillation locations is the Traffic Control Devices (TCD) manual and or Manual of Traffic Signs and Markings (MOTSAM) part 1 Signs.

Material Type

The majority of signs are Engineering Grade (Class 2) material, except for Stop, Give Way, Chevrons, and School signs (fluorescent yellow). However Council is in the process of transitioning to Class 1 reflective grade signs as they reach end of life and require replacement. The move to Class 1 is in line with best practice to improve safety for road users but also has the added benefit of increased asset performance life as Class 1 signs have an average expected life of 10 years versus the old Engineering Grade of just 8 years.

Currently approximately 82% of Councils signs are still engineering grade and these were installed between 1993 to 2020; therefore we expect to have replaced the last of these signs by 2030.

Condition

In general signs are in a reasonable condition. Areas to potentially improve include older standards of vulnerable user signs and older style fingerboard signs. The majority of the street name plates are the new reflectorised standard of white on blue/green, however, there are some remaining black on white signs which should be replaced.

Pavement Markings

Historically SDC has run a performance based specification to marking however as part of the latest round of pavement marking contracts SDC is taking more 'ownership' of this activity and has changed to a method based specification (P22) where SDC as client takes a more active role in determining what roads get marked and the frequency.

Markings are generally based on the ONRC classifications and are in line with the table below where practically possible:

ONRC Classification: Markings:

Primary Collector	Center line and Edge Lines along with all intersections marked. 3.5m marked lanes where achievable
Secondary Collector	Center line and Edge Lines along with all intersections marked. 3.0m marked lanes where achievable
Access Roads	Center Line and intersections marked (where sealed)
Low Volume Access Roads	Center Line marked where seal is greater than 5.5m wide and intersections marked (where sealed)

TABLE X: PAVEMENT MARKINGS PER ONRC CLASSIFICATION

There are a number of locations that the sealed pavement width does not allow edgelines at the above lane widths or at all. These sections of road will get widened when they are up for renewal and until then they will be left without edgelines or compromised lane widths. A common sense approach is applied as to when to start/stop edgelines on these deficient width areas to avoid a 'patchy' inconsistent appearance to road users.

All new markings shall be installed as per Manual of Traffic Signs and Markings (MOTSAM) part 2 Markings.

Raised Reflective Pavement Markers (RRPM's)

RRPM's are installed by the pavement marking contractor and used to provide additional delineation of the centerline to ensure vehicle separation during dark hours. RRPM's also assist in wet conditions when the pavement marking is hard to see as it raises the delineation above the surface water. Council's policy for installation RRPMs is:

- All Primary Collector Roads
- Secondary Collector Roads that join up Primary Collectors or State Highways for continuity of route
- Southern Scenic Route for vulnerable road users.

Operations and Maintenance

Signs Maintenance

Signage is required to be cleaned and legible in all conditions 24 hours a day. Typical maintenance includes:

- Regularly cleaning the signage, and replacing signs as the colour or reflectivity of the sign reduces
- Removing obstructions such as vegetation, other signage, parked vehicles etc
- Painting of hardware including sign posts.

Pavement Marking Maintenance

All pavement markings throughout out the SDC network is marked to the NZTA's standard Manual of Traffic Signs and Marking (MOTSAM) Part 2: Pavement Markings. There and many factors that determine the LOS for each road. This includes One Network Road Classification (ONRC), the Pavement width, and speed zone. These vary from centre lines, edge lines and raised reflective pavement markers on Primary and Secondary Collector Roads to only painting markings at controlled intersections and some bends on low volume roads.

Pavement markings generally speaking are renewed rather than maintained. However if new markings are found to not be fit for purpose due to application or faulty materials then the pavement marker will be requested to reapply the same markings prior to renewal date.

Pavement markings post reseal sites are the responsibility of reseal contractor for 3 months post sealing date. These must be of a satisfactory condition at the end of the 3 months prior to the pavement marking contractor accepting responsibility for the ongoing maintenance/renewals.

All heavy duty maintenance repairs carried out by the alliance maintenance contractors are to be marked where appropriate as soon as practically possible after carrying out the repair. The repair is not deemed practically complete unless the markings have been done and hence payment should be held until completed. It is not the pavement marking contractor's responsibility to ensure all repair patches have lines applied.

Operations and Maintenance Forecasts

Traffic Services has a fundamental affiliation with road safety and therefore increased investment is in line with the Government Road to Zero Strategy. Signage and Markings are generally deemed low cost high value interventions and therefore will be used to help manage high risk areas to aid the reduction in the road toll. Vision Zero goal is a 40% reduction in road trauma (Fatal and Serious Injury) by 2030.

Council Long Term Plan KPI:

KPI 17.1: Annual change in the number of fatalities and serious injury crashes. Target: Reduction of 1 from prior year.

Because traffic services are seen as critical to the safe operation of the network, sufficient capacity has been built into the future funding to allow for increased costs.

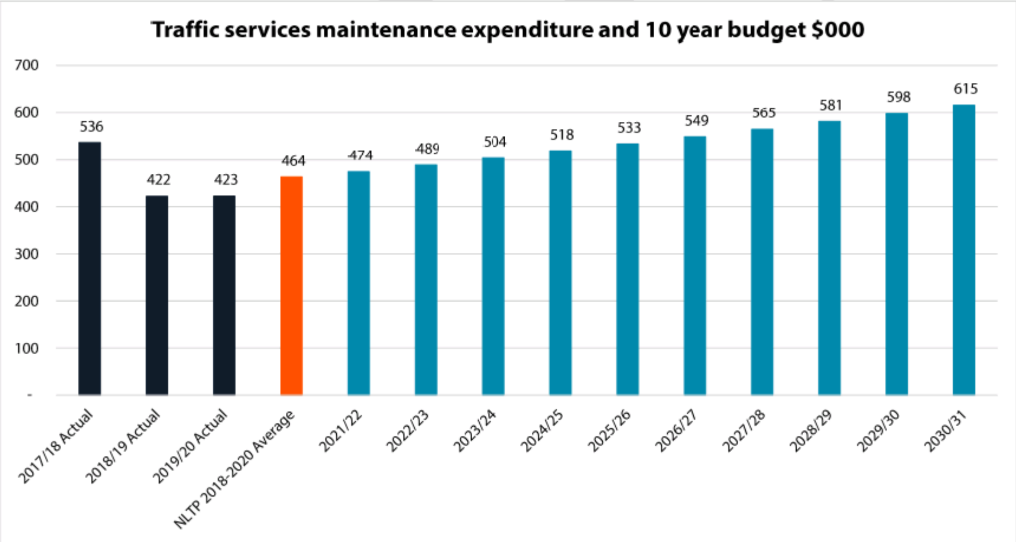


FIGURE 1: TRAFFIC SERVICES MAINTENANCE OPEX FORECASTS

Renewals

Signs Renewals

The majority of renewal works is carried out due to damage of signs either through vandalism or environmental impacts. Assets which have reached the end of useful life are assets that have failed either routine daytime inspections or night time inspections due to reflectivity.

Old Engineering Grade signs will be replaced with Class 1 signs when they are renewed.

Pavement Marking Renewals

Pavement markings are typically renewed rather than maintained. Pavement marking performance vary depending on paint used, vehicle activity and ice grit. From past performance and industry performance testing the network's current strategy involves renewing:

- All Primary and Secondary collectors annually
- All other roads biannually.

This ensure that all highly trafficked areas are marked every year and the rest of the network is marked at least once every two years. The pavement marking contract is split into two with eastern and western contracts - however at present one Contractor holds both contracts. Currently Council is on the third year of a 3+1+1 contract with Downer therefore, Council will go out for tender within this next LTP.

With one contractor the above strategy of a complete remark every second year seems challenging to achieve. Before going back to market there will be a review done of whether Councils expectations of the above timeframes are realistic/achievable or whether to limit a maximum of one pavement marking contract per contractor. During this, the frequency of the pavement marking renewals will also be review and the Contractor will be provided access to the RAMM data base. This will allow updates to be done in real time in the field.

Renewal Forecasts

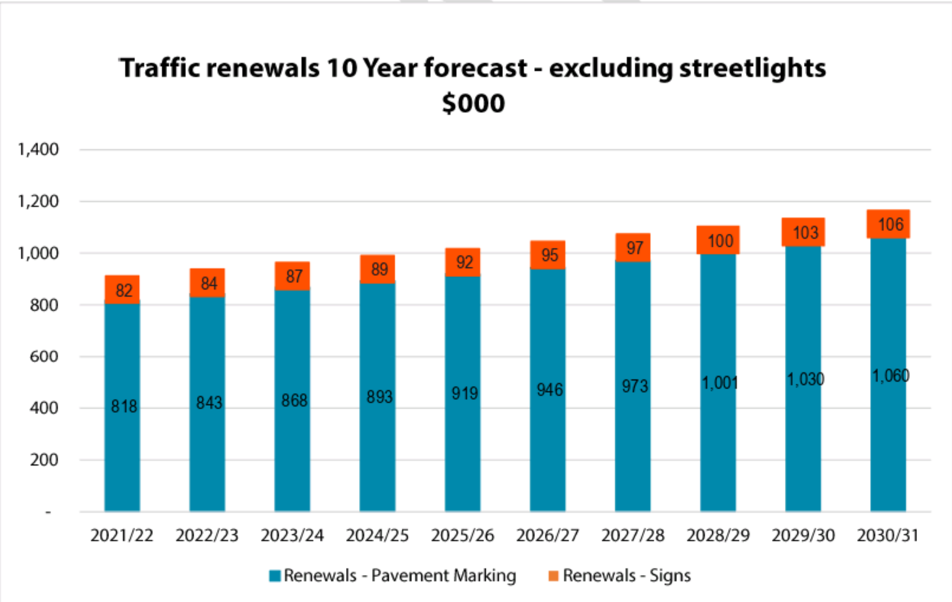


FIGURE 2: TRAFFIC SERVICES RENEWAL FORECASTS

Capital Investment

Speed Limits

A review of all Speed Limits in Southland District occurred in 2019 with consultation occurring in 2020 of the proposed amendments to the Speed Limit Bylaw.

New and additional Signage will be required if the proposed amendments are approved by affected stakeholders and adopted by Council.

Schools

Nationally there has been a focus for Road Controlling Authorities to review speed limits outside Schools as part of the overall speed limit review process outlined above. Council is in the process of quantifying which schools in the district may qualify for investment in traffic calming, reduced speed limits etc. This project will be deployed over the next 3 years.

The above project is in keeping with the social and wellbeing impacts and road safety visions of Government.

Investment vs Impact

Work completed at the time of developing the AMP indicated that signage and associated improvements around schools to achieve 40km/hr and 60km/hr speed limits will required an estimated investment of $5.3 million over 10 year period. Southland has a total of 41 of which 37 are within the SDC roading network.

FIGURE 3: INVESTMENT VS IMPACT CHARTS

Future Improvements

- Bridge Width Marker Signs have been identified in Waka Kotahi audits as not being consistently installed and therefore a district wide review needs to occur and have a remedial programme to fix errors.
- Schools will be reviewed one by one for additional traffic services to help reduce speed and improve road safety for vulnerable and multi-modal road users in the vicinity.
- Pavement Marking contract strategy and level of service reviewed prior to going back to market.
- Sign details when the sign is replaced need to be reviewed and standardized.

Street Lighting

Overview

Southland District Council has 2649 streetlights throughout the southland network. This includes 144 located in rural areas; with majority of lighting located within urban areas. These lights are primarily installed for pedestrian safety and personal security rather than road safety. However, streetlights are installed at rural intersections (flag lighting) throughout Councils network for vehicular traffic safety.

In 2018/19 Council carried out a Light Emitting Diode (LED) retrofit of the entire SDC street lighting network. Post the LED upgrade, the required maintenance has dropped to 45% of the previous maintenance costs and reduced power consumption by 40%.

LIGHTING STANDARD:	URBAN
PEDESTRIAN (CATEGORY P)	2238
VEHICULAR (CATGEORY V)	-

PEDESTRIAN CROSSING	10
BOLLARD	257
FLAG LIGHTs	144
TOTAL	2649

TABLE 1: COUNCILS CURRENT STREET LIGHT STOCK

Level of Service

Council have developed a Level of Service (LOS) to help provide consistency throughout the district. This LOS had been developed in conjunction with the AS/NZS1158 (Lighting for Roads and Public Spaces) and NZTA M30 (Specification and Guidelines for Road Lighting Design). This LOS has been split into Urban and Rural.

Urban Areas

The definition of Urban in the context of streetlighting is defined by a speed limit less than >70km/h with a density of 6.5 Dwellings per 100m on a sealed road.

Urban Street lighting can be divided into Category P Lighting, Category V Lighting, Pedestrian Crossings Lighting and Bollard Lighting. See sections below for further detail on these lighting categories.

All new luminaires installed within the SDC network must be a NZTA M30 Accepted Luminaire and meet the International Dark Skies Standards.

Category P Lighting (Pedestrian)

Currently Council use Category P standard lights for the majority of the SDC streetlight network. This standard is installed for pedestrian safety and personal security; rather than vehicular safety.

Existing Network

Council target P3R or P4R specification lighting for 80% of its urban areas. This is detailed in the AS/NZS1158.3.1 and outlines the lighting requirements while using the existing reticulation infrastructure (power poles). This provides an acceptable balance between cost and levels of service.

New Subdivisions

All new subdivisions within SDC that require streetlighting must be designed to a P3 standard and approved by a Council Engineer. The lights must be installed on standard galvanised dedicated streetlight poles. All designs must meet AS/NZS1158 and NZTA's M30 standards.

Category V Lighting (Vehicle)

Category V lighting is typically used in areas with high traffic volumes such as motorways/highways and town CBDs. This standards has a much higher standard of lighting/brightness and is not recommended in purely residential areas. Currently there are no Category V lighting within the Southland District controlled network. However, as part of the Long Term Plan; Council will conduct a review of possible locations for consideration.

Pedestrian Crossings Lighting

Pedestrian Crossing lighting shall be lit in accordance with AS/NZS 1158.4. These luminaires shall have a photometric distribution specifically designed to suit pedestrian crossings (dispersing light across the entire road crossing location). This excludes belisha beacons.

Bollard Lighting

Bollard lighting may be installed adjacent to a footpath to enhance lighting to pedestrians. This must be installed in conjunction with NZTA M30 approved streetlights and not used as a replacement. The installation and maintenance of bollards lighting is locally funded but must be approved by a Council Engineer prior to installation within the road reserve.

Bollards must be installed between the footpath and the road reserve boundary (not on the footpath). The bollards must comply with NZTA M30 Accepted Luminaires and meet the International Dark Skies Standard.

Rural Areas

Flag Lights

Flag lights are used at isolated rural intersection on an otherwise unlit route to warn motorists of the approaching intersection. Any intersections of concern will be reviewed by a Council Engineer against NZTA M30 standard.

There is an opportunity to review all rural intersections against NZTA M30 standard to then create a database of deficiencies and a prioritised programme of works to upgrade the highest at risk intersections. This will for a piece of work to be carried out over the next three years.

Operations & Maintenance

Maintenance

LED streetlights have a 20 year life expectancy, and only require cleaning and an electrical check every 7 years. Due to the increased reliability, a full network inspection will only be required once per annum. The majority of streetlight outages shall be managed through Councils Request for Service (RFS) system.

In July 2020 the SDC entered a one year Streetlight maintenance contract with Network Electrical Services; tying in with the existing Invercargill City Council Contract. This will include all Southland District streetlight repairs, inspections, testing and RAMM data updates.

Data Maintenance (RAMM)

Council carried out a district wide review of all its street lighting assets in 2017. Along with this and the information provided through the LED retrofit, Council have up to date information on the locations and types of lights throughout the district stored in the RAMM database. To ensure that this database is kept up to date Council will provide our maintenance contractor access to the RAMM data base. This to allow updates to be done in real time in the field.

Unfortunately records of Council owned light pole information is less complete. Dedicated streetlight poles have a 25 - 50 year life expectancy and the current RAMM default installation year is 1/1/1990. An improvement opportunity exists to review this data by field condition surveys and comparing to subdivision construction dates.

Renewals

As mentioned the current the life expectancy of a LED light is 20 years. Due to the LED retrofit carried out in 2017/18 Council have no luminaries renewal programs planned for this LTP. Any luminaries that fails during this LTP will be repaired through the maintenance contract.

As previously mentioned Council currently own 885 streetlight poles throughout the SDC network. However, council currently do to have accurate records of the pole age and condition. During this LTP Council will carry out a field survey to assist in a district wide renewal program for further LTPs. During this LTP any pole damaged (e.g. hit by vehicle) this will be replaced through the maintenance contract.

LOS (New Infrastructure)

As part of the Long Term Plan Council developed a spatial mapping tool to identify all areas within the existing network that meet the minimum Level of Service requirements for needing streetlighting but don't currently have any installed.

A forward works improvement programme will be developed from the output from the above tool. This will be carried out over a number of years as budget allows and with consultation/feedback from affected communities as to their respective priorities.

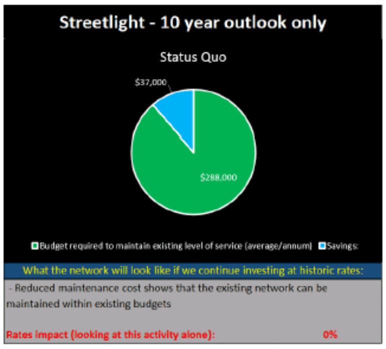
The timeframe/budgets for each township has been developed based on the work required vs funding availability. Below is a table summarising the following townships with identified gaps and the estimated values of work.

Township	Estimated Cost	Strategy (including inflation allowance)
Athol	$ 7,500	$7,500
Balfour	$ 1,500	$1,500
Browns	$ 1,500	$1,500
Colac Bay	$ 14,239	$14,239
Edendale & Wyndham	$ 14,500	$14,500
Fortrose	$ 24,615	$24,615
Lumsden	$ 3,000	$3,000
Mossburn	$ 3,000	$3,000
Otautau	$ 1,500	$1,500
Riversdale	$ 12,000	$12,000
Riverton	$ 19,500	$19,500
Te Anau	$ 90,938	$90,938
Tuatapere	$ 1,500	$1,500
Waikaia	$ 3,000	$3,000
Waikawa	$ 3,000	$3,000
Woodlands	$ 1,500	$1,500
Grand Total	**$ 202,792**	$202,792

TABLE 2: LEVEL OF SERVICE IMPROVEMENT OPPORTUNITIES PER TOWNSHIP

Investment vs Impact

Currently the funding for streetlight maintenance, renewals and power is district funded (excluding bollards) opposed to the installation of new infrastructure (LOS) and the maintenance, renewals and power of bollards which is locally funded. The graph below demonstrates the estimated cost of streetlight maintenance, renewals and power for this LTP vs historical spend.



Future Improvements

- Historically Council have had no areas of streetlighting designed to a V Category standard. However, as some communities within the district network develop some of these areas may meet V Category streetlighting requirements. Council will conduct a survey of potential locations to determine the suitability.
- With the incomplete data that Council currently hold on dedicated streetlight poles; a full review of the condition, age and type will assist in any ongoing infrastructure replacements. This can be achieved by a field survey and comparing to subdivision construction dates.
- Due to LED Streetlights having little too no light spill, a standard LED streetlight is not affective as a flaglight at rural intersections. Due to this, the 280 flag lights within the SDC network require retro fitting to supply adequate warning for motorists. A review of all rural intersections around the district will be carried out to identify intersections at highest risk for improvement.

Footpaths

Overview

Footpaths are found throughout urban areas of the Southland District network. Footpaths form part of the integral transportation network to connect communities and provide access for all vulnerable network users. Therefore when designing, constructing and maintaining the footpath network we must ensure that they meet the needs of providing accessibility for all. Footpaths provide independence, promote health, and connect neighbours. These are all principals in the Governments Policy strategy to promote multi-model transport and key focus area of road safety.

Council currently has 207.5km of existing footpaths throughout the district. Construction of these has occurred over many decades and as such there a vast variety of designs, material types etc are observed.

Footpath Type	Total Length (m)
Concrete	130319
Asphaltic Concrete	39460
Concrete Pavers	9598
Gravel	25185

Seal	2972

TABLE 1: EXISTING FOOTPATH QUANTITIES BY MATERIAL TYPE

Level of Service

Footpath Eligibility/Location

Footpaths within the Southland District are commonly located within urban areas with sufficient pedestrian demand.

Footpaths will be assessed for areas that meet the following requirements.

- Speed limit ≤50km/h
- Sealed Road Surface
- Density of ≥6.5 dwellings/businesses per 100m.

We note that some communities may wish to install footpaths to a different level of service as the initial construction cost is locally funded. However if the level of service differs from the above parameters; approval is required by a Council roading engineer; otherwise Council may choose not to maintain or renew at end of life.

If an area is deemed eligible for footpaths, the next step is to determine if footpaths are required on just one side of the road or both. Typically Low Volume Roads will have just one footpath and Access Roads (or higher classification) will have footpaths on both sides of the roads. However Points of Interest (Schools, halls, shops etc) will be considered during this evaluation.

Construction Standards

Width

To insure footpaths are wide enough to provide accessibility and room for all types of footpath users to pass each other safely; all new constructed footpaths will be constructed to a minimum width as outlined in table 2 below. These minimum widths are in accordance with "NZTA Design of the Pedestrian Network Guild" and the "Southland District Council Subdivision Land Use and Development Bylaw 2012".

Type	Width
Standard Footpath	1.5m
Shared Footpath (pedestrian/cycling)	2.5m – 3.5m
Urban CBD (with veranda)	Varying widths (front of shop to kerb)

TABLE 2: MINIMUM FOOTPATH DESIGN WIDTHS

Material

All newly constructed footpaths within the Southland District will be a constructed of a hard durable surface to allow safe mobility of all footpath users. These hard surfaces include:

- Concrete
- Asphalt or
- Concrete pavers

Concrete is the preferred option as it provides the lowest whole of life cost.

Gravel is no longer considered a suitable material as it can cause mobility issues for some users and requires a higher level of ongoing maintenance.

Tactile Pavers

Tactile Pavers will be installed in conjunction with renewal work in accordance with RTS 14 – Guidelines for facilities for blind and vision impaired pedestrians

Operations and Maintenance

Annual Footpath Survey

An annual survey is carried out to rate the condition of the footpath network on a 1 to 5 scale. This is carried out by the core services provider and currently utilises Roadroid Inventory App to collect the data. The overall score is then averaged and converted to a percentage to report on the overall condition of the footpaths as per Long Term Plan KPI 18.3.

KPI 18.1: Percentage of footpaths in reasonable or better condition. Target of ≥70%

Data

Footpath data is stored in the RAMM data base. While this data is of good quality from an inventory perspective; it has limitations based on assumed construction dates which makes forecasting difficult.

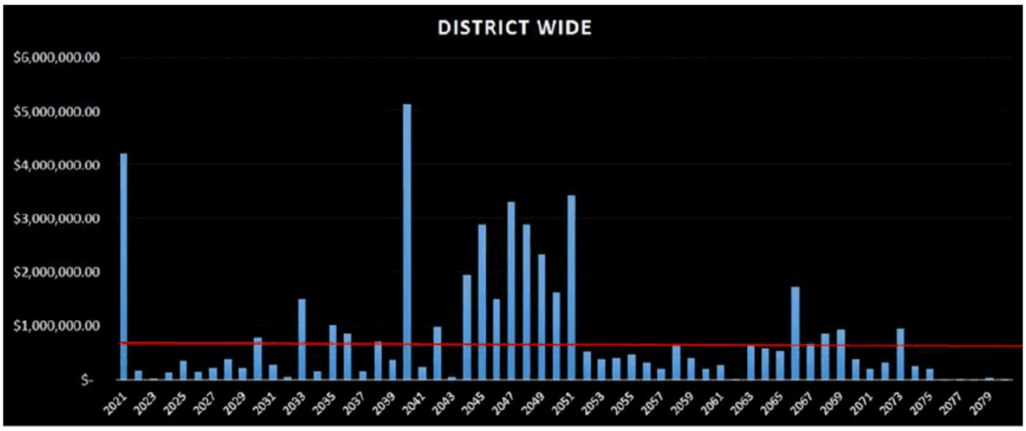
Condition data is held in the Roadroid inventory app cloud based database collected from the annual condition surveys. This is a spatial tool that uses GPS co-ordinates to map each data point collected. There is an opportunity for future improvement to refine this data into a more dynamic spatial interface to utilise both RAMM inventory data and the condition data to identify renewal programmes and level of service deficits.

Maintenance

Maintenance of footpaths include all annual cyclic activities such as lichen/moss spaying, grading and patching. Small lengths of footpath may be replaced under maintenance if it has been identified as a significant trip hazard. Typically the maintenance of footpaths is included as part of the townships streetworks budgets.

Renewals

Renewals typically occur when the asset reaches end of life or poses safety hazards such as trip hazards. This will be identified during the annual footpath condition rating survey. Expected remaining useful life held in RAMM has been utilised to determine the required annual investment in order to maintain the current footpath network. The graph below forecasts the estimated investment required to maintain the existing network without any Level of Service increases. As shown in this graph in the next two decades the required investment to maintain the current network will nearly triple. To reduce this impact the Council propose early investment for future proofing and to flatten the curve.



verage Required Send for 2021-203	Average Reqired Send for 2031-2040	verage Required Send for 2041-205	verage Required Send for 2051-206	Average Require Send for 2061-2070	verage Required Send for 2071-2080
$666,541.00	$1,026,518.05	$1,778,085.90	$699,492.55	$665,614.50	$203,049.25

Average Required Send for 2021-2080
$839,883.54

FIGURE 1: RENEWALS FORECAST

Please note: The spike shown in 2021 is due to back log of work due to historical under investment. This work will bring the network up to the desired condition.

Since 2019 the NZ Transport Agency has provided funding assistance for footpath renewals at Councils Funding Assistance Rate (FAR) of 51%. Historically footpaths were 100% community funded. All forecasting has been assumed they Council will continue to receive this funding assistance from Waka Kotahi.

Level of Service/Capital Works

Footpath LOS/Capital works refers to the construction of new footpath in areas where currently there is either no footpath or upgrading of an existing footpath to provide the desired LOS.

As part of a long term strategy; Council has reviewed all ≤50kmh speed zones against the desired LOS criteria to determine a programme of sites to be prioritised into a forward works programme for new footpath installations.

This prioritised forward works programme will be implemented as budgets allow. Shown below in Table 3 is a summary of townships with identified gaps and the estimated values of work.

Township	Required work ($)	Timeframe	Average Annual Spend in 10 years
BALFOUR	$114,109		$4,174
BROWNS	$27,744		$2,324
COLAC BAY	$116,737		$1,729
DIPTON	$17,313		$5,251
EDENDALE & WYNDHAM	$804,431		$13,823
LUMSDEN	$1,166,665		$25,023
MANAPOURI	$297,439		$27,804
MONOWAI	$21,456		$-
MOSSBURN	$246,767		$4,349
NIGHTCAPS	$562,249		$-

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OHAI	$932,117	$-
OREPUKI	$214,853	$5,191
OTAUTAU	$1,266,093	$17,122
RIVERSDALE	$259,424	$8,683
RIVERTON	$2,697,613	$54,220
STEWART ISLAND	$1,494,263	$32,319
TE ANAU	$491,510	$23,817
THORNBURY	$88,271	$5,936
TOKANUI	$141,919	$3,164
TUATAPERE	$436,788	$8,104
WAIANIWA	$21,667	$11,113
WAIKAIA	$593,143	$9,943
WAIRIO	$46,251	$1,733
WALLACETOWN	$605,271	$17,921
WINTON	$623,735	$55,997
WOODLANDS	$84,881	$6,228

TABLE 3: IDENTIFIED LEVEL OF SERVICE DEFICITS PER TOWNSHIP

Investment vs Impact

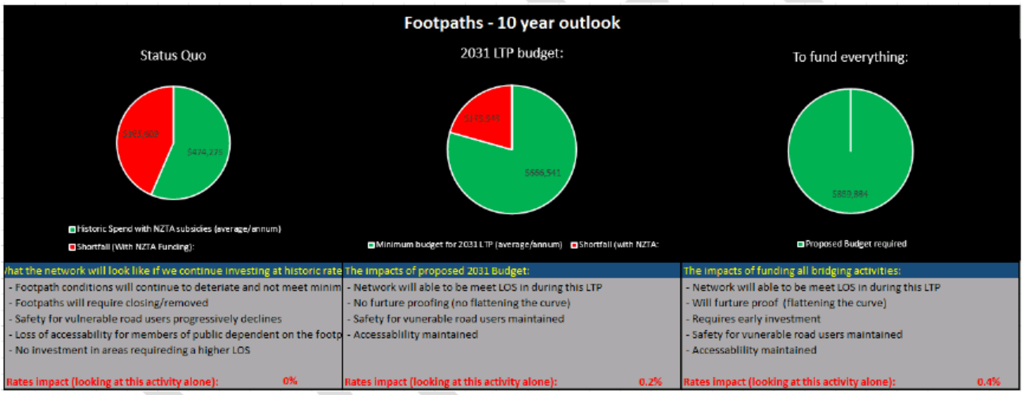

FIGURE 2: INVESTMENT VS IMPACT CHART

Future Improvements

- There is an opportunity to development smart asset management tools using GIS spatial analysis to derive works programmes from all the data Council holds. This is a work in progress.

Road Safety

Overview

Road Safety is paramount for Southland District Council and is reflected across all transportation related activities Council delivers. This includes insuring our roads are resurfaced or renewed when safety is compromised, unsealed roads are graded/maintained, appropriate signage is erected, safety barriers are installed – just to name a few.

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Nationally Road Safety is a key focus with a new Vision Zero safety strategy released by the Government late 2019. The vision is a New Zealand where no one is killed or seriously injured in road crashes. This means that no death or serious injury while travelling on our roads is acceptable

As a step towards achieving this vision, the government have set a target of a 40 percent reduction in deaths and serious injuries by 2030.

Council Long Term Plan KPI:

KPI 17.1: Annual change in the number of fatalities and serious injury crashes – reduction of 1 crash from the previous financial year.

Crash History

Southland District council is predominantly made of low volume sealed and unsealed roads. For the period from 2015 to 2020 there have been 774 recorded crashes in the CAS database, of which 10 were fatal, 89 serious injury crashes, 225 minor crashes and 420 non- injury crashes.

Fatal and Serious Injury Crashes

The crash history of Fatal and Serious injury crashes for the period from 2015 to 2020 are shown in the below table. The fatal crashes are steadily declining but the serious crash numbers is remaining steady from 15 to 17. 2019 the serious crashes increased to 19.

Year	Fatal	Serious
2015	1	17
2016	4	15
2017	0	16
2018	3	17
2019	1	19
2020	1	5

TABLE 1: LAST 5 CALENDAR YEAR FATAL AND SERIOUS CRASH STATISTICS FOR SOUTHLAND DISTRICT

Crash type	Crash numbers	% All crashes
Overtaking crashes	2	2.02
Straight road lost control/head on	23	23.23
Bend - lost control/Head on	49	49.49
Rear end/obstruction	8	8.08
Crossing/turning	13	13.13
Pedestrian crashes	2	2.02
Miscellaneous crashes	2	2.02
TOTAL	99	100

TABLE 2: CRASH TYPES FOR THE LAST 5 YEARS OF FATAL & SERIOUS CRASHES

The predominant crash type for fatal and serious crashes are

- Lost control/head-on on bends - 49.5%
- Lost control/head-on on straights - 23%
- Crossing/turning – Intersections – 13%

Crash factors	% of crashes
Alcohol	51
Failed to give way or stop	13
Fatigue	7
Incorrect lanes or position	15
Miscellaneous factors	5
Poor handling	29
Poor judgement	22
Poor observation	24
Position on Road	17
Road factors	20
Travel Speed	15
TOTAL	241

TABLE 3: CRASH FACTORS THAT CONTRIBUTED >5% OF COUNCILS FATAL AND SERIOUS CRASHES

The major contributing factors in Fatal and Serious crashes are as below

- Alcohol – was a contributing factor in 51% of the crashes
- Driver errors – Such as Poor handling, Poor Judgement and Poor Observation in total contributed in 75% of the crashes
- Road contributed in 20% of the crashes
- Vehicle speed was a contributing factor in 15% of the crashes

Previous Safety Management Strategy

The Councils Safety Management Strategy (SMS) was developed based on the Safe System approach introduced by Waka Kotahi (NZTA) in 2010. The strategy focusses on the four pillars of road safety

- Safer Road and roadsides
- Safer Speeds
- Safer Vehicles
- Safe road users

Safety Action Plans

The road safety action plans were developed as two five-year plans, 2010 to 2015 and 2016 to 2020. Both plans had focussed on different aspects and were implemented to reduce the death and serious injury crashes.

The national road safety action plan for 2016 to 2020 focussed on the below areas

- Raising public awareness through advertising campaigns
- Lowering blood alcohol levels
- Making our high-risk roads safer through rumble strips and median barriers
- Mandating electronic stability control for light vehicles.

Council's Safety Management Strategy has been implemented using the four pillars of Safe System approach

Safer Road and Roadsides

The major type of crashes within the Southland network are Loss of control crashes on bends and straights and crossing/turning crashes at intersections.

To address the above crashes SDC have developed their Safety Deficiency Database of hazards within the network and programmed treatments to reduce the Serious and Fatal injuries in crashes.

Safety deficiency database/Risk Tool

The council has developed their safety deficiency database based on the principle of safe road and roadside identifying deficiencies within the network.

The database holds the sites of bridges and embankments with steep drops for the installation of barriers. The council also has looked at sites with two or more serious and fatal crashes combined and added it to the Safety Deficiency Database to develop into Safety projects.

Fatal and Serious Injury Crash Reports

Fatal and serious crashes – Site visits reports – Investigation of crash sites and recommended treatments added to the deficiency database as a minor safety project.

Low Cost Options/Treatments

Most of the Southland District Council roads are low volume roads and the options that can be justified are limited to the low-cost options. SDC have developed their programme based on the above strategy and have focussed on achieving the best value for money within the region.

Pavement Rehabilitation Projects

The council has progressively included safety elements to minimise the risk of loss of control crashes and removal of hazards to minimise the severity. This enables the council to upgrade the roading network and improve road safety.

1. Incorporating safety aspects such as seal widening, barriers, relocation of power poles within the rehabilitation designs and construction,
2. Safety features for tourist routes seal extensions, speed limit reviews and delineation.

Safer Speeds

Speed was a contributing factor in 15% of the fatal and serious crashes, the major crash type for the network is loss of control.

To manage the speeds within the network the strategy incorporates the following low-cost options

1) Thrust gauge of out of context curves and installation of appropriate signage to address the loss of control crashes.
2) Road Safety Southland works closely with the council and the Police for education and enforcement programmes to target speeding drivers.
3) Speed Limit reviews to ensure safe and appropriate speed limits are set throughout the network.

Safer Vehicles and Safer Drivers

Driver errors such as Poor handling, Poor Judgement and Poor Observation were contributing factors in 75% of the Fatal and serious injury crashes. Vehicle factor was a contributing factor in 4% of the crashes.

Road Safety Southland forms an integral part of the Southland District Councils Safety Strategy to deliver programmes on Safe Drivers and Safe Vehicles.

1) Advertising of Safety Messages - advertising of Road Safety messages through various media outlets, the messages vary from safe speeds, don't drink and drive; look out for Motorcyclists, drive to conditions, buckle up etc. The messages target the Alcohol issue and the driver behaviours specific to Southland District.
2) Organise Seat belt restraint and Infant seat restraint compliance checks with Police.
3) Organise and deliver driver education and training programs
4) Road Safety Southland works with other Road Safety partners to coordinate advertising during major events such as Burt Munro Weekend, Field Days, various sporting events etc.

In Summary the Councils Safety Management Strategy has been developed based on the Safe System Approach when Waka Kotahi (NZTA) introduced it in NZ IN 2010. Council's roads are low volume with a relatively low number of Fatal and Serious Injury crashes. There are very few projects which can be justified based on a reduction in Fatal and Serious injury crashes within Southland.

As per the funding criteria set for Council's projects were limited to low risk/low cost options to improve safer roads and roadsides.

The projects developed by the council as per the funding criteria were

- Improving delineation – Installation of signs on out of context curves, Intersection signage improvements, Installation of pavement marking arrows on Visitor routes.
- Installation of safety barriers
- Seal extensions and widenings on visitor routes.
- Speed Limit reviews

Government Policy Statement – Safety Focus

The latest Government Policy Statement lists out the Strategic priorities which are

1) Safety – Developing a Safety System where no-one is killed or seriously injured
2) Better Travel Options – Providing people with better travel options to access social and economic opportunities
3) Improving Freight Connections – Improving freight connections for economic development
4) Climate Change – Developing a low carbon transport system that supports emission reductions while improving safety and inclusive access

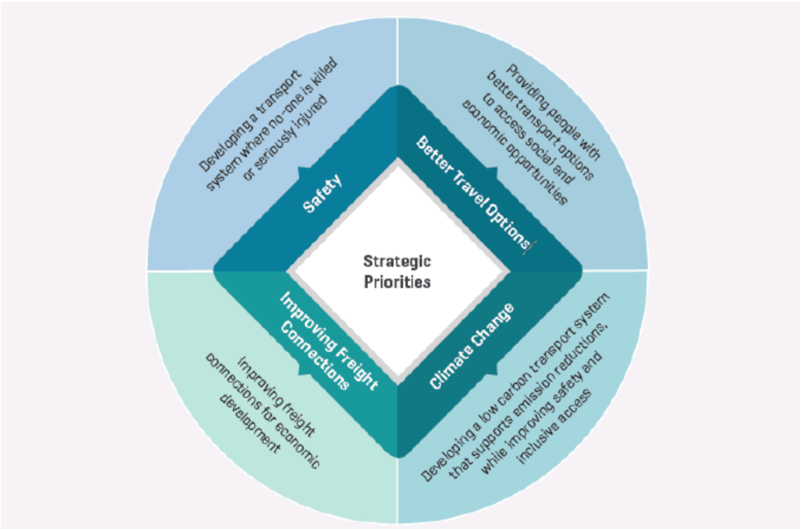

FIGURE 1:

GOVERNMENT POLICY STATEMENT – STRATEGIC PRIORITIES

Safety - Vision Zero / Road to Zero

Vision is a New Zealand where no one is killed or seriously injured in road crashes. This means that no death or serious injury while travelling on our roads is acceptable.

Vision Zero – No deaths or serious injuries during travelling on New Zealand roads. Our vision is based on Vision Zero first launched in Sweden in 1997, Vision Zero provided a common vision that brought together stakeholders, changed public attitudes and raised public expectations. Over the years this vision has led to infrastructure improvements (e.g. road barriers that separate cars from bikes and oncoming traffic, and safer pedestrian environments), lower urban speed limits, and an emphasis on safe vehicles. In the 20 years since launching the strategy, road deaths in Sweden have halved. Vision Zero has become a global movement. It has been adopted by places like Norway, New York and London and has led to significant decreases in road trauma. Vision Zero is framed as 'Towards Zero' in some jurisdictions, such as Victoria and New South Wales in Australia, as well as Canada and the European Union.

Guiding Principles

Underpinning this vision are seven guiding principles:

1) We promote good choices but plan for mistakes
2) We design for human vulnerability
3) We strengthen all parts of the road transport system
4) We have a shared responsibility for improving road safety
5) Our actions are grounded in evidence and evaluated
6) Our road safety actions support health, wellbeing and livable places
7) We make safety a critical decision-making priority.

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FIGURE 2: VISION ZERIO – GUIDING PRINCIPLES

As a step towards achieving this vision, we have set a target of a 40 percent reduction in deaths and serious injuries by 2030. This will be achieved through action in five key areas:

1) Infrastructure improvements and speed management
2) Vehicle safety
3) Work-related road safety
4) Road user choices
5) System management.

Evolving from Safe System approach to Vision Zero

The new approach focusses on evolving from Safe System approach to Vision Zero, this involves changing the approach to

- no loss of life on the roads is acceptable
- road deaths and serious injuries are preventable
- people make mistakes and are vulnerable – we need to stop simple mistakes turning to tragedies
- safety should be a critical decision-making priority in our transport decisions
- we need to focus on shared responsibility between road users, and the people who design and operate our roads.

This approach takes a proactive, evidence-based approach to building a safe road system. Road safety goes beyond preventing deaths, to improving lives and lifestyles too. It ensures people feel safe to ride their bikes, let their children walk to school. It creates road networks that connect people rather than dividing them.

The New Safety Management Strategy

Council will rewrite/update its existing Safety Management Strategy to incorporate the GPS direction and vision Zero principles. Current Safe System approach will be strengthened by incorporating the following and building the new strategy

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1) Everyone within the system accountable and responsible. Shared responsibility between the road users, and the people who design and operate the roads.
2) Roads are for multimodal transport designed for cyclists, pedestrians and vehicles.
3) Reducing the Serious and fatal crashes (40% reduction in the death and serious injury crashes in 10 years)
4) Speed limits that are safe and appropriate. Developing a program of assessment and implementation to align speed limits as per Safe System.
5) Building a safe road network means investing in infrastructure safety treatments that are proven to save lives
6) Working closely with Road Safety Southland and other key partners to make safety a part of every transport decision.

Around the Mountains Cycle Trail

Overview

The announcement of government funding for Quick Start Trails in 2009 by then Prime Minister Sir John Key was the catalyst for making the Around the Mountains Cycle Trail a reality. Southland District Council successfully secured the financial backing needed to create a trail through some of the most beautiful scenery in New Zealand.

Work on stage one from Kingston to Mossburn started in June 2013 and included the construction of purpose-built cycle bridges crossing the Mataura River and Eyre Creek. It was officially opened by Deputy Prime Minister Bill English at a ceremony in Lumsden on 1 November 2014.

Further funding was approved in 2014 to enable SDC to embark on stage two from Mossburn to Walter Peak. The 186km journey can be ridden in either direction, starting at Kingston or Walter Peak, and takes 3-5 days at a relaxed pace on this easy to conquer trail.

Many cyclists start the trail at Walter Peak Station on the shore of Lake Wakatipu, after a boat trip on the Earnslaw. The trail then follows Mount Nicholas Road, Mavora Lakes Road and Centre Hill Road. At Centre Hill the purpose built cycle trail starts and follows the south bank of the Oreti River through to Mossburn. From Mossburn the trail continues to Lumsden, and then from Lumsden the trail passes through the small townships of Five Rivers, Athol, Garston and finishes back at the lakeside of Lake Wakatipu in Kingston.

Level of Service

The Around the Mountains Cycle trail is an asset that can be utilised by the public at any time. There is no charge to use the Cycle Trail. The trail is managed by a Cycle Trail Manager who is employed by SDC on a part-time basis.

Service standards provide the basis for the lifecycle management strategies for asset and maintenance programmes. Asset management planning requires a clear understanding of customers' needs and preferences balanced by the council's ability to fund these needs.

It's classed a Grade 2-3 ride (New Zealand Cycle Trial Design guide classifications) with conditions suitable for novices and families, with the exception of the 2.5km-long Von Hill climb which can be walked if it proves too challenging. The constructed sections of the trail amount to approximately 90km of predominantly Grade 2 track. Additionally sections of the trail utilise existing roads and considered as Grade 3 sections.

Completion of Stage two of the cycle trail was reviewed by Council and the preferred option from the business case in December 2017 was adopted. This saw the completion of the trail using existing low volume roads from the end point of Centre Hill through to the termination at Walter Peak Station on the shores of Lake Wakatipu.

Operations and Maintenance

An annual allowance for maintenance of the trail is included in the LTP budgets. Maintenance relates to the constructed sections of the trail as opposed to the sections of trail that utilise the existing roads. These sections will be covered by road maintenance.

Year	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31

Budget	$74k	$76k	$78k	$80k	$82k	$84k	$86k	$88k	$91k	$93k

The capital cost of the trail was partly funded by Government contribution and by other external funders such as Community Trust of Southland and Lotteries.

A business case in December 2017 recommended ongoing funding for maintenance, marketing and promotion, and trail management. These have been allowed for in the Long Term Plan.

An allowance for consultant assessment has been made annually in the budget. This is for any additional consultant requirements outside the six yearly structural integrity bridge inspections.

An annual allowance has also been made for maintenance metal to complete surface repairs to the Cycle Trail.

In June 2020, MBIE approved OPEX funding for the position of Trail Manager, this was for $45,000 with matched funding from SDC, bringing the total to $90,000. This can be spent on operational costs for the Cycle Trail and includes the Trail Manager, maintenance and signage for the trail. This is for a 3 year term from 1st July 2019 – 30th June 2022. Any further funding will be reviewed by MBIE in the future.

Flooding occurred in February 2020 and an application to MBIE has been approved for $379,793. This will allow repairs to the Cycle Trail to be completed as well as improvements to sections of the trail, ensuring the quality of the trail meets Grade two standard.

Given that parts of the cycle trail will be repaired in 2020, and will effectively be a "new surface" in areas, it will push out renewal demand. This has been considered in setting capital renewal budgets for 25/26 and 30/31.

Approach Operations and Maintenance

Operations and Maintenance Strategy

In May 2019 SDC employed a dedicated Trail Manager to oversee the running of the Trail moving away from the Principal Trail Operator (PTO) model that was engaged over the previous five years. With the recruitment of the Trail Manager, SDC has been able to manage the Cycle Trail and set a new strategic direction. This includes ownership of the Brand, Logo, Website and Maintenance Contracts.

SDC strategy for operations includes:

- Develop, maintain, operate and promote the ATMCT
- Develop, promote, manage and operate the website (which the SDC owns)
- Develop and distribute the Brochures and Maps
- Monitor use of the Around the Mountains Cycle Trail
- Prepare the ATMCT marketing plan and delivery of marketing activities
- Maintain an Official Partnership Programme
- Provide regular communication to the Official Partners and community with information about the ATMCT

The strategy for maintenance of the trail is that Council will utilise an external supplier to carry out planned vegetation control bi-annually and to carry out surface maintenance, drainage maintenance, structures and bridge maintenance as required. In addition to this maintain the cleanliness of the toilets.

Structures will be managed as for roading structures. Major bridges will be checked for structural integrity on the same six yearly cycle as the roading bridges.

Currently the maintenance contractor is Southroads, all works are completed under the Roading Alliance Contract 17/3. Spraying has been sub-contracted to Watson Farm Spraying, post spraying Southroads will inspect the trail. This inspection will include an inspection of each culvert which will be cleared if required.

The asset information is stored in the Road Assessment and Maintenance Management Data base (RAMM) which is used for roading and associated assets.

Operations and Maintenance Trends and Forecasts

Operation and maintenance forecasts are symbiotic, in part complimentary and in part in conflict. As use of the trail increases some aspects of trail maintenance such as surface levelling will increase, caused by cycle use. On the other hand vegetation control, particularly pest plant control will decrease because of reduction achieved by early control programmes.

Regular use will create compaction of the trail surface; this is desirable. In-frequent use will allow climatic conditions such as wetting, drying, wind, freeze and thaw to loosen the surface and allow fines to be lost; this is not desirable. Loose surfaces will need to be improved by machine compacting i.e. rolling. This will be part of planned maintenance.

The financial projections are shown graphically below.

REQUIRES UPDATING Figure 0-13: Cycle Trail Opex Forecasts

Renewals

Renewal Strategy

The renewal strategy for the cycle trail is similar to the strategy for managing an unsealed road. Use of a road or trail results in loss of surface material (gravel). The renewal strategy is to replace this material at the optimum time. The variables are the rate of loss and the timing between renewal cycles.

Renewal Trends and Forecasts

The renewal trends for the cycle trail are somewhat theoretical at this point in time. The cycle trail has had relatively low use with approximately 3000 cyclists and 3000 pedestrians using the trail between 1st March 2019 and 29th Feb 2020. So there is limited information to base prediction models on. Flood damage repairs will take place in 2020 to 22km of the Cycle Trail. An allowance has been made in the 2025/26 year and the 30/31year for surface rehabilitation and some metal replacement. It is anticipated that in other years localised metal replacement will be required and this will be carried out as tasked maintenance.

Investment vs Impact

Capital Investment Strategy – Levels of Service and Demand

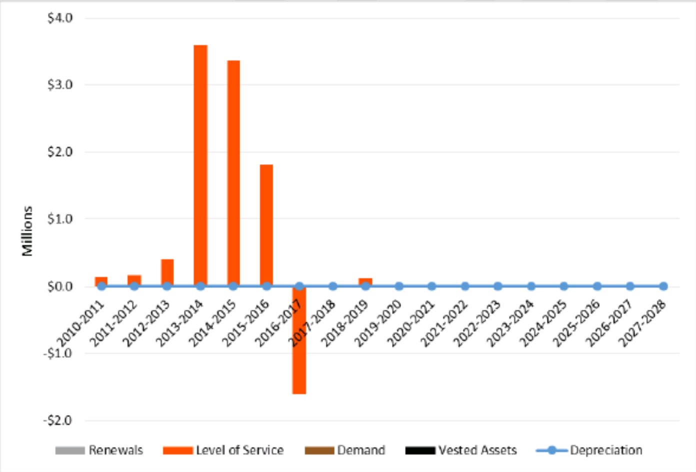
Following the Around the Mountains Cycle Trail Stage2- Business Case (Dec 2017). Council adopted the preferred option - "Option 1: Centre Hill Road Connection". This option focused on bringing the existing trail to a logical point of completion and delivering additional infrastructure required to provide a minimum acceptable standard of service (such as signage, shelters and toilets).

This construction work including five toilets and four emergency shelters in the Von Valley and a Shelter and Toilet at Centre Hill were installed in May 2019 along with additional directional and safety signage. The total cost of this project was $192,194 + GST with 50% of this being funded by MBIE.

Capital Investment Strategy Trends and Forecasts

Any further decision-making on completing the 'gap' in the trail represented by on-road or road-adjacent sections should be reviewed in 2021 as outlined in the previous AMP.

There may be opportunities for government funding following Covid-19 lockdown, and shovel ready projects. Further scoping of trail realignments should be considered.



REQUIRES UPDATING - Figure 0-65: Cycle Trail Capital Forecasts (Renewal, LOS, Demand)

Future Improvements

Future improvements will be reliant on external funding eg. MBIE

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Te Anau Manapouri Airport

Overview

What We Do

The Te Anau Airport Manapouri provide facilities for flights services in and out of the Te Anau basin. The airport has a sealed and unsealed runway, terminal building and other facilities for visitors and users including hangar spaces.

The airport is largely servicing local fixed wing and helicopter scenic flights, charter flights and high end commercial flights, utilizing large passenger aircraft related to the nearby Fiordland National Park and surrounding tourist communities, as well as an events venue with events hosted at the terminal building.

Currently Fiordland Aero Maintenance and Te Anau Helicopter Services have leased hangers from MGJV. Flights to and from the Chatham Islands are provided by Air Chatham a few times per year. Alliance Airlines of Australia operate a closed charter service for Tauck Tours of America up to three times per week during the summer season.

Most large aircraft movements are serviced by our Ground Handling staff who set the approach light systems, bird scare, baggage handling and management of the Apron activities. The airport also offers a certified refueling service.

The airport currently has the following assets:

- Runway, runway strip and apron
- Buildings and other facilities
- Access, fencing and security
- Ground handling services

Why We Do It

Te Anau Airport Manapouri is a facility designed and managed to attract and facilitate access by "air" to the Te Anau and Manapouri area communities, its businesses and the natural environment that encompasses this unique part of New Zealand through safe and efficient businesses practice.

Activity Aim: Provide a safe and reliable airport in the Te Anau Basin.

Objectives of the Te Anau Manapouri Airport Activity

The airport and supporting aviation activities associated with the airport in the Southland District (SDC) is focused on the achievement of the following objectives:

- Provision of a safe and compliant operational environment, including runways, taxiways and apron facilities for a wide variety of fixed wing (jet and prop), rotary and skydive activities.
- Provision of a welcoming terminal building of a standard comparable to the most affluent of passengers.
- Provision of an attractive Functions Centre that is well utilised for weddings, corporate functions and family social occasions.
- Provision of leased land on the non-operational areas of the aerodrome which attracts ancillary businesses to support the established tenants of the aerodrome and visiting aircraft, along with non-commercial activities such as private aircraft owners and aircraft restorers.
- To provide air based emergency access which can act as an alternative to road transport when required.

Overview of Management

The assets covered in this plan are the responsibility of the Council's Services and Assets Group under the strategic direction of Council, the Executive Leadership Team and Community Boards. Asset management responsibilities are covered in detail in Council's Asset Management Policy.

Service delivery is provided as follows:

- Operation and maintenance (O&M) is delivered by an Airport Manager contracted by Council.
- Resourcing of technical expertise for capital works and design is from internal engineering sources provided by the SDC and outsourced where necessary. The overall responsibility for the management of these projects lies with the Airport Manager.

Service Delivery Review

Section 17A of the Local Government Act 2002 requires all local authorities to review the cost-effectiveness of its current arrangements for delivering good quality local infrastructure, local public services and performance of regulatory functions at least every six years.

There has been no service delivery review for the Te Anau Airport Manapouri and none are scheduled as of June 2017. A 17A review may be implemented during the lifetime of this Activity Management Plan.

Level of Service

Level of Service/Capital Works

This section outlines why the Council is involved in this activity and the key drivers for levels of service, including customer expectations, legislative/regulatory requirements and Council outcomes. Section 0 details what level of service will be provided and the performance measures and targets which will be used to monitor performance.

The airport currently holds Part 139 Certification and is staffed by a full time airport operations manager. The terminal building is available for hire for functions.

Customer Expectations

In providing services it is important to understand what the customer using the service expects and if those expectations may change. The table below details the key customer groups, their expectations and any issues that this raises for the activity.

Customer stakeholder group	How we understand their requirements	Specific Interests	Expectations and key issues

SDC	Monthly reporting on monthly aircraft usage. LTP	Maintenance Marketing	Increased utilisation. Varied customer base. Increase in tourist orientated traffic.
Function Centre Hirers	Hirer documentation Customer Feedback	Maintenance Marketing	Attractive clean tidy venue. Safety. Competitive Pricing.
Fuel Suppliers	Monthly Requirements Annual Forecasts	Suppliers Customers Attraction to Airport with Services and Supply	Safety and compliance. Maintain fuel handlers qualification.
Hangar Tenants	Six monthly meetings.	Cost Value Basis	Well maintained airport environment for attraction of clients.
Local Aviation Community	Annual Meetings In house rules document Airport memos	Activities on airport Airport Information	Safety Procedures and information.
Non Local Aviation Community	Customer Feedback Via Website Direct Communication	Availability of Service	Internet Information. Weather Reporting. Terminal Availability.
Civil Aviation Authority	Reference to CAA Rules and Advisory Circulars Direct Contact Compliance Audit	Safety Management	Minimising incidents. Maximise compliance and introduction of Safety Management Systems. Update of information.

Table 0-1: Customer Expectations

In providing services it is important to understand what the customer using the service expects and if those expectations may change. The table below details the key customer groups, their expectations and any issues that this raises for the activity.

Planning Framework

Legislation, regulation and Council's existing strategies and policies mandate or influence some of the levels of service and performance targets we set, as illustrated in the table below for the Te Anau Manapouri Airport activity. A full description of the Council policy and planning framework impacting AM Plans is included in the *LTP and AMP Part A (r/16/8/12686).*

Legislation / Regulation / Planning Documents	How it affects levels of service and performance standards Outline any changes (implemented or pending) which is impacting the activity and describe how
Building Act 2004	Sets building code standards to provide a safe environment for users. Certain buildings must have an annual Warrant of Fitness.
RMA 1991	Consents and plans issued through the RMA define minimum standards for effluent overflows and discharges from the wastewater network.
Regional Plan	Sets policies rules and regulations for land use and resource use in the region. Tightening environmental standards may require treatment of stormwater discharges.
Civil Aviation Act 1990	Sets out the legislative frame work for the Part 139 Certified Aerodrome Rule and associated Advisory Circulars. Changes: Nil
Civil Aviation Rules Part 139	Sets out the requirements for the set and running of a certified aerodrome in New Zealand. Changes: Introduction of SMS by 2021.
Health and Safety at Work Act 2015	Sets policies and rules to protect employees and contractors whilst at work in a New Zealand workplace Changes: forms part of SMS plan.
Southland Water and Land Plan	Monitoring Water quality Changes: new plan and regulations.

Table 0-2: Te Anau Manapouri Airport Planning Framework

Levels of Service, Performance Measures and Targets

Levels of service (LOS), performance measures and targets form the performance framework for the activity detailing what the Council will provide, and to what level or standard:

- *LOS* are the outputs that are expected to be generated by the activity.
  They demonstrate the value being provided to the community or reflect how the public use or experience the service. A key objective of activity planning is to match the level of service provided with agreed expectations of customers and their willingness to pay for that level of service.
- *Performance measures* are quantifiable means for determining whether a LOS has been delivered and are generally broken into customer measures (which focus on how the public uses or experiences the service) or technical measures (which tend to be used internally to track performance or measure what the organisation does).
- *Performance targets* are the desired levels of performance against the performance measures.

The levels of service for the airport is *Facilities are fit purpose, in appropriate locations and managed cost effectively*.

Following the benefits mapping process to show the link between the outcomes and the activity and levels of service, the number of performance measures has been reduced. As a result the measures relating to the airport activity are being monitored at an operational level.

Plans Programmed to meet the Level of Service

The list below details any projects, initiatives, programmes or expenditure that the Council is planning to undertake to ensure that the level of service is achieved and/or to address any gaps between the targets and current performance. Where there are capital works projects related to improving levels of service (LoS) or maintaining levels of service (Renewal – Ren). More direct airport management control of land usage, to be able to develop current section to operational states, amend current land use to include accommodation /hangar options.

- Develop and build on some of the spare apron land to provide transition hangar for new start-up companies.

Operations and Maintenance

Historical Trends

The purpose of this section is to outline the broad O&M philosophies for the assets, understand any underlying issues and trends, and set the basis for the O&M financial forecasts.

Aviation activities within the Te Anau Ward are distributed between dedicated Council owned land assets such as airports and air strips and privately owned aircraft businesses using private land assigned to their specific activity. Prior to 2006 the assets now owned by the Council were also privately owned.

When these assets came under the Council ownership the major activity that had previously occurred had closed down or stopped operating into the region, for example Mount Cook Airlines regular charter service from Rotorua and Mount Cook.

During 2007/2008 the decision to upgrade the now Council-owned airport was made and resulted in the spike of expenditures. These values are forecast to remain stable with a slight increase due to inflationary pressure due to the scope of activity reaching its potential for the next 10 years.

Operations and Maintenance Strategy

Reactive maintenance: Reactive maintenance costs are driven by environment impacts such as unusually heavy precipitation/snow causing unanticipated erosion issues that are difficult to plan for. In addition to environmental effects, seismic activity cause unplanned maintenance activity associated with the landing surfaces that are subject to certain regulatory standards.

Reactive maintenance decisions are made by the Airport Manager in consultation with the Community Engineer. Maintenance requirements are prioritised by operational pressures and regulatory compliance.

Planned Maintenance: A schedule of annual inspections and planned maintenance has been developed and will be produced in consultation with the Community Engineers maintenance strategy. Repairs and maintenance are planned with reference to Appendix 1 "Maintenance Schedule Asset Management Plan Volume 1 Pavements and Landscaping" provided by Projenz Limited.

Operations and Maintenance Trends

There has been a slight growth in large aircraft movements by not enough to effect the maintenance management and planning.

Operations and Maintenance Forecasts

Most of the operating costs are assumed to hold constant over the 10 year period. Maintenance fluctuates to allow for expected refurbishments as detailed further below.

Road works and building maintenance can be consolidated into the annual road works and building maintenance planning projects. This would be done by associating with other similar works in the area under asset ownership of the Council and would avoid isolation of similar works whilst the contracted expertise is in the area.

Areas of consolidation would include the following:

- Entrance roads.
- Non-operational pavements.
- Traffic markings including runway and apron markings.
- Weed spraying.
- External spider proofing.
- Building staining.

The assets were assessed in November 2014 by Community Engineer, Nick Lewis. A further condition assessment will be carried out in 2018/19 before any decision is made to resurface the runway. Initially when the airport was first developed the airport project consultants when making recommendation for future expenditure under the heading of Maintenance Projects, it was forecast around the potential of heavy aircraft traffic with a low to medium utilisation. In the foreseeable future this is unlikely to occur making some of these financial allocations either incorrect or will be pushed future out from the scope of the LTP.

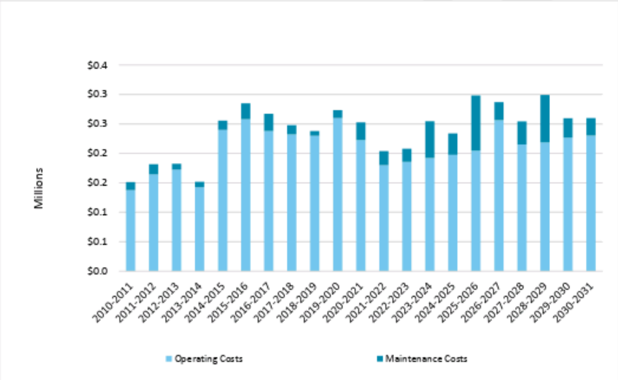

Figure 0-2: Te Anau Manapouri Airport Opex Forecasts

Approach Operations and Maintenance

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Renewals

Approach to Renewals

Renewal is the replacement (or rehabilitation) of an existing asset without changing its capacity or level of service beyond the original design.

Renewal Strategy

Renewal projects are identified by the Airport Manager and in consultation with an appropriately authorised maintenance contractor or service outlet. Renewal projects are prioritised by operational pressures and regulatory compliance. The renewal strategy is to review current best practise and economical and environmental considerations

Renewal Past Trends and Forecasts

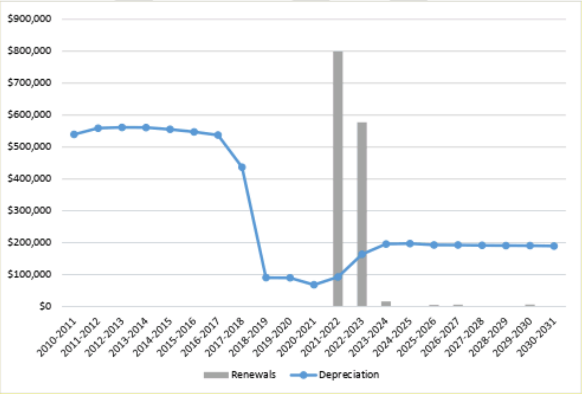
Most assets at the airport relatively new and require only maintenance or refurbishment over the next 10 years.

The following assets are subject to consideration for renewal, however, based on current knowledge, the assets budgeted for renewal in the 10 year period is the entrance road and carpark ($50,000), The main runway resealing ($294,175), the Ground Power Unit (approx. $45,000) and the ATV motorbike (approx. $5,000).

- Suzuki ATV 300 Motorbike
- Two portable Generators
- ATV Trailer
- Sound Equipment
- Catering Equipment
- Baggage Trolleys

In 2007-2008 $4.3 million capital work was undertaken which was depreciated at 10% per year. Depreciation drops significantly in 2018-2019 as there are no significant capital projects coming up.

Figure 0-3: Te Anau Manapouri Airport Renewal Trends and Forecasts



Key Projects

Details the key projects programmed for years 2021 to 2031 are outlined below.

Airports

Te Anau Airports

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Runway Surface Rehabilitation 21/22	P-10663	Runway Surface Rehabilitation 21/22	REN	21/22	798,000	Loan
GPs Upgrade	27081	GPs Upgrade	LOS	22/23	10,920	Loan
Re-carpeting	845	Graeme Hall | Property Officer - Building Assets Southland District Council -----Original Message----- From: Margaret Fahey [mailto:faheyregal@outlook.co.nz] On Behalf Of Margaret Fahey Sent: Monday, 12 June 2017 1:10 p.m. To: Graeme Hall Subject: Regal Floors Quote - TeAnau Manapouri Airport Southland District Council P.O. box 903 INVERCARGILL Attention Graham Hall Re: TeAnau Manapouri Airport To lift existing carpet tiles Prepare floors Supply and lay 100% Solution Dyed nylon carpet tiles Finish off with alloy bars $15600.00 PLUS GST	REN	22/23	16,380	Loan
Runway Surface Rehabilitation 22/23	P-10664	Runway Surface Rehabilitation 22/23	REN	22/23	557,535	Loan
Moss killing and reoiling of building	airport2	As per 2018-28 AMP	MAINT PLAN	23/24	16,773	Loan
Upgrade to security system	airport4	To upgrade the current security system including cameras and hard drive to bring it up to current standards	LOS	23/24	8,946	Loan
Runway Line Marking Programme	P-10665	Runway Line Marking Programme	REN	23/24	5,238	Loan
Airport Heat Pump Replacement	627	Replace 3 x heatpumps	REN	23/24	11,182	Loan
Painting of internal walls in terminal	airport3	To repaint internal walls due to end of life	O&M	25/26	35,279	Loan
Runway Line Marking Programme	P-10665	Runway Line Marking Programme	REN	25/26	5,508	Loan
Runway Line Marking Programme	P-10665	Runway Line Marking Programme	REN	26/27	5,652	Loan
Moss killing and reoiling of building	airport2	As per 2018-28 AMP	MAINT PLAN	28/29	19,826	Loan
Runway Line Marking Programme	P-10665	Runway Line Marking Programme	REN	29/30	5,804	Loan

* REN - Renewal, LOS - Levels of Service, DEM - Demand

Te Anau Airports

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Main runway apron resealing	27081	Main runw ay apron resealing	MAINT PLAN	18/19	65,000	Loan & Reserves
Airport Helipads	626	2 helipads made from sleepers and large gravel alongside the fuel for helicopters to land off the runw ay apron	LOS	18/19	14,000	Rates
Upgrade to security system	airport4	To upgrade the current security system including cameras and hard drive to bring it up to current standards	LOS	18/19	8,000	Rates
Moss killing and reoiling of building	airport2	As per 2018-28 AMP	MAINT PLAN	18/19	16,000	Rates
Complete reseal of runway and apron including remarking	airport1	As per the AMP 2018-28, combining of tw o projects identified	REN	21/22	325,576	Reserves
GPs Upgrade	27081	GPs Upgrade	LOS	22/23	10,920	Rates
Re-carpeting	845	To lift existing carpet tiles Prepare floors Supply and lay 100% Solution Dyed nylon carpet tiles Finish off with alloy bars $15600.00 PLUS GST	REN	22/23	16,380	Rates
Upgrade to security system	airport4	To upgrade the current security system including cameras and hard drive to bring it up to current standards	LOS	23/24	8,946	Rates
Moss killing and reoiling of building	airport2	As per 2018-28 AMP	MAINT PLAN	23/24	16,773	Rates
Airport Heat Pump Replacement	627	Replace 3 x heatpumps	REN	23/24	11,182	Rates
Painting of internal w alls in terminal	airport3	To repaint internal walls due to end of life	O&M	25/26	35,279	Reserves

Investment vs Impact

Capital Investment Strategy – LOS and Demand

The last three year period has seen improvements carried out to improve the operational effectiveness and the efficiency of the airport operation including the renewal and upgrade of the GPW Approach system.

No upgrades or new assets are proposed, the overall strategy is to maintain and renew the existing asset network.

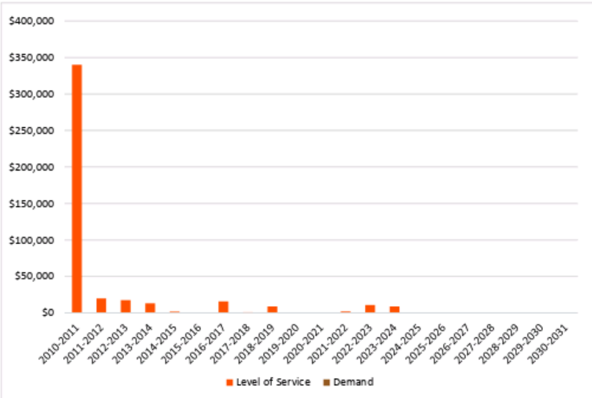


Figure 0-4: Te Anau Manapouri Airport LoS and Demand Trends and Forecasts

Future Improvements

- There is an opportunity to development smart asset management tools using GIS spatial analysis to derive works programmes from all the data Council holds. This is a work in progress.
- The completion of two new Heli-pads.

This section describes how the demand for the Te Anau Airport Manapouri is likely to change over the period of the plan, the impact any changes are likely to have and whether the Council is planning to make any changes to the activity as a result.

Predicting Future Demand for the Activity

Demand Drivers and Forecasts

The factors influencing demand for the service are summarised below. The Council has prepared corporate wide assumptions/projections for growth drivers (population, land use, dwellings, tourism) which have been used as the basis for assessing future demand for the service. These projections are detailed in the Assumptions section of the LTP and AMP Part A (r/16/8/12686).

Demand for the Te Anau Airport Manapouri service can be measured in terms of the number of landings that the airport receives over a period of one year. The factors influencing demand for service are summarised in the table below.

Demand Driver	Impact on Future Demand
Population	With an increase in population a percentage growth for recreational flying will increase providing increases in landing charges and promotion of aviation related activities. The airport structure including land available can cater from the projection of 10% growth within the next 10 years. With a declining population the reverse will be seen making it difficult to justify staffing levels and further refurbishment of facilities. The population age demographic could have an independent effect on growth if a greater percentage of the population has discretionary wealth that they choose to spend on aviation interests be it recreational or business.
Tourism	With the trend for changes in tourism visitor's nationality type towards Chinese and Malaysian with the introduction Asian based airlines direct into Christchurch, the airport is now capable of marketing to all New Zealand Charter Aviation Operators. The downstream effect will be increase in landing fees and income for associated tourist orientated businesses in the region. Other niche markets such as corporate jets and heritage aircraft are also sectors with potential for growth.
Dwelling	Due to the nature of both Te Anau and Manapouri as residential and holiday accommodation focus. With an increase in new houses, the downstream effect could provide increased activities at the airport for casual residents to access the area by air and permanent residents providing further justification for scheduled air services into the region.

Table 0-3: Demand Drivers

The information in the *LTP and AMP Part A r/16/8/12686* suggests that:

- Population for Te Anau is predicted to grow from 2938 in 2018 to around 3383 in 2028. Manapouri is predicted to grow from 332 in 2018 to around 354 in 2028.
- The number of occupied dwellings in Te Anau and Manapouri is predicted to increase proportionally to the increase in population.
- Tourism growth is expected to average 5.4% per year and the number of nights stayed in the Fiordland to increase (report New Zealand Tourism Forecasts 2016-2022).

The large aircraft movements have shown slow by steady growth of approximately 10% over the last six years with a revenue growth of 20%. Small aircraft movements have declined by 6&.

The global financial crisis and the internal financial situation meant growth of the airport activity has been minimal over the last three years. In that period the focus has been on getting the airport setup with an efficient and safe operational focus. The GPS approach is a key part of this focus.

For the purposes of the budget projections, demand in terms of landings and fees earned is assumed to hold constant over the 10-year period (apart from inflationary adjustments).

Implications of Growth/Demand

The airport underwent an extensive upgrade to the runway operating surfaces to cater for large aircraft. Further equipment has been installed to comply with additional Civil Aviation and Operator requirements. A GPS based approach system has been developed and implemented, an upgrade to the system has been completed and will go live in February 2018. This has the advantage of providing state of the art information to pilots. It also means some of the electronic equipment previously operated and maintained by the airport is now no longer needed.

AirBP have installed a new refueling terminal. This provides Av Gas and JetA1 fuel via a modem card based dispensing and payment system. This is effectively a 24 hour self-service system.

There are no further operational requirements for future growth in aircraft type that is reasonably expected for the region and type of opportunities available to the airport.

There is limited apron and terminal check-in facilities but for the envisaged growth in the next 10 years this is no concern for capacity.

As this is an asset orientated business with contract staff, future decline in business will have little effect of asset provision. Income levels and demand will affect the hours of operation.

Demand Management Strategies

The airport relates to activities associated with business and seasonal trends in the Te Anau Manapouri region which is primarily tourist driven and is partially driven by the marketing strategies of these businesses. With these drivers the airport needs to remain a viable access point for customers to promote access to the region by air.

The business is seasonally affected and must ensure that all efforts are made to cater for high demand periods and provides the level of service that the airport is capable of supporting.

Asset Management Strategies to Manage Demand

The demand for service is driven by the regional capability to attract large numbers of tourist orientated traffic. The airport and is capability is limited to the size and frequency of aircraft movement by accessible operational area. Unlike international airports, Te Anau Airport can only attract a limited size of aircraft from a regional perspective thus the level of service offered in comparison to services of larger international airports is capped. The seasonal nature of activities within the region means that the airport personnel structures have a high and low periods and must maintain that flexibility to warrant the employment or contracting of suitably qualified persons in time of need.

Also, due to a high percentage of helicopter aviation activity in the region and the nature of that activity, helicopter bases do not require large areas of land to operate and therefore have the option to locate away from the airport facilities this also limits the airport's potential to receive landing fees.

Furthermore, Te Anau Airport Manapouri has three large airports within 20 minutes flight time of Te Anau Airport two serving international traffic and all three having regular domestic services. With this in consideration the scope to expand in the current and perceived future environment suggests little further growth in size and capability. Frequency of operations at the present level of service can increase without further expenditure required by the airport.

Plans Programmed to Meet Growth/Demand Changes

The list below summarises projects, initiatives, programmes or expenditure that the Council is planning to undertake to meet changes in demand (D). Where there are capital works projects related to demand (D), these are identified in section xx.

A business case will be prepared for the installation of two new heli-pads and a start-up hanger and will be completed by July 2018.

Sustainability

The Local Government Act 2002 requires local authorities to take a sustainable development approach while conducting its business, taking into account the current and future needs of communities for good-quality local infrastructure, and the efficient and effective delivery of services.

At the Te Anau Manapouri Airport activity level, a sustainable development approach is demonstrated by the following:

- Ensuring maintenance schedule is adhered to
- Customer focused management of facilities.
- Condition assessments completed in a timely manner to ensure the maximum life expectancy of the asset

Financial Summary

10 Year Financial Forecast

The following table summarise the financial forecasts for the activity over the ten years.

Financial Forecast Summary

Roading	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($ 000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	283	275	293	989	1,021	1,061	1,078	1,104	1,145	1,144	1,180	1,231	1,323
Targeted rates	14535	14,420	14,516	13,411	15,172	17,457	18,298	20,234	22,300	23,358	24,694	25,538	26,365	28,739
Subsidies and grants for operating purposes	6,509	8,009	6,656	6,509	6,900	6,934	7,279	7,348	7,707	7,780	8,160	8,237	8,640	8,721
Fees and charges	71	62	63	68	40	42	44	74	79	78	80	82	84	86
Internal charges and overheads applied	199	456	505	641	346	317	300	288	285	286	288	289	291	292
Local authorities fuel tax, fines, infringement fees, and other receipts	1,195	921	982	991	1,042	1,054	1,084	1,106	1,127	1,147	1,170	1,194	1,218	1,342
Total operating funding	**22,510**	**24,152**	**22,996**	**21,913**	**24,490**	**26,835**	**28,066**	**30,129**	**32,602**	**33,795**	**35,535**	**36,521**	**37,829**	**40,273**
Applications of operating funding														
Payments to staff and suppliers	12235	12,928	14,147	14,099	14,190	14,292	15,019	15,126	15,904	16,067	16,758	16,956	17,722	17,836
Finance costs	-	-	-	-	240	250	267	264	264	268	266	262	259	253
Internal charges and overheads applied	1,425	1,053	1,203	1,770	2,300	2,359	2,456	2,528	2,575	2,653	2,683	2,760	2,864	2,879
Other operating funding applications	78	103	526	337	226	231	235	240	244	249	253	258	264	269
Total applications of operating funding	**13,738**	**14,084**	**15,876**	**16,206**	**16,957**	**17,143**	**17,977**	**18,158**	**18,987**	**19,236**	**19,961**	**20,236**	**21,108**	**21,286**
Surplus (deficit) of operating funding	**8,772**	**10,068**	**7,120**	**5,707**	**7,533**	**9,693**	**10,089**	**11,971**	**13,615**	**14,559**	**15,575**	**16,285**	**16,720**	**18,987**
Sources of capital funding														
Subsidies and grants for capital purposes	12714	8,405	7,420	8,911	10,385	11,670	11,847	13,291	14,571	15,480	16,556	17,303	17,741	20,157
Development and financial contributions	-	12	-	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	7,993	-391	351	1,226	1,059	1,359	447	590	879	664	581	683	578	1,827
Gross proceeds from sale of assets	26	23	-	-	-	47	10	10	30	-	53	11	11	34
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**20,733**	**8,050**	**7,770**	**10,137**	**11,443**	**13,086**	**12,304**	**13,891**	**15,479**	**16,144**	**17,189**	**17,997**	**18,330**	**21,228**
Applications of capital funding														
Capital expenditure														
- to meet additional demand	910	302	19	-	-	-	-	-	-	-	-	-	-	-
- to improve the level of service	9,876	2,673	1,024	2,179	2,230	3,073	2,408	2,530	2,639	2,741	2,735	2,859	2,849	2,988
- to replace existing assets	14055	15,071	14,076	15,310	19,153	20,594	20,643	23,330	26,080	27,407	25,617	30,812	31,595	36,637
Increase (decrease) in reserves	-4,664	55	(237)	-1,645	-2,372	-868	-651	-6	362	540	395	591	585	592
Increase (decrease) in investments	(0)	18	8	0	(35)	(21)	(7)	8	14	15	17	19	21	28
Total applications of capital funding	**29,505**	**18,118**	**14,890**	**15,844**	**18,976**	**22,778**	**22,393**	**25,862**	**29,094**	**30,703**	**32,764**	**34,282**	**35,050**	**40,215**
Surplus (deficit) of capital funding	**(8,772)**	**(10,068)**	**(7,120)**	**(5,707)**	**(7,533)**	**(9,693)**	**(10,089)**	**(11,971)**	**(13,615)**	**(14,559)**	**(15,575)**	**(16,285)**	**(16,720)**	**(18,987)**
Funding balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The information reflects the discussion throughout section 5 of this document. In particular there is an increased level of capital expenditure relating to pavement rehabilitation and bridge renewals.

Summary of Key Financial Assumptions

The Council forecasting assumptions are outlined within the Long Term Plan document and financial strategy.

Valuation Approach

Assets are revalued annually on an asset type (component) basis, as at 30 June each year. The values as at the 30 June 2020 are below:

Asset Group	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Land	$75,697,956	$75,697,956	$0
Formation	$719,987,613	$719,987,613	$0
Sealed Pavement Surface	$65,589,118	$31,376,940	$4,950,147
Sealed Pavement Structure	$442,635,972	$279,971,599	$4,532,639
Unsealed Pavement Structure	$54,331,851	$47,805,879	$2,499,064
Drainage	$81,653,685	$34,149,438	$1,094,561
Surface Water Channels	$20,492,366	$11,366,217	$273,699
Footpaths	$35,036,648	$18,041,099	$619,373
Traffic Facilities	$14,289,249	$6,276,559	$836,948
Retaining walls	$12,076,590	$9,302,297	$152,942
Street Lights	$6,355,909	$2,848,871	$195,839
Bridges and Major Culverts	$266,682,170	$143,300,533	$2,711,537
Cycle Trail	$7,376,845	$6,544,552	$117,598
TOTAL	$1,802,205,973	$1,386,669,554	$17,984,347

Funding Principles

Section 102(4) (a) of the Local Government Act 2002 requires each Council to adopt a Revenue and Financing Policy. This Policy must state the Council's policies in respect of the funding of both capital and operational expenditure.

Further information can be found in Council's Revenue and Financing Policy.

SOUTHLAND
DISTRICT COUNCIL

Water Supply

2021-2031 Activity Management Plan

Southland District Council
Te Rohe Pōtae o Murihiku

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Table of Contents

Quality Assurance Statement				
Draft AMP Template				
Southland District Council	Version:		Record No:	
15 Forth Street	Status:			
Invercargill 9840	Project Manager:			
Telephone	Prepared By:			
0800 732 732	Reviewed By:			
	Approved for issue:			

Executive summary

The services provided

Council provides 10 community potable water supplies, two treated rural supplies and nine untreated rural water supplies for stock water only. Based on current information, the schemes have a current valuation in excess of $95 million. Council is the legal entity for the ownership of the assets, the day to day operations reported through the Services and Assets Committee of Council. Rural water supply governance is through Water Supply Committees.

A number of isolated rural townships have individual private supplies, and other small communities have private community water supplies (schools, townships, halls, marae, accommodation, etc).

Council owned and provided facilities are:

Community Supplies: Edendale/Wyndham, Manapouri, Mossburn, Ohai/Nightcaps/Wairio, Orawia, Otautau, Riverton, Te Anau, Tuatapere and Winton.

Treated Rural: Eastern Bush/Otahu Flat and Lumsden Balfour.

Rural (stock): Duncraigen, Five Rivers, Homestead, Kakapo, Matuku, Mount York, Princhester, Ramparts, Takitimu.

What we aim to achieve

Council's Levels of Service (LOS), performance measures and targets are illustrated below.

WATER SUPPLY: The level of service (LoS) we provide	**LoS 4: Our water supply network provides safe, reliable and adequate supply of water.**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI 4.1: **Fault response times** – Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured[1]:					
(a) attendance for urgent call-outs: from the time Council receives notification to the time that service personnel reach the site;	a) 15 minutes	a) ≤ 1 hour	a) ≤ 1 hour	a) ≤ 1 hour	a) ≤ 1 hour
(b) resolution of urgent call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption;	b) 4 hours, 52 minutes	b) ≤ 6 hours	b) ≤ 6 hours	b) ≤ 6 hours	b) ≤ 6 hours
(c) attendance for non-urgent call-outs: from the time that Council receives notification to the time that service personnel reach the site; and	c) 1 hour, 1 minute	c) ≤ 4 hours	c) ≤ 4 hours	c) ≤ 4 hours	c) ≤ 4 hours
(d) resolution of non-urgent call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.	d) 20 hours, 20 minutes	d) ≤ 24 hours	d) ≤ 24 hours	d) ≤ 24 hours	d) ≤ 24 hours
KPI 4.2: **Customer satisfaction** – The total number of complaints received by Council about any of the following: (a) drinking water clarity; (b) drinking water taste; (c) drinking water odour; (d) drinking water pressure or flow; (e) continuity of supply, and	13 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections

(f) the way Council responds to any of these issues expressed per 1000 connections to Council's networked reticulation system.					
KPI 5.1: **Drinking water safety** – The extent to which the Council drinking water supplies complies with: (a) drinking water standards (bacteria compliance criteria) and (b) drinking water standards (protozoal compliance criteria).	a) 91% b) 91%	a) 100% b) 100%	a) 100% b) 100%	a) 100% b) 100%	a) 100% b) 100%
KPI 6.1: **Maintenance of the reticulated network** – The percentage of water lost from the Council's networked reticulation system[2]	27%	≤25%	≤25%	≤25%	≤25%
KPI 6.2: **Demand management** – The average consumption of drinking water per day, per resident within the Council district.	924 litres	≤ 850 litres per person per day	≤ 850 litres per person per day	≤ 850 litres per person per day	≤ 850 litres per person per day

1 - Attendance means from the time that the Council receives notification to the time that service personnel reach the site. Resolution means from the time that the Council receives notification to the time that service personnel confirm resolution of the fault or interruption. "Urgent" is considered complete loss of drinking-water to an urban drinking water supply. "Non-urgent "includes all other fault/interruptions to an urban drinking water supply
2 - The water loss calculation is the weighted averaged percentage loss reduction per urban drinking water supply

Table 0-1: Water Supply Performance Framework

What we are planning

Over the next 10 years, the aim is to improve performance with respect to managing water loss through continuation of zoned metering, accelerated replacement of ageing asbestos cement water mains, improving water quality compliance with NZDWS, response times for service requests, and investigating options for managing rural water supplies where it is suspected that residents are using this as a source for consumption. With the establishment of Taumata Arowai (Drinking Water Regulator) there is also an emphasis on improving Water Safety Planning, revision of standards and the need to consider future service delivery arrangements with a strong message to consider regional collaboration for the delivery of services.

Managing future demand

Demand for water supply due to population growth is not expected to change significantly over the plan period. Continued growth in townships such as Te Anau, Riverton and Winton is expected, however, at current rates it is anticipated that current infrastructure is capable of dealing with this growth. Demand projects included within previous AMPs and Long Term Council Community Plans have been deferred as a result of slower than previously anticipated growth in these catchments.

Lifecycle asset management

Table 0-2 and Table 0-3 presents an overview of the water supply schemes with condition rating based on joint inspections undertaken by Council staff and Downer NZ and local operations staff.

To achieve Council's intentions, the general asset management strategy is to:

- upgrade the potable water supplies to Drinking-water Standards (2008) by 2018. All but two sites have now been upgraded with work on Riverton at an advanced stage and options being considered for Eastern Bush.
- ensure that the asset management requirements (the maintenance and renewal requirements identified during condition assessments) are appropriately funded, prioritised and scheduled.
- installation of zoned metering to allow real time measurement of water use thus being able to target areas of high water use and proactively manage the network in respect of reducing real losses.

Longer term, consideration will need to be given to the management of some schemes as they reach the end of their asset lives and begin to require significant capital expenditure, especially those showing negative growth. In such areas it is recommended that the focus should be on increased level of planned/unplanned maintenance rather than complete renewal provided the level of service can be maintained. The expansion of the planning period to 30 years through the infrastructure strategy will provide forward notice of previous horizon projects.

The plan also proposes a strategy for managing renewals of asbestos cement pipes that are failing ahead of life.

Consideration will also be given to what options are available to Council to control properties connecting to rural schemes and using as a source of drinking water.

Financial summary

The following section contains financial information for the activity which has been generated from Council's Fulcrum budget platform. All of the financial shown includes inflation (unless otherwise stated).

Budgets across the water supply activity have been developed based on the following assumptions

Significant changes to capital programme include:

- allowance for failing asbestos cement pipes scheduled to reach end of life during the period of the AMP. Current proposed budget of $1.4M (uniflated) per year which was not in previous plan
- replacement of aging control and monitoring equipment required for controlling water treatment plants and ensuring water safety.
- replacement of other aging plant and equipment.
- introduction of programme to implement backflow prevention on all connections to the network. It is expected this this will become a focus for the new water regulator once it becomes more established.
- further work is required to understand and implement options for improving rural water supplies where it is suspected that untreated stock water is being used to supplement domestic consumption.
- operational costs have been increased by inclusion of further testing and condition assessments across networks to allow prioritization of renewals.
- it is also assumed that new contract arrangements from July 2022 will result in an increase of up to 15% which has been included in the budget. Timing of the renewal of the contract is now likely to be extended by 12 months (subject to Council approval) to more fully understand the implications on 3 waters reforms.

Water Supply	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	-	2	-	647	669	695	709	725	751	756	781	815	815
Targeted rates	3,852	3,832	3,786	4,100	4,873	5,464	5,791	6,056	6,339	6,402	6,665	7,263	7,468	7,769
Subsidies and grants for operating purposes	-	-	-	-	120	-	-	-	-	-	-	-	-	-
Fees and charges	15	5	13	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	48	47	37	47	105	106	107	108	109	111	112	113	115	116
Local authorities fuel tax, fines, infingement fees, and other receipts	6	1	1	1	1	3	3	3	3	3	3	3	3	3
Total operating funding	**3,920**	**3,884**	**3,839**	**4,148**	**5,745**	**6,241**	**6,596**	**6,875**	**7,176**	**7,267**	**7,535**	**8,160**	**8,401**	**8,703**
Applications of operating funding														
Payments to staff and suppliers	2,213	2,367	2,745	2,685	2,623	2,922	2,985	3,063	3,225	3,240	3,329	3,433	3,542	3,655
Finance costs	-	-	-	-	299	378	437	484	526	552	567	578	579	581
Internal charges and overheads applied	615	608	666	804	1,692	1,668	1,799	1,841	1,821	1,796	1,872	2,270	2,361	2,522
Other operating funding applications	(4)	(2)	-	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding	**2,823**	**2,974**	**3,411**	**3,489**	**4,614**	**4,968**	**5,222**	**5,388**	**5,572**	**5,588**	**5,768**	**6,280**	**6,482**	**6,758**
Surplus (deficit) of operating funding	**1,097**	**911**	**428**	**659**	**1,131**	**1,273**	**1,374**	**1,488**	**1,604**	**1,679**	**1,767**	**1,880**	**1,919**	**1,945**
Sources of capital funding														
Subsidies and grants for capital purposes	-	-	-	-	2,318	-	-	-	-	-	-	-	-	-
Development and financial contributions	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	467	1,081	1,086	4,442	4,467	3,580	3,044	2,907	2,227	1,719	1,551	1,165	1,247	1,147
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**467**	**1,088**	**1,086**	**4,442**	**6,785**	**3,580**	**3,044**	**2,907**	**2,227**	**1,719**	**1,551**	**1,165**	**1,247**	**1,147**
Applications of capital funding														
Capital expenditture														
- to meet additional demand	-	11	-	-	-	-	-	-	-	-	-	-	-	-
- to improve the level of service	251	561	423	3,428	4,817	2,722	2,133	1,253	122	153	130	134	139	143
- to replace existing assets	1,592	1,463	1,101	1,647	2,721	1,609	1,683	2,465	2,960	2,304	2,198	1,850	1,946	1,849
Increase (decrease) in reserves	(279)	(37)	(11)	26	426	571	649	725	797	989	1,038	1,109	1,130	1,148
Increase (decrease) in investments	(0)	-	-	-	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)
Total applications of capital funding	**1,564**	**1,999**	**1,514**	**5,131**	**7,916**	**4,853**	**4,418**	**4,395**	**3,831**	**3,397**	**3,317**	**3,044**	**3,166**	**3,092**
Surplus (deficit) of capital funding	**(1,097)**	**(911)**	**(428)**	**(659)**	**(1,131)**	**(1,273)**	**(1,374)**	**(1,488)**	**(1,604)**	**(1,679)**	**(1,767)**	**(1,880)**	**(1,919)**	**(1,945)**
Funding balance	**(0)**	**0**	**(0)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Purpose of the activity management plan

This Activity Management Plan (AMP) describes the strategies and works programmes for the Stormwater activity so as to meet the objective of delivering the required level of service for the Southland District. It will be reviewed every three years. This AMP informs Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity.
- the strategic context for the activity, the key activity management strategies and policies adopted within this environment and the main issues identified for the activity.
- a statement of the intended levels of service and performance targets.

This AMP covers a period of 10 years commencing 1 July 2021. The main focus of the analysis is the first three years and for this period specific projects have been identified in more detail. Beyond this period work programmes are generally based on trends or predictions and should be taken as indicative only. All expenditure is based on unit costs as at 1 July 2021.

Plan limitations

A status review of all AMPs for services provided by the Water and Waste Services department was carried out in 2015. The review found that the plans were meeting the core status with some areas moving towards intermediate for larger schemes. In updating this AMP, the results of the review have been taken into account. It is anticipated that over the course of implementing the projects and programmes in this AMP, progress will be made towards the advanced status in some of the larger townships in the District. Measures to lift the status are discussed further in Section 11.

This AMP attempts to address the most significant water supply asset management issues in the District. It is a living document which will undergo a formal review every three years to make amendments to reflect changes in LOS, demand projections, risk profile, life cycle information, or financial information.

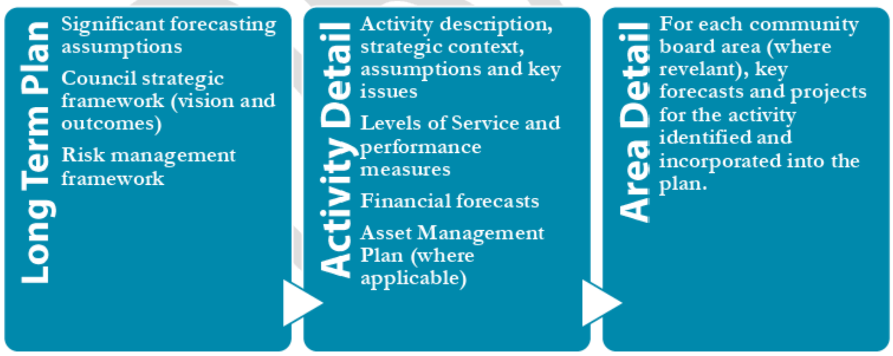
This AMP has been developed with the following key limitations:

- projects have been identified and scheduled based on the best information available at the time.
- budgets for these projects have been assessed based on the best information available at the time.
- projects towards the end of the 10 year period are flags that work is likely to be needed but it is very much at the concept phase. Options and detailed estimates will be carried out closer to the time. The final 20 years of the 30 year period are for information/assessment only.
- the completion of projects is limited to resourcing of both SDC staff and external engineering support.
- the outcomes from ongoing national inquiry following the Havelock North campylobacter outbreak in 2016 are still being worked through including a review of Drinking Water Standards and may require changes to how services are delivered which have not been allowed for or anticipated in this plan.
- to date there has been limited impact on how the activity is managed as a result of Covid-19.

A wider national review of how the 3 waters activity is managed nationally has previously been undertaken by Central Government and resulted in the setting up of Taumata Arowai which allows for the establishment of a dedicated Regulator who would assume overall responsible for ensuring service providers meet their obligations to comply with the NZ Drinking Water Standards. The review also encourages collaboration between Councils to review service delivery arrangements, something which is currently being considered at an Otago/Southland regional level. .

Plan framework

The AMP framework is illustrated below. The strategic context, significant forecasting assumptions and any activity-specific issues are documented in the main body of this Plan. Information on individual activities and services are included in the appendices to this Plan.



Activity description

Purpose of this Plan

This Activity Management Plan (AMP) describes the strategies and works programmes for the Water Supply activity so as to meet the objective of delivering the required level of service to existing and future users in the most cost effective way. This AMP informs Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity.
- the strategic environment (Council's vision and goals and future demand drivers) for the activity, the key activity management strategies and policies adopted within this environment and the main risk issues identified for the activity.
- a statement of the intended levels of service and performance targets.
- information on the scope of assets involved in delivering services, and statements on:
- the estimated cost for achieving and maintaining the target levels of service
- how Council will assess the manage the implications of demand and service levels and standards, the estimated costs of the provision of additional asset capacity and how these costs will be met
- how the maintenance, renewal and replace of assets will be undertaken, and how they will be funded
- how expenses will be met and the estimated revenue levels and other source of funds.

This AMP covers a period of 10 years commencing 1 July 2021 The main focus of the analysis is the first three years and for this period specific projects have been identified in more detail. Beyond this period work programmes are generally based on trends or predictions and should be taken as indicative only. All expenditure is based on unit costs as at 1 July 2021.

What we do

Water is a valuable resource in Southland District and Council strives to provide a reliable and adequate supply. By doing this, communities have a consistent water supply that is clean and safe to drink which supports the public health and well-being of residents.

Council's supply of water is essential for both personal and operational use across the District. It meets firefighting requirements, which in turn, leads to the increased safety of residents across the District.

The District's water supply consists of 12 drinking-water supplies, as well as nine untreated water supplies for rural (stock) consumption.

Urban and rural areas serviced by public water supplies

Ten townships within the District are reticulated, providing potable water via SDC owned and maintained infrastructure (Figure 2-1); two treated rural water supplies and nine untreated rural water schemes.

Rural water supplies have a different level of service and require customers to have a storage tank (two days capacity) on their property into which they receive a trickle-feed supply. Untreated rural supplies are provided for stock water only and the use of water for domestic purposes is prohibited. It is known that several of the users on rural schemes are using these as a source of drinking water. Options for managing this significant problem will be investigated in the first three years of this LTP.

The types of infrastructure assets used to deliver this service include:

- water sources (bores and river intake)
- water treatment facilities
- water storage reservoirs
- booster pumping stations
- trunk mains and distribution pipes
- service connections
- valves and fire hydrants
- water meters.

For urban supplies the water supply point of service is the toby or water shut-off valve on the boundary of each property. The Southland District Council owns and maintains all water supply pipelines and other parts of the water supply system up to and including the toby. All pipes, plumbing and fittings beyond the toby are owned by and are entirely the responsibility of the property owner. For rural supplies the point of service is the ball cock on the consumer's tank.

Rural areas and isolated towns

A number of isolated rural communities have individual private supplies, and other small establishments have private community water supplies (schools, townships, halls, marae, accommodation, campgrounds etc). Current rural schemes will stay as rural schemes however some work will be undertaken to determine how much, if any of the water is used for domestic purposes.

The water supply plan does not cover private water supply systems or those not owned by Council e.g. Milford Sound.

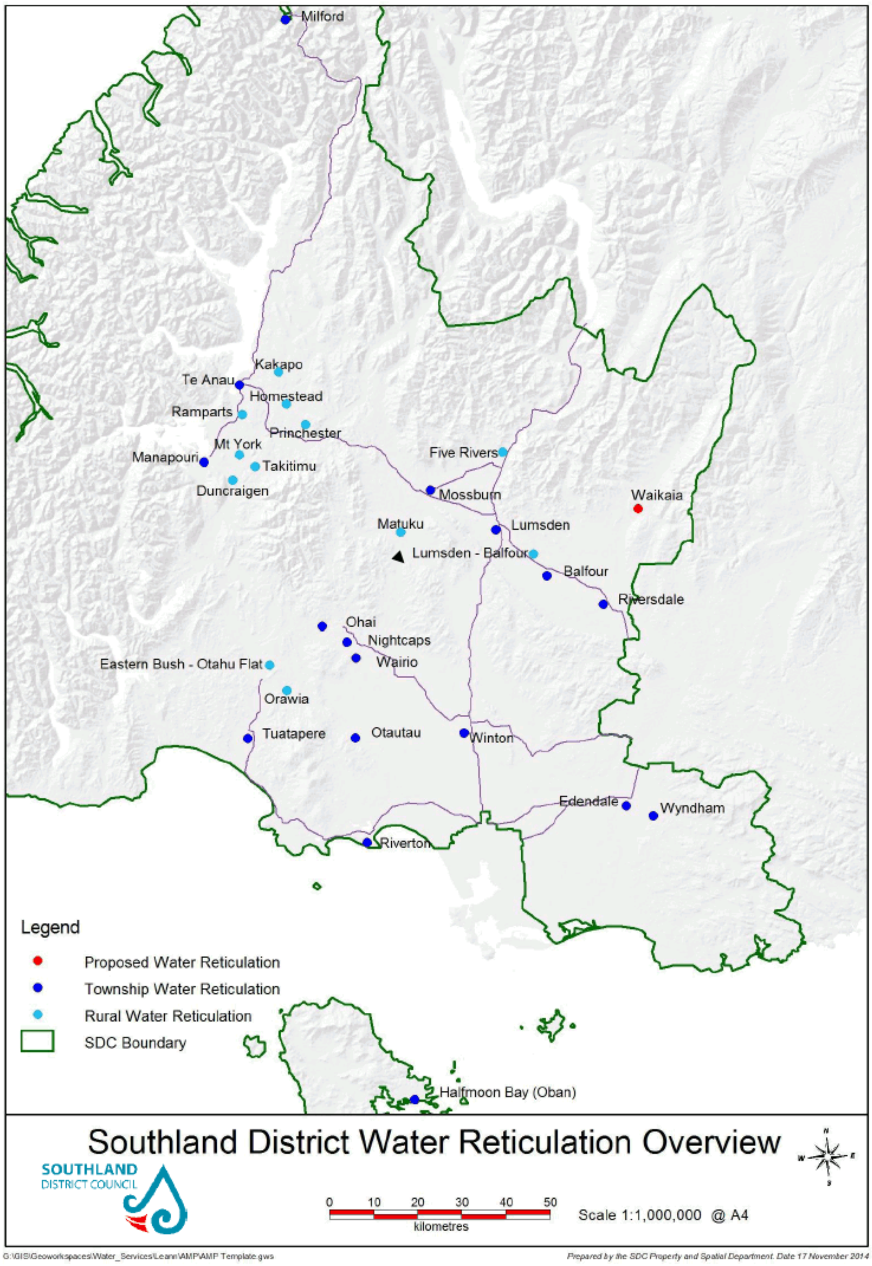


Figure 0-1: Water Supply Locations

Why we do it

By supplying safe and clean water to residents, communities can lead healthy lives. Safe and clean water is also important for many businesses and industry which set up within the District. It also contributes to community safety through the firefighting capability of the water supply system.

As such, the provision of a water supply aligns to the outcome of building **Proud, connected communities that have an attractive and affordable lifestyle.** Water supplies are part of creating a place where people have everything they need to live, work, play and visit; where they are connected to each other, the environment and the world outside Southland; and where they can enjoy a safe and fulfilling life in our unique natural environment.

Objectives of the water supply activity

The water supply activity in the Southland District is focused on providing reliable water supplies that are safe to drink and have adequate supply for use.

Urban supplies have an additional focus on providing adequate pressure and flow for fire fighting and rural water supplies have focus on continuous supply and sufficient capacity for stock. More information about level of services is in Section 5.3.

Strategic considerations

Community outcomes (and community board outcomes where applicable)

Council has adopted a Strategic Framework that identifies where Council wants to be in the future (vision) and the outcomes it aims to achieve to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions (community outcomes). The framework also outlines how it will achieve these (mission and approach) along with the key challenge it faces in doing so and its resulting strategic priorities.

Strategic Framework Component	Proposed 2021-2031 Strategic Framework
Mission	Working together for a better Southland
Vision	"Southland – one community offering endless opportunities"
Community Outcomes	Kaitiakitanga for future generations
	Inclusive connected communities
	A diverse economy creating healthy and affordable lifestyles
	Empowered communities with the right tools to deliver the best outcomes
Strategic Priorities	Improve how we work to build resilience
	Provision of appropriate infrastructure and services
	Better preparing our communities and council for future changes
	Support healthy environments and sustainable communities

The framework guides staff and informs future planning and policy direction and forms the basis for the performance framework. The table below outlines how the Stormwater activity contributes to Council's community outcomes using a benefits mapping diagram. The full levels of service and performance management framework is presented in a further section later in the document.

Outcomes	Activity contributions	Outcome objective	Benefit	Levels of Service (LoS) and Key Performance Indicators (KPI)	
Activity Objective: Providing reliable water supplies that are safe to drink and have adequate supply for use					
				LoS 4: Provide a reliable and adequate supply of water	
Kaitiakitanga for future generations	Environmental effects are reduced by ensuring that water extractions comply with consent conditions.	2c. Consider the impact on the environment	Reduced environmental Impact	KPI 4.1: Fault response times – Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured[1]: (a) attendance for urgent call-outs: from the time Council receives notification to the time that service personnel reach the site; (b) resolution of urgent call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption; (c) attendance for non-urgent call-outs: from the time that Council receives notification to the time that service personnel reach the site; and (d) resolution of non-urgent call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.	KPI 4.2: Customer satisfaction – The total number of complaints received by Council about any of the following: (a) drinking water clarity; (b) drinking water taste; (c) drinking water odour; (d) drinking water pressure or flow; (e) continuity of supply, and (f) the way Council responds to any of these issues expressed per 1000 connections to Council's networked reticulation system.
Inclusive, connected communities	Where required reticulated supplies are capable of being modified to apply conservation and demand management tools (water meters, flow restrictors, financial incentives), to forcibly reduce demand.	1a. People have everything they need to live, work, play and visit	More convenient and reliable services		
A diverse economy creating healthy and affordable lifestyles	The potential for growth of an area is strongly linked to the availability of water. Without access to reticulated supplies, residential, industrial and commercial development may not be as viable and may face additional difficulties.	1c. People can enjoy a safe and fulfilling life in our unique and natural environment	Safer drinking water Improved public safety	KPI 4.3: Drinking water safety – The extent to which the Council drinking water supplies complies with: (a) drinking water standards (bacteria compliance criteria) and (b) drinking water standards (protozoal compliance criteria).	

Outcomes	Activity contributions	Outcome objective	Benefit	Levels of Service (LoS) and Key Performance Indicators (KPI)	
Empowered communities with the right tools to deliver the best outcomes	The activity provides safe water for drinking as well as water to be used for sanitary services such as showers, toilets, washing and food preparation. In reticulated areas, water is available to support both recreation, such as swimming pools and access to drinking fountains/public toilets, and to improve amenity in areas through use of water for water gardens or for water features. The firefighting capability of the water supply helps improve the safety of people in their homes.	1a. People have everything they need to live, work, play and visit	More reliable access to water More convenient and reliable services	KPI 4.4: **Maintenance of the reticulated network** – The percentage of water lost from the Council's networked reticulation system[2]	KPI 4.5: **Demand management** – The average consumption of drinking water per day, per resident within the Council district.

Table 0-1: Activity Contribution to Council Outcomes, Levels of Service and Performance Indicators

Strategic Priorities

Council has identified four priority areas in response to the key strategic challenges facing Council and the community to achieve the vision and community outcomes. The contribution that the activity makes to these strategic priorities are shown in Table 3-2.

Strategic Priorities ▸ Contribution Area ▾	1. Improve how we work to build resilience	2. Provide appropriate infrastructure/services	3. Better preparing our communities and council for future changes	4. Support healthy environments and sustainable communities.
What will be done in the long-term (next 10 years)	Installation of energy efficient pumps and blowers as they are renewed Contribute introduction of appropriate technology to improve how best to deliver service for example mobile field working	Ensure compliance with appropriate national and regional plans	Further understand implications of community futures work on renewal strategy Understand options for management of the water supply activity in such communities	Monitor and trend consumption in areas of known demand particularly Te Anau and Winton
What will be done in the short-term (next 3 years)	Review and improve systems and procedures around data capture, management and storage Understand and implement business case approach during project development Understand implications of climate changes to our communities and how this will impact on the service we deliver Map all critical processes	Understand implications of the draft Proposed Water and Land Plan and how this impact on the service we provide Review contractual arrangements	Undertake increased planned maintenance as a surrogate to planned renewals in communities with limited growth/no growth pending development of policies around how this issue will be managed	Monitor and trend consumption in areas of known demand particularly Te Anau
Key Actions and Projects	Continued development of draft Wastewater Strategy Document with key stakeholders Continue embedding IPS	Riverton Water Treatment Upgrade Eastern Bush/Otahu Flat Water Treatment Upgrade	None identified specific to water supply activity at this stage.	None identified specific to the water supply activity at this stage
Related strategies / plans / policies	Individual Water Safety Plans	Individual Water Safety Plans	None identified	None identified

Strategic Priorities ▸ Contribution Area ▾	1. Improve how we work to build resilience	2. Provide appropriate infrastructure/services	3. Better preparing our communities and council for future changes	4. Support healthy environments and sustainable communities.
	Stage 2 Havelock North Inquiry report	Proposed Water and Land Plan		

Strategic context

The purpose of the Southland District Council Long Term Plan 2031 is to:

- provide a long term focus for Council decisions and activities
- provide an opportunity for community participation in planning for the future
- define the community outcomes desired for the District
- describe the activities undertaken by Council
- provide integrated decision-making between Council and the community
- provide a basis for performance measurement of Council.

Strategic direction setting encompasses Council's high-level goals, particularly the vision for the District, what the outcomes for the community may be, and what the strategic priorities will be for delivering work to the community.

Representation framework

Community representation was amended prior to the 2018 triennial elections. There are now nine community boards that provide representation across the district. These are:

Ardlussa	Fiordland	Northern	Oraka Aparima	Oreti
Stewart Island/Rakiura	Tuatapere Te Waewae	Waihopai Toetoe	Wallace Takitimu	

It is important that Council is seen as a leader in service delivery across the District and through this AMP, will ensure its solid waste services are fit purpose, in appropriate locations and managed cost effectively. Doing so enables Council to provide and deliver quality, professional services to the ratepayer.

Council aim to have a high level of engagement with its customers and elected members to ensure that the minimum levels of service set out in this document represent their expectations.

Key risks, issues and assumptions for the activity

The following key assumptions have been made through the development of this plan.

Key issues and risks for the next ten years

The most important issues and risks relating to the Water Supply activity for the next ten years are shown in the tables below.

Issue	Context	Implication
Fluoridation	No plans to fluoridate within this AMP	If direction is made by DHB then budgets will be re-visited. The Ministry has announced a capital assistance programme for communities required to provide fluoridation so there may be minimal impact on capex although Opex budgets would need to be increased.

Issue	Context	Implication
Strategic Direction / Industry Management	That expenditure and projects programmed in the LTP (specifically equipment upgrades at Manapouri and Eastern Bush and work related to demonstrating compliance with protozoal status and UV disinfection will mean all of Council's community drinking water supplies provide appropriate protection. It is assumed that no additional expenditure and funding over and above what has been included in the LTP will be required during the plan period.	Currently Council's community drinking water supplies provide multi barrier protection as recommended by the inquiry however Council will continue to monitor requirements identified by the regulator and plan accordingly.
	That Council will continue to be responsible for the management and operation of the Southland District community drinking water supplies until agreement has been reached on arrangements to work towards regional collaboration on service provision.	It is difficult to anticipate how changes to water management could impact on Council. Council has prepared the plan on the basis of how it currently delivers water services noting that this may change in the future. Depending on the nature of any changes, this could impact on service delivery, contracts, staffing and budgets.
Contractual	Current contractual arrangements will end in 2022. A new contract is also proposed to include increased stormwater maintenance conditions.	Given the uncertainty around future service delivery arrangements it is assumed that any future contract would be for a maximum of five years and would essentially be a stop gap until future arrangements become clearer. At the time of writing it is proposed that (subject to council approval) the current contract will be extended for a further 12 months to allow a broader understanding of the wider implications of the water reforms on the activity.
Regulatory	Minimal impact to activity from proposed Water and Land Plan Future amendments to the Drinking Water Standards likely to require further upgrades in particular to improve monitoring and reporting to the Regulator.	Proposed rules around the water supply activity offer a greater degree of protection for community supplies especially when it comes to re-consenting.

Issue	Context	Implication
Asset Data Knowledge	While Council has asset registers and many digital systems, processes and records, Council does not have complete knowledge of the assets it owns. To varying degrees Council has incomplete knowledge of asset location, asset condition, remaining useful life and asset capacities. This requires assumptions to be made on the total value of the assets owned, the time at which assets will need to be replaced and when new assets will need to be constructed to provide better service.	Council considers these assumptions and uncertainties constitute only a small risk to the financial forecasts because: - significant amounts of asset data is known; - asset performance is well known from experience; - there are plans to upgrade significant extents of poorly performing assets. As more knowledge is gained, a better forecast of capital expenditure will be incorporated into future forecasts.
Ageing infrastructure	Some of the pipe networks in the District are approaching the end of their useful life certainly within the thirty year LTP window. Maximising the economic life of the assets and determining the optimal time for replacement are important challenges. **Options:** 1. continue with renewals when assets expire (subject to further condition assessments) 2. rely on increased planned/unplanned maintenance activity in communities with limited growth and accept increased operational costs as result.	Through this plan period it is proposed un undertake accelerated replacement of up to 106km of ageing asbestos cement pipes ahead of their end of life, largely to improve network resilience and reduce levels of reactive maintenance. It is proposed that a programme is included across each year of the 10 year period with budgets included within the proposed forward works programme.
Impact of climate change	Climate change will affect the district over the medium to long term in line with predicted national changes such as increased temperatures, increasing sea levels and more extreme weather conditions characterised by extreme heavy rainfall events as well as prolonged drought periods. Over the medium to long term as the impact of climate change becomes more prevalent Council will need to be proactive in	From a three waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Curio Bay. Through the development of the 2021/31 Long Term Plan Council staff from across a range of activities along with external expertise will more fully evaluate the risks associated with climate change with further planning allowed for in future LTPs/AMP's.

Issue	Context	Implication
	considering implications on communities and infrastructure. Infrastructure planning will need to ensure that future assets are of sufficient standard and have adequate capacity to cater for predicted climate change. Any future infrastructural building work including renewals in coastal areas will be considered against projections of sea level risk. Relocation of assets will also considered if it is believed they are at risk. From a three waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Curio Bay.	

Key Risks and issues for the next ten years

The most important issues and risks relating to the Water Supply activity for the next ten years are shown in the following tables

It is noted that the key issues and risks for the stormwater activity align closely with a number of key strategic risks identified at a corporate level the most relevant ones being

- inaccurate data leading to bad decisions/asset failure
- underinvestment in infrastructure
- infrastructure not fit for purpose to withstand climate change
- natural or biosecurity event impacts the wellbeing of the District
- health and safety controls fail to protect staff and contractor safety
- difficulty retaining or recruiting staff affects service levels
- over-commitment leads to inability to deliver agreed work programme

Key risks are summarised in the following table. It is noted that issues and risks are broadly similar across all 3 waters activities.

Risk Event	Current Treatment Details	Proposed Treatment Details
Event - natural disaster causing short term disruption to service provision.	Identification of alternative short term response and recovery arrangements.	Council and Contractor to develop business continuity plans to cover natural disasters.
Event eg natural disaster causing widespread unavailability of activity staff.	Temporary or agency staff either from within Council or through external resourcing	Council and Contractor to develop contingency plans to cover natural disasters.

Risk Event	Current Treatment Details	Proposed Treatment Details
Natural disaster causes significant widespread damage to Council assets and infrastructure.	As Council assets are widespread across the District the risk of significant widespread damage is relatively low however the impact on those areas can be relatively high.	Identify strategic sites at risk and develop plan for their maintenance and return to service. Development of wider emergency management plan. Understand location of vulnerable landfill sites and develop plan for their future management.
Funding of activities will result in significant rates increases impacting on community affordability.	Decisions made with based on a trade-off between 'sweating' assets and targeting investments. Has potential to result in a large number of unbudgeted projects required through the course of the planning cycle.	Development of a well informed capital works programme based on known condition and performance of assets.
Risk to public health as a result of Council activity	Installation of multi-barrier protection on all community water supplies along with review and up-dating of Water Safety Plans. Wastewater and stormwater risks are mitigated through achieving compliance with discharge consent conditions and any investigations that may arise as a result.	As current along with any further requirements that may arise following formation of new drinking water regulator.
Health and safety risks (to staff, contractors and public) associated with operation of Council activity	All Council sites are secure, fenced off and have appropriate signage warning of multiple risks. Higher risk sites have recently been identified and expenditure approved for increasing security.	Further review of fencing and security arrangements will require additional expenditure through future planning cycles.
Breakdown in relationship/communication between Council and Contractor	Regular communications and partnering approach.	More frequent partnering meetings. Review stakeholder management arrangements through new contract. Possible opportunity to develop Alliance type approach.
Failure of co-operation with other Councils that may impact on future potential service delivery arrangements	New risk that may arise following requirement for Councils to work together to review and consider future potential service delivery arrangements.	Agree working protocols among Councils and ensure early and regular engagement with elected members to ensure consistent messaging is being fed through to all Councils.
Lack of resourcing impacts on ability to deliver services through	This is an issue of concern nationally and is currently not one that is well managed. On a	Continue to support local careers based events while pushing at a more national level

Risk Event	Current Treatment Details	Proposed Treatment Details
failure to attract appropriately trained staff into the sector.	local level Council have participated in careers events that succeeded in attracting some graduates into the organisation.	(eg through Water NZ) for a co-ordinated approach to help attract appropriately skilled people into the sector.
Loss of organisational knowledge due to sudden loss of key activity staff resulting in inefficient of inadequate management or operation.	Staff training and succession planning will mitigate risk of frequent staff turnover.	Identify individual staff needs and formulate appropriate training, in conjunction with consultant assistance until skills at appropriate level. Detailed succession planning to ensure institutional knowledge is retained.

In 2017 the Mayoral Forum authorised the establishment of a Working Group comprising Planning staff from the Southland region's Councils to scope and deliver four Region-wide studies. The Group comprised Regional and Local Planning Managers and staff, TAMI staff (Te Ao Marama Incorporated) and other Communications and technical staff from Councils.

The Climate Change Impact Assessment Report ('the Report') was one of the studies commissioned. NIWA (National Institute of Water and Atmosphere) was appointed to undertake the work which commenced in 2017 and was finalised at the end of 2018. The Report utilised a comparable methodology to the Climate Change Projections for New Zealand report and the Intergovernmental Panel on Climate Change scenarios. It used two climate change predictions being RCP (Representative Concentration Pathways) 4.5 – meaning that a large reduction in global carbon emissions is achieved and RCP 8.5 - where no reduction in carbon emissions is achieved.

It is widely accepted that the global climate system is changing and so is New Zealand's. In addition to the impacts on weather there will be impacts on water availability and natural hazard exposure. The Report calculated the potential impacts of climate change on a range of components of climate, hydrology and coastal process across Southland.

Issues

The key findings of the report are summarised as follows:

Temperature

- The projected Southland temperature changes increase with time and emission scenario. Future annual average warming spans a wide range: 0.5-1°C by 2040, and 0.7-3°C by 2090
- Autumn is the season where most of the warming occurs across all time periods and scenarios.
- The average number of hot days (maximum temperature >25°C) is expected to increase in a range spanning from 0-10 days by 2040 to 5-55 days by 2090.
- The related number of heatwave days (i.e., number of consecutive days where the temperature is higher than 25°C) is projected to increase (largest increase with elevation).
- As expected, the number of frost days is expected to decrease by 0-5 days by mid-century, and by 10-20 frost days by the end of the century.

Projected changes in rainfall

- A marked seasonality and variability across the Southland region. Annual rainfall is expected to slightly increase by mid-century (0-5%), while the increase spans 5-20% at the end of the century.

- Seasonally the largest increases are projected during winter, while summer precipitation is expected to decrease in the Waiau catchment (by up to 10% at the end of the century).
- By mid-century, the number of wet days is expected to decrease by up to 10 days across most of the region. However, wet days are then expected to increase by the end of the century for most of the region, except the Waiau catchment where 10-20 fewer wet days are expected.
- By mid-century, decreases in annual maximum 5-day rainfall are projected for the centre of the Southland Region (up to 15 mm) and increases are projected for the rest of the region, with Fiordland facing the largest increases of 15-30 mm in some parts.
- However, at the end of the century, almost the whole Southland Region (except the eastern Waiau catchment under mid-range emission scenario) is projected to experience increases in annual maximum 5-day rainfall of up to 15-30 mm and parts of Fiordland facing possible increases 45 to 105mm.

Dry days

- By mid-century the number of dry days are expected in increase up to 10 more days for much of the region.
- The central part of the region and northern and western Fiordland can expect up to 10 fewer dry days are expected (i.e. will remain wetter)
- By the end of century, a decrease in dry days (up to 10-20 days) is projected for most of the region except for the Waiau catchment (increase up to 10-20 days), eastern Fiordland, and Stewart Island.
- Meteorological drought (a period with abnormal rainfall deficit) – where soil moisture content is reduced and vegetation/pasture growth is hindered. During periods of Potential Evaporation Deficit farms are more likely to need irrigation to maintain crop or pasture growth.
- Central-northern part of the Southland Region is projected to experience the largest increases in Potential Evaporation Deficit in the future across both time slices and all emission scenarios.
- By mid-century, Potential Evaporation Deficit is expected to increase by 40-80mm per year for most of the regions, rising to over 100 m per year for the highest emission scenario by 2090.

Changes in sea level-rise

- Sea level rise is expected to be between 0.2-0.3 m above present levels by 2040 and increasing to 0.4-0.9 m by 2090.
- A present day 1 percent annual exceedance probability (AEP) coastal flood (that is a flood of a size and depth that has a 1 percent chance of happening in any year), will become much more frequent as seas continue to rise, with such large events occurring on average on a yearly basis (100 percent AEP) once sea level rise reaches 0.45 m expected between 2055-2060 and 2100.
- Moderate coastal flooding events will become even more common, occurring several times a year for that same sea-level rise.
- These floods have effects such as salt water on roads and therefore vehicles, saltwater intrusion in underground infrastructure, temporary inundation of open space, agricultural land or natural vegetation. Over time this can the fertility of soils, change plant species or cause accelerated deterioration of public and private infrastructure.
- Considering tides only, putting aside storm events, the rising sea level will result in an increasing percentage of normal high tides exceeding given present day design for coastal infrastructure and roads.
- The replacement costs of buildings exposed in areas where such high resolution LiDAR surveys are already available (mainly low-lying parts of Invercargill City) is considerable at ~$0.6–1.2B (2011 NZ$) for a range from present exposure to 1 percent AEP coastal floods up to a 1.2 m sea-level rise

The report models the effect of climate change on the "mean annual flood" which is a standard measure of floods likely to occur every 2.33 years. The modelling suggests that the mean annual flood is likely to become larger and this may mean an increase in volume for flooding generally. This requires further detailed consideration.

Little appreciable change in water supply reliability across Southland by mid-century. Late-century, however, the decreases become slightly more accentuated, particularly under a high emissions scenario. Water supply reliability is a function of both water availability and water demand to serve urban, agricultural and industrial purposes.

This regional study is a high level starting point for understanding how our climate is likely to change over the next 50 to 90 years. Given the high level of this report additional more targeted reports and internal work will need to be commissioned to better understand how these assumptions are going to impact the management of Council assets and what makes Southland an attractive place to live, do business and visit.

Regulatory considerations

Legislation, regulation and Council's existing strategies and policies mandate or influence some of the LOS and performance targets we set, as illustrated in the table below for the water supply activity.

Below is a list of legislation and regulations that are specific to the outcome of the water supply activity. The table also includes relevant bylaws and policies linked to the activity.

Legislation / Regulation / Planning Documents	**How it affects levels of service and performance standards** **Outline any changes (implemented or pending) which is impacting the activity and describe how**
Local Government Act 2002	The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and to meet the current and future needs of communities for good quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost effective for households and businesses. The act also makes provisions for public ownership and control of water supply services, a and to charge development contributions.
	Changes: None.
Resource Management Act 1991	Promotes the sustainable management of natural and physical resources. Regulates land use and subdivisional activity. Regulates discharges to land, air and water. Recognises the principles of the Treaty of Waitangi. Compliance with District and regional plans.
	Changes: None.
Regional Policy Statement 1997 (RPS) (Environment Southland)	This document's purpose in relation to water supply is to enable the use of water, while protecting its life supporting capacity and availability for future use. It is desirable that such use be efficient and non-wasteful.
	Changes: None.
Regional Water Plan for Southland 2010 (Environment Southland)	The purpose of this plan is to promote the sustainable management of Southland's rivers, lakes, groundwater and wetland resources. The plan is aimed at enabling the use and development of fresh water where this can be undertaken in a sustainable way, providing a framework for activities such as taking and using water.

Legislation / Regulation / Planning Documents	How it affects levels of service and performance standards Outline any changes (implemented or pending) which is impacting the activity and describe how
Proposed Water and Land Plan 2016	Recent or Expected Changes: The proposed Water and Land Plan was notified in 2016 with hearings held through 201. Decisions were released in 2018 with a number of appeals (including Councils) to a number of objectives policies and rules. Following the first stage of appeals in June 2019 an interim ruling was released by the Environment Court in late 2019 with a second round of appeals expected to be heard in 2021. Essentially the plan builds on the provisions of the current active plan but also provides greater certainty and security around provision of water supply for domestic purposes while also placing restrictions on certain activities particularly in the Waiau catchment.
District Plan 2012	Sets out Council's resource management strategy, including designations of water supply schemes. This ensures land use practices maintain, and where appropriate, enhance both the quality and quantity of water within the catchment areas of the water supply schemes to ensure a continues safe and economic supply of water.
	Changes: None.
Infrastructure Strategy	Sets long term direction for the management of assets and infrastructure
	Changes: The updated 2021 strategy signals the need for greater investment required from both capex and opex spending
Subdivision and Land Development Standards Bylaws 2012	Specifies Council's minimum requirements for subdivision and land development for the installation of water supply reticulation, while promoting sustainable development. Sets minimum engineering specifications for infrastructure.
	Changes: None although it may be prudent to review ahead of its approved date.
Utilities Access Amended Act 2011	The purpose of the Code is to enable access by utility operators to transport corridors to be managed in a way that disruptions to roads by water supply pipe installations are kept to a minimum while maintaining safety and maximising the benefits to the public.
	Changes: None.
Water Supply Bylaw 2017	Requires all persons to make application before connecting to the water supply network and outlines conditions for taking water and penalties for illegal tampering of Council property.
	Changes: None.
SNZ PAS 4509:2008 - New Zealand Fire Service Firefighting Water Supplies Code of Practice	Provides direction on what constitutes and adequate supply of water for firefighting in Urban Fire Districts. This includes areas covered by any agreements under Section 38 or 39 of the Fire Service Act.
	Changes: None.
Taumata Arowai – Water Services Regulator Bill	The bill establishes Taumata Arowai the water services regulator as a new crown agent and provide for its objectives functions and operating principles. The Bill is part of a broader package of reforms to the regulatory system for 3 waters. The Government has indicated a separate bill will be proposed to give effect to decisions to implement system wide reforms to the regulation of drinking and source water and targeted reforms to improve the regulation and performance of wastewater and stormwater networks and will include consideration of future service delivery arrangements.

Legislation / Regulation / Planning Documents	How it affects levels of service and performance standards Outline any changes (implemented or pending) which is impacting the activity and describe how
Drinking-water Standards of New Zealand 2005 Revised 2018 (Ministry of Health)	Prescribe the maximum allowable values (MAVs) for determinants of public health significance and compliance criteria. Allows small supplies to have a Public Health Risk Management Plan in place in order to reduce compliance requirements provided risk is well managed.
	Changes: The design of the standards are currently under further review following formation of Tamauta Arowai Establishment Unit. They also include development of a series of 'acceptable solutions' for single use supplies and rural supplies and

Three waters reforms

Reform in the three waters sector has been progressing for some time. However, since the Havelock North incident in 2016 it has become an area of high priority for central government.

Following the Havelock North incident, the government commenced a formal inquiry, which recommended a Three Waters Review be undertaken. The review considered options for improving regulatory and service delivery arrangements for drinking water, wastewater and stormwater services (Three Waters) to better support New Zealand's prosperity, health, safety and environment. Most three waters assets and services, but not all, are owned and delivered by local authorities.

The government's three waters review highlighted that, in many parts of the country, communities cannot be confident that drinking water is safe, or that good environmental outcomes are being achieved. This work also raised concerns about the regulation, sustainability, capacity and capability of a system with a large number of localised providers, many of which are funded by relatively small populations.

Taumata Arowai - the Water Services Regulator Bill has now passed into law with significant work well advance with the establishment of the crown entity. . The bill is relatively simple in that its focus is on establishing the new water regulator as a crown entity, under the Crown Entities Act 2004. The bill also outlines the agencies objectives, functions, operating principles and governance arrangements and is expected to be enacted by mid-2020.

A separate bill will give effect to the decision to implement system-wide reforms to drinking water regulation, alongside targeted reforms to improve the regulation and performance of wastewater and stormwater networks.

The regulatory components of this work are well progressed with the development of new legislation and the creation of Taumata Arowai, the new, independent water services regulator. This new Crown entity is currently being built, and will become responsible for drinking water regulation once a separate Water Services Bill, which is currently before Parliament, is passed (anticipated mid 2021).

Following the onset of Covid-19, central government have reviewed the approach being followed to three waters reform. This review has in part been driven by a number of factors including:

- a risk that a number of local authorities may look to defer operating and capital expenditure in an attempt to manage rate increases in a post Covid-19 environment
- the desirability of creating a broader economic stimulus for local economies in a post Covid-19 environment.

This process led, in July 2020, to the government announcing a funding package of three waters (drinking water, wastewater, stormwater) infrastructure, and to support the reform of local government water services delivery arrangements.

Council has been allocated $7.03 million by the Crown, if it opts in to the reform programme. A further $11.15 million has been allocated to the region to agree an appropriate distribution between participating councils. This funding has been provided as a grant, which does not need to be repaid if Council does not ultimately commit to reform at later stages of the process. The funding must be expended by 31 March 2021. This stimulus funding is central government's approach to kick start economic growth post Covid-19.

Since then Council has developed a delivery plan identifying projects that could be grouped to develop a Delivery Plan which has ultimately been approved by the Department of Internal Affairs and consists of both capital work as well as investing a significant amount to improve knowledge of the condition of assets including wastewater and stormwater condition assessment across targeted networks where known issues have been identified. Further information on work identified under the Delivery Plan is highlighted in further sections within the plan.

In moving into this environment the government has indicated that its starting intention is public multi-regional models for water service delivery to realise the benefits of scale for communities and reflect neighbouring catchments and communities of interest. There is a preference that entities will be in shared ownership of local authorities. Design of the proposed new arrangements will be informed by discussion with the local government sector.

In addition endeavour to proactively address the range of service delivery options that might exist the Otago Mayoral Forum has initiated a working group process, with external consultant assistance, to explore the range of delivery options that might exist in relation to the delivery of water services across the Otago region. They have also invited the Southland councils to participate in this work. Staff have indicated that this Council is keen to participate.

Demand management strategies

Given that changing demand is primarily driven by changing land use, this is a potential key means of managing future demand. However, the predominantly low population and rural nature of Southland has meant that to date there has been very little requirement for land use control. There are one or two exceptions to this, primarily Te Anau and Manapouri, but also potentially Winton. Consideration of demand management for these towns primarily relates to ensuring development is appropriate to the function rather than limiting traffic growth per se. However, there is still a need to ensure that land use planning continues to consider impacts on road networks as part of the overall scheme.

This section describes how demand for Council's water supply is likely to change over the period of the plan, the impact any changes are likely to have and whether Council is planning to make any changes to the activity as a result.

Predicting future demand for the service

Demand drivers

The factors influencing demand for the service are summarised in the table below. Council has prepared corporate wide assumptions/projections for growth drivers (population, land use, dwellings, tourism) which have been used as the basis for assessing future demand for the service.

Demand Driver	Impact on Future Demand
Growth in population	Expect water consumption to increase in proportion to population and subdivision growth. – although this has slowed down in recent years
Growth in tourism (peak population)	Expect water consumption to increase in proportion to tourism especially in areas such as Te Anau and to a lesser extent Riverton. It is noted that post Covid-19 pandemic that tourism has reduced significantly and is unlikely to recover in the short term and as such it is expected that water consumption will reduce significantly in these areas.
Land use change	Quality of water affected due to soil nitrification caused by increased dairying as seen in areas around Balfour and Edendale.
Changes in regulation	Expectation that future applications for water takes will include a comprehensive demand management strategy highlighting steps to be taken to reduce consumption.
Economic changes	Current economic conditions have resulted in a downturn in development. This is anticipated to continue for the short to medium term.
Restrictions for future water abstraction	There are restrictions in the availability of raw water sources to meet future demands in some areas where aquifers are deemed to be over allocated.
Climate change	Prolonged dry periods may result on increased pressure on a number of schemes that may necessitate imposing hose pipe or similar restrictions at times of peak demand.
Technological changes	Two trends which reduce the demand for water from the reticulated water supply system are: • dual water supply systems, where the use of water from the reticulated water supply for potable (drinking water) purposes is supplemented by the use of rainwater collected from impervious surfaces such as roofs for purposes such as garden irrigation, and toilet flushing. • the use of "grey water" (water from washing machines, showers etc.) for garden watering. Councils Sub-division and Land Development Bylaw promotes consideration of such 'low impact' technologies on new developments although there has been no uptake of them to date.

Table 0-1: Demand Drivers for Water Supply

Demand forecasts

Taking into account the key drivers for this activity above, the information in the LTP suggests that – (not necessarily) in urban areas:

- population will increase from 29,613 in 2013 to around 32,992 in 2028 (an increase of around 11%), increasing to 37,021 in 2043.
- the amount of land used for dairy farming is projected to rise from about 164,000 hectares in 2013 to 190,000 hectares in 2028, increasing to 215,000 hectares in 2043 due to the ongoing conversion of sheep and beef (pastoral) farms to dairy.
- the number of tourism visits to Southland is expected to increase from around 1,793,000 in 2015 to 2,712,000 in 2023 and reach 3,046,000 by 2046.

It is expected that demand for the service will remain mostly the same. Growth in Te Anau and Riverton, Winton and Manapouri may need extensions to the water supply reticulation to service new subdivisions, although as present the rate of development across the District has slowed down in response to current economic conditions and reduction in tourism numbers post Covid 19 so the timing of this is uncertain and may extend beyond the current 10 year window covered in the LTP 2021-31.

SCHEME	2013	CENSUS			CONNECTIONS	CURRENT DEMAND (2017)			FUTURE DEMAND
	CENSUS	FORECAST ONLY			2017	Scheme Storage	Mean Demand	Max Demand	2038
	(ACTUAL)	2018	2028	2038		Capacity (m^3)	m^3 / Day	m^3 / Day	(Max) m^3 / Day
Edendale/Wyndham	1152	1046	1051	1092	561	357	441	543	515
Lumsden Balfour	579	610	620	599	438	653	2230	2568	2,657
Manapouri	228	332	354	378	248	170	187	264	438
Mossburn	201	222	210	208	120	309	254	311	322
Ohai/Nightcaps/Wairio	609	606	553	520	374	606	558	645	551
Otautau	798	892	884	931	420	438	803	1000	1,167
Riverton	1506	1655	1770	1892	1117	1158	999	1203	1,511
Te Anau	2628	2938	3383	3785	2002	1155	2855	3706	5,338
Tuatapere	561	557	565	585	302	433	500	623	650
Winton	2436	2430	2593	2814	1241	3885	1401	1660	1,918

* 2013 Census population used as last varified population count.

Table 0-2: Water Supply Demand

Implications of growth/demand

The implications of the above trends point to expected increases in both the number of households (in towns with growth).

Growth in population is expected to necessitate an increase in the extraction of water for water supply purposes. This will need to be managed in a way that maintains the health of watercourses from which water is extracted. There are restrictions in the availability of raw water sources to meet future demands in some areas, particularly in the Mataura River catchment and the Lumsden aquifer.

Urban growth and peak growth will also require extensions to the water supply reticulation to service new residential subdivisions and, in some cases, upgrading the capacity of new pipes. In particular, future growth in Te Anau and Winton will require substantial focus on capacity upgrades for intakes, treatment plants, storage and the reticulation.

Care will need to be taken to ensure the quality of raw water is not adversely affected by increased soil nitrification caused by changes to agricultural practices and land use.

Demand management strategies

Water loss management

Through the 2015 LTP Council introduced a programmed of zoned metering to enable future decisions on targeting leakage studies and understanding areas of demand. To date these have been installed on the Ohai Nightcaps, Otautau, Tuatapere and Mossburn schemes. A similar approach is planned across six further schemes. This was the approach adopted following completion of a Water Balance Survey and development of a strategy to manage water losses and is a continuation of a five year programme identified in the previous AMP.

A water balance is a 'top-down' approach to identifying where water supplied into a water supply distribution network is utilised, and is typically used to establish the level of water loss occurring in a water supply network and acts as the starting point to allow development of an overall strategy to manage water losses.

Water loss performance indicators for each of the supply areas are shown in Table 6-3. This includes the Infrastructure Leakage Index (ILI).

The ILI is the ratio of actual water losses (Current Annual Real Losses or CARL) to the Unavoidable Annual Real Losses (UARL) which is a theoretical calculation of what water losses levels can be achieved (at the current pressure) with 'first class' water loss management. The ILI is a proven performance indicator which has been used internationally since 2000.

Supply Area	Current Annual Real Losses (CARL) t/conn/d or m3/km/d*	Unavoidable Annual Real Losses (UARL) t/conn/d or m3/km/d*	Infrastructure Leakage Index (ILI)	Non-Revenue Water (Financial Indicatory)** %
Te Anau	920	56	16.5	45.6%
Winton	210	46	4.6	22.6%
Riverton	121	102	1.2	17.4%
Ohai/Nightcaps/Wairio	6.0*	2.2	2.7	30.2%
Edendale/Wyndham	123	67	1.8	21.1%
Manapouri	137	35	3.9	20.4%
Mossburn	16.2*	1.1	14.6	43.6%
Otautau	1,058	105	10.1	60.0%
Tuatapere	1,102	77	14.2	56.2%
Lumsden Township	354	55	6.4	32.0%
Overall Totals	499	73	6.9	38.4%

Table 0-3: Summary of Water Loss Performance Indicators (and % NRW)

The results indicate that very high water losses are occurring in four supply areas Te Anau, Mossburn, Otautau and Tuatapere, and that high water losses are occurring in Lumsden Township. Subsequent leakage detection programme undertaken in Te Anau identified a number of previously undiscovered leaks which have since been repaired. Following installation of the zoned meters a further balance survey will be undertaken to determine the success of the approach, or how it can be amended.

It is noted that the four supplies are in areas where there are gravels, and where there is likely to be a high number of 'unreported leaks'. Unreported leaks are often the cause of very high leakage as they are not visible above ground and not reported by the public for repair. Hence these leaks have extensive 'run times', until the leaks are located by active leak detection measures.

Water loss strategy

All water networks leak to a certain extent, and over time, leakage typically increases until an unacceptable amount of water is being lost through leakage from both the public water supply network and private plumbing systems. A water loss strategy is necessary to address the issues of what an appropriate and/or economic level of leakage is reasonable for the particular network(s), and how the water supplier is going to achieve and maintain the desired level of water loss. A programme to achieve the target over a desired/affordable timeframe is also necessary, and, as mentioned, as leaks will continue to develop, the strategy should also provide for the on-going efficient monitoring and maintenance of an appropriate level of leakage.

The key actions and main costs outlined in the strategy relate to the monitoring and zoning of the network (by the creation of District Metered Areas (DMAs) for monitoring) and the real time monitoring of minimum night flows in these sectors using telemetry or GSM monitoring. This will allow detailed monitoring of leakage in the system and facilitate effective active leak detection work. The cost estimates for this work is based on typical costs for the work, and an amount for contingencies has also been included in the overall budget.

The current level of water loss in the Southland District network is variable across all schemes with an overall reduction in water loss necessary in a prioritised manner. It is anticipated that water losses will reduce as a renewal programme is accelerated.

It is noted that because the majority of customers are not metered, and customer water use has been assessed when calculating the estimated volume of real losses from the public water supply network, there is a relatively high level of uncertainty in the calculations and also the possibility that a high level of private leakage (or wastage) is contributing to the estimated level of real losses. In any case, identifying areas of the network with high water losses (based on high Minimum Night Flows), and dealing with the water loss issues, whether public or private (including dealing with private water wastage), should result in a significant reduction in the volume of water supplied as indicated above.

There are a number of other benefits (with potential savings) associated with the programme. In particular, for water supply networks with predominantly unmetered connections, obtaining water demand information for zones within each network provides valuable information on customer water use which is very beneficial for future planning and determining demand management initiatives.

This water loss strategy is based on actions which have been proven to effectively reduce water losses.

Improved efficiency of active leak detection will be achieved by identifying and implementing successful strategies for specific DMAs and by using appropriate technologies and equipment. Having schematics and drawings of DMAs increases efficiency, as does documenting specific strategies and work routines.

The continual review (improvement) of SDC's water supply standards covering the selection of pipe materials, fittings and construction standards and on-going watermain renewal programmes are essential components of water loss management to reduce background leakage long term and to minimise water loss from watermain bursts.

The on-going commitment of the organisation to reducing water losses is critical to achieving the proposed water loss target, and staff at all levels of the organisation need to know that their actions and efforts in implementing this water loss strategy are supported and encouraged by management."

Leak detection surveys will demonstrate management of demand for support of resource consent applications. In preparation and expectation of leak detection, all new water plant upgrades have been fitted with modern electronic water meters.

Public education

Although there is no structured education programme, Water and Waste Services (WWS) publish articles promoting water conservation on a regular basis in the "First Edition" quarterly newsletter. The newsletter is distributed to all residents and ratepayers. Important local issues are also advised through the respective Community Board and Water Supply Committee, Such education includes advice on water conservation, rainwater harvesting and management of individual private supplies. Although Council gives advice on such issues it does not directly fund their promotion.

Water metering

To date water metering has only been applied to extraordinary users and they are charged according to usage. Metering (despite charging) could be considered as a demand management technique in townships conscious of water efficiency. Extension of Council's current approach to metering will be re-considered as part of the development of future plans but it is not expected that universal metering and billing will deliver significant short term benefits given lack of growth within most communities.

Households and other users not classed as extraordinary currently pay a District-wide rate. District metering is not being progressed until all schemes are at least bulk metered.

Restricted water supplies

Rural supplies have flows restricted to provide the purchased volume of water to be delivered evenly over a 24 hour period. Removal of restrictors, particularly during the summer periods, has led to schemes running out of water in the past. To counteract this, additional monitoring of these schemes by the contractor is required and action can be taken under Council's Water Supply Bylaw 2008 (and 2017 draft Bylaw) against repeat offenders.

Plans programmed to meet growth/demand changes

The list below summarises projects, initiatives, programmes or expenditure that Council is planning to undertake to meet changes in demand (DEM). Where there are capital works projects related to demand (DEM), these are identified in Section 6.

- demand for water supply due to population growth is not expected to change significantly over the plan period. Continued growth in townships such as Te Anau, Riverton and Winton is expected, however, at current rates it is anticipated that current infrastructure is capable of dealing with this growth. Demand projects included within previous AMPs and Long Term Council Community Plans have been deferred as a result of slower than previously anticipated growth in these catchments as well as a drop off in tourism numbers.
- the demand management strategies outlined above will help ensure that the amount of water that Council requires to service the community will not increase substantially over time.

Sustainability

The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and to meet the current and future needs of communities for good quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost effective for households and businesses.

At the Water Supply activity level, this approach is demonstrated by the following:

- consider the use of energy efficient motors and blowers on water treatment plants and pump stations as they are renewed
- developed zoned metering programme to identify areas of high consumption
- developed programme of targeted leak detection in areas where consumption is known to be high.
- develop a programme to consider the key impacts of climate change particularly drought on the activity.
- move to new electricity contracts which allow larger consuming schemes to operate more efficiently

Social and cultural

There are concerns from the wider community over the continuance of fluoridation of the water supply. There are also concerns, although at a much lower level, over the practice of chlorination. This plan includes the continuation of chlorination and fluoridation but keeps within bounds as limited by the drinking water standards.

No negative cultural effects have been identified.

Environmental

The potential negative effects of the Water Supply Activity on the environment are:

- the effects on the environment of discharges of chlorinated water from maintenance activities or pipeline failures.
- the environmental effects of asbestos pipes on disposal.
- disposal of water treatment by-products causing environmental degradation.
- degradation of watercourses and groundwater through over extraction of water for treatment.

Council mitigates against these potential negative effects by ensuring:

- discharges of chlorinated water from the water supply system are of short duration. Chlorine levels in the water are low and any effects are likely to be localised and relatively minor.
- the disposal of asbestos pipes is undertaken by qualified people in a safe and approved manner.
- the disposal of water treatment by-products is taken to landfill.
- extraction of water is regulated by resource consent conditions issued by Environment Southland.

Economic and financial

The purpose of the water supply activity is to provide the desired level of service in the most cost effective manner through the management of assets for present and future customers. We do this by:

- recognising the consumption of assets and appropriately funding it (yet to be discussed with Council). Categorising capital versus operational expenditure.
- allocating costs and preparing forecasts over the long-term (30 years or more).
- reporting on financial performance.

Key projects

The following table summarises the key projects that will be delivered across the life of this Activity Management Plan.

LOCATION	DESCRIPTION	BUDGET	YEAR
Eastern Bush OF	Water supply upgrade	$4,010K	21/22 – 23/24
Manapouri	Water Treatment Plant Upgrade	$1,607K	21/22 – 22/23
Lumsden Balfour Rural	Metering- District Metered Areas	$103K	21/22 – 22/23
Riverton	Metered District Areas	$87K	24/25
Te Anau	Sandy Brown Rd- Booster Upgrade	$225K	23/24 – 24/25
Te Anau	Contact tanks upgrade	$436K	24/25
Various sites	Dosing & Monitoring Instrumentation.	$564K	Across life of plan
Various sites	Replacement SCADA to all water schemes	$338K	21/22 – 27/28

Te Anau	Consent Renewal Preparation (Lake & River expires 2024)	$77K	22/23
Riverton	Riverton water replacement of sand filters and pipework	$336K	25/26
Various sites	End of life Water Storage replacement	$327K	24/25
Various sites	End of life Water pumps & electrical	$110K	24/25 – 25/26
Te Anau	Mains replacement ahead of time	$1,086K	21/22 – 22/23
Edendale/Wyndham	Blower replacement	$188K	27/28
Edendale/Wyndham	Consent Renewal preparation	$52K	22/23
Lumsden Balfour Rural	UV and turbidity monitoring	$228K	27/28 – 28/29
Lumsden Balfour Rural	Consent Renewal preparation	$53K	23/24
Te Anau Rural Supply (Mt York)	Consent Renewal Preparation- Mt York	$53K	23/24
Mossburn	Reservoir and chlorine monitoring (subject to condition assessment)	$272K	24/25
Mossburn	Consent Renewal Preparation	$53K	23/24
Ohai Nightcaps Wario	Water main renewal Sinclair Ave Nightcaps	$114K	22/23
Ohai Nightcaps Wario	Switchboard and monitoring Ohai	$58K	26/27
Ohai Nightcaps Wario	Consent Renewal preparation - Ohai	$150K	21/22
Ohai Nightcaps Wario	Tank replacement	$218K	24/25
Otautau	Consent Renewal Preparation (Expires 2024)	$52K	22/23
Riverton	Reticulation Upgrade	$1,222K	25/26 – 26/27
Riverton	Emergency Water Discharge Consent	$50K	21/22
Te Anau Rural Supply (Duncraigen)	Intake screen	$50K	21/22
Riverton	WTP Geobag Alum Sludge Removal	$50K	21/22
Te Anau Rural Supply (Princhester)	Trunk main - Princhester	$54K	24/25
Te Anau Rural Supply (Takitimu)	Switchboards and pumps- Takitimu	$182K	25/26

Te Anau Rural Supply (Takitimu)	Consent Renewal Preparation- Takitimu	$53K	23/24
Various	Auto valving to meet DWS compliance.	$562K	21/22 – 22/23
Various	Replacement of AC Pipe at end of useful life (Residual of $24.8m beyond 2031)	$16.2M	Across life of the plan
Winton	Turbidity and pH monitoring / correction - facility and equipment	$534K	21/22 – 22/23
Districtwide	District wide Double check valves and Accuflo high rise bases	$1,250K	Across life of the plan
Asset Data	Water Wastewater Stormwater Infrastructure Design Standards Development	$100K	21/22 – 22/23
Matuku Rural Supply	Treatment options	$80K	21/22
Te Anau Rural Supply	Treatment options	$150K	21/22
Te Anau Rural Supply	Treatment implementation (Acceptable solution)	$1,594K	22/23 – 24/25

Our levels of service

Levels of service, performance measures and targets

Levels of service (LOS), performance measures and targets form the performance framework for the activity detailing what Council will provide, and to what level or standard:

LOS are the outputs that are expected to be generated by the activity. They demonstrate the value being provided to the community or reflect how the public use or experience the service. A key objective of activity planning is to match the level of service provided with agreed expectations of customers and their willingness to pay for that level of service.

Performance measures are quantifiable means for determining whether a LOS has been delivered.

Performance targets are the desired levels of performance against the performance measures.

The levels of service provide the basis for the management strategies and works programmes identified in the AMP. By clarifying and defining the levels of service for the activity (and associated assets), Council can then identify and cost future operations, maintenance, renewal and development works required of the activity (and associated assets) to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

Table 5-4 details the level of service, performance measures and performance targets for the Water Supply activity. The table sets out Council's current performance and the targets it aims to achieve within the next three years and by the end of the next 10 year period.

WATER SUPPLY: The level of service (LoS) we provide	**LoS 4: Our water supply network provides safe, reliable and adequate supply of water.**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI 4.1: **Fault response times** – Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured[1]: (a) attendance for urgent call-outs: from the time Council receives notification to the time that service personnel reach the site;	a) 15 minutes	a) ≤ 1 hour	a) ≤ 1 hour	a) ≤ 1 hour	a) ≤ 1 hour
(b) resolution of urgent call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption;	b) 4 hours, 52 minutes	b) ≤ 6 hours	b) ≤ 6 hours	b) ≤ 6 hours	b) ≤ 6 hours
(c) attendance for non-urgent call-outs: from the time that Council receives notification to the time that service personnel reach the site; and	c) 1 hour, 1 minute	c) ≤ 4 hours	c) ≤ 4 hours	c) ≤ 4 hours	c) ≤ 4 hours
(d) resolution of non-urgent call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.	d) 20 hours, 20 minutes	d) ≤ 24 hours	d) ≤ 24 hours	d) ≤ 24 hours	d) ≤ 24 hours
KPI 4.2: **Customer satisfaction** – The total number of complaints received by Council about any of the following: (a) drinking water clarity; (b) drinking water taste; (c) drinking water odour; (d) drinking water pressure or flow; (e) continuity of supply, and (f) the way Council responds to any of these issues expressed per 1000 connections to Council's networked reticulation system.	13 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections
KPI 4.3: **Drinking water safety** – The extent to which the Council drinking water supplies complies with: (a) drinking water standards (bacteria compliance criteria) and	a) 91%	a) 100%	a) 100%	a) 100%	a) 100%
(b) drinking water standards (protozoal compliance criteria).	b) 91%	b) 100%	b) 100%	b) 100%	b) 100%
KPI 4.4: **Maintenance of the reticulated network** – The percentage of water lost from the Council's networked reticulation system[2]	27%	≤25%	≤25%	≤25%	≤25%
KPI 4.5**: Demand management** – The average consumption of drinking water per day, per resident within the Council district.	924 litres	≤ 850 litres per person per day	≤ 850 litres per person per day	≤ 850 litres per person per day	≤ 850 litres per person per day

1 - Attendance means from the time that the Council receives notification to the time that service personnel reach the site. Resolution means from the time that the Council receives notification to the time that service personnel confirm resolution of the fault or interruption. "Urgent" is considered complete loss of drinking-water to an urban drinking water supply. "Non-urgent "includes all other fault/interruptions to an urban drinking water supply
2 - The water loss calculation is the weighted averaged percentage loss reduction per urban drinking water supply

Table 0-1: Levels of Service

Changes to the performance framework

The levels of service and key performance indicators have been reviewed following a benefits mapping exercise to ensure Council's performance framework is focussed on measuring the activity benefits at the outcome and objective level. As a number of measures are mandatory they cannot be significantly altered. Other non-mandatory measures are considered fit for purpose

Plans programmed to meet the levels of service

The list below details the main projects, initiatives, programmes that Council is planning to undertake to ensure that the level of service is achieved and/or to address any gaps between the targets and current performance. Where there are capital works projects related to improving levels of service (LoS) or maintaining levels of service (Renewal – REN), these are identified in Section 7.

- upgrades of the Riverton (currently underway) and Eastern Bush Otahu Flat (in the period of the plan) water treatment plants will ensure that all community water supplies are fully compliant with the current Drinking Water Standards.
- over the next 10 years, the aim is to maintain and where practicable improve performance with respect to water quality compliance with NZDWS and response times for service requests. This should also result in reduced numbers of complaints.
- review the level of service to rural supplies with respect to compliance with Drinking Water Standards and identification of acceptable solutions that will demonstrate compliance.

Three waters review and Havelock North inquiry

The Government established an Inquiry into the issues relating to the contamination of the Havelock North Water Supply last year.

Stage 1 of the Inquiry addressed matters relating directly to the Havelock North water contamination incident and the response to that incident. The stage 1 findings were released in May and included:

- contamination of drinking water was confirmed as the source of the outbreak.
- contamination is understood to have arisen from inundation of neighbouring paddocks, resulting in water from a pond entering the aquifer around 90m from the bore identified as the source.
- failings on the part of both the district council and regional council, although not directly responsible for the outbreak, were definitely a contributing factor.
- lack of contingency planning by the district council.
- failure of technical advisers to adequately assess and report on security of bore heads.

Water and waste staff are currently working through understanding the implications of the findings in relation to the 12 community water supplies for which Council has responsibility.

Stage 2 of the inquiry, which was released in December 2017 addressed broader systemic issues and provides recommendations about managing water supplies across New Zealand. It examines the existing statutory and regulatory regimes involved in delivering drinking water to what amendments are required to ensure the public are provided with the maximum level of public health protection.

Some of the key recommendations from the inquiry and how these might impact on Council activities include:

Promotion of the following six principles of drinking water safety:

Principal 1 - A high standard of care must be embraced

Principle 2 – Protection of source water is of paramount importance

Principle 3 – Maintain multiple barriers against contamination

Principle 4 – Change preceded contamination (for example changes in environmental conditions)

Principle 5 – Suppliers must own the safety of drinking water

Principal 6 – Apply a preventative risk management approach

Once the Eastern Bush upgrade is completed in 2018 all supplies will have multi stage treatment with chlorine disinfection on all supplies. Council intends to review other processes to ensure we can thoroughly demonstrate we are meeting the intent identified within these six principles.

Abolition of secure classification system

The only Council source impacted by this recommendation is the Riverton deep bore source. However, it is noted that the supply is currently taken from the Aparima river. As a consequence of this recommendation Council have installed UV disinfection to the supply to ensure the site meets appropriate standards.

Encourage universal treatment

On completion of the work at Riverton and Eastern Bush all community drinking water supplies will have multiple barriers to protect from contamination, including chlorination.

Establishment of a drinking water regulator

This dedicated regulatory body will have responsibility to oversee all other reforms recommended by the panel. It was further recommended that is established early and promptly. The legislation enabling the establishment has now been enacted and the crown entity is in the process of being established (Taumata Arowai).

Interim improvements at and by the Ministry of Health and RMA and health acts

This includes a requirement for improvements of source protection and the requirement for all future bore supplies to have all bore heads above ground. Council has included funding in the current LTP for improvements to bore heads to help meet this requirement.

Establishment of licensing and qualifications system for drinking water suppliers and operators

This recommendation is likely to have an impact on training and development of staff not only within Council but also Contractors and operators. A national body of operators, contractors owners and other stakeholders has been established to determine how this will be set up, operated and audited for compliance. At this stage there are uncertainties around the structure and timing of the body and as a result no funding has been included within the LTP at this stage.

Creation of dedicated and aggregated drinking water suppliers

This matter has been discussed for a number of years among Councils and others within the industry with a number of different operating models proposed. It is anticipated that further amendments to budgets will be required once further information is established on the future direction of the sector as a whole. This document will be updated to reflect these changes as they arise.

The need for regional collaboration has prompted authorities across Otago and Southland to work collaboratively to understand potential opportunities for working together to understand suitable models for future service delivery. Indications from Government are that they would like this to be on a voluntary basis however if they felt that action was not happening or moving too slowly that they may step in and institute changes that they see fit. In order to help develop an indicative business case to drive this the Otago Southland Councils were successful in securing funding to advance the work.

Fluoridation

The Health (Fluoridation of Drinking Water) Amendment Bill received its first reading in Parliament on 29 May 2017. The Bill transfers responsibility for deciding on which community supplies require fluoridation from Councils to the District Health Boards. It is currently anticipated that the Bill will pass before the end of 2017 but remains unclear as to which communities DHBs may identify as requiring fluoridation. Given the uncertainty around this Council are not currently budgeting any expenditure that may be required at this stage, however this may change in the consultation around the LTP as it has in previous years.

Activity and asset management

Overview of management

The activity and assets covered in this plan are the responsibility of Council's Water and Waste Services Department (WWS) under the strategic direction of Council, the Executive Leadership Team and Services and Assets Committee, and Water Supply Committees in the case of locally rated rural water supplies. Asset management responsibilities are covered in detail in Council's AM Policy. Service delivery is provided as follows:

Operation and maintenance (O&M) is delivered by Downer NZ with technical oversight provided by Council's water and waste department.

Capital works design and procurement is managed by WWS and engineering consultants where required.

Additional information about the how the activity is managed is detailed in Section 2.

Lifecycle asset management means considering all asset management options and strategies to deliver the agreed level of service and to inform decision-making for asset renewal, replacement, upgrade and disposal. Effective lifecycle planning is about making the right investment at the right time to ensure that the asset delivers the desired level of service over its full-expected life, at the minimum total cost. This section explains the approach for:

- providing new or upgraded assets to improve service levels, providing for growth and demand
- operating and maintaining assets
- renewing or replacing assets
- disposing of assets at the end of their useful life.
- all asset data has been extracted/reported as at 30 June 2019

Overview of the water supply assets

Asset value and depreciation

The scheme values and depreciation information below is from the 2020 valuation, excluding SCADA equipment in Invercargill.

SCHEME	REPLACEMENT COST $	DEPRECIATED ASSET VALUE $	ANNUAL DEPRECIATION $
Balfour	905,520	490,442	10,880
Duncraigen	385,732	125,990	8,000
Eastern Bush	1,470,141	652,943	19,542
Edendale/Wyndham	7,116,525	6,200,393	102,667
Five Rivers	245,788	133,146	3,024
Homestead	1,347,850	553,602	24,624
Kakapo	1,985,341	873,935	28,766
Lumsden/Balfour	8,207,631	5,002,379	128,953

SCHEME	REPLACEMENT COST $	DEPRECIATED ASSET VALUE $	ANNUAL DEPRECIATION $
Lumsden	2,146,210	1,199,928	29,916
Manapouri	2,545,904	1,041,936	40,982
Matuku	436,384	199,537	7,613
Mossburn	2,331,299	1,073,966	44,273
Mount York	1,494,969	649,950	24,288
Ohai/Nightcaps Wairio	7,679,685	3,206,706	127,650
Orawia	252,423	169,635	4,065
Otahu Flat	1,542,196	783,662	19,450
Otautau	4,513,714	1,440,663	76,205
Princhester	370,704	118,241	8,184
Ramparts	2,601,815	1,362,400	34,623
Riverton	12,696,412	6,696,440	212,677
Takitimu	1,512,536	677,641	25,967
Te Anau	17,652,796	10,965,856	272,970
Tuatapere	4,571,249	1,929,486	94,194
Winton	11,304,086	7,400,213	171,854
Total	**95,366,441**	**52,951,891**	**1,523,954**

Table 0-1: Asset Value and Depreciation

Asset condition and performance

The condition of the schemes has been rated using the condition and performance table below. Condition rating is based on joint inspections undertaken by SDC staff and Downer's National Asset Manager and local operations staff.

Grades have been assigned by considering information from a number of different sources including:

- IPS Database;
- previous AMPs;
- joint asset inspection
- pipe condition assessments
- Council staff based on institutional knowledge;
- operating staff based on local knowledge.

Table 7-2, Table 7-3 and Table 7-4 indicates the general average condition at a scheme level with details in the Appendices. The assessment criteria showing how these grades (condition and performance and confidence) have been assessed can be found in the Scheme Plans section on page 70.

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	MEETS DRINKING-WATER STANDARD 2008	COMMENTS
Edendale/ Wyndham	2011	611	1	1	Yes	New scheme. No known condition or performance issues.
Manapouri	1969	228	3	3	Yes	Plant upgraded in 2011, investigations are required for intake upgrade. Further upgrade work planned 2021
Mossburn	1969/13	104	3/1	1	Yes	New Plant installed 2014.
Ohai/Nightcaps/ Wairio	1953	395	3/1	1	Yes	New plant installed 2011/12. Replacement membranes installed in 2020. Ageing network requiring targeted renewals.
Otautau	1963	428	4	4	Yes	Plant upgraded 2014. Well head upgrade 2019. Water main through main street replaced. Network requires further targeted renewals.
Riverton	1972	1,062	4	4	Yes	Network requires further targeted renewals.

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	MEETS DRINKING-WATER STANDARD 2008	COMMENTS
Te Anau	1968/13	1,985	4	4	yes	LOS - Electrical upgrade in progress. Well head upgrade 2019. Network known to be in poor condition and required further targeted renewals.
Tuatapere	1971/13	304	3/1	3	Yes	Plant upgraded 2012. No known condition or performance issues.
Winton	1956/13	1,188	3/1	1	Yes	Plant upgraded 2014. Second well installed 2015. All AC pipework now replaced with modern equivalent.

Table 0-2: Urban Water Supplies

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	MEETS DRINKING-WATER STANDARD 2008 (BY)	COMMENTS
Eastern Bush/Otahu Flat (treated)	1972	40	3	3	No, July 2022	Further scoping for upgrade required. Network requires targeted renewals in known identified areas.
Lumsden/Balfour (treated)	1979	433	1/3	1	Yes	New Plant installed 2010.

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	MEETS DRINKING-WATER STANDARD 2008 (BY)	COMMENTS
						Network requires targeted renewals in known identified areas
Orawia	1984/13	8	2	3	Yes	Micro plant installed 2016. No known condition or performance issues.

Table 0-3: Rural Drinking-water Supplies

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	COMMENTS
Duncraigen	1979	1	3	3	LOS - Electrical upgrade 2011. Currently in process of divesting this scheme back to Landcorp. No known condition or performance issues.
Five Rivers	1979	5	3	3	Community run rural scheme. No known condition or performance issues.
Homestead	1979	21	2	3	LOS - Electrical upgrade 2011. Rising main replacement 2015. No known condition or performance issues.
Kakapo	1979	52	3	3	LOS - Electrical upgrade 2011. Requires targeted renewals in known identified areas.
Matuku	1972	8	2	3	Requirement for fish screen as condition of resource consent. No known condition or performance issues

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	COMMENTS
Mount York	1972	15	3	2	No known condition or performance issues
Princhester	1970s	3	2	3	No known condition or performance issues
Ramparts	1970s	56	2	2	Pipeline renewal 2017 No known condition or performance issues
Takitimu	1970s	26	2	3	Pipeline renewal 2017 No known condition or performance issues

Table 0-4: Rural Non-Drinking-water Supplies

Data source and confidence

Table 7-5 shows the level of reliability rating of Council's water supply data. The assessment criteria showing how these grades (reliability confidence) have been assessed can be found in the Scheme Plans section on page 70.

ACTIVITY	CURRENT RELIABILITY RATING	COMMENTS
Asset Description	Reliable	Description data is available in IPS and will be reviewed and updated as further information is received.
Valuation	Reliable	Annual valuation now undertaken. As part of the review process we are considering what opportunities are available to refine the valuations process so that more scheme specific information could be utilised, rather than generic information. For example where it is known that the asset life of asbestos cement pipes is adversely affected by ground conditions the valuation process will be altered to reflect this.
Condition and Performance	Reliable	Condition and performance is currently assessed through review of data in IPS relating to planned and reactive maintenance activities. We also rely on local operator knowledge and experience. In addition water quality data is sampled in accordance with DWS requirements and data is stored on the WINZ database. Where required by the DWS a number of community supply schemes will also have a Public Health Risk Management Plan. Age and condition data within IPS will be regularly updated based on best available knowledge at the time. This will result in alterations being made to asset lives within individual schemes.

ACTIVITY	CURRENT RELIABILITY RATING	COMMENTS
Financial Forecasts	Reliable	Currently estimates have been made based on current market rates, annual asset valuations and direct enquiries. Projects within the first three years should be expected to have an uncertainty of up to +/- 25% with projects in the outer years up to +/- 50%. Currently no capital work will be carried out without Council approval. As part of the current plan review an assessment of funding options will be carried out to address issues of sustainability and affordability especially of a number of smaller schemes.

Table 0-5: Data Source and Confidence

Approach to operations and maintenance

The purpose of this section is to outline the broad O&M philosophies for the assets, understand any underlying issues and trends, and set the basis for the O&M financial forecasts.

SDC implement performance based contracts to achieve defined service standards for the operation and maintenance of the wastewater system, and undertake monthly audit procedures for monitoring contractor performance and controlling the quality of data (work activity, financial, attribute and spatial data) and physical works.

All operation and maintenance (O&M) is carried out under a contract, currently awarded to Downer. Details of each facility are located in the Downer O&M Manuals which are developed for each site. These are maintained by Downer and located at its offices in Invercargill and periodically reviewed by Council. It is noted that the current contract expires in 2022 with work now underway to start to develop a new contract.

The objectives of this contract are to ensure that:

- the Principal's drinking water, rural water and wastewater systems comprising the contract facilities are managed and operate in compliance with the requirements of resource consents and the New Zealand Drinking-water Standards as appropriate.
- the LOS and Key Performance Indicator target levels contained in the AMPs and the Contract are achieved.
- the condition of the Principal's drinking water, rural water and wastewater assets comprising the Contract Facilities is maintained as specified in the Contract throughout the Contract term.
- the operation and maintenance of the Principal's drinking water, rural water and wastewater services comprising the Contract Facilities are delivered safely and in a cost effective manner.
- drinking water, rural water and wastewater services are provided reliably in the District.
- requests for Service and incidents are responded to and resolved promptly.

In addition to the O&M contract, SDC receive professional services contracts with a number of Infrastructure Service Providers including Stantec and Waugh Infrastructure Management.

There are also a number of services are delivered from other Council units:

- information management department provides assistance with asset management information systems, plans and mapping.
- finance department provides assistance with rates collection and water billing.

Service delivery review

Section 17A of the Local Government Act 2002 requires all local authorities to review the cost-effectiveness of its current arrangements for delivering good quality local infrastructure, local public services and performance of regulatory functions at least every six years.

In view of the fact that the contract term expires in two years it is prudent to consider if a further review should be undertaken while the scope of new contract arrangements are investigated. As of early 2021 consideration is being given (subject to Council approval) to extend the contract for a further 12 months.

Asset performance monitoring

Council operates the IPS Asset Management System. This computer software records all incidents of work undertaken on water and wastewater assets in the District. The types of work (water leaks for instance) can then be compared to previous years.

The following applications are utilised by WWS to monitor the performance of asset systems and achievement of service standards, manage risks, and support asset management decision-making:

IPS and reporting

Information is stored against each asset in an IPS database including:

- work Orders (WO) and maintenance records (asset failure and developing an expenditure history),
- customer Service (water supply and wastewater) (SR),
- condition reports (recorded by operation and maintenance contractor, critical assets are routinely
- system performance monitoring (flooding, etc.),
- facility/equipment parameters,
- estimated design life,
- valuation information,
- any operator comments.

The O&M contractor has live access to IPS. Their performance is monitored in real-time by NAG and monthly using Crystal reports to interrogate SR and WO response and resolution times.

Other information stored in scheme working folders or SDC's electronic document management system (RM8) includes:

- flow monitoring and network modelling,
- demand forecasts.

Existing asset information has been transferred from hard copy records and supplemented with specific capture projects over the last few years. The asset register is now believed to be 90% complete. An internal audit for accuracy has not yet been carried out.

- condition reports (critical assets are routinely inspected visually and using a variety of invasive and non-invasive surveys with limited CCTV),
- maintenance records (asset failure and expenditure history),
- water quality monitoring at various sites [undertaken by Environment Southland (ES)],
- request for service records,

- demand forecasts.

Geomedia smart client

Council operates Hexagon Geomedia Smart Client. This currently linked to Pathway and IPS.

SCADA

Every water and wastewater facility is equipped with telemetry (SCADA Supervisory Control And Data Acquisition). Station RTU's (Radio Transmitter Units) transmit data either on a change in state or on a 60 minute polling rate to the base-station at SDC Head Office Invercargill. There are two SCADA systems in operation running on two dedicated computers:

Datran system: QTech software (Datran RTU) was installed in 1990. In 2004, SDC were becoming frustrated with the poor service and lack of prompt supply of Datran parts and made enquiries into an

Kingfisher system: Citect software (Kingfisher RTU) was installed as part of the Stewart Island Wastewater Upgrade and is now being installed in all new stations.

All radio traffic from the mainland is received to the SDC base station via the Mid-Dome repeater site leased from Jackson & Wills Limited. Traffic from Stewart Island is received via the SDC owned Peterson's Hill repeater site.

The computers manage the information and page any station alarms via the cellular network. Alarms are set to local operators first and escalate if they are not acknowledged. After hours alarms are monitored by Council's Answer Service.

Other applications

Hilltop - used for stores and analysing SCADA data.

Water Information System New Zealand (WINZ) - the national database for storing data for public health services and the Ministry of Health (MOH) purposes.

System critical incidents such as water leaks and sewer blockages are particularly noted. Evidence of increasing numbers (trending up) are further analysed to see if the events are extraordinary and higher than would be normally expected. Such trending and analysis will form the basis of future capital programmes. Recent examples of this include replacement of watermains in Winton and Otautau.

Costs of operation and maintenance have increased each year for several years. These price increases are partially due to inflation, legislation, and ageing assets that require more maintenance to keep going.

Unplanned (reactive) operations and maintenance strategy

All unplanned maintenance expenditure below $5,000 is covered within the O&M contract. Costs for unplanned maintenance above the $5,000 threshold are covered by District funding.

Where repeated breakdowns occur on an asset, the contractor, in agreement with Council, will replace the asset to reduce both the risk and cost associated with unplanned maintenance. In addition where Council defers renewals in favour of increased renewals costs for reactive repairs and increased inspections will be agreed between Council and contractors.

Planned (scheduled) operations and maintenance strategy

Council keeps good records of the installation date for all of its assets. This information is stored in IPS. The information is used to predict the likely replacement date (subject to condition assessment) as utilities wear out. In broad terms, planned or scheduled operations and maintenance schedules are designed to get the longest possible service life while meeting level of service targets and legislative requirements.

As time goes by we continue to collect in field information from inspections and condition assessments. This information is used to moderate basic end of life assumptions to get the longest possible life from the utility.

In this respect, the contractor has written new operation and maintenance schedules for all above ground plant, the purpose of which is to keep this plant at the highest level of reliability. These maintenance schedules are programmed into the IPS asset management system and become automatic "scheduled" maintenance items.

The cost of such maintenance is driven by level of service and legislative requirements of the contract.

In this respect, the contractor has written new operation and maintenance schedules for all above ground plant, the purpose of which is to keep this plant at the highest possibility level of reliability. These maintenance schedules are programmed into the IPS Asset Management System and become automatic "scheduled" maintenance items.

The cost of such maintenance is driven by LOS and legislative requirements of the contract.

Condition assessments

The O&M contract puts particular emphasis on collecting operational information from detailed inspection schedules. As new improved information comes to hand, it is added to the Infor (IPS) IPS data base so as to allow for better decisions to be made on the (in particular) timeliness of capital expenditure.

The most recent round of condition inspections are undertaken jointly by Council staff and Downer operations and asset management staff. These latest inspections indicate that plant and equipment is being maintained as per previous inspections.

Treatment plant inspections

Treatment plants are visited by contract staff at intervals that are appropriate to the system criticality of the process going on there. In this respect, water treatment plants are inspected three times a week and oxidation ponds are inspected once a week. At least one joint inspection will take place every year.

Rural supplies are inspected at varying frequencies; less in winter but more frequently in summer to manage to monitor frequency of removal of restrictors.

Leak detection

Council has instigated Water Balance and Water Loss Strategies for Urban Water Schemes in 2014 and will progressively be carrying out leak detection to achieve its three year goal of an Infrastructure Leakage Index (ILI) of less than 3.

It is likely that leak detection and demand management will become more important in the future as consents for water takes come up for renewal and there will be an increased focus on demonstrating efficiency and active conservation management.. In preparation and expectation, all new water plant upgrades have been fitted with modern electronic water meters.

O&M work is required to be in accordance with best practice and comply with the Subdivision and Land Development Standards 2012.

The location of electrical, telecommunications, and gas services is obtained during contract preparation as part of the professional services contract. It is the responsibility of contractors to verify the location of services as a condition of contract.

Operations and maintenance trends and forecasts

Operations, repairs and maintenance costs have shown an upward trend since 2010/11 largely as a result of new schemes becoming operational (Edendale Wyndham, Lumsden Balfour, and Ohai Nightcaps), existing schemes receiving upgrades most recently Winton, Te Anau Otautau, Mossburn and Riverton, and inflation increases and the move to a new O&M contract. While savings have been realised in a number of areas for example electricity (following change of supplier) the general trend is still increasing. Further upgrades to Eastern Bush Otahu Flat and Manapouri scheme will see further increases in future operating costs largely due to increased power requirements.

Increases relate to inflationary increases and increased operational costs associated with LOS upgrades.

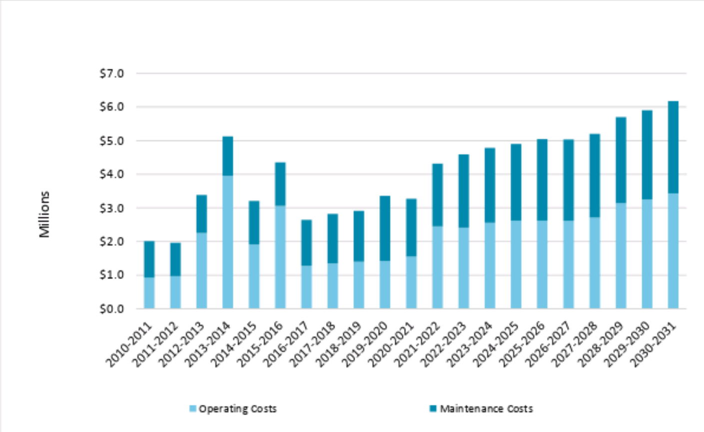


Figure 0-1: Water Opex Forecasts

Approach to renewals

Renewal is the replacement (or rehabilitation) of an existing asset without changing its capacity or level of service beyond the original design.

Renewal strategy

Renewals are considered as they near the end of their effective lives, where the cost of maintenance becomes uneconomical, or when the risk of failure of critical assets is sufficiently high. Renewal decisions are made by asset managers based on the performance and condition of existing assets, the economics of renewing the asset, and their assessment of the acceptability of the risk of asset failure. Renewal decisions are supported by the maintenance contractor based on their knowledge of the systems. The theoretical life expectancies and replacement costs of asset components are used for financial projections.

Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during planned maintenance inspections, operational activity and investigation of customer complaints. Indicators of non-performing assets include:

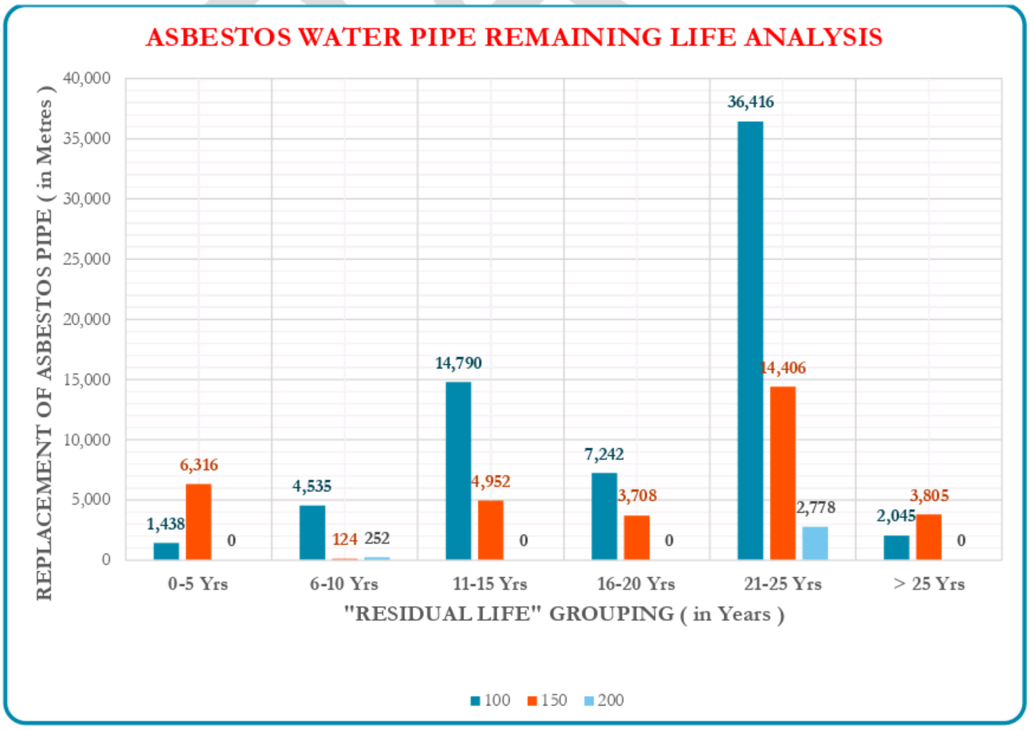
- structural failure,
- repeated asset performance failure,
- significant leakage/mains bursts,
- ineffective and/or uneconomic operation,
- insufficient treatment,
- inefficient energy consumption.

The general renewal strategy is to either replace or rehabilitate assets when justified by:

- age and condition - the age or condition of the asset is or will result in a condition based failure.
- asset performance - when it fails to meet the required level of service. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets.
- risk - the risk of failure of the asset and associated financial, environmental and social impact justifies action (eg impact and extent of loss of wastewater treatment, impact on receiving water body, health risk).
- economics - the cost of maintenance for that asset component is deemed to be uneconomic to continue repairing the asset when the annual cost of repairs exceeds the annual cost of renewal. Economic factors may also come into consideration in order to co-ordinate renewals with the other major works, eg while a tank is empty for inspection or refurbishment/renewal, the associated channels are refurbished at the same time.
- to co-ordinate with work on other utilities, e.g. watermain replacement may be brought forward to coincide with renewals of the footpath under which it runs.
- staff knowledge - staff knowledge of the condition may differ to what is stored in the database.

Replacement strategy for asbestos cement pipes

Analysis of breakage rates on ageing asbestos cement pipes indicates failures appear to be increasing in particular around Otautau, Riverton, Lumsden and Te Anau. Data from IPS indicates approximately 106km of asbestos pipes remain across all Council networks which are due to reach projected end of life as illustrated in the graph. It is noted that areas of the AC network has failed up to 20 years ahead of asset life and consideration should be given to development of an overall replacement programme to ensure levels of service continue to be met.



In the development of this plan and the LTP capital works programme three renewal scenarios were considered.

- staged programme to replace 10% of the remaining network per each year of the LTP period which will result in complete replacement over the life of the current plan. Estimated cost $3-4 Million per year.
- staged programme to replace 5% of the remaining network per each year of the LTP period which will result in complete replacement over a 20 year period. Estimated cost $1.5-3 Million per year.
- staged replacement based on a more smoothed schedule more closely based on expected asset life. This would involve a smoother renewal of approximately 1.5km per year over the term of the LTP with an annual estimated cost of $1.4 Million.

While the first two options will address the issue in a shorter time it would result in a number of areas where pipes may be replaced will ahead of their projected end life. These options are also likely to have a higher capital cost across the life of the plan.

It is proposed to implement the third option while also undertaking further condition assessment on those mains predicted to reach end of life from year 11 onwards to allow a longer term renewals programme to be developed.

By delaying this work places additional stresses on the networks and is likely to result in a drop in level of service provided. Conversely replacement with modern PE/PVC materials will help improve other levels of service including helping reduce water losses and leakage rates which will also have a knock on financial benefit.

Above ground assets

1. IPS renewal forecasts for years 2021 to 2031 of the LTP are generated and exported to an Excel spreadsheet.
2. Annual Condition Reports are prepared by Downers and imported to the Excel spreadsheet, including Downers "Remaining Life" assessment.
3. A Renewal Programme is developed using:
   a. Downer "Remaining Life" assessment.
   b. Reviewing "Asset Criticality" by extending replacement of low criticality assets and prioritising high criticality assets.
   c. While the foregoing forms the basis of the Renewal Programme it may be modified to:
      (a) Spread work out to "smooth" work peaks.
      (b) Allow "bundling" of small projects to allow better economies of scale.
4. Comparison between IPS and Downer reports to assess whether global asset lives need changing.
5. Assets that have reached their predicted expiry date as per IPS asset lives, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

Inground reticulation assets

At the beginning of LTP Year 1 (2021):

1. Develop a Condition Assessment Programme for assets scheduled for renewal in years 2018 to 2021 which meet the following criteria:
   a. Large diameters or lengths (indicatively more than 500 metres or $75,000 replacement value.)
   b. High criticality assets - particularly rising mains.

c. Other assets that have historical performance problems, are in aggressive ground conditions or the Contractor is aware of "special" factors relating to premature asset failure.

By the end of LTP Year 1 (30 June 2021):

2. Review renewal budget forecasts, taking into account:
   a. Asset inspection results (which can accelerate or delay projected renewals).
   b. Extend asset lives for criticality 1-3 assets for 5 to 10 years beyond IPS Renewal Date if permitted by the condition assessment.
   c. Schedule criticality 4-5 asset replacements arbitrarily by 10 years from IPS Replacement Date based on condition assessment of criticality 1-3 results.
3. While the foregoing forms the basis of the Renewal Programme it may be modified to:
   a. Spread work out to "smooth" work peaks.
   b. Allow "bundling" of small projects to allow better economies of scale.

Unplanned water renewal

1. Condition assessments undertaken for:
   a. The third pipe break on any length of pipe of 100 metres or less.
2. Renewal decisions will be made based on the findings of the inspection results and the criticality of the asset.

Capital works programme prioritisation process

1. Projects from the following sources are included in the CAPEX project list:
   a. Renewal forecasts from IPS, modified as before described.
   b. Resource Consent compliance requirements of E.S.
   c. Future Demand (Te Anau)
2. Projects are scheduled as follows:
   a. Renewals as per Renewals Strategy.
   b. Resource Consents to meet expiry dates.
   c. Future demand as required by development timing.
3. Prioritisation Rating (1 to 5) applied to projects:
   a. All regulatory projects get a priority rating of 1.
   b. Priority of 1 to 5 is based on staff judgement of project importance.
   c. Priority rating is used to:
      i. Prioritise timing of works within a financial year.
      ii. Reallocate projects to other financial years in the event that the full programme cannot be delivered.
4. Other scheduling constraints (if any) can be applied to the work programme.

Prioritisation of renewals

Renewals expenditure may be reviewed and prioritised if the total cost of renewal works is beyond the community's current ability to fund it. If deferral of renewal work is necessary, the impact of this deferral and the ongoing achievement of LOS are assessed.

Emphasis is placed on life cycle planning although the deferral of some renewal works may have no immediate or short term impact on operations, continued deferral of renewals will eventuate in a liability in the long term. If work is deferred for any reason, this work will be re-prioritised alongside the next year's renewal projects and a revised programme established.

Assets that have reached their predicted expiry date as per IPS asset lives shown in the following table, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

ASSET CODE	ASSET NAME	LIFE (YEARS)
WATER		
WPL/ARTR	Aerator	20
WPL/BLGS	Buildings	80
WPL/BPMP	Backwash Pump	30
WPL/CABT	Cabinet	30
WPL/CBLK	Chain Block	40
WPL/CHLT	Chlorinator	20
WPL/CHMN	Chlorine Monitoring	20
WPL/CNTK	Contact Tank	50
WPL/CPMP	Chlorine Pump	20
WPL/DCSC	Design and Supervision Costs	30
WPL/FLMT	Flowmeter	20
WPL/FLMX	Flashmixer	25
WPL/FLTR	Filter	50
WPL/FPMP	Filter Pump	20
WPL/GRND	Grounds	20
WPL/LNDR	Launders	40
WPL/PIPE	Pipework	60
WPL/PWRL	Power Line (Supply)	40
WPL/SCRN	Screen	50
WPL/SDTK	Sediment Tank	80
WPL/SGEN	Standby Generator	40
WPL/SLDY	Sludge Drying	80
WPL/STRC	Structure	80
WPL/STTL	Settling Tanks	80
WPL/SWBD	Switch Board	30
WPL/UVMN	Ultra Violet Monitoring	30
WPL/VLPR	Water Valve Pressure Reducing	40
WPL/VLVM	Water Valve Mech	40
WPL/VLVS	Valves	60
WPL/WPMP	Water Pump	30
WTR/HYD	Water Hydrants	50
WTR/MAIN	Water Mains (All Types)	40 -100
WTR/MTR	Water Meter	35
WTR/VLV	Water Valves	50
WTR/WSL	Water Lateral	80

Table 0-6: Asset Codes and Life

Renewal trends and forecasts

Renewals expenditure fluctuates historically and in the plan. This is driven by age and condition data held within IPS. Constant movement of replacement dates is due to detailed condition assessments allowing extension of effective "life".

Figure 7-2 compares the renewal profile to depreciation in the LTP. A number of treatment plants have been upgraded during the last ten years and will not be due for replacement until after 2031. As underground pipe infrastructure has an expected life of up to 100 years there is limited requirement for renewals over until 2031. In the period from 2031 to 2051 there is an increased level of renewals required.

To ensure that today's ratepayers are contributing to the assets being used Council has implemented a policy during the a previous LTP to phase in the funding of depreciation. Funding of water deprecation is increasing by 10% per annum from 2015-16 to 2020-21 with 5% after that to 2028-29 when 100% depreciation is being funded.

Estimates for renewals in this Asset Plan have been made based on current market rates, the Asset Valuation 2019 as prepared by Waugh Infrastructure with third party establishment of rates and lives.

Projects within the three year "active pane" of the LTP it should be expected to have an uncertainty of up to + 20% with projects in the outer years (years 4 to 10) up to + 50% accuracy.

The 2021 to 2031 LTP is the second 30 year period LTP with years 11 to 30 grouped in five year "bands". The philosophy with projects in the 10 to 30 year period are that they are flags that work is likely to be needed but it is very much at the concept phase.

Once it has been decided to proceed with a project, a detailed scope for small scale projects is generally agreed and quoted with the O&M Contract or larger projects are designed either in-house or by consulting professional engineers with work carried out by preferred contractor generally through the competitive tendering process.

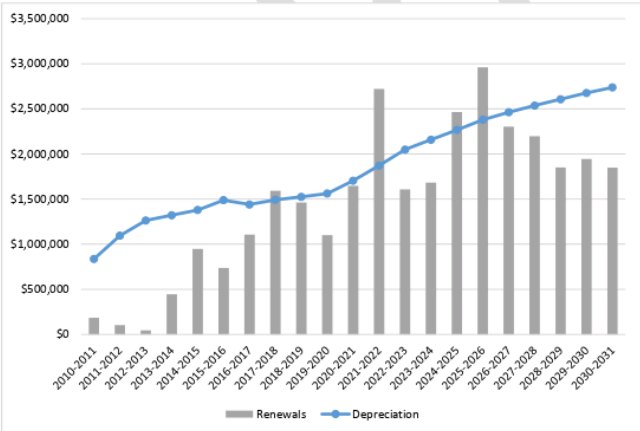


Figure 0-2: Water Renewal Forecasts (showing depreciation)

Capital investment strategy – LOS and demand

Overall the strategy is to complete investment to upgrade schemes to meet requirements of the NZ Drinking Water Standards. Over the first three years of this AMP upgrade Eastern Bush / Otahu Flat will be undertaken. Once complete all sites will be capable of meeting Drinking Water Standards. In addition, two projects have been included in the AMP as a result of the Havelock North water inquiry – one to demonstrate compliance with protozoal status and the other to provide further protection following removal of 'Secure Status' for Riverton water supply through installation of UV disinfection.

In terms of rural water supplies, funding will be set aside for investigations and options around how to deal with those connections who are using the stock water as a source of drinking water. This will be during the next three years of the LTP cycle.

Capital investment trends and forecasts – LOS and demand

LOS expenditure has levelled off significantly over the period, and reflects levels of MOH subsidy funding awarded to Council which has now ceased. Further LOS expenditure is planned over the following AMP period to ensure that DWS are complied with, most notably Eastern Bush/Otahu Flat.

Following the release of stage 2 of the findings from the Havelock North Inquiry, Council has allocated further funding in years 2 and 3 of the LTP to allow further upgrades to our drinking water treatment plants to improve data capture to allow demonstration of compliance with protozoal standards.

Council has also included an additional project to install UV disinfection at the Riverton Water Treatment Plant following removal of 'Secure Status" for groundwater sources ($512k in 2019 - 2021) following release of the inquiry.

There has not been any further demand expenditure over the past five years, and it is further anticipated that this trend will continue over the next three year period.

There is currently little demand growth across any of Council's water supply schemes. As a result, no upgrades or new assets are proposed; the current overall strategy is to maintain and renew the existing asset network as it reaches end of life.

A review of population growth projections within the District has indicated that there is little anticipated growth within the upcoming 10 year period and as a result there is no demand projects in this period. There has been no capital investment for demand over the past five years. It is expected that this trend will continue over the next 10 years and will allow any demand projects to be deferred until the growth occurs.

This increase alone is unlikely to require a demand related project within the 10 year period however sustained slow but steady growth beyond this will trigger the need at some point further in the future.

This is provided tourist numbers do not change significantly and that demand can be managed in other ways ie through education and/or some form of restrictions over the relatively short periods of peak demand.

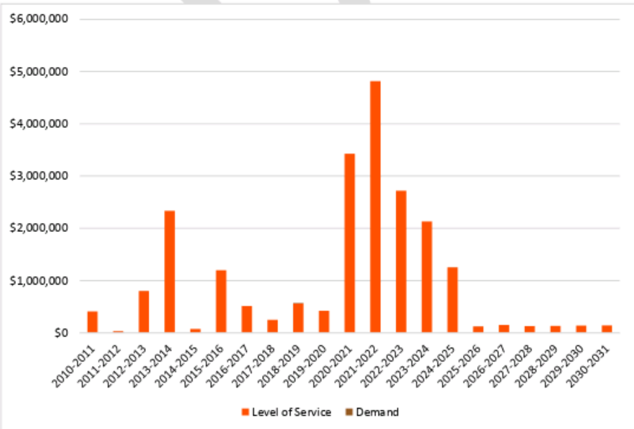


Figure 0-3: Water LoS and Demand Forecasts

Community board area context

The water supply activity is currently district funded i.e funded by those communities connected to Council owned and operated reticulation. There are a number of other communities across the district where there are currently no Council wastewater services provided for example a number of communities in Northern Southland. In the event that communities wish to receive reticulated water supply services it is anticipated that they will show the appropriate level of commitment by funding part or all (in the absence of Government or Council subsidy) of initial up front costs for construction after which the ongoing operational costs would be funded through the district rate. No new water supply systems will be constructed without significant community consultation.

It is noted that Community Boards have not been specifically through the development of this plan however they will have the opportunity to be heard through the upcoming Long Term Plan 2021/31 process.

Asset management improvement

This section summarises the AM practices (data, systems, processes) applied to AM planning. It assesses the current and desired level of practice in relation to the 'AM Maturity Index'1 and identifies an improvement programme for the next three years. SDC have engaged Waugh Consulting to provide a "Valuation Improvement Plan" that addressed shortcomings of data associated with Asset Management which is being progressively integrated into Council's management system.

Progress against previous asset management improvement programme

The following table summarises the status of improvement projects identified in the previous improvement plan. While many projects have had some work undertaken, many are incomplete. To support improved delivery of this AMP improvement plan, it will be subject to formal project management and regular reviews.

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
Capacity Data Demand Forecasting Processes CAPEX Contract Management	Capital development works planning	Understand network capacity.	Partially completed - the capacity of treatment plants and pumping stations is recorded in IPS for most items. Where information is found to be untrue it is amended.
		Document process for determining demand projections considering all demand influences and analysing usage/capacity trend information and identifying implications.	Water Balance and Water Loss Strategy have been developed and will be reviewed and updated.

1 NAMS International Infrastructure Management Manual, 2011

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
		Develop Project Management Manual/Code.	Project management reported through CAMMS
Condition Data Performance Data Asset Life Data Financial Data Failure Prediction Risk Management Strategy Optimised Decision-making	Capital renewal works planning	Develop and document process for monitoring critical assets.	Monitored via IPS and Operation and Maintenance contract.
		Develop process for predicting condition decay based on pipe failure records.	In conjunction with WSP Opus (and others) condition reporting.
		Identify critical assets and undertake more detailed risk assessment. Develop process for routine review of risk.	To be completed.
		Develop process to analyse maintenance/renewal options.	Not completed.
Asset Categorisation Location Data Physical Attributes Data O & M Data O & M Monitoring Asset Register System Maintenance Management System	Data Collection and Processes	Develop documented procedures for collection, entry and quality assurance.	Completed - process developed and being implemented.
		Develop standard reports from IPS to readily analyse O&M information.	Completed - Crystal reports developed to assist at O&M Contract meetings.
		Utilise IPS database	Completed
		Encourage O&M Contractor to utilise maintenance function.	Completed - O&M contractor using function.
Risk Management Data AM Improvement	AM improvement	Review the completeness of the O&M plans and update as required.	Partially Completed - Plant sheets revised when major change to facility.
		Develop project task sheets for each planned improvement activity.	To be completed.
Legislative Compliance	AM staff resources	Review processes in place to keep staff abreast of legislative change.	Completed - Library system developed and implemented.

Table 0-7: Progress since 2012 AM Improvement Plan

Assessing current and desired asset management practices

Understanding and defining requirements

	CURRENT STATUS	FUTURE STATUS AND IDENTIFIED IMPROVEMENTS
The AM Policy	Core. Council wide AM Policy has been developed.	Intermediate. Annual reviews.
Levels of Service and Performance Management	Core. Key levels of service have been identified and are monitored and reported against. Performance framework in place and appropriate. LOS have been agreed with the community using the consultative process and communicated through the LTP 2021-2031 processes. Regular monitoring against LOS is carried out through quarterly and annual reporting. LOS have customer agreed service levels underpinned with technical measures.	Intermediate. Develop processes for evaluation of economic, social, environmental impact of offering different levels of service. Develop data collection/reporting process for new measures.
Demand Forecasting	Core. Demand forecast includes latest population projections. Demand drivers are understood. Leakage detection surveys carried out on scheme by scheme basis.	Intermediate/advanced quantify the key factors that make up demand Water Balance and Strategy completed (eg leakage) especially in peak-sensitive areas. Development of District-wide leakage detection programme commenced. District-wide metering not feasible - Demand Strategy is locating zoned metering on all community schemes.
Asset Knowledge and Condition Assessment	Core. Physical attribute and financial information is good for all schemes. All data recorded in IPS. Remaining life information and financial description well understood.	Medium. Development of detailed condition assessment programmes and understanding of performance and capacity is required. Align IPS age and condition data with future renewal programmes.
Risk Management	Minimum activity level key risks identified by operational staff, contractors and consultant. Identification of critical assets is at a very basic level.	Core. Development of Council wide risk policy to allow understanding of Council's appetite for risk. Development for framework for identification of critical assets and subsequent maintenance and recovery plans.

Table 0-8: Understanding and Defining Requirements

Developing asset lifecycle strategies

	CURRENT STATUS	FUTURE STATUS AND IDENTIFIED IMPROVEMENTS
Operational Decision-making	Core. Service level gaps have been identified and projects programmed to address these gaps. Options have been identified to address different issues. Projects have been prioritised (ranked) based on risk and affordability.	Intermediate/ advanced. Develop systems and processes for predicting condition decay based on pipe failure records. Develop processes to analyse maintenance/renewal options based around information within IPS.
Capital Planning and Decision-making	Core All physical work identified for the 20 year period with the 10 year programme included in the budgeting system.	Medium. Develop longer term renewals programme based on renewals data and unit rates. Review and develop plan for improvement of asset valuation process.
Financial Management	As above.	As above.

Table 0-9: Developing Asset Lifecycle Strategies

Asset management enablers

	Current Status	Future Status and Identified Improvements
The AM Team	Core Asset manager leads AMP process with co-ordination occurring across Council. This AM plan has been prepared based on information held within previous plans. The plan has been prepared by SDC with assistance from local operators (Downer), consultants (Stantec, Waugh Consultants, and other SDC staff such as Project Delivery Team.	Medium: Continue with three yearly AM Plan review cycle to flow into the LTP 2021-2051. Internal review (currently underway) to review/clarify asset owner, service provider roles. This will be documented in reviewed job descriptions.
AM Service Delivery	Core Council staff, in conjunction with Governance bodies, determine O&M practices and develop capital programmes in support of these. Provided by a combination of internal and external service providers.	Medium. Develop capability around IPS as an asset management tool
AM Information Systems	Core. Information stored in IPS. Other systems are available to assist with the decision-making process including SCADA, contractors tool (Water Outlook) and financial information is based in JDE and Fulcrum.	Medium. Review IPS/Fulcrum link to refine and develop new process to assist with annual valuation. Develop IPS capability within the organisation in order to allow for more efficient optimised decision-making.

	Current Status	Future Status and Identified Improvements
Quality Management	Core. Three year improvement plan has been prepared.	Medium. Review suitability of KPIs for monitoring against the delivery of the improvement plan.
Improvement Planning	Core. AMP improvement developed based on analysis of current/desired practice.	Medium. Formal Annual Reports on AMP improvement progress and interim informal reviews.

Financial summary

Budgets across the water supply activity have been developed based on the following assumptions

Significant changes to capital programme include:

- allowance for failing asbestos cement pipes scheduled to reach end of life during the period of the AMP. Current proposed budget of $1.4M (uniflated) per year which was not in previous plan
- replacement of aging control and monitoring equipment required for controlling water treatment plants and ensuring water safety.
- replacement of other aging plant and equipment.
- introduction of programme to implement backflow prevention on all connections to the network. It is expected this this will become a focus for the new water regulator once it becomes more established.
- further work is required to understand and implement options for improving rural water supplies where it is suspected that untreated stock water is being used to supplement domestic consumption.
- operational costs have been increased by inclusion of further testing and condition assessments across networks to allow prioritization of renewals.
- it is also assumed that new contract arrangements from July 2022 will result in an increase of up to 15% which has been included in the budget. Timing of the renewal of the contract is now likely to be extended by 12 months (subject to Council approval) to more fully understand the implications on 3 waters reforms.

10 year financial forecast

The following graphs/table summarise the financial forecasts for the activity over the ten years.

1.1.1. Financial summary

Water Supply	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	-	2	-	647	669	695	709	725	751	756	781	815	815
Targeted rates	3,852	3,832	3,786	4,100	4,873	5,464	5,791	6,056	6,339	6,402	6,665	7,263	7,468	7,769
Subsidies and grants for operating purposes	-	-	-	-	120	-	-	-	-	-	-	-	-	-
Fees and charges	15	5	13	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	48	47	37	47	105	106	107	108	109	111	112	113	115	116
Local authorities fuel tax, fines, infringement fees, and other receipts	6	1	1	1	1	3	3	3	3	3	3	3	3	3
Total operating funding	**3,920**	**3,884**	**3,839**	**4,148**	**5,745**	**6,241**	**6,596**	**6,875**	**7,176**	**7,267**	**7,535**	**8,160**	**8,401**	**8,703**
Applications of operating funding														
Payments to staff and suppliers	2,213	2,367	2,745	2,685	2,623	2,922	2,985	3,063	3,225	3,240	3,329	3,433	3,542	3,655
Finance costs	-	-	-	-	299	378	437	484	526	552	567	578	579	581
Internal charges and overheads applied	615	608	666	804	1,692	1,668	1,799	1,841	1,821	1,796	1,872	2,270	2,361	2,522
Other operating funding applications	(4)	(2)	-	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding	**2,823**	**2,974**	**3,411**	**3,489**	**4,614**	**4,968**	**5,222**	**5,388**	**5,572**	**5,588**	**5,768**	**6,280**	**6,482**	**6,758**
Surplus (deficit) of operating funding	**1,097**	**911**	**428**	**659**	**1,131**	**1,273**	**1,374**	**1,488**	**1,604**	**1,679**	**1,767**	**1,880**	**1,919**	**1,945**
Sources of capital funding														
Subsidies and grants for capital purposes	-	-	-	-	2,318	-	-	-	-	-	-	-	-	-
Development and financial contributions	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	467	1,081	1,086	4,442	4,467	3,580	3,044	2,907	2,227	1,719	1,551	1,165	1,247	1,147
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**467**	**1,088**	**1,086**	**4,442**	**6,785**	**3,580**	**3,044**	**2,907**	**2,227**	**1,719**	**1,551**	**1,165**	**1,247**	**1,147**
Applications of capital funding														
Capital expenditure														
- to meet additional demand	-	11	-	-	-	-	-	-	-	-	-	-	-	-
- to improve the level of service	251	561	423	3,428	4,817	2,722	2,133	1,253	122	153	130	134	139	143
- to replace existing assets	1,592	1,463	1,101	1,647	2,721	1,609	1,683	2,465	2,960	2,304	2,198	1,850	1,946	1,849
Increase (decrease) in reserves	(279)	(37)	(11)	26	426	571	649	725	797	989	1,038	1,109	1,130	1,148
Increase (decrease) in investments	(0)	-	-	-	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)
Total applications of capital funding	**1,564**	**1,999**	**1,514**	**5,131**	**7,916**	**4,853**	**4,418**	**4,395**	**3,831**	**3,397**	**3,317**	**3,044**	**3,166**	**3,092**
Surplus (deficit) of capital funding	**(1,097)**	**(911)**	**(428)**	**(659)**	**(1,131)**	**(1,273)**	**(1,374)**	**(1,488)**	**(1,604)**	**(1,679)**	**(1,767)**	**(1,880)**	**(1,919)**	**(1,945)**
Funding balance	**(0)**	**0**	**(0)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

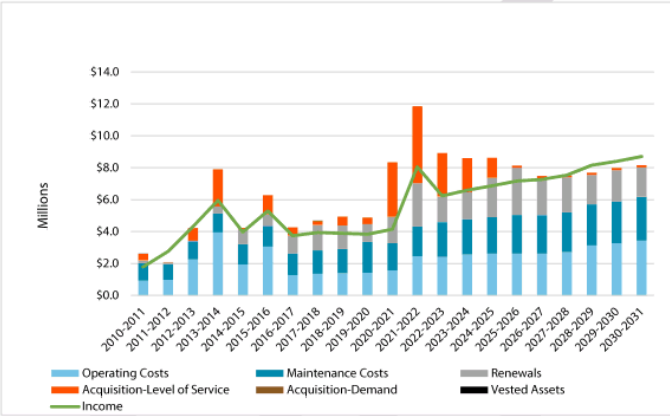


Figure 0-1: Water Supply Total Expenditure (District-wide)

1.1.2. Total income

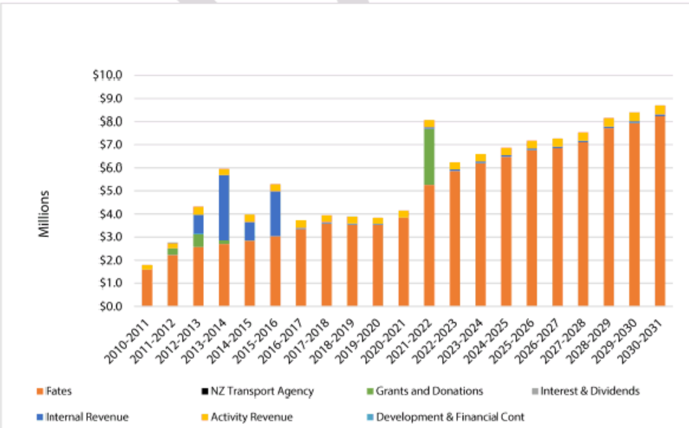


Figure 0-2: Water Supply Total Income

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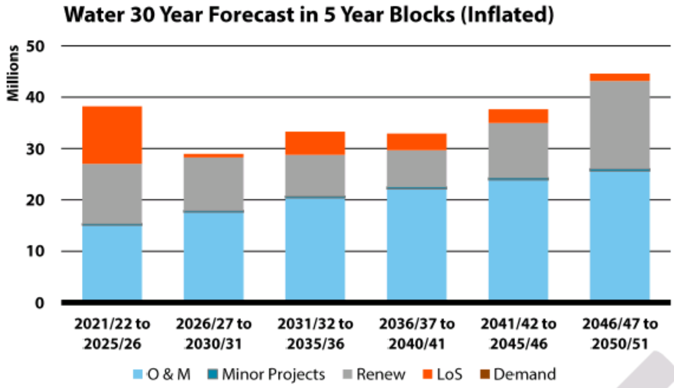


Figure 0-3: 30 Year Expenditure Forecasts (from Infrastructure Strategy)

Financial forecast summary

The following section contains financial information for the activity which has been generated from Council's Fulcrum budget platform as at February 2021. All of the financial shown includes inflation (unless otherwise stated). The costs associated with the Water Supply activity are included in the Water Supply Activity Statement in Council's LTP.

Summary of key financial assumptions

The current activity plan has been developed assuming that:

- forecast renewals within the 10 year period will be subject to additional condition surveys and detailed investigations. Years 11 to 30 will not be subject to survey until they present within the 10 year LTP window. Known problems outside the LTP window may be required to maintain security of supply.
- future changes to operating costs will be influenced by changes to inflation and as a result of scheme upgrades to meet LOS requirements, most notably Drinking-water Standards 2008, but also outcomes from the Havelock North Inquiry and DIA 3 Waters work.
- future demand is likely to remain unchanged (and may decline in places due to Covid-19) and as such any upgrades to meet future demand have been deferred to the last years of the 10 year period and will be further deferred if this demand does not exist.
- MOH subsidy funding is no longer available for scheme upgrades and is unlikely to be unavailable in the future however future tranches of Government Funding (Stimulus) may be available within the first years of the plan.

Key factors that may influence future operating costs that have currently not been budgeted for include:

- significant increase in transportation costs. Transportation costs are recalculated on a quarterly basis as part of the escalations process for re-baselining contract costs. Increases in transport costs are largely dependent on oil and diesel prices which are outside Council's control. Currently budgeted operational costs allow for an increase based largely on historical trends.
- the impact of ES's approach to future consent renewals for water takes could have a significant impact on costs depending on future operating costs which have not been fully budgeted for. These requirements are

currently not fully understood but are likely to require the development of demand strategies for each scheme.

Should this be linked to the Finance Strategy? Should there be any new material here?

Valuation approach

Statutory financial reporting requirements require Council to revalue its fixed assets triennially. Water supply infrastructure assets were last valued as at 30 June 2020 in accordance with Public Benefit Entity International Public Sector Accounting Standard 17 Property, Plant and Equipment (PBE IPAS17). All assets have been valued at the component level (maintenance managed item-MMI) where appropriate. A summary of the 2019 valuations is presented in Table 7-1.

The following assumptions have been made in the preparation of the valuations:

- that all asset data has been reviewed and updated.
- that all valuations are based on the "Modern Equivalent Replacement Cost" basis.
- where new technology is available or where present assets do not require full replacement, adjustments have been made.
- that the rates for urban watermains have been set at systematic renewal costs rather than short length replacement costs.
- that previously the rural watermain rates were set based on competitive rates from large replacement contracts recently constructed outside of the District. The 2019 rates have been set at replacement rates similar to recent contract rates associated with a rural main replacement contract in the Southland District.
- the asset lives and unit rates have been peer reviewed by Waugh Consulting and signed off by Audit NZ.

Funding Principles

Section 102(4) (a) of the Local Government Act 2002 requires each Council to adopt a Revenue and Financing Policy. This Policy must state Council's policies in respect of the funding of both capital and operational expenditure for its activities.

In summary, for Water Supply, operational and capital expenditure will be funded as follows:

- operating funding for drinking water supplies is funded on a District-wide basis by all those connected to such a scheme. Rural stock water schemes are funded locally by those connected to the schemes.
- renewals and LoS upgrades on existing schemes are funded by loans and or reserves and contributions where appropriate.
- Depreciation on existing assets is to be funded in increments until 100% funding is reached in 2028-2029. These reserves are to fund the repayment of loans for capital work, followed by capital expenditure for renewal and LoS
- rural water supply capital works are funded solely through local contributions and loans.
- capital works for new urban schemes are funded from communities wanting to receive the service. A previous Council subsidy of 16.67% District contribution related only to those receiving central government subsidy and are no longer available.

- smaller projects not eligible for subsidy may be funded through loans. Local contributions are funded either via rates, loans or from scheme operating reserves.

Further information can be found in Council's Revenue and Financing Policy. The current policy is adopted in 2018 is available online and in Council's document management system (refer R/17/8/18227). The policy is in the process of being reviewed for the 2021 LTP and the updated information regarding the policy will be included in the AMP once finalised.

Fees and charges

Appendix - scheme plans

Introduction

This section introduces the headings found in the following appendices offering explanations and definitions of information sources, methodologies and terminology common to all supplies.

The financial reports provided in this section incorporate the business units that fund the operating activities but exclude business units which contain existing township/ratepayer loans and depreciation.

Description

This area describes the current physical scope, condition and performance (measured against target standards) of the assets used in the Water Supply Activity. This information is the basis for determining future maintenance and capital programmes, and developing appropriate management strategies. Information has been collated from the databases held in SDC's asset.

Connection information has been provided by the Rates Department as a query of how many water rates or units of water are charged for each scheme.

Asset information has been sourced from historical AMPs, IPS, and scheme working folders.

Asset condition, capacity and performance

Measuring

During the development of previous AMPs an assessment of condition and performance was made using grades defined by the New Zealand Water Industry National Asset Grading Standards (see tables below). This revision does not re-grade each asset but instead updates grades based on recent information. These act as a reference for the condition, performance and confidence of individual schemes as discussed in the following sections.

Further asset condition, capacity and performance criteria are revisited following joint inspections. The asset condition and performance information is included

Condition and performance grades

GRADE	CONDITION	PERFORMANCE	DESCRIPTION
1	Very Good	Always meets Technical LOS	No significant adverse short term impact.
2	Good	Almost always meets Technical LOS	Failure will cause localised and serious disruptions to service delivery.
3	Moderate	Generally meets Technical LOS	Failure will cause localised and serious disruptions to service delivery, possible health and safety effects and/or loss of critical data.
4	Poor	Does not generally meets Technical LOS	Failure will cause serious disruption to service delivery over a substantial area, possible health and public safety effects.
5	Very Poor	Never meets Technical LOS	Widespread and serious disruption to service delivery, possible health and public safety effects.

Table 0-1: Asset Condition and Performance Grades (Courtesy of Maunsell Limited)

Confidence grades

GRADE	CONFIDENCE	DESCRIPTION
A	Highly reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented and recognised as the best method of assessment.
B	Reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented but has minor shortcomings; for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain	Data is based on sound records, procedures, investigations and analysis that is incomplete or unsupported, or extrapolation from a limited sample for which Grade A or B data is available.
D	Poor	Data is based on unconfirmed verbal reports and/or cursory inspection and analysis.

Table 0-2: Data Source and Confidence Gradings (Courtesy of Maunsell Limited)

Assets that have reached their predicted expiry date as per IPS asset lives, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

Appendix A: Duncraigen Rural Water Supply

Description

The Duncraigen (restricted) Rural Water Supply has one connection (Landcorp Farming Limited) to the scheme with a total of 30.8 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

1998 - Water Permit granted to extract 120 m^3/day from the Waiau River for 20 years.

2005 - Low river event causing high sediment load through pumps.

2006 - Low river event causing high sediment load through pumps.

2008 - Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2012 - Telemetry replaced.

Process Description

River water is drawn from the Waiau River and pumped to storage reservoirs and farm storage tanks. Water is not treated. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 94532 granted to take 120 m^3/day from the Waiau River at a rate of 5 m^3/hr. Consent expires 29 May 2028.

(b) Intake headworks

Water is drawn from the Waiau River approximately 1,000 m upstream of the Mararoa control structure. Water is drawn through a 600 mm inclined steel pipe with slots located in the river. Pumps are manually adjusted on guide rails to ensure the inlets are under water. The intake is affected by river quality and quantity issues, however, a turbidity switch owned and operated by the Meridian Energy discharges dirty water through the control gates bypassing the intake.

Pump Controls: Pump control is by a pressure switch with 10 minute delay. The pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 90 m^3 equivalent to approximately 18 hours at full demand.

(e) Reticulation

The rising main and gravity main is made up PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(f) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset Condition and Performance

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Inclined pipe	3	3	B	2044
	Primary Pump 1	3	3	B	2041
	Primary Pump 2	3	3	B	2041
	Switchboard	3	3	C	2041
	Telemetry	2	5	A	2041
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage	Main Reservoir	2	2	C	2044
Reticulation	Gravity mains	3	3	B	2065
	Rising mains	3	3	B	2084
	Valves	3	3	B	2045
	Hydrants	-	-	-	-
	Meters	-	-	-	-

Appendix Table A: Duncraigen Condition and Performance

Note: New meter installed 2016.

Although the primary pumping equipment is nearing the estimated failure year it was decided to programme replacement of both pumps for 2014/15 as there has been no indication that pump condition is deteriorating. The pipework in the switchboard/intake shed has also been programmed for replacement in the same year due to poor condition.

The switchboard and telemetry is also nearing the end of economic life with SCADA programmed in line with other Te Anau basin SCADA renewals and has been renewed accordingly.

Operation and maintenance

The lines are now requiring flushing four times per year as an increasing amount of sediment is sucked into intake. This work is now scheduled in IPS.

Critical assets

Critical assets identified are:

The rising main from intake to reservoir.

Key issues

- the telemetry unit has been upgraded to Kingfisher/Citect as the SCADA system.
- pumping equipment has been renewed.
- electrical equipment has been renewed.
- suspected that water is being used as a source of drinking water

Capital expenditure plan

The following renewal projects have been programmed as they are either at the end of their design life or due to poor condition/performance.

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Duncraigen)	RW39	MS Project 39 in 23/24	REN	23/24	22,540	Reserves

Appendix B: Eastern Bush - Otahu Flat RWS (Treated)

Description

The Eastern Bush leg of the scheme has 35 connections with a total of 134 units of water allocated (1 unit equals 1,818 L/day). The Otahu Flat leg of the scheme 40 connections with a total of 114 units of water allocated (1 unit equals 1,818 L/day).

The scheme registered with the MOH but is currently ungraded.

History

The scheme was installed by Wallace County Council in 1972 with the majority of construction work carried out by consumers to keep costs down.

1982 - SDC took over responsibility for the scheme built by the Wallace County Council.

1995 - Telemetry installed.

1999 - Water Permit granted to extract 6.1 L/s from the Wairaki River for 20 years.

2002 - New intake well constructed and chlorine dosing pump installed to replace the unreliable suction dosing system. New switchboard installed.

2004 - New well pump installed.

2005 - New secondary pump installed for Otahu Flat.

2007 - PHRMP approved by Drinking Water Assessor.

2008 - Five kilometre section of falling main from OF reservoir replaced due to poor condition. Chlorine pump replaced.

2012 - Well pump replaced.

2013 Chlorine dosing replaces HTH solution.

2014 - Investigations on options for treatment upgrade investigated.

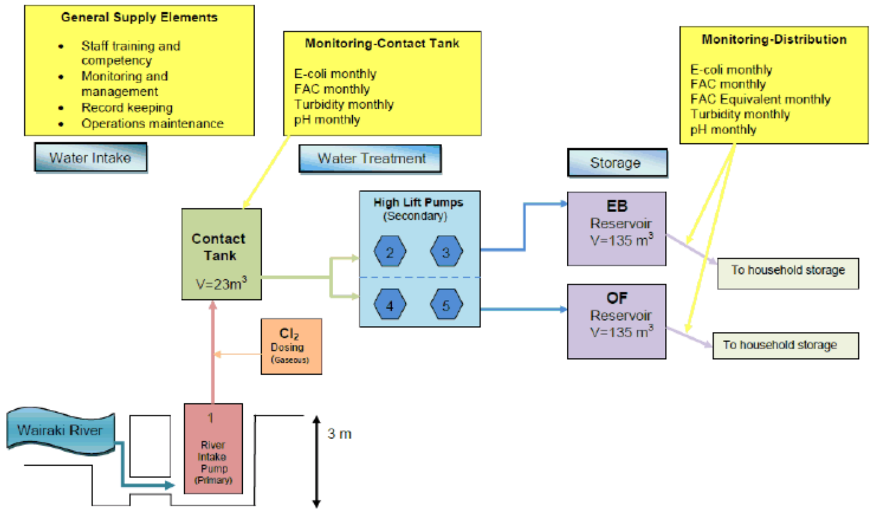
2014 Soft starting of motors incorporated.

2016 - Replacement water main across Clifden Bridge

2017 - Call for tenders for upgrade treatment plant (currently on hold pending outcome from Havelock North inquiry)

2017 - Applications prepared for water take consent and consent for discharge of wastewater

Process description



River water is drawn from a shared intake in the Wairaki River which pumps water to a clear water tank. The water is treated with chlorine for disinfection. Each leg draws water depending on demand and pumps to respective reservoirs before discharging to household storage tanks. The supply network consists of gravity mains and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

This scheme is currently on a permanent "Boil Water Notice". This is due to low residual chlorine levels in the reticulation. It is understood this is due to the quality of raw water,
ie the capacity of the treated water to hold chlorine is undermined by the large amount of organic matter in the raw water.

(a) Abstraction

Water Permit 98217 granted to take 6.1 L/s from the Wairaki River when flows are greater than 6.1 L/s and not more than 10% of river flow within 61 L/s or less. Consent expires 24 December 2019.

(b) Intake headworks

Water is drawn from the gravels of the Wairaki River upstream of the Wairaki Road bridge. Water flows under gravity into a pool area with a slotted pipe buried under clean gravel. The pipe carries water to a well containing a submersible pump located in the river reserve.

Land use consent 99177 to divert the Wairaki River and excavate to maintain the diversion channel. Consent expires 24 December 2019.

Design: treated rural water scheme. Restricted supply to household storage tanks.

Catchment: Waiau catchment.

Pump controls: the Eastern Bush pumps are controlled by a solar powered ultrasonic level controller (ultrasonic hawk unit) and transmitted to the treatment plant via UHF link (SALCOM).

The Otahu Flat pumps are controlled by a solar powered pressure transducer level control at the reservoir and transmitted to the treatment plant via UHF link (SALCOM).

The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

This scheme uses chlorine disinfection automatically dispensed which is made into a solution for dosing by the operator. Each sub-scheme has respective duty and standby pumps.

(d) Storage

The EB reservoir has a capacity of 135 m^3. The time equivalent at current demand is 13.3 hours (134 units). The OF reservoir has a capacity of 135 m^3.
The time equivalent at current demand is 15.6 hrs (114 units).

(e) Reticulation

For Eastern Bush the rising main is a 100 mm diameter asbestos cement pipe.
A sample tested in July 2005 shows this line to be in very poor condition.
Gravity mains are made of polyethylene and PVC. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme. There are no meters or hydrants on this scheme.

The Otahu Flat rising main is made of unknown material. Gravity mains are made of PVC, polyethylene, and asbestos cement. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Well	4	4	C	2031
	Primary Pump 1	3	3	B	2029
Treatment Plant	Chlorine pump	3	3	C	2028
	Deplox	1	1	A	2029
	Switchboard	4	3	C	2031
	Telemetry	2	5	A	2031
Eastern Bush Sub-Scheme					
Pump stations	Secondary Pump 1	1	2	C	2030
	Secondary Pump 2	3	3	C	2018
	Surge Protection Eq.	3	5	C	Unknown
Storage	EB Reservoir	4	4	B	2031
Reticulation	Gravity mains	3	3	B	2031
	Rising mains	5(**)	5(**)	A	2024
	Valves	3	3	B	2024
	Hydrants	-	-	-	-
	Meters	-	-	-	-
Otahu Flat Sub-Scheme					
Pump stations	Secondary Pump 1	1	2	C	2020
	Secondary Pump 2	3	2	C	2018

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Surge Protection Eq.	3	5	C	Unknown
Storage	OF Reservoir	4	4	B	2031
Reticulation	Gravity mains	3	3	B	2031
	Rising mains	4	4	B	2019
	Valves	3	3	B	2021
	Hydrants	-	-	-	-
	Meters	-	-	-	-

Appendix Table B: EB and OF Condition and Performance

** AC Pipe Sample Condition Assessment by OPUS dated 6 July 2005.

Note: Upgrade planned 2018/2019.

Operation and maintenance

Increasing maintenance is being carried out on shallow lines. Some areas may need to be deepened especially at driveway/road crossings. There is also increasing maintenance being carried out to divert the river back towards the intake well.

Critical assets

Critical assets identified are:

- the Eastern Bush rising main from intake to reservoir.
- the Otahu Flat rising main from intake to reservoir.
- the well pump.
- the chlorine pump.

Key issues

- this scheme is currently on a permanent "Boil Water Notice". This is due to low residual chlorine levels in the reticulation. It is understood this is due to the quality of raw water, ie the capacity of the treated water to hold chlorine is undermined by the large amount of organic matter in the raw water
- an assessment is needed to establish current and future demand prior to the following reticulation renewals
- the Eastern Bush rising main to the reservoir is in very poor condition and due for replacement (especially area through the swamp)
- the Otahu Flat rising main is likely to be in similar condition and should be replaced pending condition assessment at time of bursts
- the reservoir tanks on both schemes are in poor condition and due for renewal pending a storage assessment
- the secondary pumps are due for renewal medium term
- scheme does not qualify for MOH funding due to low deprivation

- renewal of the resource consent
- the scheme is required to meet the DWS including the development of a PHRMP (completed 2007) and associated infrastructure upgrades
- the majority of the reticulation meets the end of design life in 2031.

Capital expenditure plan

Eastern Bush Otahu Flat is now a combined scheme.

Eastern Bush

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Water Supply Upgrade - Stage 1	WAT62	MS Project WAT62	LOS	18/19	750,000	District Funding
Water Supply Upgrade - Stage 1	WAT62	MS Project WAT62	LOS	19/20	791,611	District Funding

Appendix C: Five Rivers Rural Water Supply

Description

It is understood that the Five Rivers (restricted) Rural Water Supply has five connections to the scheme with approximately 66 units of water allocated (1 unit equals 1,818 L/day).
SDC collect no rates or asset management data from this scheme.

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is managed by the Five Rivers Water Supply Committee with support available from technical staff at the SDC. The scheme is maintained by the consumers.

History

It is unknown when the scheme was built but estimated at 1980s. The scheme was built by Council of the day with the assistance of a government subsidy.

1990s - SDC relinquished operation and maintenance of the scheme to the Committee.

1998 - Water Permit granted to extract 120 m^3/day from Tank Creek for 20 years.

Process description

River water is collected from Tank Creek and gravity fed to farm storage tanks.

From the intake, water gravitates through the reticulation to farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns service connections from the trunk main to the ballcock on the storage tanks but only carries out maintenance work at the request of the scheme committee. Council collects no rates for this scheme.

(a) Abstraction

Water Permit 97376 granted to take no more than 120 m^3/day from Tank Creek at a maximum rate of 5 m^3/hr. Consent expires 26 August 2018.

(b) Intake headworks

Water is collected from the Tank Creek approximately 1,500 m upstream of State Highway 6. Water falls by gravity to a 23 m^3 reservoir. There are no pumps.

Design: restricted supply to farm storage tanks

Catchment: unconfined catchment

Pump controls: there are no pumps and no SCADA

Standby power: no standby power supply is required.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 23 m^3 equivalent to approximately 4.6 hours at current demand (66 units).

(e) Reticulation

The gravity mains are made up of PVC and polyethylene. It is understood that PVC mains are rubber-ring jointed. Service connections are also believed to be PVC. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(f) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset capacity

A summary inventory of the water supply assets is given below:

ASSET TYPE		CAPACITY	
Intake	Weir	5 m^3/hr	Sufficient
Treatment Plant	n/a	n/a	n/a
Storage	Main reservoir	23 m^3	Sufficient
Reticulation	6.600 km	Various	Sufficient

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Weir	3	3	C	2037
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage	Main Reservoir	3	3	C	2037
Reticulation	Gravity mains	3	3	B	2057
	Rising mains	-	-	-	-
	Valves	3	3	B	2027
	Hydrants	-	-	-	-
	Meters	-	-	-	-

Appendix Table C: Five Rivers RWS Condition and Performance

Note: Flow meter installed 2015.

Operation and maintenance

No known issues.

Critical assets

None identified.

Key issues

- it is suspected that this is being used as a source of potable water
- resource consent application being prepared in 2017.

Capital expenditure plan

The only proposed expenditure relates to renewal of resource consent required in 2018.

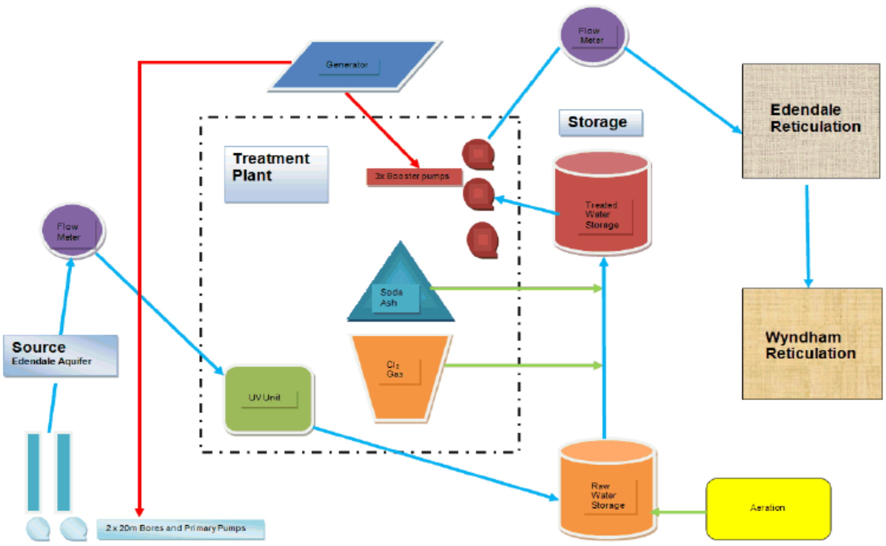
Appendix D: Edendale-Wyndham Scheme

History

The Edendale-Wyndham water supply was constructed between 2007 and 2008 serving the townships of Edendale and Wyndham. The scheme was constructed with the aid of Ministry of Health Funding and Subsidy from Southland District Council with ratepayers funding the balance (33%). The scheme currently has 561 connections serving a population of 1152 as per the 2013 census.

Raw water source

The raw water supply is sourced from a terrace aquifer that lies to the west of Edendale within the Edendale groundwater zone. There are two bores that produce the raw water and these are approximately 20 metres deep. These two bores are located on the west side of Homestead Road approximately 800 metres north of SH 1 on a piece of land owned by Council



Treatment

From the raw water tank the water flows into the treated water tank by gravity (ie, a balancing of levels between the treated water and raw water tanks) as the treated water tank is drawn down by the supply pumps.

The pipe work between the tanks has a static mixer installed. This static mixer allows for the dosing and mixing of:

1. Chlorine dosed from 2 x 70 kg pressurised cylinders in parallel, both chlorine bottles are on scales with the weight being shown on SCADA. There is automatic change-over between chlorine cylinders when one bottle runs out of chlorine.

   Chlorine dosing: Gaseous chlorine is dosed from pressurised 70 kg cylinders to the carry water line via an injector unit, the maximum level of FAC chlorine is not to exceed 5 mg/litre. If the chlorine level in the treated water is outside the range of 0.5 - 1.5 mg/litre an alarm is sent out to the operator.

2. Soda ash dosed by dosing pumps from a liquid (6-10% soda ash solution) form mixed (by aeration) in a 2,500 litre APD (manufacturer) tank.

   Soda ash and chlorine are both dosed via carry water line from the WTP building, the dosing of both is controlled by a Depolox 5 analyser unit.

   Soda ash: the soda ash is mixed in a 2,500 litre bunded tank by use of a blower and air sparge arrangement. From the tank dosing pumps (duty/standby) dose the mixture into the carry water line.

Booster pumps

The water in the raw and treated water tanks are drawn down as required by the booster pumps to meet demand; the treatment system does not have any elevated storage and therefore the pumps must operate continuously to meet all demand requirements (a generator is supplied for emergency power back up to ensure that the pumps keep operating even when a power failure occurs). If one of the three pump units fails then another will immediately activate. The booster pumps are Lowara 15 kW with maximum flow 30l/s with a nominal head 45 m maintained with constant pressure VFD control. The booster pump set design is based upon the operational philosophy of maintaining constant pressure on the supply side of the pump.

There is a generator at the water treatment plant that supplies emergency power primarily to maintain the pumps during a power outage. The generator is a caterpillar GEP110/2 which is 110 kVa and 88 kw rated with a rated frequency of 50 Hz. The generator starts automatically when there is a power cut, an alarm is sent to the operator, notifying them that there has been a power failure. The generator is run and visually checked monthly.

Reticulation

The treated water is transferred from the WTP to Edendale through a PN12 O-PVC pipe. This main is approximately 3 km long and contains a number of air valves and scour points.

The reticulation in both towns is PN 12.5 O-PVC pipe of varying diameters for the mains and the laterals are MDPE 25 mm PN 12.5 (blue coloured pipe) with a tapping band and elbow coming off the main and a aquaflow manifold toby box at each boundary which incorporates twin check valve for backflow prevention.

Water is transferred to Wyndham via the Edendale reticulation system and via a main of PN12 O-PVC main.

Excellent pipe location and size information is available on Council's GIS system. Firefighting capacity is excellent with all hydrants meeting 25l/s as required for Class E firefighting requirements.

Condition and performance

Given that all assets are newly constructed they all classed as grade 1 in terms of both condition and performance.

Note: No Information.

Key issues

None identified.

Capital expenditure plan

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
District Metered Areas	WAT79	MS Project WAT 79 in 19/20	LOS	19/20	19,475	District Funding
Consent Renewal Preparation	WAT789	MS Project WAT789 in 22/23	REN	22/23	21,990	District Funding
Blower Replacement	WAT1679	Additional project in 18-28 LTP	REN	27/28	158,451	District Funding

Appendix E: Homestead Rural Water Supply

Description

The Homestead (restricted) Rural Water Supply has 21 connections to the scheme with a total of 121.7 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore is not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

- New switchboard installed.
- New transfer pump installed (P1).

1999 - Transfer pump (P2) installed (ex Takitimu).

2000 - Water Permit granted to extract 600 m^3/day from the Whitestone River for 20 years.

2002 - 100 m of old AC rising main was renewed in PVC.

2004 - Well slots cleared and new raw water intake pipe installed.

2005 - Low well protection installed into well.

2006 - New transfer pump installed at pump house (Lowarra SV 3307/2 15 kW).

2008 - Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2012 - Install Kingfisher SCADA and switchboard.

2014 - Work underway to replace rising main from intake to tanks along realigned route.

Process Description

River water is drawn from an unconfined aquifer adjacent to the Whitestone River and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

(a) Abstraction

Water Permit 99019 granted to take no more than 600 m^3/day from the Whitestone River at a maximum rate of 25 m^3/day. Consent expires 14 June 2020.

(b) Intake headworks

Water is drawn from the Whitestone River approximately 4 km upstream of State Highway 94. Water is drawn through a 900 mm slotted steel well approximately 3.9 m deep. There are two surface mounted centrifugal pumps in parallel pumping to the reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel.

Design: restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pumps are controlled by solar powered ultrasonic level control (ultrasonic hawk unit) at the reservoir and transmitted to the pump station via UHF link (SALCOM). Low well protection prevents the pumps from running dry. The pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 136 m^3 equivalent to approximately 14.8 hours at current demand (121.7 units).

(e) Reticulation

The rising main is constructed of 100 mm diameter asbestos cement and likely to be in poor condition. The gravity mains are polyethylene and PVC. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(f) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below. It was noted in 2006 that three of the reservoir tanks are leaking badly.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	3.9 m Well	1	2	C	2031
	Transfer Pump 1	2	2	B	2025
	Transfer Pump 2	2	2	A	2026
	Surge Protection eq	4	5	C	2020
	Switchboard	1	1	C	2030
	Telemetry	1	1	A	2030
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage	Main Reservoir	1	1	C	2051
Reticulation	Gravity mains	3	3)	B	2031
	Rising mains	4	4	B	2117
	Valves	3	3	B	2031
	Hydrants	N/A	N/A	N/A	-
	Meters	3	3	C	2031

Appendix Table E: Homestead RWS Condition and Performance

Operation and maintenance

No issues.

Critical assets

Critical assets identified are:

- the rising main from the intake to the reservoir.

Key issues

- it is suspected that this scheme is being used as a source of drinking water by some users

Capital expenditure plan

The following renewal projects have been programmed:

Te Anau Rural Water Supply

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Homestead)	RW108	MS Project 108 in 18/19	REN	18/19	20,000	Reserves
Plantroom valves (Homestead)	RW1602	Additional project 18-28 LTP	REN	20/21	7,169	Reserves

There are no LOS or demand projects planned for the 10 year period.

There is currently no disposal plan in place for assets.

Appendix F: Kakapo Rural Water Supply

Description

The Kakapo (restricted) Rural Water Supply has 52 connections to the scheme with a total of 162.6 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

2000 - Water Permit granted to extract 500 m^3/day from the Upukerora River for 20 years.

2001 - New ultrasonic level control fitted to main reservoir.

2004 - Hydraulic model completed.

2005 - 100 m of faulty glue jointed falling main replaced.

- New booster pump 2.

2008 - Water meters installed on the Kakapo and Dale lines.

- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2010 - SCADA and switchboard replaced.

Process description

River water is drawn from the Upukerora River and pumped to storage reservoirs before discharging to farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

(a) Abstraction

Water Permit 99017 granted to take 500 m^3/day from the Upukerora River at a maximum rate of 21 m^3/hr. Consent expires 3 May 2020.

(b) Intake headworks

Water is drawn from the east bank of the Upukerora River approximately 9 km upstream of State Highway 94. Water is drawn through a 900 mm slotted steel well approximately 5.9 m deep. At the intake there is a main pump station containing two surface mounted centrifugal pumps in parallel pumping to the main reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel.

Design: restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pumps are controlled by solar powered ultrasonic level control (ultrasonic hawk unit) at the reservoirs and transmitted to the main pump station via UHF link (SALCOM). The main pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 230 m^3, equivalent to approximately 18 hours at full demand. The booster reservoir has a capacity of 23 m^3, equivalent to approximately 18 hours at full demand.

(e) Booster station

There are two pumps discharging to network reticulation:

Pump controls: pump control is by a pressure switch with a delay and transmitted to the intake via UHF link (SALCOM).

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising main is made of AC and gravity mains are made of polyethylene and PVC. The PVC and AC pipes are assumed to be rubber-ring jointed. Service connections are also believed to be PVC. No leak detection assessment has been carried out to date. A hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End of Life (IPS)
Intake	5.9 m Well	2	2	C	2031
	Transfer Pump 1	4	5	C	2023
	Transfer Pump 2	2	1	C	2023
	Pressure Surge eq.	4	5	C	unknown
	Switchboard	1	1	A	2047
	Telemetry	1	1	A	2025
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Booster Station	Booster Pump 1	5	3	C	2022
	Booster Pump 2	2	2	A	2030
	Switchboard	1	1	A	2047
	Telemetry	1	1	A	2025
Storage	Main Reservoir	4	3	C	2031
	Booster Reservoir	4	3	C	2031
	Telemetry	2	5	A	2025
Reticulation	Gravity mains	3	3	B	2031

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End of Life (IPS)
	Rising mains	4	4	B	2031
	Valves	3	3	B	2031
	Hydrants				
	Meters				

Appendix Table F: Kakapo RWS Condition and Performance

Operation and maintenance

No issues.

Critical assets

Critical assets identified are:

- the rising main from the intake to the main reservoir.
- the rising main from the main reservoir to the booster reservoir.
- the booster pump.

Key issues

- the condition of the rising main is unknown but likely to be in poor condition. Replacement has been programmed subject to a condition assessment.
- difficulty supplying consumers with allocated water due to illegal consumption - install water meters on repeat offenders. Consider installing branch meters to monitor flows.
- it is suspected that the water is being used as a source for domestic drinking water

Capital expenditure plan

The following renewal and LOS projects have been programmed:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Kakapo)	RW138	MS Project RW138 in 18/19	REN	18/19	20,000	Reserves
Replacement tanks (Kakapo)	RW139	Replacement of tanks in Kakapo scheme	REN	18/19	40,000	Loan
Plant and Equipment (Kakapo)	RW1605	Additional project in 18-28 LTP	REN	21/22	12,658	Reserves

Appendix G: Lumsden/Lumsden-Balfour Scheme

Description

The Lumsden-Balfour (restricted) Rural Water Supply has 193 connections to the scheme with a total of 766 units of water allocated (1 unit equals 2,000L/day).

The Lumsden township has 245 connections to the scheme and a total of 284 units of water allocated.

The scheme registered with the MOH and currently has a grading Aa (2010).

The scheme services the wider Lumsden area as far as Balfour to the east and Castlerock to the west. Although the population of the townships is projected to decrease over the planning period, the projected number of connections does not follow the same trend.
As farming practices change, the water usage is trending up.

History

The scheme was built with a large local input in the late 1970s by Lands and Survey as part of the government farming enterprise.

1980 - Scheme was commissioned feeding the farming areas surrounding Lumsden and Balfour.

1995 - Telemetry installed.

- Ultra sonic level control installed at the Balfour reservoir.

1996 - AMP produced.

- Water Permit granted to extract 2,480 m^3/day from groundwater under the Oreti catchment for 15 years.

1998 - First large volume dairy consumer joins the scheme.

2000 - Scheme is re-restricted to lower excessive pumping hours.

2003 - AMP revised.

- Scheme Headworks and Capacity Report undertaken.
- Hydraulic Model built by Roly Hayes, Water Engineer.

2004 - Unsuccessful test bore drilled to 61 m at Treatment Plant in search of deep water.

- Clayton Valve was purchased and is ready for installation.
- Longridge Booster Station re-located.

2005 - Solar panel capacity increased at Balfour reservoir.

- Pump control at Balfour reservoir upgraded to pressure transducer.
- AMP produced.

2006 - Switchboard condition assessment.

- Oreti River moved to the far side of its channel causing the well to go dry. Operator had to pump directly from the river into the well.

2007 - River moved again.

- Drilling carried out at three sites looking for deep water to remedy raw water supply issues.
- PHRMP approved by Drinking Water Assessor.

- Installation of break pressure tanks for Lumsden township.

2008 - Drilling continues to the south of Lumsden township.

- Turbidity meter installed at intake.

2009 - AMP reviewed.

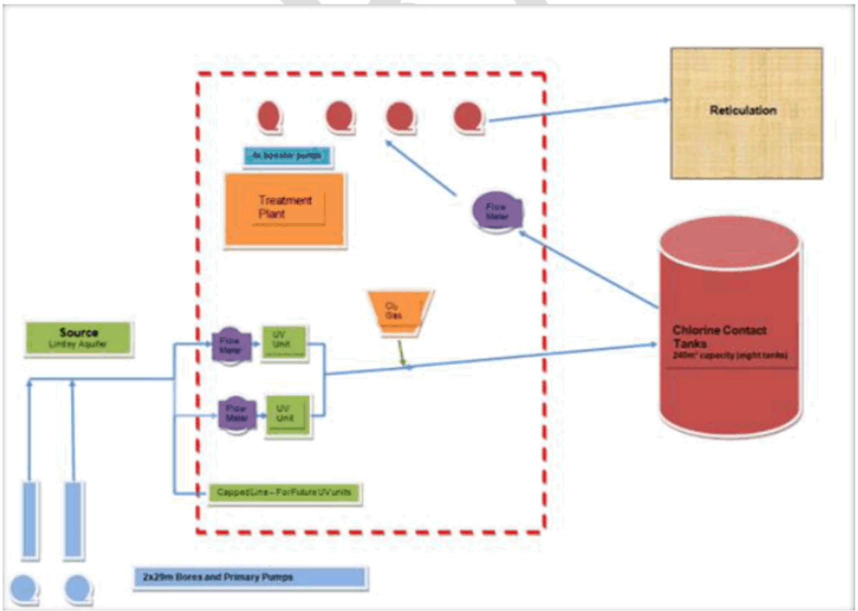
- Sub-mains pressure project carried out, including the installation of toby valves (at the boundary of each property) and service connections to each property.

2010 - New treatment plant built on Lintley Road consisting of two UV units (27L/s each), new chlorine equipment, one tonne chlorine tank, four secondary pumps with variable speed drives (7.5 kW), eight 30 cubic contact tanks, three flow meters, two new wells (Well west, Well east), well pumps currently set at 20L/s well pumps each on variable speed drives (maximum output 24L/s).

- Pressure reducing valve added on 63 mm pipeline at 96 Lintley Road.
- New reticulation 250 mm diameter uPVC main installed between the new treatment plant on Lintley Road and the end of the existing 200 mm diameter main at the 'Tee', 1.9 km west on Macale Road.
- Old falling main between break pressure tank on 888 Old Balfour Road and new valve has been retired.
- Old water treatment plant retired.
- Renewed Main Reservoir tank farm 20 tanks (450 m³).
- Renewed Balfour Reservoir tank farm 40 tanks (fifth tank on site is private).

2015 - Water main replaced over SH bridge

Process description



Groundwater is drawn from the gravels of the Oreti River catchment, passed through a treatment plant before being pumped through the scheme reticulation and main reservoir, the Lumsden township reservoir and the Balfour reservoir. Water is treated with UV, chlorine gas and sent to contact tanks before being pumped into the reticulation. Treated water gravitates down to the Balfour Reservoir before discharging into farm storage tanks. A booster station at Longridge lifts water to the Longridge reservoir. The supply network consists of gravity mains, rising mains, and valves.

Council owns and maintains the service connections from the trunk main to the ballcock on the household storage tanks.

(a) Abstraction

Water Permit 205657 granted (25 February 2009) to take groundwater in the Oreti catchment at a maximum rate of 66l/s. Consent expires 25 February 2029.

PERIOD	MAXIMUM DAILY VOLUMES (M^3/DAY)	MAXIMUM ANNUAL RATE (M^3/DAY)
Commencement until 30 June 2019	4,200	1,050,000
1 July 2019 until 30 June 2028	5,350	1,337,000
1 July 2028 until expiry	5,760	1,435,000

(b) Intake headworks

Water is drawn from a confined aquifer of the Oreti River catchment through two borehead wells west of the main treatment plant on Lintley Road. Well depth is approximately 24 metres to the top of the well screen, with six metre long stainless steel wedge wire screens.

Design: treated rural water scheme. Restricted supply to farms and household storage tanks on the Lumsden-Balfour rural area, including Balfour township. Lumsden township is unrestricted but metered into the township.

Catchment: confined aquifer - may have a slight infiltration from upper unconfined aquifer.

(c) Water treatment

The treatment building is aligned in parallel on a duty/standby system. Suction and delivery pipework is 200 mm diameter stainless steel on the pumps.

There are two UV units (Wedeco spekton 150 reactors) and four (30 kw Lowara SV4607/2F300T) pumps.

Each pump is fitted with a Hydrovar variable frequency drive.

A surge relief valve is located on the delivery line which will operate in the event of a power failure.

Pump controls: pump control is by pressure in the rising main to the main reservoir. The pump station is monitored by Council's Kingfisher SCADA system.

Standby power: no standby power supply is incorporated.

(d) Storage

The Main Reservoir has a capacity of 450 m^3 equivalent to approximately seven hours at full demand. The tank farm consists of 20 concrete tanks.

The Balfour Reservoir is a 90 m^3 (four tanks) reservoir located on a rise on the Old Balfour Road, north-west of the town, feeds Balfour town and the rural supply network beyond Balfour. (Note - there is an extra tank at the reservoir site that is a consumer tank). The reservoir is gravity fed from the main reservoir and the secondary pumps at the WTP. An altitude valve at the Balfour reservoir controls the filling of the reservoir, a pressure transducer that transmits via UHF link radio to the Invercargill office.

The Longridge Reservoir is a 23 m^3 (one tank) reservoir located on Longridge Hill, feeds Longridge North and properties off Longridge Road.

Additional individual on-site storage of 48 hours is required off every connection.

(e) Booster station

The Longridge Booster Station contains two Grundfos CP3-100 pumps sending treated water to the Longridge Reservoir.

Pump controls: pump control is by a pressure switch and time delay. The pump station is monitored by Council's Kingfisher SCADA system.

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising mains are made of PVC. Gravity mains are made of polyethylene and PVC. No leak detection assessment has been carried out to date. A very basic hydraulic model has been produced for this scheme.

In Balfour, a 150 mm diameter uPVC main runs along Queen Street from the reservoir, and west along Kruger Street. The main reduces to 100 mm diameter uPVC south of the last fire hydrant in Queen Street, and also east along Kruger Street. Individual service connections are 20 mm HDPE. Testing results from hydrants in Balfour are sufficient to meet a W3 classification for Firefighting (7).

In the rural area, the majority of the reticulation mains linking reservoirs and in the top portion of branch lines are 200 mm and 150 mm diameter uPVC pipes. Extremities of branch lines are largely 100 mm diameter uPVC pipes, which reduce to 63 mm, 50 mm and 20 mm as the number of connections reduces. Individual service connections range in size from 15 mm to 25 mm diameter HDPE depending on the number of units being supplied and the available pressure (which depends on the location within the network).

Water meters

There are no zone or consumer water meters on this scheme but each consumer is restricted by the number of units they purchased.

Hydrants

There is one hydrant in the Balfour community but none in the outer rural network.

Asset condition and performance

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	30 m Well 1	1	1	A	2100
	30 m Well 2	1	1	A	2100
Treatment Plant	Transfer Pump 1	1	1	A	2039
	Transfer Pump 2	1	1	A	2039
	Transfer Pump 3	1	1	A	2039
	Transfer Pump 4	1	1	A	2039
	Chlorinator	1	1	A	2039
	UV unit controls	1	1	A	2029
	Surge Protection eq	1	1	A	2029
	Switchboard	1	1	A	2029
	Telemetry	1	1	A	2029

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Storage	Main Reservoir	1	1	A	2038
	Balfour Reservoir	1	1	A	2038
	Longridge Res.	3	3	B	2038
Booster Station (Longridge)	Booster Pump 1	2	2	C	2028
	Booster Pump 2	2	2	C	2020
	Pressure Surge eq	3	5	C	Unknown
	- Switchboard	3	2	C	2020
	- Telemetry	2	2	A	2027
Reticulation	Gravity mains	4	4	B	2058
	Rising mains	1	1	A	2058
	Valves	3	3	B	2038
	Hydrants	3	3	B	2069
	(Lumsden and Balfour Only)	3	3	B	2069
	Meters	3	3	B	2029

Appendix Table G: Lumsden/Lumsden-Balfour Condition and Performance

Note: The old Lumsden Water Treatment Plant has been abandoned, however in the case of a major event eg, earthquake, the plant could be re-activated.

Operation and maintenance

No issues.

Critical assets

Critical assets identified are:

- rising main from the treatment plant to the reservoirs/reticulation
- the chlorinator.
- the UV units
- the secondary pumps
- the well pumps and wells
- rising main to the Longridge reservoir
- falling main to the Lumsden township.

Key issues

There is currently a considerable amount of interest in extending the scheme to new users. It is therefore proposed to develop a short term and long term development strategy.
The short term strategy will focus on options available to allow a number of new farms to connect. The longer term option will also consider requirements to put Balfour township onto direct feed as well as potentially extending to Riversdale.

Capital expenditure plan - Lumsden

The issues discussed above have been addressed with the following projects:

Capital expenditure plan - Lumsden-Balfour (rural)

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Metering - District Metered Areas	WAT178	MS Project WAT178 in 17/18	LOS	19/20	83,025	District Funding
Consent Renewal Preparation	WAT177	MS Project 177 in 23/24	REN	23/24	22,540	District Funding
UV and Turbidity monitoring	WAT1683	Additional project in 18-28 LTP	REN	27/28	188,361	District Funding

Disposal plan

The old pump plant has been decommissioned, with electricity disconnected. The plant building and equipment are not insured. The asset is "maintained" for emergency situation only and is a short term solution at best.

Appendix H: Manapouri Water Supply

Description

The Manapouri community has an estimated 2013 usual resident population of 228 with a projected 2028 usual resident population of 354. The estimated peak population for Manapouri was 940 in 2006, projected to 332 in 2018. The scheme has 248 total equivalent connections.

History

The scheme was built in the 1969 by the New Zealand Electricity Department to service the workers village.

1975 - Water supply is chlorinated despite severe opposition from town residents.

1982 - SDC took over responsibility for the scheme.

1991 - Significant repairs are made to the rising main in the area of Frasers Beach.

1995 - Telemetry installed.

1999 - Montgomery Watson undertakes Hydraulic Analysis of reticulation.

2001 - Minor structural work and maintenance of the Water Tower is undertaken.

2002 - Depolox chlorine monitoring installed.

- Water Permit granted to extract 865 m^3/day from Lake Manapouri for 20 years.

2004 - S10K chlorine dosing installed.

2007 - New Secondary Pump 2 (Goulds GIS 80x65-160 5.5 kW).

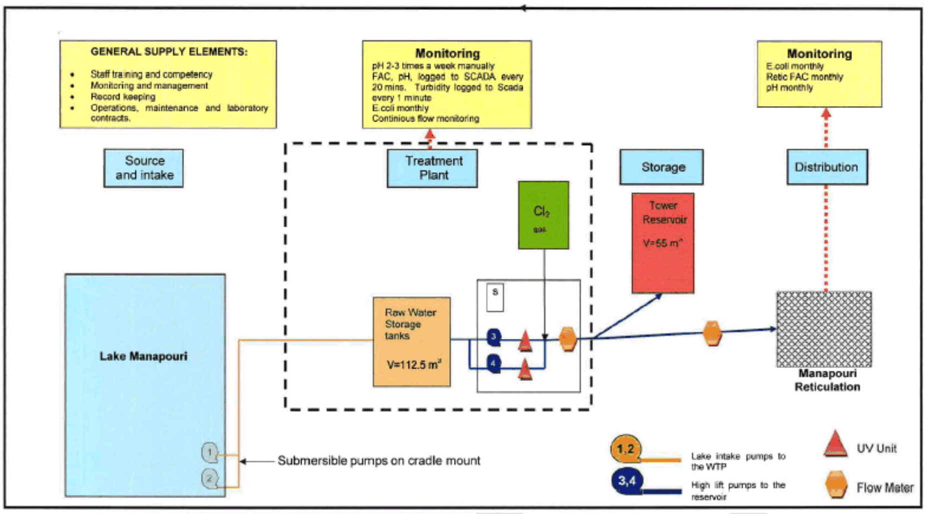
2008 - Scheme extension along Hillside Rd, 50 mm line.

- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2012 - Treatment plant upgrade undertaken to meet Drinking-water Standard requirements. Installation of UV disinfection along with pump and pipework upgrades.

2017 - Options for improvements considered

Process Description



Lake water pumped from Lake Manapouri to the treatment plant where water is treated with chlorine gas. Treated water is lifted to the Tower Reservoir before pressurising the reticulation. The supply network consists of gravity mains, rising mains, and valves.
Council owns and maintains the service connections from the trunk main to the toby at the boundary.

(a) Abstraction

Water Permit 201796 granted to take no more than 865 m³/day from Lake Manapouri. Consent expires 4 August 2023.

(b) Intake headworks

Two pumps are fixed to a cradle on the bed of Lake Manapouri. At normal lake level they lie in approximately 6-7 m of water. A sealed electrical supply extends from the lakeside to the pumps. Low lake levels expose the electricity supply cables at the water edge. Separate 50 mm diameter polyethylene rising mains extend from each pump to the lake shore where they join into a single 100 mm diameter asbestos cement rising main which extends 44 m (vertical) to the treatment plant.
Flexible steel helicore pipe connections are fitted in-line near the pumps and near the shore connection into the 100 mm diameter rising main.

Duties are alternated and pumps are stopped and started automatically at pre-set contact tank water levels.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: controlled by a direct connection to level sensors in the contact tanks.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

The treatment plant is located under the tower reservoir and consists of disinfection equipment and contact tanks. Chlorine gas is injected to disinfect the raw water prior to entering the contact tanks.
Correct doses are consistently achieved by set point chlorination controlled by a Depolox-4 unit.
Two pumps: An original 5.5 kW Brown Brothers pump and the new Goulds pump lift treated water to the tower reservoir.

Pump controls: the pumps are controlled by an ultra sonic level controller in the tower reservoir with a direct connection to the switchboard. The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

Five concrete contact tanks provide 112.5 m^3 of contact storage. The tower reservoir has a capacity of 55 m^3. It is constructed of steel and elevated approximately 18 m above ground. For a current population of 306 usual residents at 250 L/p/day gives storage time of 17.2 hours, see comment below for fire storage.

(e) Reticulation

The rising main is made up of asbestos cement and polyethylene. Gravity mains are made up of PVC, polyethylene, and asbestos cement. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme. Good pipe location and size information is available on Council's GIS. Some general observations from a review of this information are as follows:

Firefighting capacity is poor in Manapouri. Few of the hydrants in Manapouri satisfy the minimum flow requirements of 25 L/s. Those that do comply are located on Waiau Street near Pearl Harbour and at the intersection of View Street. Three quarters of the hydrants are capable of flows less than 80% of the required 25 L/s flow for Class E Firefighting Requirements.

The Tower Reservoir is capable of providing water for approximately 25 minutes of concurrent Class E and average daily flows (if starting at 80% full). The minimum requirement is one hour standby flow for Type E fire zones.

If the contact tanks are considered part of the available storage then approximately one hour and 25 minutes of concurrent Class E at average daily flows (if starting at 80% full) can be provided. To provide for continuity of electricity supply to the high-lift pumps, which supply water to the town from the contact tanks, a standby generator would be required.

(f) Water meters and hydrants

There are no zone or consumer water meters and 36 hydrants on this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Pump Cradle	3	3	B	2028
	Primary Pump 1	3	3	B	2026
	Primary Pump 2	3	3	B	2023
Treatment Plant	Chlorinator	1	1	C	2018
	Contact Tanks	5	5	C	2018
	Secondary Pump 1	1	1	C	2023
	Secondary Pump 2	1	1	A	2027
	Switchboard	2	2	C	2025
	Telemetry		1	A	2031
	UV Units	1	1	A	2037

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ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Flow Meter	1	1	A	2037
Storage	Tower Reservoir	2	2	C	2060
Reticulation	Gravity mains	3	3	B	2028
	Rising mains	4	4	B	2028
	Valves	3	3	B	2018
	Hydrants	3	3	B	2060
	Meters	3	3	B	2030

Appendix Table H: Manapouri Condition and Performance

Operation and maintenance

No known issues.

Critical assets

Critical assets identified are:

- rising main from the intake to the reservoir
- the chlorinator.

Key issues

- lack of firefighting capacity at a number of locations
- the reservoir will also require replacement within the planning period
- the ageing reticulation is coming to the end of design life in 2028
- raw water quality can vary with high turbidity events causing risk of non-compliance with Drinking Water Standards. It is proposed to investigate options for improvements in the upcoming LTP period.

Capital expenditure plan

The following renewal projects have been identified to address condition and performance issues:

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Extend Water Treatment Plant for pH correction system	WAT241	result of scheme tour 2014 MS Project WAT241	LOS	18/19	160,371	District Funding
Replace pipeline contact tanks to manifold and intake upgrade	WAT259	result fo scheme tour 2014	REN	19/20	138,375	District Funding
Metering - District Metered Areas	WAT262	MS Project WAT262	LOS	19/20	24,088	District Funding
Electrical mains replacement to intake in shielded cable	WAT1505	Additional project in 18-28 LTP	REN	19/20	117,875	District Funding
Lateral to Possum Lodge replace with 50mm to assist pressure	WAT1527	Additional project 18-28 LTP	REN	19/20	66,625	District Funding
WTP upgrade re turbidity	WAT1531	Additional project in 18-28 LTP	LOS	19/20	512,500	District Funding
Extend Water Treatment Plant for pH correction system	WAT241	result of scheme tour 2014 MS Project WAT241	LOS	20/21	157,286	District Funding
WTP upgrade re turbidity	WAT1531	Additional project in 18-28 LTP	LOS	20/21	524,288	District Funding
Consent Renewal Preparation	WAT261	MS Project - WAT261	REN	21/22	21,475	District Funding
Switchboards, pumps and monitoring	WAT1687	Additional project in 18-28 LTP	REN	24/25	182,793	District Funding

There is currently no disposal plan in place for assets.

Appendix I: Matuku Rural Water Supply

Description

The Matuku (restricted) Rural Water Supply has eight connections to the scheme with a total of 156 units of water allocated (1 unit equals 1,818L/day). There are also eight trough connections with a total of 161 units allocated. The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Matuku Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1998 - Water Permit granted to extract 219.6 m^3/day from the Aparima River for 20 years.

1998 - A new intake structure was constructed to replace the old well following ongoing poor yield issues.

2003 - Dewatering pump installed in an inclined pipe to better manage turbid water.

2007 - Radio replaced.

- Additional highlift pump installed (Lowara SV805 2.2 kW).

2008 - River pump replaced.

- Spare river pump purchased (Lowara 8GS07 0.75 kW).

2014 - Investigations into water loss undertaken.

2017 - Safety improvements at intake undertaken.

2017 - Application for re-consenting of intake prepared.

Process description

River water is drawn from the Aparima River and pumped to a storage reservoir and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves.
Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 97373 granted to take no more than 219.6 m^3/day from the Aparima River at a maximum rate of 9.15 m^3/hr. Consent expires 26 August 2018.

(b) Intake headworks

Water is drawn from the Aparima River by a dewatering pump located in an inclined PVC pipe. The pump is manually adjusted on a rope to ensure the inlet is under water. The intake is affected by river quality and quantity issues. The river pump discharges to a clearwater tank.

A Discharge Permit 97374 to release silt from the intake pipe and filter backwash on to land. Consent expires 26 August 2018.

Design: restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: the river pump is controlled by a direct link to float switches in the clear water tank.

Standby Power: no standby power supply is incorporated.

(c) Water treatment

This is a non-potable untreated supply.

(d) Pump stations

There are two booster pumps conveying water to the reservoir:

Pump controls: The booster pumps operate on a duty-standby arrangement. They are controlled by an ultrasonic level control (ultrasonic hawk unit) powered by a direct cable link. The pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: No standby power supply is incorporated.

(e) Storage

The main reservoir has a capacity of 45 m^3. It is 3.8 hours storage at current demand (156 units).

(f) Reticulation

The rising main is PVC. The gravity mains are polyethylene and PVC. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters and 1 hydrant on this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Inclined pipe	2	2	C	2031
	River pump	3	3	B	2020
	River Pump (spare)	3	3	B	N/A
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Pump stations	Clear water tank	1	1	C	Unknown
	Pump 1	2	2	C	Unknown
	Pump 2	2	2	A	2032
	Switchboard	4	3	C	2025
	Telemetry	2	2	A	2025
Storage	Main Reservoir	4	3	D	2031
Reticulation	Gravity mains	3	3	B	2051
	Rising mains	3	3	B	2051
	Valves	3	3	B	2031
	Hydrants	N/A	3	B	2051
	Meters	3	3	B	2025

Appendix Table I: Matuku Rural Water Supply Condition and Performance

Operation and maintenance

No known issues.

Critical assets

Critical assets identified are the rising main from the intake to the reservoir and the river pump.

Key issues

- poor performance of the river pump.
- the telemetry unit (RTU) requires upgrading to Kingfisher/Citect, the SCADA system.
- the scheme may be required to meet the DWS including the development of a PHRMP and associated infrastructure upgrades. For planning purposes it has been assumed that this scheme would be categorised as Rural Agricultural. To date there is no confirmation around required timescales, however this date had been extended beyond.
- renewal of water permit in 2018.

Capital expenditure plan

The following LOS and Renewal projects have been programmed to address the above issues:

Matuku

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Install flowmeter and new intake pump	RW272	MS Project RW272 in 17/18	REN	18/19	20,000	Loan & Reserves

Appendix J: Mossburn Water Supply

Description

The Mossburn community has an estimated 2013 usual resident population of 201 with a projected 2018 usual resident population of 222. The scheme has 120 connections.

The scheme registered with the MOH but is currently upgraded.

History

The township water supply was established in 1964 with a supply bore at the north end of Cumberland Street and a small diameter pipework system. Labour for scheme construction was provided by the residents of Mossburn as a cost saving measure. The original bore is now partially collapsed.

1982 - SDC took over responsibility for the scheme.

1986 - Water supply upgrade which include large diameter main with firefighting capacity, new well in Cumberland Street and additional reservoir storage.

1991 - Water Permit granted to extract 440 m^3/day from groundwater in the Oreti catchment for 10 years.

1995 - Telemetry installed.

1997 - Local well re-developed.

2001 - New well constructed and pump (Grundfos SP25-7 5.5 kW) installed to accommodate for the expansion of Silver Fern Farms Limited (formerly PPCS).

2005 - New switchboard installed at intake.

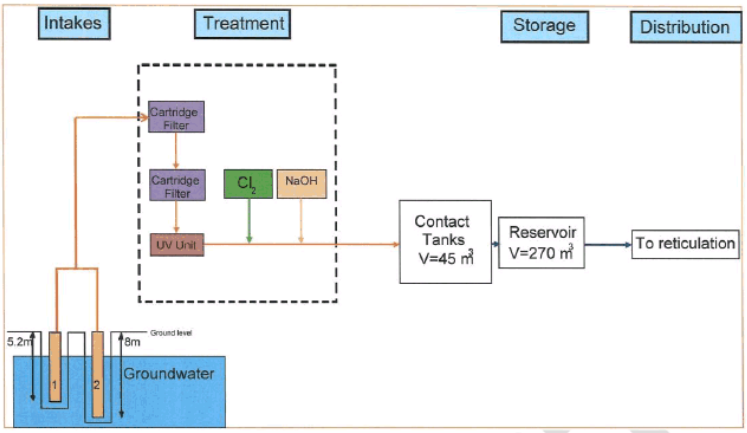
2006 - Water meter installed at intake.

- Water Permit 200181 granted.
- Cornwell Street main renewed due to poor condition.

2014 - New treatment plant installed in 2014.

2016 - Silver Fern Farms works closes down.

Process description



Groundwater is drawn from the gravels of the Oreti River catchment by two wells. Water is aerated and treated with chlorine gas before being pumped to the main reservoir. Treated water gravitates to network reticulation. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the toby at the boundary.

(a) Abstraction

Water Permit 200181 granted to take a total of 600 m^3/day from groundwater in the Oreti catchment. Consent expires 3 November 2026.

(b) Intake headworks

Raw water is sourced from two wells near the golf course. The "local" well was constructed in 1986 approximately 300 m from the true right bank of the Oreti River and 5.2 m deep.

An 8 m deep well was installed October 2001 to supplement the supply and is located 100 m north of the "local" well. Over the past few years there have been numerous low well events.

Primary P1 is located in the remote well and is of slightly less capacity than the Primary P2. The pump is a multi-stage submersible pump in good condition, however, this pump is approximately 15 years old and due for replacement in 2005.

Primary P2 is located in the local well and is of slightly greater capacity than the Primary P1. The pump is a multi-stage submersible pump in good condition.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: The primary pumps are controlled by an ultrasonic level control (ultrasonic hawk unit) at the reservoir by a direct cable link. The pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

In 2014 a new treatment plant was constructed to meet requirements of the Drinking Water Standards. This is now a multi stage plant incorporating filtration pH correction with caustic soda, chlorination and UV disinfection before water is pumped up to the existing contact tanks from where water is supplied to the reticulation network by gravity.

(d) Storage

Total storage of 308 m^3 is available comprising of contact tank 44 m^3 (2 x 5,000 gallon) and main reservoir storage at 264 m^3 (12 x 5,000 gallon). The main reservoir has approximately 12 hours at full demand.

(e) Reticulation

The rising main is PVC. Gravity mains are polyethylene and PVC. The majority of the reticulation network was installed in the early 1960s. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme. Hydrants tested by the New Zealand Fire Service comply with the "New Zealand Fire Service Code of Practice for Firefighting Water Supplies" requirement.

(f) Water Meters and Hydrants

There is a zone meter on the rising main from the intake as well as 14 consumer water meters.

There are 26 hydrants on this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	3.3 m Well (old)	5	5	A	Out of Service
	5.2 m Well (Local)	2	4	B	2040
	8 m Well (Remote)	2	4	B	2061
	Primary P1 (Remote)	3	3	B	2025
	Primary P2 (Local)	3	3	B	2025
	Switchboard	1	1	A	2030
	Telemetry	1	1	A	2025
Treatment Plant	Filtration	1	1	A	2025
	pH Correction	1	1	A	Unknown
	Chlorination	1	1	A	Unknown
	UV Disinfection	1	1	A	2021
Storage	Main Reservoir	3	3	B	2021
	Flow Meter	1	1	A	2037
Reticulation	Gravity mains	3	3	B	2084
	Rising mains	3	3	B	2084
	Valves	3	3	B	2044
	Hydrants	3	3	B	2084
	Meters	1	1	B	2084

Appendix Table J: Mossburn Condition and Performance

Operation and maintenance

There are issues with the telecom communication line occasionally failing between the intake and the reservoir - this can cause the pumps to fail to start when the reservoir calls for water.

There are occasional periods of low water levels in the wells but it is unclear whether this is a groundwater issue or a well issue.

There have been issues in the past with the capacity of the well and the inability to keep up with demand in summer. It is thought that this is due to groundwater levels but flow paths are uncertain. The wells are thought to have slotted (steel) casing screens which may be corroding and restricting entry of water to the wells.

Critical assets

Critical assets identified are:

- rising main from the intake to the treatment plant.
- the chlorinator.
- UV Disinfection
- rising main to contact tanks.

Key issues

- both wells are not performing during dry summers and are due for redevelopment.
- the reservoir and contact tanks meet the end of their design life in 2021.
- Bedford Road continues to present problems for properties connected to the 25 mm rider main. It is proposed to extend the existing eight service connections to the 100 mm main and decommission the rider main.

Capital expenditure plan

The following projects have been programmed to address the above issues.

Acquisition - demand

There are no projects programmed to meet increasing demand in this 10 year period.

Monowai Sewerage Scheme

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Contact tanks and clorine monitoring	WAT1691	Additional project 18-28 LTP	REN	23/24	184,310	District Funding
Consent Renewal Preparation	WAT288	MS Project - WAT288	REN	23/24	22,540	District Funding

Appendix K: Mount York Rural Water Supply

Description

The Mount York (restricted) Rural Water Supply has 15 connections to the scheme with a total of 175.5 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1989 - Water Permit granted to extract 1056 m^3/day from the Mararoa River for 10 years (combined consent for Mt York and Takitimu).

1995 - Telemetry installed.

1999 - Takitimu scheme removed from combined intake.

2002 - New Booster Station constructed to service the Freestone Hill area.

2006 - Water Permit 99164 granted.

2008 - New vertical multistage pump (Pump 1) installed at intake (Lowara SV33-07 15 kW).

- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).
- New vertical multistage pump (Pump 2) installed at intake (Lowara SV33-07 15 kW).

Process description

River water is drawn from the Mararoa River and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 99164 granted to take 1,056 m^3/day (in association with Takitimu RWS) from groundwater in the Waiau catchment. Consent expires 7 November 2026.

(b) Intake headworks

Water is drawn from the Mararoa River approximately 3,000 m downstream of Hillside-Manapouri Road. Water is pumped by centrifugal pumps to a 182 m^3 reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pump control is by a multi-level controller (float-less switch) at the reservoir and transmitted to the intake via UHF link (SALCOM).

The intake is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 182 m^3. The time equivalent at full demand is 13.6 hrs at current demand (175.5 units).

The Mt York reservoir has a capacity of 22 m^3. The time equivalent at full demand is unknown.

The Freestone reservoir has a capacity of 91 m^3. The time equivalent at full demand is unknown.

(e) Booster stations

1. (Mt York/Lester Stephens)

There is one pump discharging to the network.

Pump controls: pump control is by a multi-level controller (float-less switch) at the reservoir and transmitted to the intake via UHF link (SALCOM). Mr Stephens runs the pump manually when required. Very low use site.

Standby power: no standby power supply is incorporated.

2. (Freestone)

There is one pump discharging to the network. There was an agreement in place to provide electricity to the Freestone farm for an electric fence as part of the agreement to locate the station on the farm. In recent years the farm also takes power for a new woolshed. This is causing an increased burden on the supply.

Pump controls: pump control is by a pressure switch with a delay. The pump station is not monitored by Council's SCADA system.

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising main is PVC. Gravity mains are PVC and polyethylene. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	3.5 m Well	3	2	C	2031
	Transfer Pump 1	1	1	A	2033
	Transfer Pump 2	1	1	A	2033
	Surge Protection	4	5	C	2005
	Switchboard	1	1	C	2020
	Telemetry	1	3	A	2018

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage	Main Reservoir	5	2	C	2008
Booster Station 1	Booster Pump 1	4	3	C	2010(**)
	Switchboard	5	4	C	2028
Booster Storage 1	Mt York reservoir	3	2	C	2018
Booster Station 2	Booster Pump 2	1	1	B	2027
	Switchboard	2	2	C	2027
Booster Storage 2	Freestone reservoir	3	2	C	2018
Reticulation	Gravity mains	3	3	B	2051
	Rising mains	3	3	B	2051
	Valves	3	3	B	2021
	Hydrants	N/A	N/A	N/A	N/A
	Meters	3	3	B	2051

Appendix Table K: Mount York RWS Condition and Performance

Operation and maintenance

No issues.

Critical assets

Critical assets identified are:

- rising main from the intake to the main reservoir.
- rising main from the intake to the Mt York reservoir.
- rising main from the intake to the Freestone reservoir.
- Freestone booster pump.

Key issues

It is suspected that the supply is being used as a source of drinking water.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Plant and Equipment (Mt York)	RW1609	Additional project in 18-28 LTP	REN	20/21	19,036	Reserves
Consent Renewal Preparation (Mt York)	RW316	MS project RW316	REN	23/24	22,540	Reserves

Appendix L: Ohai-Nightcaps-Wairio Water Supply

Description

The Ohai-Nightcaps community has an estimated 2013 usual resident population of 609 with a projected 2018 usual resident population of 606. The scheme has 374 connections.

History

The scheme was built in 1952 for the Ohai community. Originally an untreated scheme the water was pumped from the Morley Stream in the north-east of Ohai to header tanks on the hill to the south.

1972 - Full treatment plant constructed after high risk of contamination identified (the water fermented). Treatment facility included coagulation, clarification, pH correction, followed by filtration and chlorination.

1972 - Supply extended to Nightcaps.

1982 - SDC took over responsibility for the scheme.

1987 - Supply extended to Wairio and the former Wairio School (now Te Kohanga Reo O Ohai) beyond.

2000 - Mount Linton Station joins scheme as a large consumer.

2001 - Ageing dosing pumps are replaced.

- Primary Pump 2 (1963) replaced (Southern Cross 80x50-315) and intake modified to the original dry well to setting/suction tank arrangement. Primary Pump 3 removed from service.

2002 - Water Permit granted to extract 800 m^3/day from the Morley Stream for 20 years.

2003 - Discharge Permit granted to discharge 2,000 m^3/year of backwash water from the sand filters at the treatment plant for 20 years.

2006 - Mixing tower overhauled.

2007 - Primary Pump 1 replaced (Goulds GIS 80x50-315 45 kW).

2008 - Leak detection work carried out due to severe water shortages especially in the Sinclair Avenue area.

- PHRMP approved by Drinking Water Assessor.

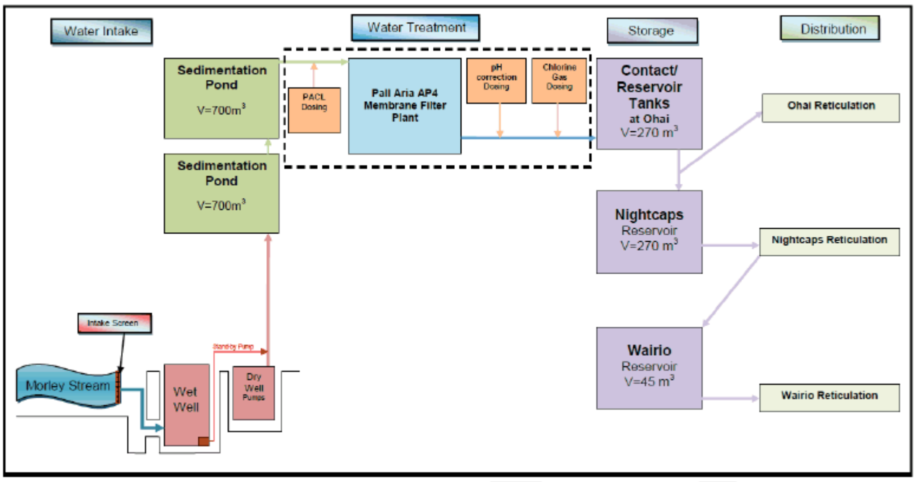
2009 - MOH Subsidy funding for the following work carried out between 2009 and 2011.

- Replacement falling main to Nightcaps.
- Upgrade of Nightcaps storage tanks from 272 m^3 to 407 m^3.
- New treatment plant capable of treating up to 1,200 m^3/day.

2012 - In-take upgrade completed.

2017 - Consent for increased water take granted.

Process description



River water is drawn from the Morley Stream and pumped to the treatment plant and the reservoir. Treated water gravitates to the reticulation network. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the toby tap at the boundary.

(a) Abstraction

Water Permit 20474 granted to take no more than 800 m^3/day from the Morley Stream. Consent expires 28 November 2022.

(b) Intake headworks

Water is pumped from the intake to the treatment facilities, on the hill to the south, through a 650 m long, 150 mm diameter concrete lined steel rising main. The intake is affected by river quality and quantity issues. At times extra pumping equipment is required to pump river water into the wet well. The intake was upgraded in 2012.

(c) Water treatment

The treatment facilities are located on designated, elevated land to the south of the water intake. The rising main from the intake discharges into a mixing tower where alum and polyelectrolyte are mixed into the water. Water then cascades into the lower reservoir for coagulation and finishing settlement of floc. The alum dosed water is subsequently treated via a micro-filtration plant which was commissioned in late 2012. Consent expires 28 November 2022.

(d) Storage

The main reservoir has a capacity of 227 m^3. The time equivalent at full demand is unknown.
The Nightcaps reservoir has a capacity of 407 m^3. The time equivalent at full demand is unknown. The Wairio reservoir has a capacity of 45 m^3. The time equivalent at full demand is unknown. There are two fire storage (22.5 m^3 each) reservoir tanks in Wairio (one at each end of the town) which are fed off the third Wairio reservoir.

(e) Reticulation

From the intake to treatment plant the rising main is made of concrete lined steel. The Nightcaps booster rising main is made of PVC. Gravity mains are made up of asbestos cement, PVC, polyethylene, copper, and steel. No hydraulic model has been produced for this scheme.

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Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Inlet structure	3	5	C	2040
	Primary Pump 1	1	1	A	2032
	Primary Pump 2	1	2	C	2026
	Switchboard	1	1	A	2030
	Telemetry	1	1	A	2025
Treatment Plant	Microfiltration Plant	1	1	A	2022
	*Chem. mixing tower	1	1	A	2025
	*Clarifier	4	4	C	2029
	*Alum dosing pumps	1	1	A	2026
	Telemetry	1	1	A	2026
Storage 1	Main Reservoir	4	4	C	2011
Booster station	Booster Pump	N/A	N/A	N/A	-
	Switchboard	1	1	C	2023
Storage 2	Nightcaps Reservoir	3	2	C	2031
Storage 3	Wairio Reservoir	4	3	C	2046
Storage 4	Wairio firefighting	5	4	C	2046
Reticulation	Gravity mains	4	4	B	2018
	Rising mains	4	4	B	2018
	Valves	4	4	B	2018
	Hydrants	4	4	B	2046
	Meters	4	4	B	2023

Appendix Table L: Ohai-Nightcaps-Wairio Condition and Performance

Operation and maintenance

Site security has been an increasing issue for the Ohai Treatment Plant with increasing costs for repairs caused by vandalism.

There is an emerging trend for higher maintenance costs associated with valves and hydrants.

Critical assets

Critical assets identified are:

- rising main from the intake to the treatment plant.
- falling mains from treatment plant to Ohai and Nightcaps.
- new membrane treatment plant.
- chlorinator.
- Nightcaps booster pump.

Key issues

- the reticulation begins to meet the end of the design life in 2022. Strategically it has been agreed to rely on an increase of planne /unplanned maintenance rather than undertake a significant renewals programme.
- the Wairio fire tanks are in poor condition and need replaced (the WSC has requested that prior to the Wairio tanks being replaced the condition be reviewed and the results discussed with the Committee).

Capital expenditure plan

The following projects have been programmed to address the above issues:

Ohai/Nightcaps/Wairio Water

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Tank replacement	WAT696	replacement of tanks at Ohai for safety purposes	REN	18/19	90,000	District Funding
Ohai - Consent Renewal Preparation	WAT342	MS Project - WAT342 (LOS Statutory)	REN	20/21	20,972	District Funding
Nightcaps - Water main renewal Sinclair Ave	WAT1504	Additional project in 18 - 28 LTP	REN	22/23	109,951	District Funding
Ohai - Switchboard and monitoring	WAT1694	Additional porect 18-28 LTP	REN	26/27	191,055	District Funding

Appendix M: Orawia Water Supply

Description

The scheme has eight connections to the scheme with a total of 24 units of water allocated (1 unit equals 1,818L/day).

The scheme is registered with the MOH but is currently ungraded.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1998 - Water Permit granted to extract 45.5 m^3/day from the Waiau catchment for 20 years.

2014 - New package water treatment plant installed.

2015 - Intake upgrades completed

2017 - New water take consent prepared.

Process description

Spring water is collected and gravitates to a treatment plant before discharging into household storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

Consumers have been issued with a permanent Boil Water Notice.

(a) Abstraction

Water Permit 97372 granted to take at a maximum rate of 45.5 m^3/hr.

Consent expires 30 October 2018.

(b) Intake Headworks

Water is collected from the Orawia Spring approximately 2,000 m north-west of the Orawia township. The intake is affected by surface water quality and quantity issues. An improvement is planned for the 2015 year.

Design: treated urban supply. Restricted supply to household storage tanks.

Catchment: Unconfined catchment.

Pump controls: there are no pumps and no SCADA.

Standby power: no standby power supply is required.

(c) Water treatment

Package water treatment plant based around filtration and disinfection was installed in 2014

(d) Storage

The main reservoir has a capacity of 46 m^3. The time equivalent at full demand is approximately one day at the current demand (24 units).

(e) Reticulation

The gravity mains are made up of polyethylene and PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(f) Water meters

There are no zone or consumer water meters and three hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Inlet structure	2	2	A	2036
Treatment Plant	Package Plant	1	1	A	2025
Storage	Main Reservoir	1	1	A	2046
Reticulation	Gravity mains	3	3	B	Unknown
	Rising mains	3	3	B	Unknown
	Valves	3	3	B	Unknown
	Hydrants*	-	-	-	N/A
	Meters	1	1	A	2036

Appendix Table M: Orawia Condition and Performance

* Hydrant requirements for this scheme are no longer required.

* Filtration and chlorination and UV is combined at "package plant".

Operation and maintenance

New treatment plant operating well.

Critical assets

Critical assets identified are:

- filters
- chlorination.

Key issues

Intake was upgraded in 2015.

Capital expenditure plan

No projects are planned.

Appendix N: Otautau Water Supply

Description

The Otautau community has an estimated 2013 usual resident population of 798 with a projected 2018 usual resident population of 892. The scheme has 420 connections.

History

The Otautau water supply was established in 1963/1964.

1975 - New well constructed to reduce risk of upstream contamination (low groundwater levels and suspected contamination from farm effluent - no longer in operation).

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

1997 - Secondary pumps renewed.

1997 - Treatment plant switchboard replaced and upgraded to include soft start to secondary pumps.

2001 - Chlorination installed.

2004 - Water Permit granted to extract 1,056 m^3/day from groundwater in the Aparima catchment for 20 years.

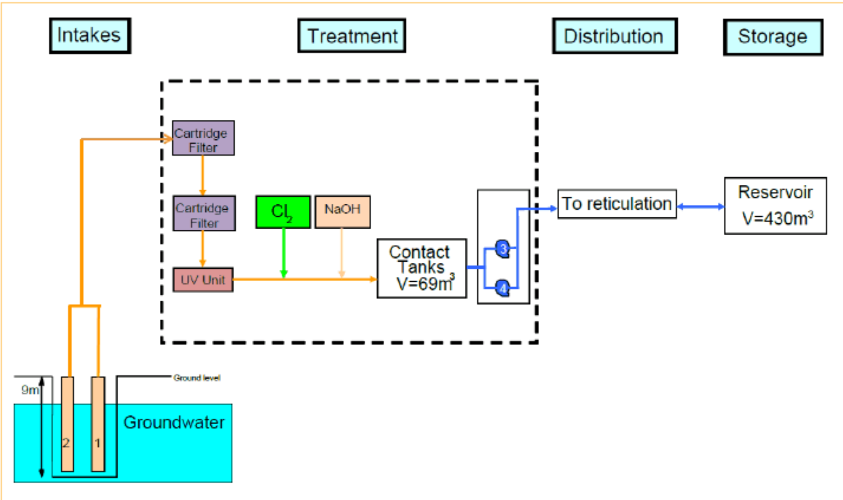
2005 - Pipe samples tested by Opus (Elton Street).

2009 - Slaughterhouse road main replacement.

2011 - Replacement of 150 mm AC pipe on Main Street.

2014 - Treatment plant upgraded with filtration pH correction and UV disinfection equipment installed.

Process description



Groundwater is drawn from the gravels of the Aparima River catchment and passes through a treatment plant before being pumped to the main reservoir. Treated water gravitates to the reticulation network. The supply network consists of gravity mains, rising mains, fire hydrants and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

(a) Abstraction

Water Permit 99185 granted to take 1,056 m^3/day from groundwater in the Aparima catchment. Consent expires 19 July 2024.

(b) Intake headworks

The intake and treatment plant are located on Liemen Street approximately 150 m from the true right bank of the Aparima River. The well is constructed of 760 mm slotted steel to a depth of nine metres and contains two submersible pumps (duty/standby) who deliver raw water to the contact tanks at the treatment plant.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: primary pumps are controlled by probes in the contact tanks by a direct cable link.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

The water is chlorinated as it enters the contact tanks following a simple aeration device. The aeration treatment serves to increase the pH of the raw water typically from 6.1 up to 7.0 before entering the reticulation system. The purpose of the pH correction is to decrease the slightly corrosive effect of the water on metal and cement pipework and fittings. Water from the contact tanks is supplied through the reticulation network to the reservoir by two secondary pumps (duty/standby).

Pump controls: the secondary pumps are controlled by an ultrasonic level control (ultrasonic hawk unit) at the reservoir and transmitted to the treatment plant via UHF link (SALCOM). The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

The main reservoir has a capacity of 360 m^3 equivalent to approximately 16 hours at full demand. The precast concrete reservoir is located 1.7 km south-west of the centre of Otautau on Knutsford Road.

(e) Reticulation

The rising main and gravity mains are asbestos cement and polyethylene. The majority of the reticulation network was installed in 1963/64. The gravity mains are primarily 150 mm diameter asbestos cement trunk mains and 100 mm diameter sub-mains. Minor, smaller diameter, laterals extend from the 100 mm diameter laterals in Kendal Street to the west up Slaughterhouse Road and to some other peripheral properties along the western boundary of the urban area.

(f) Water meters

There is a meter on the rising main leaving the plant and 25 consumer water meters. There are 96 hydrants on this scheme.

Condition and performance

The pipe sample tested by Opus in 2005 was in very poor condition. The operator also reports lines in Slaughterhouse Road, Gray Street, Lieman Street and George Street as being in poor condition.

Some cracks were recently identified in the front wall of the reservoir.

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Old Well	2	2	A	Unknown
	9 m Well	3	4	C	2034
	Primary Pump 1	1	2	A	2020
	Primary Pump 2	1	2	A	2022
	New Primary pump	1	1	C	2028
Treatment Plant	Aerator REMOVED 2015	2	2	C	2026
	Chlorinator	3	3	C	2018
	Contact tanks	2	2	C	2023
	Secondary Pump 1	2	2	C	2023
	Secondary Pump 2	2	2	C	2023
	Switchboard	1	1	A	2025
	Telemetry	1	5		
Storage	Main Reservoir	2	4	C	Unknown
Reticulation	Gravity mains	4	3	B	2022
	Rising mains	5	3	B	2022
	Valves	3	3	B	2018
	Hydrants	3	3	C	2022
	Meters	3	3	C	2022

Appendix Table N: Otautau Condition and Performance

Note: There is now UV and filtration and PH correction at treatment plant.

Operation and maintenance

Increasing amount being spent maintaining Talbot valves suggesting these are at the end of their life. Renewal strategy required. Raw water quality is degrading over time, consider programming raw water monitoring.

Critical assets

Critical assets identified are:

- rising main from the intake to the reservoir.
- the aerator.
- the chlorinator.

Key issues

- although both primary pumps have met the ends of their design lives the decision has been made in conjunction with the Community Board to keep the pumps in service until they fail. This is on the basis that there are two operating pumps with a spare pump ready to install.
- the issue for Otautau is the aerator is at the end of the design life and needs replaced.

- confirm condition of reservoir.
- reticulation renewals will be required pending likely condition assessment work. Allow for lateral/valve replacements.
- the contact tanks meet the end of the design life in 2012.
- the telemetry unit (RTU) requires upgrading to Kingfisher/Citect, the SCADA system.
- the scheme is required to meet the DWS including the development of a PHRMP and associated infrastructure upgrades. For planning purposes it has been assumed that this scheme would be categorised as minor with compliance due by 1 July 2014.
- the renewal of the water permit is due in 2024.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Otautau

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WAT435	MS Project WAT435	REN	22/23	21,990	District Funding

Appendix O: Princhester Rural Water Supply

Description

The Princhester (restricted) Rural Water Supply has three connections to the scheme with a total of 19.9 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise. There have been difficulties in the past with probes due to the low conductivity of the water.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

1998 - Water Permit granted to extract 50 m^3/day from the Lagoon Creek for 20 years.

2002 - New well installed to overcome water quality issues.

2006 - New intake pump (Lowara 6G S30 3 kW).

2008 - Section of rising main from booster replaced (approximately 1.3 km).

- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

Process description

River water is drawn from Lagoon Creek and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 98094 granted to take 50 m^3/day from Lagoon Creek at a maximum rate of 0.002 m^3/s. Consent expires 22 January 2019.

(b) Intake headworks

Water is drawn from an intake well situated on the east bank of Lagoon Creek approximately 3,500 m upstream of State Highway 94. Water is pumped by a centrifugal pump to the main reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel. Well levels have not changed since the well was installed. There is a secondary intake from a spring that can feed directly into the booster reservoir during some months of the year.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pump control is by solar powered ultrasonic level controller (ultrasonic hawk unit) at the main reservoir and transmitted to the intake via UHF link (SALCOM). The intake is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 68 m^3 equivalent to approximately 13 hours at full demand. The Booster reservoir has a capacity of 46 m^3 equivalent to approximately 9.5 hours at full demand.

(e) Booster stations

There is one pump in discharging to the network.

Pump controls: pump control is by a pressure switch with a delay. The pump station is not monitored by Council's SCADA system.

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising main and gravity main is made up of PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters, hydrants and valves

There are no zone or consumer water meters or hydrants on this scheme. There are an unknown number of valves.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below.

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End of Life (IPS)
Intake	5 m Well	4	2	C	2040
	Primary Pump 1	1	1	A	2032
	Switchboard	2	2	C	2018
	Telemetry	2	5	A	2018
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage 1	Main Reservoir	2	2	C	2040
Booster station	Booster Pump 1	3	3	C	2018
	Switchboard	4	4	C	2018
Storage 2	Booster Reservoir	2	4	C	2040
Reticulation	Gravity mains	4	3	B	2020
	Rising mains	4	3	B	2020
	Valves	3	3	B	2040
	Hydrants	N/A	N/A	N/A	-
	Meters	3	3	C	2040

Appendix Table O: Princhester RWS Condition and Performance

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Operation and maintenance

There are increasing issues relating to private property leaks. Scheme sometimes suffers from a lack of supply during the winter months.

Critical assets

Critical assets identified are:

- the well pump.
- the rising main from the intake to the main reservoir.
- the rising main from the main reservoir to the booster reservoir.

Key issues

- electrical equipment at the intake and the booster are at the end of their design lives.
- resource consent renewal will be applied for in 2018.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Princhester)	RW439	MS Project in 17/18	REN	18/19	20,000	Rates & Reserves

Appendix P: Ramparts Rural Water Supply

Description

The Ramparts (restricted) Rural Water Supply has 56 connections to the scheme with a total of 166.7 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

2000 - Water Permit granted to extract 720 m^3/day from Kakapo Swamp for 20 years.

2004 - New Booster Pump 1 installed (Grundfos CP8-80K 3 kW).

2006 - New Booster Pump 2 installed (Lowara SV808 4 kW).

2007 - New motor to Primary Pump 1.

2008 - New Primary Pump 1 (Lowara 2630/15 18.5 kW).

- New Primary Pump 2.
- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

Process description

River water is drawn from Kakapo Swamp and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 99018 granted to take 720 m^3/day from the Kakapo Swamp at a maximum rate of 30 m^3/hr. Consent expires 3 May 2020.

(b) Intake headworks

Water is drawn from intake wells situated at the north end of the Kakapo Swamp. Water is pumped by submersible bore pumps to the main reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel. The intake is affected by river quality and quantity issues.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pump control is by solar powered ultrasonic level controller (ultrasonic hawk unit) at the main reservoir and transmitted to the intake via UHF link (SALCOM). The intake is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

This is a non-potable untreated supply.

(d) Storage 1

- the main reservoir has a capacity of 182 m^3 equivalent to approximately 13 hours at full demand.
- the Kepler reservoir has a capacity of 136 m^3 equivalent to approximately 230 hours at full demand.
- the Booster reservoir has a capacity of 68 m^3 equivalent to approximately 230 hours at full demand.

(e) Booster station

There are two boosters pump discharging to the network.

Pump controls: pump control is by a pressure switch with a delay. The pump station is not monitored by Council's SCADA system.

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising main is made of PVC. The gravity mains are made up of PVC and polyethylene. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	5.3 m Well	2	2	C	2034
	Primary Pump 1	1	1	A	2033
	Primary Pump 2	1	1	A	2033
	Switchboard	4	3	C	2018
	Telemetry	2	5	A	2018
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage 1	Main Reservoir	2	2	C	2034
Storage 2	Kepler Reservoir	2	2	C	2034
Booster stations	Booster Pump 1	1	1	A	2029
	Booster Pump 2	1	1	A	2027
	Switchboard	1	1	C	2018
Storage 3	Booster Reservoir	2	2	C	2034
Reticulation	Gravity mains	3	3	B	2054
	Rising mains	3	3	B	2054
	Valves	3	3	B	2024
	Hydrants	N/A	N/A	N/A	-
	Meters	3	3	C	2034

Appendix Table P: Ramparts RWS Condition and Performance

Operation and maintenance

At times there have been issues with low well levels indicating the slots in the well may be corroding.

Critical assets

Critical assets identified are:

- rising main from the intake to the main reservoir.
- rising main from the main reservoir to the booster reservoir.
- rising main from the main reservoir to the Kepler reservoir.

Key issues

- reticulation renewals are programmed to address areas in poor condition.
- The renewal of the water permit is due in 2020.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Te Anau Rural Water Supply

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Ramparts)	RW482	MS Project RW482 in 18/19	REN	18/19	20,000	Reserves
Plant and equipment (Ramparts)	RW1613	Additional project in 18-28 LTP	REN	23/24	11,160	Reserves

Appendix Q: Riverton Water Supply

Description

The Riverton community has an estimated 2013 usual resident population of 1,506, with a projected 2018 usual resident population of 1,655. The scheme has 1,117 total equivalent connections.

History

Riverton's public water supply was established in 1975.

A summary of main dates and actions is:

1975 - Water supply established.

1976 - Treatment building constructed.

1982 - SDC took over responsibility for the scheme.

1987 - Water Permit granted to extract 73.6 m^3/hr from the Aparima River for 10 years.

1994 - Intake pumps replaced.

- Discharge Permit granted to discharge 91 m^3/day of backwash water to Jacobs River Estuary for 10 years.

2000 - Depolox chlorine monitoring installed.

2002 - Raw intake pumps and infrastructure upgraded.

2003 - AMP revised.

2004 - Flood damage to the intake cut the water supply to the town for several days. Repairs were covered by insurance.

- New Secondary Pump 2 installed (Southern Cross 80 x 50-250 37 kW).
- Discharge Permit expired.

2005 - Xypex repairs carried out to the clarifier.

- Dirty water incident disrupted the WTP but chlorine residual was maintained in the reticulation.

2006 - New Secondary Pump 1 installed (Goulds GIS 80 x 50-250 37 kW).

2007 - PHRMP approved by Drinking Water Assessor.

- New consent granted to upgrade intake (construct infiltration gallery) and take water.

2008 - AC watermain across bridge renewed (C07-40).

- PHRMP approved by the MOH.
- Upgrades to intake carried out with MOH subsidy.
- Rising main from intake to treatment plant renewed carried out with MOH subsidy.

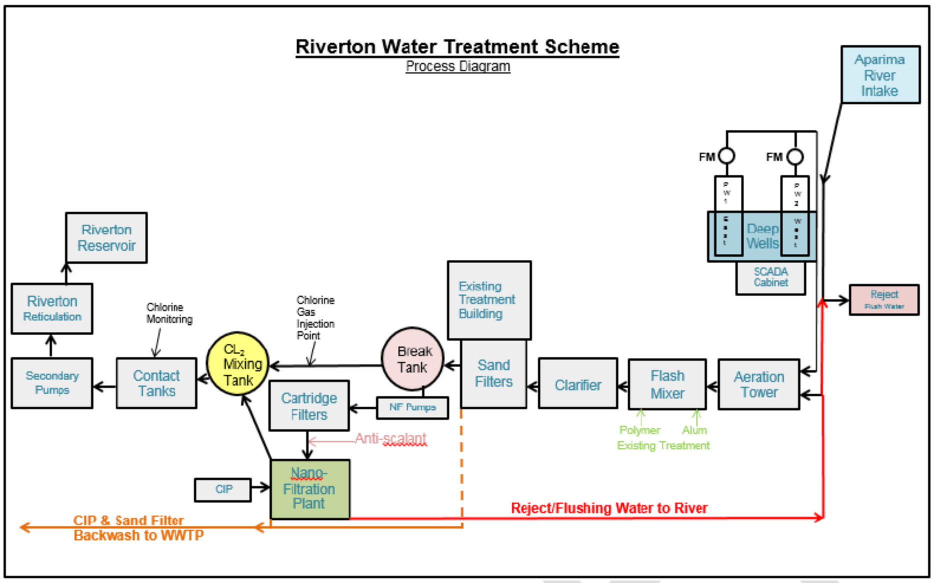
2011 - Investigations to identify new source for the water supply completed.

2012 - New supply wells drilled at site of test location (currently awaiting consent).

2014 - Stage 1 upgrade of treatment plant completed.

2017 - Stage 2 commissioning undertaken

Process description



Water is pumped from twin bores at 36 Centre Road, Gummies Bush and pumped to a Paterson Candy PCI treatment plant, clarifier and sand filters before being pumped through the reticulation to the main reservoir.

The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the toby on the boundary.

(a) Abstraction

Water Permit: Auth-20158384 issued 4 April 2016; Expires 4 April 2051.

Extraction not greater than 36 l/s, 3135 m3/day, 655,175 m3/year

(b) Intake headworks

There are two (2) wells 300mm diameter steel casing with 6 meter lengths of 2mm Johnston wedge wire screen in bottom of each well.

The wells are 15 meters apart and operate in duty/stand by set-up with each pump generally changing duty automatically between starts, but either well can be selected to run.

The wells are 118 meters deep, Pump Well 1 is the eastern well, and pump 2 is the western well.

Pump well 2 ground level is 1 meter lower than pump well 1 ground level. The static water in the wells is approximately 3-4 meters below the well flanges.

The wells are situated as a high knob of land to avoid the artesian head that would otherwise occur.

They are 150mm "mag flow" water meter, 150mm testable check valve and hand valve on each well. There is a VSD variable Speed Drive on each pump.

Currently the pumps at a rate varying from 20-25 l/s but could pump to 30 l/s if required. The wells would have capacity to pump 40 l/s subject to a resource consent approval. There is a monitoring well approximately 150 meters to the north of pump well 1 and pump well 2 where the aquifer water level is monitored as per the consent.

The rising main from the well site to the Water Treatment Plant is 200 mm diameter "O" PVC- Series 2 pipe PN 9.

The rising main is directionally drilled under the Aparima River in (2 meter depth under the bed of the river) HDPE pipe with an isolation valve on the North side if the bridge, along with a flushing valve.

The well site has a switch board, variable speed drives on each pump, SCADA and radio link back to the water treatment site.

Catchment: Well catchment is confined. Water quality (water tested by GNS) - the water is approximately 150 years old, The well water has no e-coli bacteria, tested twice weekly for 4 months from 26 Sept 2017, Oct, Nov, Dec 2017, Jan 2018. Water has medium-high, Total Iron Fe 0.45-0.55 mg/l water has high calcium content. Raw water hardness level 180-205

Stand by power: This no stand by power and the well head or the water treatment plant site. Each site has plugs and switches to enable a mobile generator to be installed at the site. Currently (Jan 2018) the maintenance contractor has three stand by generators that can be used around the district.

(c) Water treatment

Raw water from the wells enters the two (2) aeration towers to oxidise the iron that is in solution in the water, then passes through a "Degas" tank and the original flash mixer and clarifier.

The water is then drawn the two (2) rapid sand filters to remove the iron that has precipitated out. The clarifier also helps with the final degas of the water.

Currently no chemical is added to the water in the pretreatment stage. The pH of the raw water is approximately 8.0pH. The turbidity of the raw water ex the sand filters is <0.12

The water then flows through to the break tank where the flow is divided. Approximately 80% pumps through the Nano filtration plant and 20% of the flow bypasses the Nano filtration plant. This reduces the hardness of the water to below a hardness level of 100, which is considered "soft water" under the DWSNZ.

Chlorine is dosed into the flow just prior to the mixing tank and the FAC level is monitored on the exit pipe from the mixing tank.

The chlorine level is also monitored on line as the water leaves the plant.

The nano-filtration plant reduces the pH of the water. The water leaving the plant generally has a pH in the 7.2 to 7.6 range.

Discharge Permit AUTH 20158546 to release backwash water and accelerator sludge into the Jacobs River Estuary at a maximum rate of 699.84 m3/day is in force until 4 April, 2051.

A single story concrete block pump station situated beside the treatment plant contains electrical control equipment and two secondary pumps (operating in parallel). The two secondary pumps are used to pump water from the treatment plant into the reticulation network with excess continuing to the reservoir. The pumps are controlled by telemetry from the reservoir.

The pump station also contains the backwash pump.

Pump controls: secondary pumps are controlled by an ultrasonic level control (ultrasonic hawk unit) at the reservoir and transmitted to the treatment plant via radio link. The treatment plant is monitored by Council's SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

The main reservoir has a capacity of 1,020 m^3. The time equivalent at full demand is unknown but should be approximately two days at current demand (1,527 people at plant design flow of 340 L/p/day).

(e) Reticulation

Both rising mains are made of asbestos cement. Gravity mains are made up of asbestos cement, polyethylene, and PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date.

No hydraulic model has been produced for this scheme. Excluding connections the reticulation network consists mainly of 100 mm and 150 mm diameter pipes.

Rider mains are not common. The reticulation pipes generally form a good ring main coverage of the town. Isolation valves and four double type air valves have been installed. During the 1970s all valves had the old hemp packing to the glands replaced with Teflon.

(f) Water meters

There are water meters on lines leaving the intake, plant, and reservoir and 28 consumer water meters.

There are 207 hydrants on this scheme. All hydrants are the screw down type (mostly Blakeborough), with 80% being 'squat' design and the remainder medium depth hydrants.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Well 1 (118 m)	1	1	A	2068
	Well 2 (117 m)	1	1	A	2068
	Primary Pump 1	1	1	C	2022
	Primary Pump 2	4	4	C	2032
	Flow meter 1	1	1	A	2033
	Flow meter 2	1	1	A	2027
	Compressor	3	3	C	Unknown
	VSD's (x 2)	1	5	A	2033
	Switchboard	1	1	C	2027
	Telemetry	1	2	A	2025
Treatment Plant	Aeration Tower	1	1	A	2068
	Poly dosing pumps	2	2	C	2026
	SCM				
	Sediment Tanks/Clarifier	3	3	C	2024
	Rapid Sand Filters	2	3	C	2027
	Settling Ponds	3	3	B	Unknown
	Chlorinator	1	2	A	2032
	pH dosing pumps	2	2	C	2025
	Contact Tanks	3	2	C	2027
	Nanofiltration Plant	1	1	A	2033
	Secondary Pump 1	1	2	C	2019
	Secondary Pump 2	1	2	A	2025

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Backwash Pump	1	2	A	2025
	Spare Chl Pump 1	Unknown	Unknown	Unknown	Unknown
	Chl sample pump	2	3	C	2025
	Air blower	1	2	C	2025
	Switchboard (T'ment)	2	2	A	2025
	Switchboard (2no)	2	2	A	2025
	Telemetry	1	1	A	2032
Storage	Main Reservoir	3	3	B	2034
Reticulation	Gravity mains	3	3	B	2035
	Rising mains	4	3	B	2035
	Valves	3	3	B	2025
	Hydrants	3	3	C	2035
	Meters	3	2	B	2035

Appendix Table Q: Riverton Condition and Performance

Note: There are two parallel system operating for intake sites and water treatment. 2016 WTP elements will be noted when "as-built" details are entered to I.P.S.

Some AC sampling has been carried out with samples graded in moderate to poor condition. The rising main from the intake was sampled in 2003 and graded as poor. This has now been replaced.

The current performance of the treatment plant was because the current quality of raw water is very poor. At the time of writing, the intake was being upgraded. Pending the quality of water from the new intake treatment upgrades are likely to be required.
Treatment improvements will be identified through the PHRMP and upgrades have been programmed.

Operation and maintenance

The shaft sleeves on the transfer pumps wear faster than expected due to the amount of sediment in the raw water.

There is increasing maintenance costs associated with certain laterals - programme replacement.

Critical assets

Critical assets identified are:

- rising main from the intake to the treatment plant
- clarifier
- sand filters
- chlorinator
- Nano filtration plant
- rising main from the treatment plant to the reservoir

Key issues

The water quality and security has been addressed with a new source at 36 Gummies Road Centre Bush and extensive development of the water treatment plant in High Street Riverton, with the introduction of a membrane filtration system. Sludge produced in the water making process is now consented for disposal to the Aparima River.

Should there be future demand[2] it is estimated that upgrades will be required to the clarifier, filters, secondary pumps, contact tanks and increase in the main size to Rocks area. Given low growth rates this work is not considered necessary in the upcoming period.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Riverton/Aparima

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Scheme Improvements	26362	Treatment Plant Upgrade, Rising Main & intake improvements	LOS	18/19	206,247	Mix & Loan
200mm Magflow at water out at Water Treatment Plant	WAT1510	Additional project in 18-28 LTP	LOS	18/19	15,000	District Funding
Replace water main above Bowling club and main at John St	WAT1534	Replace water main above Bowling club previously washed out due to slip (80m) and main at 59 John St for hydrant service	REN	18/19	20,000	District Funding
Metering - District Metered Areas	WAT564	Additional project in 18-28 LTP MS Project WAT564 in 19/20	LOS	19/20	73,800	District Funding
Replace water main above Bowling club and main at John St	WAT1534	Replace water main above Bowling club previously washed out due to slip (80m) and main at 59 John St for hydrant service	REN	19/20	85,224	District Funding
Additional UV disinfection	WAT545	Additional project in 18-28 LTP UV disinection at Riverton WTP for up to 50% of flow that we are currently caliming secure statue for. Project added following Havelock North stage 2 report release.	LOS	19/20	512,500	District Funding

2 There currently is no growth anticipated in Riverton over the next 10 years.

Appendix R: Takitimu Rural Water Supply

Description

The Takitimu (restricted) Rural Water Supply has 26 connections to the scheme with a total of 135.4 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1989 - Water Permit granted to extract 1,056 m^3/day from the Mararoa River for 10 years (combined consent for Mt York and Takitimu).

1995 - Telemetry installed.

1998 - Water Permit granted to extract 120 m^3/day from the Waiau River for 20 years.

1999 - New intake constructed after flooding destroyed the rising main from the Mt York intake.

2003 - New Booster Pump 1 installed (Grundfos CR5-8 1.1 kW).

2005 - New Booster Pump 2 installed (Grundfos CR5-8 1.1 kW).

2006 - 110 m of rising main from intake replaced due to poor condition.

- Coats 80 mm PVC line replaced due to poor condition.

2007 - McConnell 32 mm PE line replaced due to poor condition.

2008 - Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2016 - Rising Main replaced

Process description

River water is drawn from the Mararoa River and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves.

Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 99164 granted to take 1,056 m^3/day (in association with Mt York RWS) from groundwater in the Waiau catchment. Consent expires 7 November 2026.

(b) Intake headworks

Water is drawn by one pump from an inclined well situated on the west bank of the Mararoa River approximately 3,000 m downstream of the Hillside-Manapouri Road. The intake is affected by river quality and quantity issues. The switchboard for the pump is pole mounted and within the reach of flood waters.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pump control is by solar powered ultrasonic level controller (ultrasonic hawk unit) at the main reservoir and transmitted to the intake via UHF link (SALCOM). The intake is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 150 m^3 equivalent to approximately 13 hours at full demand. The Booster reservoir has a capacity of 25 m^3.

The time equivalent at full demand is unknown. The track up to this reservoir is treacherous during winter and frequently impassable.

(e) Booster station

There are two pumps in parallel discharging to network reticulation.

Pump Controls: Pump control is by a pressure switch with a delay. The pump station is not monitored by Council's Datran SCADA system.

Standby Power: No standby power supply is incorporated.

(f) Reticulation

The rising main is made of an unknown material. Gravity mains are made up of polyethylene, PVC, and AC. The pipes should have been installed with rubber-ring joints. Isolation valves and four double type air valves have been installed.

During the 1970s all valves had the old hemp packing to the glands replaced with Teflon. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	7 m Well	3	3	B	2044
	Primary Pump 1	3	3	B	2024
	Switchboard	3	3	B	2020
	Telemetry	1	4	A	2018
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage 1	Main Reservoir	4	3	C	2031
Booster stations	Booster Pump 1	1	1	A	2028
	Booster Pump 2	1	1	A	2030
	Switchboard	1	1	C	2028

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Storage 2	Booster Reservoir	3	2	C	2031
Reticulation	Gravity mains	3	3	B	2051
	Rising mains	4	4	B	2051
	Valves	3	3	B	2021
	Hydrants	N/A	N/A	N/A	-
	Meters	3	3	C	2035

Appendix Table R: Takitimu RWS Condition and Performance

Rising main is in poor condition and subject to premature failure due to incorrectly installed PN12 to cope with 160 m head.

Operation and maintenance

There have been increasing repairs to rising main over recent years. There are ongoing difficulties accessing intake during the winter months due to poor condition of track.

Critical assets

Critical assets identified are:

- the well pump.
- the rising main from the intake to the main reservoir.
- the rising main from the main reservoir to the second reservoir.

Key issues

Areas of reticulation are in need of replacement.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Takitimu)	RW591	MS Project RW591 in 23/24	REN	23/24	22,540	Reserves
Switchboards and pumps (Takitimu)	RW1616	Additional project for 18-28 LTP	REN	25/26	161,885	Reserves

Appendix S: Te Anau Water Supply

Description

The Te Anau community has an estimated 2013 usual resident population of 2,628 with a projected 2018 usual resident population of 2,938. The scheme has 2002 total equivalent connections.

History

The scheme was built in 1966.

Te Anau currently has two water supply sources. The primary source is from three shallow bores adjacent to Lake Te Anau to the north-west of town near the cricket oval. Two of these bores were installed in 1966 as part of Te Anau's first community water supply scheme. The third bore was installed in 1995 to help meet increasing demands.

In 1976 the Upukerora bore (second source) was commissioned and until October 1993, when the bore filtration failed, it was Te Anau's principal water supply source. When the Upukerora River is in flood significant turbidity/discolouration is evident in the Upukerora supply. The supply has been extended over time to meet requirements of a number of subdivisions within the township.

2000 - Town service lane upgrade.

- Low pressure supply to Lakefront rural lifestyle blocks.

2001 - First stage of rising main upgrade project.

2002 - Watermain extension to Lawson Burrow Crescent (Luxmore Stage IX).

2003 - Watermain extension to Hawea Place (end of Tom Plato Drive) (Fiordland Estates Stage I).

- Patience Bay and Murchison Avenue extensions (Patience Bay Stage 2).
- Watermain extension to Lawson Burrow and Earl Place (Luxmore Stage X) 2004. Water permit granted to extract 2,100 m^3/day from groundwater for back-up supply from the Waiau catchment for 20 years.
- Water permit granted to extract 6,500 m^3/day from groundwater from the Waiau catchment for 20 years.
- Watermain extension to McIvor Place (Luxmore Stage XI).
- Matai Street watermain upgrade and extension along Sandy Brown Road. Booster station constructed at Sandy Brown Road.

2005 - Well No. 4 constructed.

2006 - Major upgrade to Lakeside WTP (C06-18) including modification to the contact tank manifold, new pumps and pipework, and new switchboard and telemetry.
A switchboard and telemetry was installed at the reservoir. A back-up generator was installed.

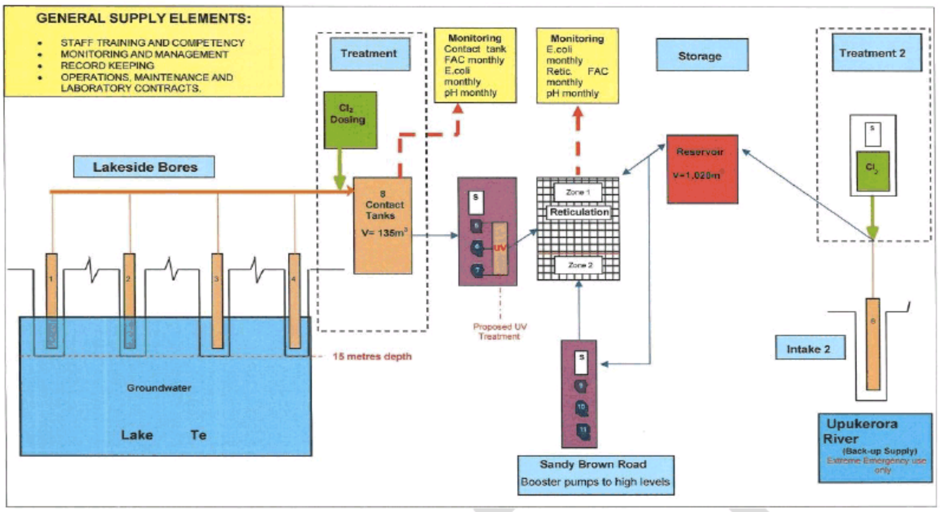
- Rising main upgrade along Milford Road, installed approximately 2.2 km of 300 mm mPVC and associated valves, hydrants, and polyethylene water service laterals (C06-05).

2008 - Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2013 - Treatment plant upgraded to meet new Drinking water standards.

2017 - Mackinnon Loop mains replacement undertaken

Process description



Groundwater is drawn from the gravels of the Waiau catchment and passes through a treatment plant before being pumped through the reticulation to the main reservoir.
A back-up intake treats water and pumps straight to the reservoir. Treated water gravitates back to the reticulation network. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the toby at the boundary. There is a low pressure restricted supply along Milford Road. In this case Council owns all the pipework and fittings up to the restrictor unit.

(a) Abstraction

Water Permits 20355 and 20356 granted to take no more than 6,500 m^3/day and 2,100 m^3/day respectively from groundwater in Waiau catchment. Consent expires 5 July 2024.

(b) Intake 1 Lakewise (WT081)

Four wells draw water through sands and gravels from the Waiau catchment adjacent to Lake Te Anau. The bores are shallow (12-15 m deep) and are located approximately 100 m apart 30-50 m back from the normal lake edge. There is one pump in each well with a combined pump extraction capacity of approximately.

367 m^3/hr. The duty primary pump (which is alternated) starts when at a pre-set contact tank water. The other primary pumps are progressively activated as lower water levels are reached. Water from the lakeside source is pumped to a series of eight 22.7 m^3 contact tanks (181.6 m^3 in total).

Note: Old bore casing remains in place approximately 6 m from the new Well 2 casing the old well headworks serves as an access point for maintenance and raw water sampling.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: primary pumps are controlled by ultrasonic level control (ultrasonic hawk unit) transmitters located in the contact tanks and directly linked to the lakeside treatment plant.

Standby Power: Standby power is provided from the generator at the lakeside treatment plant.

(c) Lakeside Water Treatment Plant (WT081)

Treatment is provided by the injection of chlorine through a manifold immediately prior to the contact tanks. Contact time at the lakeside source is provided by 8 x 22.7 m^3 concrete tanks. Some degree of treatment is provided by the gravel/sand media surrounding the wells. However, the level of this treatment is not known. Continuous chlorine monitoring was installed in 2001 and is linked to the SCADA telemetry system.

The contact tanks are connected to high lift pumps (housed in a concrete block pump building) which deliver water into the reticulation system.

Water from the lakeside high lift pumps is delivered directly into the town reticulation with the excess continuing to the reservoir.

In 2006 following pressure demand problems and increasing electricity costs associated with the 90 kW motor, a redesign of the pumping equipment was carried out. Three new Goulds GIS 100X65-200Z 37 kW pumps were installed. They are plumbed to operate individually or in series when needed at peak times. The existing four pumps were decommissioned and removed from site.

Pump controls: the secondary pumps are controlled by an ultrasonic level controller at the reservoir and transmitted to the Upukerora pump station via UHF link (SALCOM) and then to the treatment plant via VHF radio. The station monitored by Council's Datran SCADA system via VHF radio.

Standby power: A 275kVA Caterpillar GEH275 Diesel generator was installed in 2006 to provide emergency power supply for the WTP.

(d) Pump stations

A booster station with 30 m^3 storage was constructed in 2004 as part of a service extension in Sandy Brown Road. This pump station provides the required pressure and flow to the upper terrace area while buffering any fluctuations from the town supply.

Pump controls: pump control is by a pressure switch with a delay. The pump station is monitored by Council's Datran SCADA using Kingfisher RTU equipment system via VHF radio.

Standby Power: No standby power supply is incorporated, however, there is a generator plug on the switchboard.

(e) Storage (WT082)

The main reservoir has a capacity of 1,020 m^3. The time equivalent at full demand is unknown. The reservoir is a covered circular 15 m diameter concrete tank located to the east of Te Anau on a terrace approximately 28 m above the Upukerora source. The full water level of the (6 m high) reservoir is approximately 47 m above the lakeside high lift pumps and approximately 38 m above the current township (on the lower terraces). There is a magflow meter on the outlet. There is also an isolation valve present on the reservoir outlet pipe which could be connected to a pressure sensor within the reticulation. It has been located there in mind of the valve automatically closing in the event of a major burst.

(f) Reticulation

The rising main is PVC. Gravity mains are PVC, asbestos cement, and polyethylene. The pipes should have been installed with rubber-ring joints. Leak detection assessments have been carried out in the past although the data has not been compiled for this plan. Very good pipe location and size information is available on Council's GIS.

Council has a hydraulic model (H20NET) of the reticulation network that enables various flow and demand regimes to be emulated and the effects on supply pressures and flows to be evaluated at various parts of the network. The model requires further development.

The reticulation system consists of two ring-main systems with a series of sub-main branches. A delivery pipe extends from the lakefront high lift pumps to the reticulation system at the northwest end of Bligh Street and from the intersection of Milford Road and Howden Street to the reservoir. This delivery pipe is a combination of 300 mm and 200 mm diameter PVC and 300 mm diameter mPVC.

Piped reticulation networks supply all Te Anau properties on the lower terraces. Most commercial and out of town consumers are metered or are on restricted flow supplies. The extension along Sandy Brown Road from Milford Road to new booster station, increases from 150 mm to 200 mm to service the upper terrace area.

(g) Water meters

There are magflow meters on the lines leaving the treatment plant and on the outlet to the reservoir. There are 78 consumer water meters. All meters on this water supply are read quarterly by Council's service contractors, who also repair any leaks or defects.

(h) Hydrants

There are 261 hydrants on this scheme. Hydrants are the screw down type.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Primary Intake	12 m Well No. 1	2	2	C	2025
	Primary Pump 1	2	2	C	2023
	12 m Well No. 2	2	2	C	2025
	Primary Pump 2	2	2	C	2020
	12-15 m Well No. 3	1	1	C	2025
	Primary Pump 3	2	2	C	2022
	15 m Well No. 4	1	1	C	2065
	Primary Pump 4	1	1	C	2030
Treatment Plant	Secondary Pump 1	1	1	A	2031
	Secondary Pump 2	1	1	A	2031
	Secondary Pump 3	1	1	A	2031
	Chlorinator	1	1	C	2023
	Analyser	1	1	A	2020
	Turbidity meter	1	1	A	2021
	Magflow meter	1	1	A	2031
	Contact Tanks	4	2	C	2018
	Switchboard	2	2	C	2019
	Telemetry	2	1	A	2025
	Generator	1	1	A	2056
	UV Units	1	1	A	2017
Booster stations	Pump 1	1	2	C	2029
	Pump 2	1	2	C	2029
	Jockey pump	1	2	C	2029
	Settling Tank	1	2	C	Unknown
	Switchboard	1	2	C	2029

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Telemetry	1	1	A	2019
Back-up Intake	12 m Well No. 1	5	5	C	2062
	Back-up Pump 1	5	5	B	2026
Back-up Treatment	Chlorinator	5	5	C	2027
	Switchboard	5	5	C	2027
	Telemetry	5	5	A	2025
Storage	Main Reservoir	2	2	C	2025
	Magflow meter	1	1	A	2031
	Switchboard	1	1	A	2036
	Telemetry	1	1	A	2026
Reticulation	Gravity mains	3	3	B	2026
	Rising mains	3	3	B	2026
	Valves	3	3	B	2016
	Hydrants	3	3	C	2026
	Meters	3	3	C	2026

Appendix Table S: Te Anau Condition and Performance

Operation and maintenance

Increasing maintenance spent on repairing laterals. Programme funds to replace.

Critical assets

Critical assets identified are:

- the Lakeside chlorinator
- the rising main from the treatment plant to the main reservoir
- the back-up chlorinator
- the back-up rising main

Key issues

Long term future growth expected outside duration of current AMP.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Te Anau

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Metering - District Metered Areas	WAT675	MS Project WAT675 in 17/18	LOS	18/19	101,500	District Funding
Sandy Brown second water tank and VSD on third pump	WAT1512	Second water tank at Sandy Brown Pup Station and VSD on third pump incl SCADA and logic work. Additional project in 18-28 LTP.	LOS	20/21	52,429	District Funding
Lateral replacement ahead of time and Switchboards/monitoring	WAT1524	Te Anau laterals required ahead of time Pomplona, Quintin, Homer, Henry, Duncan & Burnby Drive. Additonal project in 18-28 LTP	REN	21/22	1,068,265	District Funding
Consent Renewal Preparation	WAT671	MS Project WAT671 in 22/23	REN	22/23	21,990	District Funding

Appendix T: Tuatapere Water Supply

Description

The Tuatapere community has an estimated 2013 usual resident population of 561 with a projected 2018 usual resident population of 557. The scheme has 302 total equivalent connections.

History

The current reticulated water supply was installed in the early 1970s and until recent times has remained unchanged.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

1996 - Contract let to upgrade the water supply using Waiau Working Party funds.

1999 - Water permit granted to extract 960 m^3/day from groundwater in the Waiau catchment for 20 years.

2000 - Commissioning of the new treatment plant upgrade is complete.

2001 - pH correction is added to the treatment process.

2005 - Secondary Pump 2 renewed.

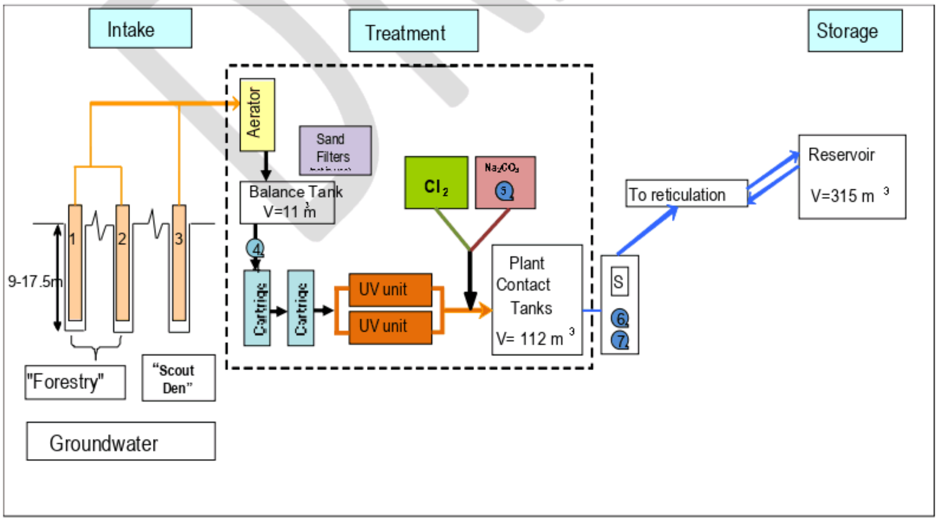
2007 - Difficulties maintaining pressure in town during winter due to numerous leaks.

2008 - Risk of flood to the WTP increases as Waiau River begins encroaching on the true right bank adjacent to the plant.

- PHRMP approved by the MOH.

2013 - Treatment upgrade completed.

Process description



Groundwater is drawn from the gravels of the Waiau catchment and passes through a treatment plant before being pumped through the reticulation to the main reservoir.

Treated water gravitates to the reticulation network. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 98317 granted to take no more than 960 m^3/day from two bores as back-up town supply from groundwater in the Waiau catchment at a maximum rate of 40 m^3/hr. Consent expires 13 August 2019.

(b) Intake headworks

Since the water supply upgrade of 1997 the town has had two supply wells. The original Bush Well is located in road reserve at Erskine Road to a depth of six to eight metres. There are two submersible pumps discharging in the asbestos cement rising main. This well has had problems with corroded slots leading to low well levels. The well is currently out of service to protect the pumps.

The secondary (Forestry Well) and primary source is a newer well established in 1998, located in the Forestry Road Reserve approximately 25 m from Half Mile Road. One pump draws water from an aquifer 5 m deep. The rising main is PVC pipe and links to the existing rising main from Well No. 1.

For most of the year the Well No. 1 supplies water to the treatment plant, but during summer both wells are utilised in tandem to mitigate the effects of a low yield.

As part of the 1997 water supply upgrade the original Waiau River intake has been decommissioned.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: pump control is by a direct link to level sensor electrodes mounted within the balance tank at the treatment plant. The intake is monitored direct link to the treatment plant.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

The water treatment plant is located in the Tuatapere Domain on the banks of the Waiau River. The plant has been inundated with floodwaters several times in the past. The plant is now at risk of collapse as the river undermines the adjacent bank.

Raw water from the intake enters a stainless steel cascade type aerator with a design flow rate of 40 m^3/hr. From the aerator water falls into an 11,000 L balance tank providing flow buffering ahead of the filter pump.

pH correction has been added to the treatment process to address the mildly aggressive raw groundwater. Water exiting the filters is low in pH around 6. In order to achieve a final pH in the reticulation a 5% lime slurry is added to the water. The system comprises of a make-up tank complete with mechanical stirrer. The lime slurry is injected into pipe feeding the contact tanks. The dose rate is preset in the electronic controller located in the treatment building.

Water is drawn from the contact tanks and pumped to the town reticulation and reservoir by two secondary pumps (duty/standby). Both pumps can be run together if required.

Pump controls: the filter pump is controlled by a pressure switch with a delay. The lime slurry pump is controlled by electronic controller with set-points adjusted via SCADA. The secondary pumps are controlled by a direct link (leased telecom circuit) to an ultrasonic level controller in the reservoir. The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

The main reservoir has a capacity of 318 m^3 equivalent to approximately 15 hours at full demand.

(e) Reticulation

The rising main is asbestos cement. The gravity main is asbestos cement, polyethylene and PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

Excluding connections the reticulation network consists generally of 100 mm and 150 mm diameter pipes. Rider mains are not common. The reticulation pipes are generally asbestos cement the particular type is generally unknown. The level of mains failures is low, typically one per year. Consumer laterals utilise "Talbot" connectors. These are failing more regularly due to age and corrosion effects.

(f) Water Meters

There is a water meter on the line leaving the plant and 15 commercial, industrial and institutional users metered. Of the metered supplies, the most significant consumers are Lindsay and Dixon, Waiau Hotel and DT King Transport.

(g) Hydrants

There are 59 hydrants which are the screw down type. The town is well serviced by hydrants, with most of the hydrants complying with fire service flow and pressure requirement except for a small number at the western end of Half Mile Road.

Condition and performance

The corrosive water causes problems with many metal fittings in the reticulation especially the Talbot valves, and tapping bands. Premature replacement is likely to be required. It may be economic to replace the lateral while the toby and tapping band is being replaced.

There is a 50 mm main in Bridge Street with five repairs.

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake 2 (Forestry)	12 m Well	5	5	A	2007
	Primary Pump 3	3	3	B	2020
	Switchboard	2	2	C	2007
	Telemetry	2	5	A	2010
Treatment Plant	Balance Tank	2	2	C	2045
	Dosing pumps	2	2	C	2016
	RS Filters	2	4	C	2034
	Cartridge Filters	2	2	C	2034
	Chlorinator	2	3	C	2021
	Contact Tanks	1	1	A	2070
	Secondary Pump 1	1	2	C	2023
	Secondary Pump 2	1	2	C	2025
	Switchboard	2	2	C	2025
	Telemetry	2	5	C	2025
	Spare sec. pump	4	4	A	2005

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Spare sec. pump	4	4	A	2008
Storage	Main Reservoir	1	1	A	2090
Reticulation	Gravity mains	3	3	B	2030
	Rising mains	4	4	B	2030
	Valves	3	3	B	2020
	Hydrants	3	3	C	2030
	Meters	3	3	C	2030

Appendix Table T: Tuatapere Condition and Performance

Note: Intake (Bush) has been abandoned 2014. There are two x forestry bores and scout den and UV's and Aeration Tower.

Operation and maintenance

There have been issues in the past with frost causing bursts on private property with an unoccupied dwelling.

There are increasing costs associated with the premature failure of Talbot valves at the lateral connection tapping on the main.

Critical assets

Critical assets identified are:

- the aerator
- the sand filters
- the cartridge filters
- the chlorinator
- the lime dosing pump
- the rising main from the treatment plant to the reservoir.

Key issues

- contact tanks were in poor condition and were renewed in 2013
- the reservoir tanks have been replaced and fenced
- the telemetry unit (RTU) requires upgrading to Kingfisher/Citect, the SCADA system.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Tuatapere

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WAT736	MS PRoject WAT736 in 18/19	REN	18/19	20,000	District Funding
Powdercoat, sandblast and boardwalk	WAT1532	Additional project in 18-28 LTP	O&M	20/21	73,400	District Funding

Appendix U: Winton Water Supply

Description

The Winton community has an estimated 2013 usual resident population of 2,436 with a projected 2018 usual resident population of 2,430. The scheme has 1,241 total equivalent connections.

History

Winton's public water supply was established in 1956 including an intake located on Gerrard Road near the Oreti River and the water tower. A number of key activities have been undertaken since construction with those from 2000 documented below.

2000 - New primary pump installed.

2001 - Seismic assessment carried out on the water tower.

2004 - Sections of Park, Mackenzie and Hilary Streets renewed in PVC.

2006 - New primary pump installed (Goulds 8JNHC 22 kW) due to fault. Other pump repaired and kept as spare in Winton Depot.

- Sections of AC mains renewed with pipe bursting and directional drilling techniques: Grange, Home, Mary, Eglinton, Albert, Mackenzie, and John Streets.

2007 - Air core investigations were carried out and unsuccessful test bores were constructed at the Maternity Hospital site and Ivy Russell Park.

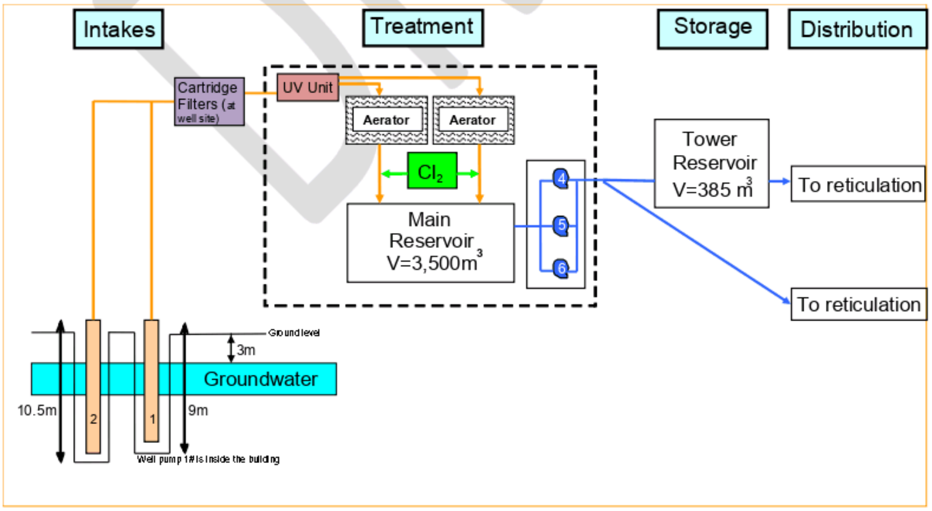
2008 - All secondary pumps overhauled.

2014 - Construction of a second intake well completed

2014 - Treatment upgrade completed

2015-17 - Mains renewal programme undertaken

Process description



Groundwater is drawn from the unconfined gravels of the Oreti catchment and pumped to a treatment plant and main reservoir. Treated water is pumped to a water tower before it gravitates to the reticulation network.

The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 94248 granted to take 3,000 m^3/day from groundwater in the Lower Oreti groundwater zone. Consent expires 30 September 2008.

(b) Intake headworks

The contributing aquifer consists of clean sandy gravels, up to 4 m thick, associated with the Oreti River. The well is located between a drainage ditch 70 m to the east and Substation Road 250 m to the west. The rising main from the well to the reservoir is a 200-225 mm diameter asbestos cement pipe constructed in 1975.

The well is located inside a concrete block shed containing the electrical control gear, surge protection equipment, pipework and valves. There is insufficient room within the well for a second submersible pump and pump removal is achieved by lifting the pump out through the shed roof.

The ground water level is typically 2-3 m below ground and normal draw-down is two to three metres. A single submersible pump is located inside the 750 mm diameter well. The submersible pump delivers water into the reservoir 2.6 km to the south-east. Five piezometer holes have been installed around the well to monitor ground water levels.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: the primary pump is controlled by an ultrasonic level control (ultrasonic hawk unit) at the reservoir and transmitted to the intake plant via UHF link (SALCOM). The intake transmits to the treatment plant which is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

Gas chlorination equipment is housed in the pump station building next to the main reservoir dosed by Depolox. Gas levels are regularly checked and the equipment is reliable. The pH is corrected by forced draught aeration prior to the reservoir.

The aerator is located on top of the reservoir. It is necessary to correct the pH for aesthetics, to reduce corrosiveness and to improve the efficiency of chlorination.

The treatment building (1975) also contains three tower delivery pumps (in parallel), surge protection equipment, and one redundant pump (since relocating aerators to top of the reservoir). The tower secondary pumps are used to pump water from the reservoir into the reticulation network and when the inflow from the pump station is greater than the demand outflow from the reticulation network the tower reservoir fills.

Pump controls: the secondary pumps are controlled by an ultrasonic level control (ultrasonic hawk unit) at the tower and transmitted to the treatment plant via UHF link (SALCOM). The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

Storage and chlorination contact time is provided by a reservoir to the east of the town centre and additional storage is provided by a water tower (header tank) in the town centre.

The 3,500 m^3 main reservoir is a covered single circular reinforced concrete tank, consisting of pre-stressed concrete bands, which contain precast wall panels. It is on ground and located at the southern end of Florence Road about 200 m east of Great North Road. It shares a fenced compound with the pump station.

The water tower is the original reservoir and is a reinforced concrete cantilever structure with a capacity of 365 m^3. A 10 m diameter, 5.5 m high concrete reservoir tank rests on top of the supporting hollow concrete column, which is approximately 7 m in diameter and 29 m tall.

(e) Reticulation

The rising main is approximately 3,030 m and constructed of asbestos cement. Gravity mains are made up of asbestos cement, PVC, polyethylene, concrete spun reinforced, steel concrete lined. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

Excluding connections the reticulation network consists generally of 100 mm diameter with some 150 mm diameter pipes. Rider mains are not common. The reticulation pipes generally form good ring main coverage of Winton.

There are approximately 1,154 connections, approximately 90% of which are Low Density Polyethylene (LDPE) and the remainder (mainly in the town centre) copper. All connections were copper prior to 1968. In the period 1968 to 1985 most of the copper connections were replaced with LDPE pipes, generally as roads were reconstructed and sealed. Isolation valves and four double type air valves have been installed. During the 1970s all valves had the old hemp packing to the glands replaced with Teflon.

(g) Water meters

There is a water meter on the line from the intake. There are 15 commercial, industrial and institutional users metered, with 85% of meters installed between 1992 and 1997. The most significant industrial users are Craigpine Timber Limited and Central Southland College.

(h) Hydrants

All 165 hydrants are the screw down type (mostly Blakeborough), with 80% being 'squat' design and the remainder medium depth hydrants.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Gerrard Road Well	5	5	A	Decommissioned
	9 m Wells x 2	2	2	C	2034
	Primary Pump 1& 2	1	1	A	2031
	Spare Primary pump	5	5	A	2025
	Surge Protection eq	1	2	C	2024
	Switchboard	2	2	A	2025
	Telemetry	2	3	C	2025

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ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Treatment Plant	Chlorinator	1	2	C	2026
	Aerator (forced draft)	4	5	C	2025 2028
	Secondary Pump 1	1	2	A	2028
	Secondary Pump 2	1	2	A	2028
	Secondary Pump 3	1	2	A	2015
	Spare Chl Pump	2	2	C	2025
	Switchboard	2	2	C	2025
	Telemetry	1	2	A	
Storage	Main Reservoir	2	2	C	2038
	Tower reservoir	4	4	D	2015
Reticulation	Gravity mains	5	5	B	2100
	Rising mains	4	4	B	2100
	Valves	3	3	B	2100
	Hydrants	3	3	C	2100
	Meters	3	3	C	2050

Appendix Table U: Winton Condition and Performance

Note: Tower reservoir has been used "over-life" due to the fragile nature in some areas of supply reticulation as head pressure supply is more constant than variable speed pump supply.

The condition of the reticulation in Winton is improving with the most fragile AC (Fibrolite) now replaced. An ongoing replacement programme has been scheduled in order to optimise maintenance and renewals costs.

The condition of the reticulation in Winton is improving with the most fragile AC (Fibrolite) now replaced. An ongoing replacement programme has been scheduled in order to optimise maintenance and renewals costs.

Operation and maintenance

The worst areas of fragile AC have now been replaced but maintenance trends identify that other areas within the reticulation are now requiring increased numbers of repairs. Further replacements have been programmed.

The tower is average in IPS but is still functional and operational. The demolition of this asset is estimated at $400,000 and will be required possibly by 2035. 10 yearly structural inspection and reports will be required.

Critical assets

Critical assets identified are:

- the rising main from the intake to the treatment plant.
- the rising main from the main reservoir to the tower reservoir.

Key issues

- resource consent expires 2039.
- the scheme is required to meet the DWS including the development of a PHRMP and associated infrastructure upgrades. For planning purposes it has been assumed that this scheme would be categorised as minor with compliance due by 1 July 2011.
- develop a strategy to cater for future demand without compromising the existing infrastructure.
- the issues for Winton are the ongoing replacement of the 15 km AC gravity main meets the end of their design life in 2015 Replacement of all mains will be complete by 2018.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Winton

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Metering - District Metered Areas	WAT790	MS Project WAT790 in 18/19	LOS	20/21	32,506	District Funding
Turbidity and pH monitoring	WAT1717	Additional project in 18-28 LTP	REN	26/27	23,225	District Funding

SOUTHLAND DISTRICT COUNCIL

Waste Water

2021-2031 Activity Management Plan

Southland District Council
Te Rohe Pōtae o Murihiku

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<tr><th colspan="5">Quality Assurance Statement</th></tr>
<tr><td colspan="5">Draft AMP Template</td></tr>
<tr><td rowspan="6">Southland District Council
15 Forth Street
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Telephone
0800 732 732
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<tr><td>Prepared By:</td><td colspan="3"></td></tr>
<tr><td>Reviewed By:</td><td colspan="3"></td></tr>
<tr><td>Approved for issue:</td><td colspan="3"></td></tr>
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Executive summary

The services provided

Nineteen towns within the District are reticulated with Southland District Council (SDC) owned and maintained wastewater infrastructure. Based on current information the schemes have a current replacement cost valuation in excess of $130M. Council is the legal entity for the ownership of the asset being responsible for ensuring all conditions of appropriate resource consents are met.

A number of isolated rural townships have individual private schemes which are not included within the Wastewater Activity Management Plan.

Council owned and provided facilities are Balfour, Browns, Edendale/Wyndham, Gorge Road, Lumsden, Manapouri, Monowai, Nightcaps, Ohai, Riversdale, Riverton, Stewart Island, Te Anau, Tokanui, Tuatapere, Otautau, Wallacetown and Winton.

A further treatment plant recently installed at Curio Bay in the Catlins currently services a Council reserve and is considered under the appropriate Parks and Reserve Activity Management Plan.

Council's schemes are operated and maintained by Downer NZ with all capital work planned and programmed by Council's Water and Waste Services department. Council staff also provide technical and planning advice to ratepayers, consultants and contractors on any issues related to the wastewater activity.

What we aim to achieve

Council's Levels of Service (LoS), performance measures and targets are illustrated in

What LoS we provide	**LOS1: Provide reliable wastewater collection and treatment services that protects public health and the environment**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI 1.1: **System and adequacy** – The number of dry weather sewerage overflows from the territorial authority's sewerage system, expressed per 1000 sewerage connections to that sewerage system.	<1	≤1	≤1	≤1	≤1
KPI 1.2: **Response to sewerage system faults** - Where the Council attends to sewerage overflows resulting from a blockage or other fault in the Council's sewerage system, the following median response times measured:					
(a) Attendance time: from the time of notification to the time when service personnel reach the site; and	a) 18 minutes	a) ≤1 hour	a) ≤1 hour	a) ≤1 hour	a) ≤1 hour
(b) Resolution time: from the time of notification to this time that service personal confirm resolution1 of the blockage or other fault	b) 2 hours 20 minutes	b) ≤6 hours	b) ≤6 hours	b) ≤6 hours	b) ≤6 hours
KPI 1.3: **Customer satisfaction** – The total number of sewerage system complaints about any of the following: (a) sewerage odour (b) sewerage system faults (c) sewerage system blockages; and (d) the Council's response to issues with its sewerage system, expressed per 1,000 connections to the Council sewerage system.	7 per 1,000 connection	≤8 per 1,000 connections	≤8 per 1,000 connections	≤8 per 1,000 connections	≤8 per 1,000 connections
KPI 1.4: **Management of Environmental impacts** - Compliance with resource consents for wastewater discharges, measured by the total number of:					
(a) Abatement notices	0	0	0	0	0
(b) Infringement notices	0	0	0	0	0

(c) Enforcement orders	0	0	0	0	0
(d) Convictions received in relation to the resource consents	0	0	0	0	0
KPI 1.5: Percentage of monitoring results that show compliance with resource consent conditions.	Not measured	100%	100%	100%	100%
1 - In accordance with operations and maintenance contract timeframes.					

Table 0-1.

Over the next 10 years, Council's intention is generally to maintain or improve the level of performance by:

- reducing the number of network overflow incidents; and
- improving the quality of wastewater effluent discharges and the level of compliance with consent conditions.

What LoS we provide	**LOS1: Provide reliable wastewater collection and treatment services that protects public health and the environment**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI 1.1: **System and adequacy** – The number of dry weather sewerage overflows from the territorial authority's sewerage system, expressed per 1000 sewerage connections to that sewerage system.	<1	≤1	≤1	≤1	≤1
KPI 1.2: **Response to sewerage system faults** - Where the Council attends to sewerage overflows resulting from a blockage or other fault in the Council's sewerage system, the following median response times measured: (b) Attendance time: from the time of notification to the time when service personnel reach the site; and (b) Resolution time: from the time of notification to this time that service personal confirm resolution[1] of the blockage or other fault	a) 18 minutes b) 2 hours 20 minutes	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours
KPI 1.3: **Customer satisfaction** – The total number of sewerage system complaints about any of the following: (a) sewerage odour (b) sewerage system faults (c) sewerage system blockages; and (d) the Council's response to issues with its sewerage system, expressed per 1,000 connections to the Council sewerage system.	7 per 1,000 connection	≤8 per 1,000 connections	≤8 per 1,000 connections	≤8 per 1,000 connections	≤8 per 1,000 connections
KPI 1.4: **Management of Environmental impacts** - Compliance with resource consents for wastewater discharges, measured by the total number of:					
(a) Abatement notices	0	0	0	0	0
(b) Infringement notices	0	0	0	0	0
(c) Enforcement orders	0	0	0	0	0
(d) Convictions received in relation to the resource consents	0	0	0	0	0
KPI 1.5: Percentage of monitoring results that show compliance with resource consent conditions.	Not measured	100%	100%	100%	100%
1 - In accordance with operations and maintenance contract timeframes.					

Table 0-1: Wastewater performance framework

What we are planning

Through the life of the AMP Council staff will continue to develop a proposed wastewater strategy which aims to target those discharges which are seen to be having the greatest negative environmental impact, with specific upgrades planned for Winton, Te Anau Riversdale Manapouri Ohai Nightcaps and Edendale Wyndham. From 2020 detailed options will be developed for Winton, Manapouri and Edendale Wyndham ahead of its consent renewal date from 2023, and Nightcaps ahead of its renewal date of July 2027. Similar optioneering will be undertaken for all discharges that require new consents. Renewal work subject to age and condition assessment will be undertaken as scheduled.

Managing future demand

Demand for wastewater services due to population growth is not expected to change significantly over the plan period. Continued growth in townships such as Te Anau, Riverton and Winton is expected, however, at current rates it is anticipated that current infrastructure will be capable of dealing with this growth although in Winton management of inflow and infiltration across the network will be required to be undertaken. An element of the Te Anau upgrade will be attributed to demand though this has been scaled back significantly from previous estimates due to lower than anticipated growth. The more recent impact from Covid-19 will also have an effect on demand especially in areas previously reliant on international tourism.

Demand projects included within previous AMP and LTPs have been deferred as a result of slower than previously anticipated growth in these catchments. Demand projects are funded using development contributions that have previously been collected with the remainder of the project funded from loans with repayments funded by rates. The development and financial contribution policy is currently in remission; should Council choose to collect development contributions it would be for the Te Anau area only.

Lifecycle asset management

The Activity and asset management section presents an overview of Council-owned wastewater schemes in the District with condition rating based on joint inspections undertaken by SDC staff and contractors Downer NZ local operations staff.

To achieve Council's intentions, the general asset management strategy is to:

- maintain the assets to a level fit for purpose
- work with Council contractors and governance bodies to identify capital or maintenance requirements
- ensure that the asset management requirements (operational and capital) are appropriately funded, prioritised and scheduled
- develop and refine renewal strategies, based on age, condition and best available local knowledge, and future population predictions. In some areas this may mean that renewals will be deferred in preference to additional planned/unplanned maintenance
- ensure resource consent conditions are met
- longer term, consideration will need to be given the management of some schemes as they reach the end of their asset lives and begin to require significant capital expenditure. The wastewater function became District funded in 2012

All renewals will be subject to future condition assessments prior to any work being undertaken. It is widely recognised that previous lack of investment in infrastructure is no longer viewed as an appropriate or sustainable outcome and as a result capex investment in infrastructure renewals should be increased across a range of Council activities.

Financial summary

Operational costs during the period of the plan increase mainly by inflation and increased interest costs for funding loans used to complete capital projects, but are also impacted by increased maintenance and electricity where additional treatment is occurring or there will be a change in the disposal method notably Te Anau, Winton, Manapouri and Edendale/Wyndham.

A number of wastewater have been upgraded during the last ten years and will not be due for further upgrade until after 2031. The figure shows a significant amount of level of service work in the future to improve the quality and method of discharge of wastewater across the district. Historically this is the result of providing a service in additional communities.

Figure 0-2 compares the capital expenditure to depreciation in the LTP. There are a number of years where the depreciation is greater than the capital work being completed. The capital program is partially due to the age of the infrastructure and with the increase in depreciation with the completion of the upgrade in Te Anau in 2021/22. To ensure that today's ratepayers are contributing to the assets being used Council has implemented a policy during the 2015-25 LTP to phase in the funding of depreciation. Funding of wastewater deprecation is increasing by 10% per annum from 2015-16 to 2020-21 with 5% after that to 2028-29 when 100% depreciation is being funded.

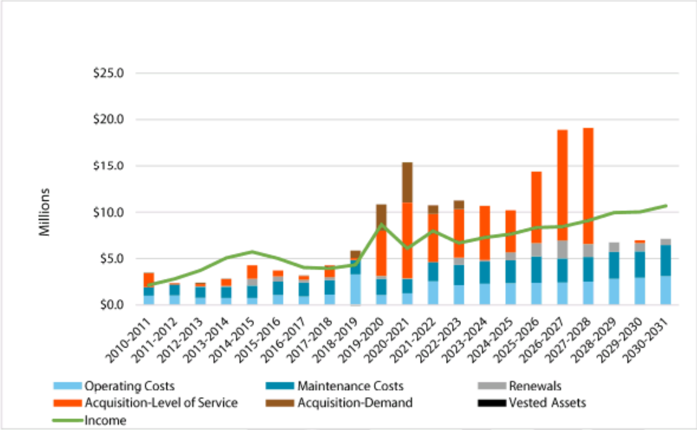

Figure 0-1: Wastewater Financial Summary (excluding depreciation)

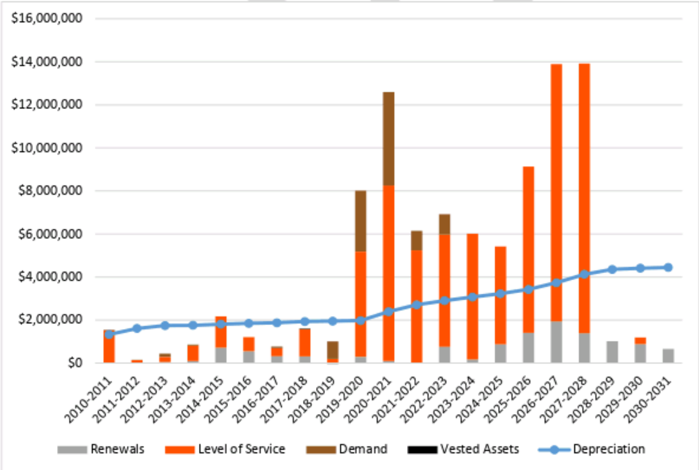

Figure 0-2: Wastewater capex summary

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Purpose of the Activity Management Plan

This Activity Management Plan (AMP) describes the strategies and works programmes for the stormwater activity so as to meet the objective of delivering the required level of service for the Southland District. It will be reviewed every three years. This AMP informs Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity
- the strategic context for the activity, the key activity management strategies and policies adopted within this environment and the main issues identified for the activity
- a statement of the intended levels of service and performance targets.

This AMP covers a period of 10 years commencing 1 July 2021. The main focus of the analysis is the first three years and for this period specific projects have been identified in more detail. Beyond this period work programmes are generally based on trends or predictions and should be taken as indicative only. All expenditure is based on unit costs as at 1 July 2021.

Plan limitations

The intent of the AMP is to address and manage the most significant wastewater asset management issues in the District. It is a living document which will undergo a formal review every three years to make amendments to reflect changes in LoS, demand projections, risk profile, life cycle information, or financial information.

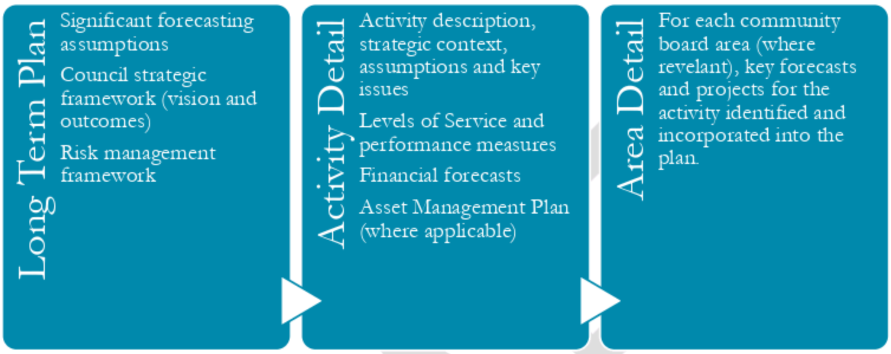
This AMP has been developed with the following key limitations:

- projects have been identified and scheduled based on the best information available at the time
- budgets for these projects have been assessed based on the best information available at the time
- projects towards the end of the 10 year period are flags that work are likely to be needed but it is very much at the concept phase. Options and detailed estimates will be carried out closer to the time
- the completion of projects is limited to resourcing of both SDC staff and external engineering support
- issues and projects identified beyond the LTP period but within the 30 year window for the infrastructure will be only be rough estimates to be refined closer to the period when they will be implemented. These are likely to change significantly over the life of the 30 year strategy
- at the time of writing the full implications of the proposed Water and Land Plan are still unclear as key objectives policies and rules are still subject to Environment Court appeal. In addition there is a need for more clarity around the proposed catchment limit setting approach and how this may be affected by the recently updated National Policy Statement for Freshwater Management and the expected National Environmental Satndard concerning wastewater and stormwater discharges. It is believed that this will have significant impact on all discharges (particularly in relation to preferences for land based discharges) however until further detail has been developed around the limit setting process assumptions have been made around the degree of upgrades likely to be required. The key assumptions are largely that upgrades will primarily address the following contaminants of concern, nitrogen, phosphorous, sediment (solids) and E.Coli (pathogens).In response to the Plan Council

have prepared an overall Wastewater Strategy which sets out how it is proposed to manage the impact from wastewater discharges over the life of the 10 years of the 2021/31Long Term Plan and beyond

- to date there has been limited impact on how the activity is managed as a result of Covid-19.

Plan framework



The AMP framework is illustrated above. The strategic context, significant forecasting assumptions and any activity-specific issues are documented in the main body of this Plan. Information on individual activities and services are included in the appendices to this plan.

Activity description

This Activity Management Plan (AMP) describes the strategies and works programmes for the wastewater activity so as to meet the objective of delivering the required level of service to existing and future users in the most cost effective way. This AMP informs Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity
- the strategic environment (Council's vision and goals and future demand drivers) for the activity, the key activity management strategies and policies adopted within this environment and the main risk issues identified for the activity
- a statement of the intended levels of service and performance targets
- information on the scope of assets involved in delivering services, and statements on:
  - the estimated cost for achieving and maintaining the target levels of service
  - how Council will assess the manage the implications of demand and service levels and standards, the estimated costs of the provision of additional asset capacity and how these costs will be met
  - how the maintenance, renewal and replace of assets will be undertaken, and how they will be funded

– how expenses will be met and the estimated revenue levels and other source of funds.

This AMP covers a period of 10 years commencing 1 July 2021. The main focus of the analysis is the first three years and for this period specific projects have been identified in more detail. Beyond this period work programmes are generally based on trends or predictions and should be taken as indicative only. All expenditure is based on unit costs as at 1 July 2021.

What we do

Council provides wastewater schemes for communities throughout the District which collect, treat and dispose of wastewater from residential properties, businesses and public facilities.

This service also includes the collection, treatment and disposal of industrial liquid wastes (commonly known as trade wastes) from industrial and commercial premises across the District.

Council owns 19 wastewater schemes and related infrastructure throughout the District which are operated and maintained by Downer NZ and overseen/ managed by Council staff.

Urban and rural areas serviced by public wastewater systems

Nineteen towns within the District are reticulated with SDC owned and maintained wastewater infrastructure (see **Error! Reference source not found.** for localities). These public wastewater systems are intended to carry out two main functions:

The collection, treatment and disposal of wastewater from residential properties, business properties and from public sanitary facilities in Southland District.

The collection, treatment and disposal of industrial and commercial liquid wastes (often known as trade wastes) from industry in the District.

The local wastewater reticulation to which each serviced property is connected consists of an extensive network of relatively small diameter pipes (mostly 150 mm) which discharge into a system of trunk sewers of larger sizes (ranging up to 525 mm in diameter). The trunk sewers convey wastewater to treatment plants, which use a range of processes including screening, sedimentation (settlement of suspended material), biological stabilisation of the organic material in the wastewater and disinfection using ultra violet light to deactivate micro-organisms (typically bacteria and viruses) in the effluent.

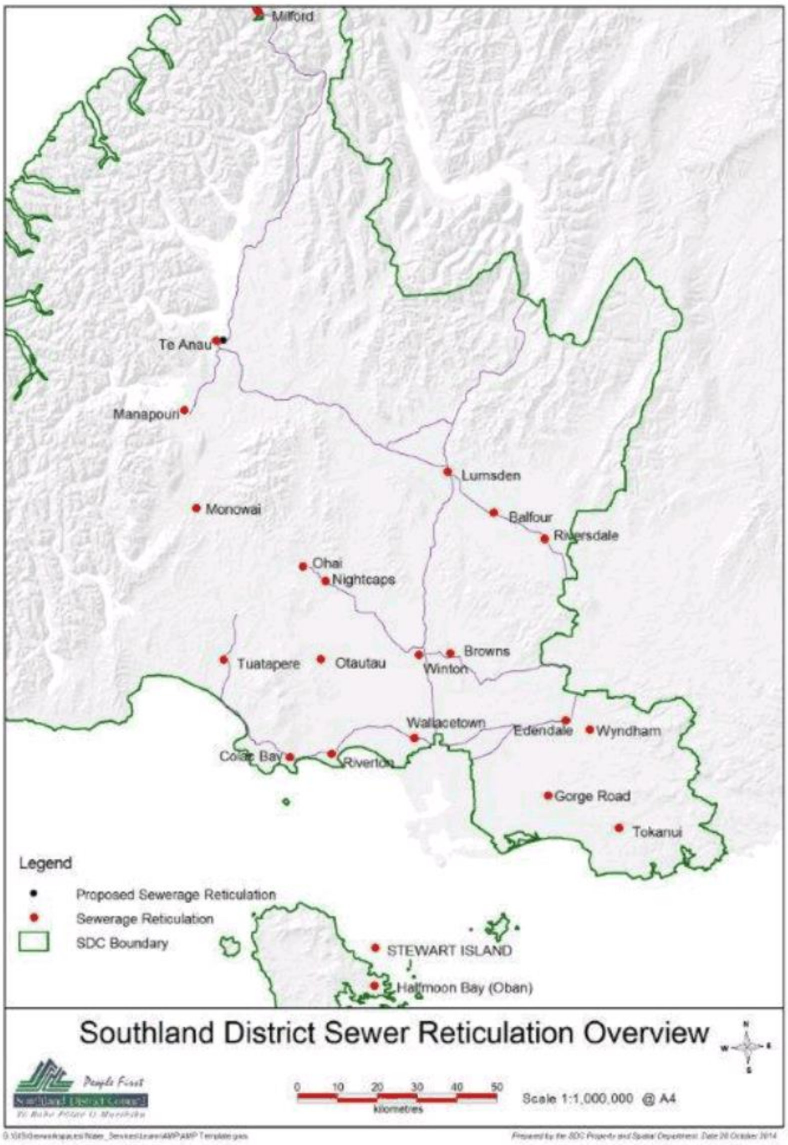
Treated effluent is typically discharged into the environment as directed by individual resource consents administered by Environment Southland (ES).

Rural areas and isolated towns

The Southland District is predominantly a rural area. Properties in rural areas and small isolated towns usually have private individual wastewater disposal systems which generally comprise conventional septic tanks with soak holes or on-site effluent disposal fields.

It is not usually practical to provide a reticulated wastewater service in rural areas because of the lengths of the networks required and the inability to spread the cost of the infrastructure required (pipes, pumps, treatment facilities, operation and maintenance, management) across a sufficient number of consumers. Reticulated wastewater systems are provided when the land use in these areas change or they are developed for normal residential housing with sections too small to provide adequate on-site treatment, or where there is public health or environmental risks associated with current private wastewater disposal facilities.

This Activity Plan does not cover private wastewater systems.



Why we do it

Purpose of the activity

The activity helps to maintain public health by preventing the spread of disease and helps protect the environment by treating wastewater prior to discharge to the environment. It also supports the needs of businesses and industry that operate in the District. Wastewater contributes to Southland's communities

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being desirable places to live, work and play in. The wastewater infrastructure Council provides in the District aligns with the community outcome of "supporting our communities". It also contributes to and encourages economic growth within communities served by Council infrastructure.

Objectives of the wastewater activity

The wastewater activity in Southland District (SDC) is focused on the achievement of the following objective:

To provide reliable wastewater collection and treatment services that protect public health and the environment.

More information about level of services is in the section: Our Levels of Service.

Strategic considerations

Community outcomes

Council has adopted a Strategic framework that identifies where Council wants to be in the future (vision) and the outcomes it aims to achieve to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions (community outcomes). The framework also outlines how it will achieve these (mission and approach) along with the key challenge it faces in doing so and its resulting strategic priorities.

Strategic Framework Component	Proposed 2021-2031 Strategic Framework
Mission	Working together for a better Southland
Vision	"Southland – one community offering endless opportunities"
Community outcomes	Kaitiakitanga for future generations
	Inclusive connected communities
	A diverse economy creating healthy and affordable lifestyles
	Empowered communities with the right tools to deliver the best outcomes
Strategic priorities	Improve how we work to build resilience
	Provision of appropriate infrastructure and services
	Better preparing our communities and council for future changes
	Support healthy environments and sustainable communities

The framework guides staff and informs future planning and policy direction and forms the basis for the performance framework. The table below outlines how the stormwater activity contributes to Council's community outcomes using a benefits mapping diagram. The full levels of service and performance management framework is presented in a further section later in the document.

Outcomes	Activity contributions	Outcome objective	Benefit	Levels of Service (LoS) and Key Performance Indicators (KPI)		
Activity Objective: Reliable wastewater collection and treatment that protect public health and the environment.						
				LoS 1: Provide reliable wastewater collection and treatment that protect public health		
Kaitiakitanga for future generations	Utilising culturally sensitive methods of disposal is also an important part of the activity	2b. Consider social, cultural and economic wellbeing	Better alignment with cultural values	KPI 1.1: **System and adequacy** - The number of dry weather sewerage overflows from the territorial authority's sewerage system, expressed per 1000 sewerage connections to that sewerage system.	KPI 1.2: **Response to sewerage system faults** - Where the Council attends to sewerage overflows resulting from a blockage or other fault in the Council's sewerage system, the following median response times measured: (a) Attendance time: from the time of notification to the time when service personnel reach the site; and (b) Resolution time: from the time of notification to this time that service personal confirm resolution1 of the blockage or other fault	KPI 1.3: **Customer satisfaction** - The total number of sewerage system complaints about any of the following: (a) sewerage odour (b) sewerage system faults (c) sewerage system blockages; and (d) the Council's response to issues with its sewerage system, expressed per 1,000 connections to the Council sewerage system.
Inclusive, connected communities	The potential for growth of an area is strongly linked to the availability of reticulated wastewater. Without such systems in place, there is a limit to the level of residential, industrial and commercial development which can be accommodated.	1a. People have everything they need to live, work, play and visit	More convenient and reliable services			

Outcomes	Activity contributions		Outcome objective		Benefit		Levels of Service (LoS) and Key Performance Indicators (KPI)				
A diverse economy creating healthy and affordable lifestyles	By providing a wastewater service which meets the needs of businesses and industry at the lowest sustainable cost, the activity contributes towards building a strong economy in the district.		2c. Consider the impact on the environment		Reduced environmental Impact		KPI 1.4: **Management of Environmental impacts** - Compliance with resource consents for wastewater discharges, measured by the total number of: (a) Abatement notices (b) Infringement notices (c) Enforcement orders (d) Convictions received in relation to the resource consents		KPI 1.5: Percentage of monitoring results that show compliance with resource consent conditions.		
Empowered communities with the right tools to deliver the best outcomes	The health and safety of urban built areas is strongly influenced by the sanitary systems available and the reliability of those services - without which public health may be at risk. By providing a wastewater service which meets the needs of businesses and industry at the lowest sustainable cost, the activity contributes towards building a strong economy in the district.		1c. People can enjoy a safe and fulfilling life in our unique and natural environment		Improved public safety						

Strategic priorities

Council has identified four priority areas in response to the key strategic challenges facing Council and the community to achieve the vision and community outcomes.

Strategic Priorities ▸ Contribution Area ▾	1. Improve how we work to build resilience	2. Provide appropriate infrastructure/services	3.Better preparing our communities and council for future changes	4. Support healthy environments and sustainable communities
What will be done in the long-term (next 10 years)	Installation of energy efficient pumps and blowers as they are renewed Contribute introduction of appropriate technology to improve how best to deliver service for example mobile field working	Ensure compliance with appropriate national and regional plans	Further understand implications of community futures work on renewal strategy Understand options for management of the wastewater activity in such communities	Monitor and trend flow and load patterns in areas of known demand in particular Te Anau and Winton
What will be done in the short-term (next 3 years)	Review and improve systems/procedures around data capture, management and storage Understand and implement business case approach during project development Understand implications of climate changes to communities and how this will impact on the service Map all critical processes	Understand implications of the draft Proposed Water and Land Plan and how this impact on the service we provide	Undertake increased planned maintenance as a surrogate to planned renewals in communities with limited growth/no growth pending development of policies around how this issue will be managed.	Monitor and trend flow and load patterns in areas of known demand in particular Te Anau and Winton
Key actions and projects	Continued development of draft Wastewater Strategy Document with key stakeholders Continue embedding Infor (IPS)	Te Anau wastewater treatment upgrade Riversdale wastewater upgrade Winton wastewater upgrade	None identified specific to wastewater activity at this stage	None identified specific to wastewater activity at this stage
Related strategies / plans / policies	Draft Wastewater Strategy	Proposed Water and Land Plan National policy statement for freshwater management	None identified	None identified

Strategic context

The purpose of the Southland District Council Long Term Plan 2031 is to:

- provide a long term focus for Council decisions and activities
- provide an opportunity for community participation in planning for the future
- define the community outcomes desired for the District
- describe the activities undertaken by Council
- provide integrated decision-making between Council and the community
- provide a basis for performance measurement of Council.

Strategic direction setting encompasses Council's high-level goals, particularly the vision for the District, what the outcomes for the community may be, and what the strategic priorities will be for delivering work to the community.

Representation framework

Community representation was amended prior to the 2018 triennial elections. There are now nine community boards that provide representation across the district. These are:

Ardlussa	Fiordland	Northern	Oraka Aparima	Oreti
Stewart Island/Rakiura	Tuatapere Te Waewae	Waihopai Toetoe	Wallace Takitimu	

It is important that Council is seen as a leader in service delivery across the District and through this AMP, will ensure its wastewater services are fit purpose, in appropriate locations and managed cost effectively. Doing so enables Council to provide and deliver quality, professional services to the ratepayer.

Council aim to have a high level of engagement with its customers and elected members to ensure that the minimum levels of service set out in this document represent their expectations.

Key risks, issues and assumptions for the activity

Key issues and risks for the next 10 years

The most important issues and risks relating to the Wastewater activity for the next ten years are shown in the tables below.

It is noted that the key issues and risks for the stormwater activity align closely with a number of key strategic risks identified at a corporate level the most relevant being

- inaccurate data leading to bad decisions/asset failure
- underinvestment in infrastructure
- infrastructure not fit for purpose to withstand climate change
- natural or biosecurity event impacts the wellbeing of the District
- health and safety controls fail to protect staff and contractor safety
- difficulty retaining or recruiting staff affects service levels
- over-commitment leads to inability to deliver agreed work programme.

Key Issue	Context	Implications
Proposed Water and Land Plan for Southland	*Context:* The proposed Southland Water and Land Plan is now largely operative while some elements are still under appeal and being considered by the Environment Court. This plan sets the framework around how water as a whole will be managed across the region. It also sets the scene for the introduction of catchment limit setting across a series of Freshwater Management Units (FMUs). There is as of yet little clear direction as to how the limit setting process will be implemented but is expected that significant upgrades of wastewater treatment plants are likely to be required, and where possible move towards land based discharges especially in areas where background water is already degraded as a result of human influence. *Options:* 1. Plan for upgrades at all sites when consents are due for renewal – without understanding the implications of the limit setting process on Council. 2. Do nothing until further information on limit setting process is available. 3. Target key upgrades at a number of key plants that would be seen as delivering the biggest environmental wins within the course of this LTP knowing that further upgrades will be required at other sites in the future. Delivery of upgrades at Te Anau and Winton would for example be seen as the biggest wins while further upgrades at Riversdale and Nightcaps will be undertaken as a result of recent resource consent decisions.	Changes within national and regional planning frameworks now indicate a strong preference for discharges to land over discharges to water from Council's wastewater treatment plants. From a Southland perspective the impact of this may be significant in terms of ability to discharge to land under all conditions. It is also likely to require significantly large areas of land to allow discharge to occur particularly from larger schemes such as Te Anau and Winton.
Upcoming capital work in declining communities	*Context:* Council has identified a number of communities where themes such as ageing populations, declining communities or low decile communities raise issues in the way services are delivered, especially in relation to how renewal of infrastructure may impact overall affordability for the delivery of the service. *Options:* 1. Do nothing. 2. Plan infrastructure renewals based on age and condition survey among all communities 3. Identification of key communities where this issue is most relevant and manage the issue by deferring capital work while relying more on planned and reactive maintenance on the infrastructure. Council's preferred option is 3.	This is likely to result in a different levels of service between communities but Council needs to think carefully about how this is managed into the longer term, especially in a manner that avoids non-compliance with resource consents.

Key Issue	Context	Implications
Ageing infrastructure.	*Context:* Some of the pipe networks in the District are approaching the end of their useful life certainly within the 30-year LTP window. Maximising the economic life of the assets and determining the optimal time for replacement are important challenges. *Options:* 1. Continue with renewals when assets expire (subject to further condition assessments). 2. Rely on increased planned/unplanned maintenance activity in communities with limited growth and accept increased operational costs as result. Council's preferred option is 1; Council will undertake condition assessment CCTV survey of assets to help determine the optimal time for replacement.	Through undertaking this work there is an opportunity to investigate alternatives to complete renewals, for example structural lining of pipes.
Climate change	*Context:* Climate change will affect the District over the medium to long term in line with predicted national changes, such as increased temperatures, increasing sea levels and more extreme weather conditions characterised by extreme heavy rainfall events as well as prolonged drought periods. Over the medium to long term as the impact of climate change becomes more prevalent Council will need to be proactive in considering implications on communities and infrastructure.	Infrastructure planning will need to ensure that future assets are of sufficient standard and have adequate capacity to cater for predicted climate change. Any future infrastructural building work including renewals in coastal areas will be considered against projections of sea level risk. Relocation of assets will also be considered if it is believed they are at risk. From a three waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Curio Bay. Through the development of the 2021/31 LTP Council staff from across a range of activities along with external expertise will more fully evaluate the risks associated with climate change with further planning allowed for in future LTP/AMP's. At present there has been no change to future works programmes to address issues

Key Issue	Context	Implications
		arising through climate change.
Strategic direction	While change around how the sector is managed is anticipated the AMP has been developed on the basis of building on the previous AMP while trying to understand the implications of ongoing reviews and inquiries.	It is remains difficult to fully anticipate what changes are likely to arise following the national reforms. At this stage it is understood that the greater impact will be on the water supply and wastewater activities. In anticipation of the outcome of the reviews the AMP adopts a 'holding pattern' while also noting the need to significantly invest in both opex and capex budgets in order to maintain Levels of Service. It is also noted that the budget for upgrading Winton WwTW has been significantly increased in order to reflect potential need for additional land acquisition and also based on costs noted for the Te Anau wastewater upgrade currently under construction.
Asset data knowledge	While Council has asset registers and many digital systems, processes and records, we do not have complete knowledge of the assets under our ownership. To varying degrees Council has incomplete knowledge of asset location, asset condition, remaining useful life and asset capacities. This shortfall requires assumptions to be made on the total value of the assets owned, the time at which assets will need to be replaced and when new assets will need to be constructed to provide better service.	Council considers these assumptions and uncertainties constitute risk and proposes to address this by increasing it programme for condition assessment of assets to improve knowledge around age and condition of wastewater assets. As levels of understanding improve, a better forecast of capital expenditure will be incorporated into future forecasts.

Key risks are summarised in the following table. It is noted that issues and risks are broadly similar across all three waters activities and align closely with corporate risks.

Risk Event	Current Treatment Details	Proposed Treatment Details
Event - natural disaster causing short term disruption to service provision.	Identification of alternative short term response and recovery arrangements.	Council and Contractor to develop business continuity plans to cover natural disasters.
Event eg natural disaster causing widespread unavailability of activity staff.	Temporary or agency staff either from within Council or through external resourcing	Council and Contractor to develop contingency plans to cover natural disasters.

Risk Event	Current Treatment Details	Proposed Treatment Details
Natural disaster causes significant widespread damage to Council assets and infrastructure.	As Council assets are widespread across the District the risk of significant widespread damage is relatively low however the impact on those areas can be relatively high.	Identify strategic sites at risk and develop plan for their maintenance and return to service. Development of wider emergency management plan. Understand location of vulnerable landfill sites and develop plan for their future management.
Funding of activities will result in significant rates increases impacting on community affordability.	Decisions made with based on a trade-off between 'sweating' assets and targeting investments. Has potential to result in a large number of unbudgeted projects required through the course of the planning cycle.	Development of a well-informed capital works programme based on known condition and performance of assets.
Risk to public health as a result of Council activity	Installation of multi-barrier protection on all community water supplies along with review and up-dating of Water Safety Plans. Wastewater and stormwater risks are mitigated through achieving compliance with discharge consent conditions and any investigations that may arise as a result.	As current along with any further requirements that may arise following formation of new drinking water regulator.
Health and safety risks (to staff, contractors and public) associated with operation of Council activity	All Council sites are secure, fenced off and have appropriate signage warning of multiple risks. Higher risk sites have recently been identified and expenditure approved for increasing security.	Further review of fencing and security arrangements will require additional expenditure through future planning cycles.
Breakdown in relationship/communication between Council and Contractor	Regular communications and partnering approach.	More frequent partnering meetings. Review stakeholder management arrangements through new contract. Possible opportunity to develop Alliance type approach.
Failure of co-operation with other Councils that may impact on future potential service delivery arrangements	New risk that may arise following requirement for councils to work together to review and consider future potential service delivery arrangements.	Agree working protocols among councils and ensure early and regular engagement with elected members to ensure consistent messaging is being fed through to all Councils.
Lack of resourcing impacts on ability to deliver services through failure to attract	This is an issue of concern nationally and is currently not one that is well managed. On a local level Council have participated in careers events	Continue to support local careers based events while pushing at a more national level (eg through Water NZ) for a co-ordinated approach to help

Risk Event	Current Treatment Details	Proposed Treatment Details
appropriately trained staff into the sector.	that succeeded in attracting some graduates into the organisation.	attract appropriately skilled people into the sector.
Loss of organisational knowledge due to sudden loss of key activity staff resulting in inefficient of inadequate management or operation.	Staff training and succession planning will mitigate risk of frequent staff turnover.	Identify individual staff needs and formulate appropriate training, in conjunction with consultant assistance until skills at appropriate level. Detailed succession planning to ensure institutional knowledge is retained.

Impact of climate change

Climate change will affect the district over the medium to long term in line with predicted national changes such as increased temperatures, increasing sea levels and more extreme weather conditions characterised by extreme heavy rainfall events as well as prolonged drought periods.

Over the medium to long term as the impact of climate change becomes more prevalent Council will need to be proactive in considering implications on communities and infrastructure.

Infrastructure planning will need to ensure that future assets are of sufficient standard and have adequate capacity to cater for predicted climate change.

Any future infrastructural building work including renewals in coastal areas will be considered against projections of sea level risk. Relocation of assets will also be considered if it is believed they are at risk.

From a three waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Orepuki and Curio Bay.

Through the development of the 2021/31 Long Term Plan Council staff from across a range of activities along with external expertise will more fully evaluate the risks associated with climate change with further planning allowed for in future LPT/AMP's.

The Climate Change Impact Assessment Report ('the Report') was one of the studies commissioned. NIWA (National Institute of Water and Atmosphere) was appointed to undertake the work which commenced in 2017 and was finalised at the end of 2018. The Report utilised a comparable methodology to the Climate Change Projections for New Zealand report and the Intergovernmental Panel on Climate Change scenarios. It used two climate change predictions being RCP (Representative Concentration Pathways) 4.5 – meaning that a large reduction in global carbon emissions is achieved and RCP 8.5 - where no reduction in carbon emissions is achieved.

It is widely accepted that the global climate system is changing and so is New Zealand's. In addition, to the impacts on weather, there will be impacts on water availability and natural hazard exposure. The report calculated the potential impacts of climate change on a range of components of climate, hydrology and coastal process across Southland.

Issues

The key findings of the report are summarised as follows:

Temperature

- the projected Southland temperature changes increase with time and emission scenario. Future annual average warming spans a wide range: 0.5-1°C by 2040, and 0.7-3°C by 2090

- Autumn is the season where most of the warming occurs across all time periods and scenarios
- the average number of hot days (maximum temperature >25°C) is expected to increase in a range spanning from 0-10 days by 2040 to 5-55 days by 2090
- the related number of heatwave days (i.e., number of consecutive days where the temperature is higher than 25°C) is projected to increase (largest increase with elevation)
- as expected, the number of frost days is expected to decrease by 0-5 days by mid-century, and by 10-20 frost days by the end of the century.

Projected changes in rainfall

- a marked seasonality and variability across the Southland region. Annual rainfall is expected to slightly increase by mid-century (0-5%), while the increase spans 5-20% at the end of the century
- seasonally the largest increases are projected during winter, while summer precipitation is expected to decrease in the Waiau catchment (by up to 10% at the end of the century)
- by mid-century, the number of wet days is expected to decrease by up to 10 days across most of the region. However, wet days are then expected to increase by the end of the century for most of the region, except the Waiau catchment where 10-20 fewer wet days are expected
- by mid-century, decreases in annual maximum 5-day rainfall are projected for the centre of the Southland Region (up to 15 mm) and increases are projected for the rest of the region, with Fiordland facing the largest increases of 15-30 mm in some parts
- however, at the end of the century, almost the whole Southland Region (except the eastern Waiau catchment under mid-range emission scenario) is projected to experience increases in annual maximum 5-day rainfall of up to 15-30 mm and parts of Fiordland facing possible increases 45 to 105mm.

Dry days

- by mid-century the number of dry days are expected in increase up to 10 more days for much of the region
- the central part of the region and northern and western Fiordland can expect up to 10 fewer dry days are expected (ie will remain wetter)
- by the end of century, a decrease in dry days (up to 10-20 days) is projected for most of the region except for the Waiau catchment (increase up to 10-20 days), eastern Fiordland, and Stewart Island
- meteorological drought (a period with abnormal rainfall deficit) – where soil moisture content is reduced and vegetation/pasture growth is hindered. During periods of Potential Evaporation Deficit farms are more likely to need irrigation to maintain crop or pasture growth
- central-northern part of the Southland Region is projected to experience the largest increases in potential evaporation deficit in the future across both time slices and all emission scenarios
- by mid-century, Potential Evaporation Deficit is expected to increase by 40-80mm per year for most of the regions, rising to over 100 m per year for the highest emission scenario by 2090.

Changes in sea level-rise

- sea level rise is expected to be between 0.2-0.3 m above present levels by 2040 and increasing to 0.4-0.9 m by 2090
- a present day 1 percent annual exceedance probability (AEP) coastal flood (that is a flood of a size and depth that has a 1 percent chance of happening in any year), will become much more frequent as seas continue to rise, with such large events occurring on average on a yearly basis (100 percent AEP) once sea level rise reaches 0.45 m expected between 2055-2060 and 2100

- moderate coastal flooding events will become even more common, occurring several times a year for that same sea-level rise
- these floods have effects such as salt water on roads and therefore vehicles, saltwater intrusion in underground infrastructure, temporary inundation of open space, agricultural land or natural vegetation. Over time this can the fertility of soils, change plant species or cause accelerated deterioration of public and private infrastructure
- considering tides only, putting aside storm events, the rising sea level will result in an increasing percentage of normal high tides exceeding given present day design for coastal infrastructure and roads
- the replacement costs of buildings exposed in areas where such high resolution LiDAR surveys are already available (mainly low-lying parts of Invercargill City) is considerable at ~$0.6–1.2B (2011 NZ$) for a range from present exposure to 1 percent AEP coastal floods up to a 1.2 m sea-level rise.

The report models the effect of climate change on the "mean annual flood" which is a standard measure of floods likely to occur every 2.33 years. The modelling suggests that the mean annual flood is likely to become larger and this may mean an increase in volume for flooding generally. This requires further detailed consideration.

Little appreciable change in water supply reliability across Southland by mid-century. Late-century, however, the decreases become slightly more accentuated, particularly under a high emissions scenario. Water supply reliability is a function of both water availability and water demand to serve urban, agricultural and industrial purposes.

This regional study is a high level starting point for understanding how our climate is likely to change over the next 50 to 90 years. Given the high level of this report additional more targeted reports and internal work will need to be commissioned to better understand how these assumptions are going to impact the management of Council assets and what makes Southland an attractive place to live, do business and visit.

Regulatory considerations

Legislation, regulation and Council's existing strategies and policies mandate or influence some of the LoS and performance targets we set, as illustrated in the table below for the wastewater activity. A full description of Council's policy and planning framework impacting AMPs is included in the LTP.

Below is a list of legislation and regulations that are specific to Wastewater. The table also includes relevant bylaws and policies linked to the activity.

Legislation / Regulation / Planning Documents	How it (and any changes proposed or implemented since the last plan) affects levels of service and performance standards
Local Government Act 2002	The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and to meet the current and future needs of communities for good quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost effective for households and businesses. The act also makes provisions for public ownership and control of public wastewater services, a requirement to make wastewater assessments and to charge. Development contributions.
	Changes: None.
Regional Policy Statement 1997	This document's purpose in relation to wastewater is to ensure the quality of water and the environment is not contaminated by

Legislation / Regulation / Planning Documents	How it (and any changes proposed or implemented since the last plan) affects levels of service and performance standards
	wastewater discharges. It aims to provide for current and future generations while aiming to improve the quality of the environment.
	Changes: None.
Regional Water Plan for Southland 2008	This plan remains operative while appeals are outstanding on the Proposed Southland Water and Land Plan. The purpose of this plan is to promote the sustainable management of Southland's rivers, lakes, groundwater and wetland resources. The plan is aimed at enabling the use and development of fresh water where this can be undertaken in a sustainable way, providing a framework for activities such as discharges to water.
	Changes: None.
Regional Coastal Plan for Southland 2007	Fundamental principles in the management of the CMA are set out and then sections of the plan deal with wastewater discharges that have a range of environmental, social and cultural effects.
	Changes: None.
District Plan 2012	Sets out Council's resource management strategy, including how Council will control the effects of wastewater discharges to ensure that the adverse effects on the environment are avoided.
	Changes: None.
Infrastructure Strategy	Sets long term direction for the management of assets and infrastructure
	Changes: The updated 2021 strategy signals the need for greater investment required from both capex and opex spending
Utilities Access Amended Act 2010	The purpose of the Code is to enable access by utility operators to transport corridors to be managed in a way that disruptions to roads by wastewater pipe installations are kept to a minimum while maintaining safety and maximising the benefits to the public.
	Changes: None.
Subdivision and Land Development Standards Bylaw 2012	Specifies Council's minimum requirements for subdivision and land development while promoting sustainable development.
	Changes: None although it may be opportune to review ahead of its proposed date.
Trade Waste Bylaw 2018	Requires persons on trade premises to apply for a permit to discharge to the sewer network and allows conditions to be placed on the wastewater parameters before discharge.
	Changes: None.
Wastewater Drainage Bylaw 2017	Requires all persons to make application before connecting to the wastewater network and outlines conditions for accepting wastewater. The bylaw is currently being reviewed and updated.
	Changes: None.
NZ Water Industry National Asset Grading Standards and International Infrastructure Management Manual	Provides guidelines on asset grading and asset management
	Changes: None.
Pipe Inspection Manual	Provides guidelines on pipe asset grading.
	Changes: Staff work to most up to date version available

Legislation / Regulation / Planning Documents	How it (and any changes proposed or implemented since the last plan) affects levels of service and performance standards
Hazardous Substances and New Organisms Act 1996	The purpose of this Act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms.
	Changes: None.
Resource Management Act 1991	Promotes the sustainable management of natural and physical resources. Regulates land use and sub-divisional activity. Regulates discharges to land, air and water. Recognises the principles of the Treaty of Waitangi. Compliance with district and regional plans.
	Changes: None.
National Policy Statement for Freshwater Management	Sets national policies and bottom line standards for freshwater management and provides Regional Council with the authority and responsibility to develop policies, objectives and rules around how freshwater is managed across the country
	Changes: An updated NPS was released in 2020 and precedes a NES focussing on wastewater and stormwater discharges which is likely to impact on the way that activities are delivered.
Proposed Water and Land Plan	Recent or expected changes: The proposed Water and Land Plan was notified in 2016 with hearings held through 201. Decisions were released in 2018 with a number of appeals (including Councils) to a number of objectives policies and rules. Following the first stage of appeals in June 2019 an interim ruling was released by the Environment Court in late 2019 with a second round of appeals expected to be heard in 2021. Essentially the plan builds on the provisions of the current active plan but also indicates a strong preference for wastewater discharges to be land based rather than to water. The objectives and policies are very explicit on this point with a specific rule identifying water based discharges as non-complying activity status.
	Changes: The plan is under appeal though provisions relating to water discharges are operative at this stage.
Taumata Arowai – Water Services Regulator Bill	The bill establishes Taumata Arowai the water services regulator as a new crown agent and provide for its objectives functions and operating principles. The Bill is part of a broader package of reforms to the regulatory system for 3 waters. The Government has indicated a separate bill will be proposed to give effect to decisions to implement system wide reforms to the regulation of drinking and source water and targeted reforms to improve the regulation and performance of wastewater and stormwater networks and will include consideration of future service delivery arrangements.
Draft Wastewater Strategy	To provide a tool to help prioritise wastewater treatment upgrades in a manner that deliver overall environmental benefits at appropriate time whilst remaining affordable. It will also aid with the development of a 30-50-year capital works programme. It will also help demonstrate an understanding of Councils responsibilities and obligations in response to the proposed Water and Land Plan.

Legislation / Regulation / Planning Documents	How it (and any changes proposed or implemented since the last plan) affects levels of service and performance standards
	Changes: The draft strategy has been developed based on consenting regional catchment load limits however may change depending on timing of anynew National Environmental Statement.

Three waters reforms

Reform in the three waters sector has been progressing for some time. However, since the Havelock North incident in 2016 it has become an area of high priority for central government.

Following the Havelock North incident, the government commenced a formal inquiry, which recommended a Three Waters Review be undertaken. The review considered options for improving regulatory and service delivery arrangements for drinking water, wastewater and stormwater services (Three Waters) to better support New Zealand's prosperity, health, safety and environment. Most three waters assets and services, but not all, are owned and delivered by local authorities.

The government's three waters review highlighted that, in many parts of the country, communities cannot be confident that drinking water is safe, or that good environmental outcomes are being achieved. This work also raised concerns about the regulation, sustainability, capacity and capability of a system with a large number of localised providers, many of which are funded by relatively small populations.

Taumata Arowai - the Water Services Regulator Bill has now passed into law with significant work well advance with the establishment of the crown entity. The bill is relatively simple in that its focus is on establishing the new water regulator as a crown entity, under the Crown Entities Act 2004. The bill also outlines the agencies objectives, functions, operating principles and governance arrangements and is expected to be enacted by mid-2020.

A separate bill will give effect to the decision to implement system-wide reforms to drinking water regulation, alongside targeted reforms to improve the regulation and performance of wastewater and stormwater networks.

The regulatory components of this work are well progressed with the development of new legislation and the creation of Taumata Arowai, the new, independent water services regulator. This new Crown entity is currently being built, and will become responsible for drinking water regulation once a separate Water Services Bill, which is currently before Parliament, is passed (anticipated mid 2021).

Following the onset of Covid-19, central government have reviewed the approach being followed to three waters reform. This review has in part been driven by a number of factors including:

- a risk that a number of local authorities may look to defer operating and capital expenditure in an attempt to manage rate increases in a post Covid-19 environment
- the desirability of creating a broader economic stimulus for local economies in a post Covid-19 environment.

This process led, in July 2020, to the government announcing a funding package of three waters (drinking water, wastewater, stormwater) infrastructure, and to support the reform of local government water services delivery arrangements.

Council has been allocated $7.03 million by the Crown, if it opts in to the reform programme. A further $11.15 million has been allocated to the region to agree an appropriate distribution between participating councils. This funding has been provided as a grant, which does not need to be repaid if Council does not ultimately commit to reform at later stages of the process. The funding must be expended by 31 March 2021. This stimulus funding is Centrals Government s approach to kick start economic growth post Covid-19.

Since then Council has developed a delivery plan identifying projects that could be grouped to develop a Delivery Plan which has ultimately been approved by the Department of Internal Affairs and consists of both capital work as well as investing a significant amount to improve knowledge of the condition of assets including wastewater and stormwater condition assessment across targeted networks where known issues have been identified. Further information on work identified under the Delivery Plan is highlighted in further sections within the plan.

In moving into this environment the government has indicated that its starting intention is public multi-regional models for water service delivery to realise the benefits of scale for communities and reflect neighbouring catchments and communities of interest. There is a preference that entities will be in shared ownership of local authorities. Design of the proposed new arrangements will be informed by discussion with the local government sector.

In addition, endeavour to proactively address the range of service delivery options that might exist the Otago Mayoral Forum has initiated a working group process, with external consultant assistance, to explore the range of delivery options that might exist in relation to the delivery of water services across the Otago region. They have also invited the Southland councils to participate in this work. Staff have indicated that this Council is keen to participate.

Demand management

Given that changing demand is primarily driven by changing land use, this is a potential key means of managing future demand. However, the predominantly low population and rural nature of Southland has meant that to date there has been very little requirement for land use control. There are one or two exceptions to this, primarily Te Anau, but also potentially Winton. Consideration of demand management for these towns primarily relates to ensuring development is appropriate to the function rather than limiting growth per se. However, there is still a need to ensure that land use planning continues to consider impacts on road networks as part of the overall scheme.

This section describes how the demand for Wastewater is likely to change over the period of the plan, the impact any changes are likely to have and whether Council is planning to make any changes to the activity as a result.

Predicting future demand for the service

Demand drivers

The factors influencing demand for the service are summarised in the table below. Council has prepared corporate wide assumptions/projections for growth drivers (population, land use, dwellings, tourism) which have been used as the basis for assessing future demand for the service.

Demand Driver	Impact on Future Demand
Population	Expect wastewater volumes to increase in proportion to population and in areas of new sub-development.
Stock trucks	No Council scheme currently accepts stock truck effluent and it is currently not intended that this position alters.
Land changes	Expect wastewater volumes to increase in proportion to the amount of land development.
Water consumption trends	With the exception of water used for irrigation and unaccounted for water, most water supplied by the SDC water supply systems are subsequently discharged into the wastewater reticulation. As water conservation measures are implemented it is anticipated this could lead

Demand Driver	Impact on Future Demand
	to an overall reduction in wastewater volumes offsetting some of the increases that occur as a result of growth.
Network condition	Anticipate wastewater volumes to increase in areas where there is an ageing network, and/or high levels of groundwater which can have an effect on levels of infiltration for example Winton
Stormwater cross connections	Expect wastewater volumes to increase in areas where there are unknown stormwater cross connections during times of heavy rainfall.

Table 0-1: Demand drivers for wastewater

Information from the previous assumptions noted

- population will increase by an average of 0.83% per annum across the period from 2013-2043
- the amount of land used for dairy farming is projected to rise from about 164,000 ha in 2013 to 215,000 ha in 2043 due to the ongoing conversion of sheep and beef (pastoral) farms to dairy
- It is predicted that while resident population changes will be minor, tourist numbers will grow significantly between 2015 and 2043[1]. The majority of growth in tourism activity is predicted to occur within the Fiordland Regional Tourism Organisation area (which includes the Te Anau). At the time of development of this plan it is noted that international numbers have all but dropped away completely as a result of the Covid-19 pandemic and it is likely to remain at a low level for a considerable period of time. This is likely to have a resultant knock on effect on wastewater flows in tourist locations. For example Te Anau has seen flows drop back to pre 2014 numbers in the early part of 2020.

As a result of this, it is expected that demand for the service will remain mostly the same. Growth in Te Anau and Riverton, Winton, Oban and Manapouri may need extensions to the wastewater reticulation to service new subdivisions, although at present the rate of development across the District has slowed down in response to current economic conditions and Covid-19 so the timing of this is uncertain but is better represented in the extended 2021 to 2051 LTP Asset and Service Implications.

Table 0-2 illustrates the average inflow to treatment per capita for each scheme. This can help identify which schemes may need to be targeted for Investigation and Infiltration Programmes (after taking into account large commercial users on the scheme which may distort results).

Scheme	Population	Average Daily Flow (m3)	Average per person (litres/day)
Balfour	126	77	611
Edendale-Wyndham	1,152	339	346
Gorge Road	192	12	240
Lumsden	453	288	635
Manapouri	228	92	403
Nightcaps	306	131	428
Ohai	303	129	425
Stewart Island	387	91	235
Otautau	798	183	229
Riversdale	456	188	412
Riverton Rocks	698	219	313

1 Based on the forecast of visitor nights and actual visitor numbers from the Ministry of Business Innovation and Employment and Infometrics. This includes international and domestic visitors.

Scheme	Population	Average Daily Flow (m3)	Average per person (litres/day)
Riverton Town	808	376	465
Te Anau	2,628	1161	441
Tokanui	150	28	186
Tuatapere	561	173	308
Winton	2,436	1114	457

Table 0-2: Wastewater inflows 2013-2014 (populations updated to 2013 census)

Although not showing the highest per capita demand I/I work has been initially targeted on Winton where it is known that infiltration often leads to non-compliances with consent flow conditions and where a significant LoS upgrade is programmed to be undertaken within the first three years of the plan.

Implications of growth/demand

Urban growth and peak growth will require upgrades to the wastewater pumping and storage infrastructure to service new residential subdivisions and, in some cases, upgrading the capacity of existing pipes.

However, with the exception of Te Anau, scheme capacities are expected to be able to cater for long term future demand. Where necessary there may be some extensions to the wastewater reticulation to service new subdivisions. As of 2015 Council has applied a policy of not collecting development contributions and as a consequence alternative funding mechanisms will need to be considered to fund demand based upgrades. Where contributions have been collected previously they will be used to fund any demand work completed.

Stock truck effluent dump sites and motor home dump stations could cause issues with overloading in both nutrient/pathogen levels and flow for local pump stations and treatment plants. At present none of Council's schemes are currently significantly impacted on by either although it is noted the has been an increasing number of resource consent applications for unmanned fuel stations that included the installation of a campervan dump station. Prior plans identified potential growth in Stewart Island (Oban), Riverton and Winton which could require investment, however current census data does not support this. Work was undertaken to purchase additional aeration for the Winton, Te Anau and Oban oxidation ponds. In the case of Winton and Te Anau the primary driver was to improve operational performance, whereas for Oban it was to address demand brought about by increasing tourist numbers arriving on day visits from cruise ships.

Demand management strategies

SDC uses the following strategies to manage demand:

Connection of downpipes

SDC have historically carried out inspections of properties where volume in the sewers increases dramatically during rain events. Owners of properties that are found to have downpipes connected to gully traps are sent Improvement Notices instructing them to redirect stormwater out of the sewer.

Tradewaste

Septic Tank cleaning businesses have access to discharge into treatment plants located within the larger communities, currently only Te Anau. This is so that small treatment systems are not overwhelmed by the concentrated discharge. Council proposes to:

- enforce (where appropriate) the Trade Waste Bylaw to control the discharge of industrial effluents to the wastewater networks. (Trade waste does not form a significant proportion of the waste stream in the majority of Council's schemes)
- apply Trade Waste discharge charges – and to restrict such discharges to those systems that can cope with additional loading. Until recently the only site accepting imports of septic tank waste is Te Anau however this has been stopped until the planned upgrade of the treatment plant is completed.

It is noted that the majority oc community wastewater schemes are largely domestic and light commercial/industrial with no significant trade waste components. While the Trade Waste bylaw is in existance no premises are currently managed and charged under it.

Public education

Although there is no formal education programme, WWS publish articles on a regular basis in Council's "First Edition" quarterly newsletter. The newsletter highlights a number of education initiatives including steps people can consider to reduce water consumption, educate on what not to flush down a toilet and steps that can be taken to manage septic tanks.

Important local issues are also advised through the respective Community Boards as appropriate.

CCTV inspections

Close Circuit Television (CCTV) is used to help us identify the cause of blockages. CCTV inspections are crucial when there are problems in drains. Drains block for many reasons and it is essential to really see the problem before taking the next step. CCTV is carried out in areas where there are suspected high levels of infiltration, and also prior to upcoming renewals work to help target expenditure to those areas where it is required the most. Recent CCTV surveys in Ohai identified no significant issues in terms of infiltration.

Inflow/infiltration

It is estimated from variations in flows through the treatment plant and pump stations that stormwater inflow and groundwater infiltration make up a significant amount of total wastewater volumes in the following wastewater systems:

- Lumsden
- Ohai
- Riversdale
- Winton.

Schemes have been continually upgrade by the installation of SCADA controlled Magflow meters to accurately assess the extent of Inflow / Infiltration within each wastewater scheme.

Schemes that also suffer from infiltration/inflow but not to the same extent are:

- Oban
- Te Anau
- Tokanui.

Further CCTV work and infiltration studies and condition assessments will be carried out across a number of communities where it is known that infiltration forms a significant portion of the base flow. Identified renewals expenditure within the 10-year period will be targeted on areas where identified by studies and via information supplied by Council's operations and maintenance contractor. It is noted that there may be an opportunity to fund some of this work through future tranches of Government funding through its reforms programme.

Plans programmed to meet growth/demand changes

Historically SDC has taken advantage of the Ministry of Health's Sanitary Works Subsidy Scheme (SWSS) to gain maximum funding assistance (50%) for a scheme extension on Stewart Island and new schemes in Gorge Road, Wallacetown, Tuatapere and Edendale Wyndham.

With the removal of the subsidy scheme, it is not anticipated that any new schemes will be constructed within the upcoming 10-year period. With a relatively low or in some cases negative population growth it is not anticipated that any existing scheme will require upgrading to meet increased demand, with the exception of Te Anau however tourist related demand growth is expected to remain low post Covid-19 pandemic conditions.

However, the situation may arise within the 30-year horizon that new reticulated systems will be required in a number of areas where high numbers of failing septic tanks causes contamination of groundwater, surface water and stormwater drainage for example Curio Bay. Current or recent demand based upgrades include:

- the proposed Te Anau wastewater upgrade to irrigate land at the Kepler Block north of the Te Anau airport Manapouri. This project will address both Level of Service issues as well as allowing for future demand driven growth. This is the only project within the current and proposed LTP to have a demand related portion allocated through the budget platform
- funding from development contributions previoulsy collected was also used in 2016 to fund the purchase of additional aeration for the Oban oxidation pond to cope with influx of short term demand driven by an increase in cruise ships visiting the Island
- it is not anticipated that there will be any further demand driven projects required over the upcoming period.

Sustainability

The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and to meet the current and future needs of communities for good quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost effective for households and businesses.

At the wastewater activity level, a sustainable development approach is demonstrated by the following:

- consider the use of energy efficient motors and blowers on water treatment plants and pump stations as they are renewed
- develop a programme to consider the key impact of climate change across the activity particularly in terms of extreme rainfall events
- move to new electricity contracts which allow larger consuming schemes to operate more efficiently.

The ability to improve the sustainable outcomes in the provision of infrastructural services is highest during the planning and design phase. Asset type, location and design can significantly impact sustainability outcomes, e.g. accessibility, urban form, land-use, heritage, health and wellbeing. Good planning and design can lead to improved economic and social benefits.

The operation of infrastructure has ongoing impacts - particularly as they relate to energy use and emissions, runoff, noise, light, ecological impacts, safety, etc. Operation can provide ongoing employment and economic benefit.

The construction of infrastructure impacts on material use, energy, water, waste, etc. Construction can provide employment, with potential to target 'social' procurement.

The wastewater activity contributes to the sustainable development within the District by provision of:

- safe wastewater collection and disposal system to enhance public health within the community
- treatment systems to reduce impacts of our discharges on the environment.

Social and cultural

The sewerage activity provides one of the building blocks for a safe, sustainable communities. This activity management plan aims to provide systems that are continuously available to residents through maintenance and renewal plans to replace assets prior to failure, and to minimise times when the service is unavailable to any property. The treatment plants ensure that natural areas are available for recreational activities without risks to public health, and that ecological values are sustained. The plan also recognises the importance of land based discharges to iwi and where practicable look to remove discharges from water as treatment systems are upgraded.

Environmental

Council hold consents for discharges from each of its wastewater treatment plants. The consents include conditions limiting contaminants in the discharges to air, water and land to protect the receiving environments from unsustainable drainage.

Council seeks to operate the activity in ways that minimise the use of resources and effects on the environment. Strategies include:

- selection of plant and pipe materials to maximise useful service life
- minimisation of wastage during construction
- selection of energy efficient plants and energy audits of operating plant
- design for adaption and resilience to hazards and climate change and changing land use.

Economic and financial Council's goal is to continue to provide the sewerage activity which achieves the desired levels of service in the most effective manner by:

- recognising the consumption of assets over their lifetime and funding their renewal through depreciation.
- categorising capital versus operational expenditure
- allocating costs and preparing forecasts over the long term (30 years and beyond)
- reporting on financial performance
- researching and identifying practical and cost effective alternative service delivery options.

Key projects

The following table identifies key projects that it is proposed to undertake through the ten-year period of the 2021/31 LTP.

Location	Description	Budget	Year (s)
*Tokanui	Strengthen embankments to ponds	$100K	21/22
*Stewart Island	Disposal field upgrade	$300K	21/22 – 22/23
Te Anau	Wastewater upgrade demand portion	$1810K	21/22 – 22/23
*Te Anau	Wastewater upgrade	$2890K	21/22 – 22/23

Winton	Consent renewal preparation (expires 2023)	$200K	21/22
Various locations	SCADA replacement	$1,386K	22/23 – 26/27
Various locations	Inflow project to comply with consent limits Tokanui and Riversdale	$150K	21/22
Various locations	End of life wastewater pumps and electrics	$563K	23/24 – 27/28
Various locations	Chainlink fencing to remaining oxidation ponds (schemes)	$559K	24/25 – 26/27
Various locations	Safety ladders to oxidation ponds.	$30K	21/22
Various locations	Oxidation pond sludge surveys (Oban, Otautau and Tokanui)	$80K	21/22
Various locations	Completion of oxidation pond desludging Nightcaps and Lumsden.	$414K	22/23
Balfour	Consent renewal preparation (expires 2024) and treatment upgrade	$1,800K	22/23 – 23/24
Edendale/Wyndham	Discharge consent (expires 2023) and consent condition investment	$3,345K	21/22 – 23/24
Gorge Road	Consent renewal preparation	$45K	25/26
Gorge Road	Upgrade	$669K	27-28 - 28/29
Lumsden	Consent renewal preparation	$238K	27/28
Manapouri	Consent renewal preparation (expires 2024)	$134K	21/22
Manapouri	Treatment upgrade	$4,305K	23/24 – 24/25
Monowai	Consent renewal preparation – installation of piezometers	$20K	20/21
Monowai	Consent renewal	$179K	27/28
Nightcaps	Treatment upgrade including land disposal investigation	$3,550K	24/25 – 26/27
Nightcaps	Switchboard and pumps	$97K	25/26

Ohai	WWTP discharge consent renewal	$120K	21/22
Otautau	Switchboard renewals	$699K	27/28 – 28/29
Otautau	Consent renewal preparation	$179K	27/28
Riversdale	Wet well improvement	$285K	22/23
Riversdale	Treatment upgrade Stage 2	$2,645K	21/22 – 22/23
Riverton	Treatment renewal townside infiltration basins and sewer pumps	$185K	24/25
*Riverton	Extend sewer to Princess and Carrol Streets	$100K	22/23
Stewart Island	Switchboards, cabinets and pumps	$1,294K	29/30 – 30/31
Stewart Island	Balance of pumps to Stage 1 sewer pump stations	$60K	22/23
Stewart Island	Consent renewal preparation (expires 2024)	$207K	22/23
Stewart Island	Disposal field upgrade	$300K	21/22
Te Anau	Switchboards and pumps replacements	$470K	28/29 – 29/30
*Te Anau	Caswell Road upgrade	$1,000K	21/22 – 22/23
Te Anau	Remove and dispose of sludge offsite	$391K	21/22 & 25/26
*Te Anau	Oxidation pond improvements relating to flooding of the Upukeroa River	$80K	21/22
Tuatapere	Consent renewal preparation	$234K	21/22 27/28
Wallacetown	Replacement wastewater pumps	$65K	24/25
Wallacetown	Wastewater consent contribution to Alliance for upgrade	$149K	27/28
Winton	Consent renewal	$200K	21/22
Winton	Eastern wastewater reticulation design and upgrade Florence Street	$2,439K	24/25 – 26/27
Winton	Switchboards and aerators	$545K	26/27 – 27/28
Winton	Treatment upgrade	$29M	25/26 – 27/28

Winton	Stormwater infiltration project	$1,162K	21/22 – 24/25
District Wide – various locations	Wastewater condition assessment CCTV of piped assets	$1,036K	21/22 – 30/31

*Denotes – full or part funded through Government funding

Our Levels of Service

Levels of Service, performance measures and targets

This section outlines the levels of service (LoS), performance measures and targets form the performance framework for the activity detailing what Council will provide, and to what level or standard:

- LoS are the outputs that are expected to be generated by the activity. They demonstrate the value being provided to the community or reflect how the public use or experience the service. A key objective of activity planning is to match the level of service provided with agreed expectations of customers and their willingness to pay for that level of service.
- Key Performance Indicators (or performance measures) are quantifiable means for determining whether a LoS has been delivered and are generally broken into customer measures (which focus on how the public uses or experiences the service) or technical measures (which tend to be used internally to track performance or measure what the organisation does).
- Performance targets are the desired levels of performance against the performance measures.

The levels of service provide the basis for the management strategies and works programmes identified in the AMP. By clarifying and defining the levels of service for the Wastewater activity (and associated assets), Council can then identify and cost future operations, maintenance, renewal and development works required of the activity (and associated assets) to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

What LoS we provide	**LOS1: Provide reliable wastewater collection and treatment services that protects public health and the environment**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI 1.1: **System and adequacy** – The number of dry weather sewerage overflows from the territorial authority's sewerage system, expressed per 1000 sewerage connections to that sewerage system.	<1	≤1	≤1	≤1	≤1
KPI 1.2: **Response to sewerage system faults** - Where the Council attends to sewerage overflows resulting from a blockage or other fault in the Council's sewerage system, the following median response times measured: (c) Attendance time: from the time of notification to the time when service personnel reach the site; and (b) Resolution time: from the time of notification to this time that service personal confirm resolution[1] of the blockage or other fault	a) 18 minutes b) 2 hours 20 minutes	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours
KPI 1.3: **Customer satisfaction** – The total number of sewerage system complaints about any of the following: (a) sewerage odour (b) sewerage system faults	7 per 1,000 connection	≤8 per 1,000 connections	≤8 per 1,000 connections	≤8 per 1,000 connections	≤8 per 1,000 connections

(c) sewerage system blockages; and (d) the Council's response to issues with its sewerage system, expressed per 1,000 connections to the Council sewerage system.					
KPI 1.4: **Management of Environmental impacts** - Compliance with resource consents for wastewater discharges, measured by the total number of:					
(a) Abatement notices	0	0	0	0	0
(b) Infringement notices	0	0	0	0	0
(c) Enforcement orders	0	0	0	0	0
(d) Convictions received in relation to the resource consents	0	0	0	0	0
KPI 1.5: Percentage of monitoring results that show compliance with resource consent conditions.	Not measured	100%	100%	100%	100%
1 - In accordance with operations and maintenance contract timeframes.					

Table 0-1 details the levels of service, performance measures and performance targets for the Wastewater activity. The table sets out Council's current performance and the targets it aims to achieve within the next three years and by the end of the next 10-year period.

The LoS have been chosen to ensure that the wastewater service meets all obligations, whether legal or public. The measures will guarantee that if any problems do occur there is a minimum response time and that the action will be to a suitable standard.

What LoS we provide	**LOS1: Provide reliable wastewater collection and treatment services that protects public health and the environment**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI 1.1: **System and adequacy** – The number of dry weather sewerage overflows from the territorial authority's sewerage system, expressed per 1000 sewerage connections to that sewerage system.	<1	≤1	≤1	≤1	≤1
KPI 1.2: **Response to sewerage system faults** - Where the Council attends to sewerage overflows resulting from a blockage or other fault in the Council's sewerage system, the following median response times measured: (d) Attendance time: from the time of notification to the time when service personnel reach the site; and (b) Resolution time: from the time of notification to this time that service personal confirm resolution[1] of the blockage or other fault	a) 18 minutes b) 2 hours 20 minutes	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours	a) ≤1 hour b) ≤6 hours
KPI 1.3: **Customer satisfaction** – The total number of sewerage system complaints about any of the following: (a) sewerage odour (b) sewerage system faults (c) sewerage system blockages; and (d) the Council's response to issues with its sewerage system, expressed per 1,000 connections to the Council sewerage system.	7 per 1,000 connection	≤8 per 1,000 connections	≤8 per 1,000 connections	≤8 per 1,000 connections	≤8 per 1,000 connections
KPI 1.4: **Management of Environmental impacts** - Compliance with resource consents for wastewater discharges, measured by the total number of:					
(a) Abatement notices	0	0	0	0	0
(b) Infringement notices	0	0	0	0	0
(c) Enforcement orders	0	0	0	0	0
(d) Convictions received in relation to the resource consents	0	0	0	0	0
KPI 1.5: Percentage of monitoring results that show compliance with resource consent conditions.	Not measured	100%	100%	100%	100%
1 - In accordance with operations and maintenance contract timeframes.					

Table 0-1: Levels of Service

Changes to the performance framework

The levels of service and key performance indicators have been reviewed following a benefits mapping exercise to ensure Council's performance framework is focussed on measuring the activity benefits at the outcome and objective level. As a number of measures are mandatory they cannot be significantly altered. Other non-mandatory measures are considered fit for purpose.

Plans programmed to meet the Level of Service

The list below details any projects, initiatives, programmes or expenditure that Council is planning to undertake to ensure that the level of service is achieved and/or to address any gaps between the targets and current performance. Where there are capital works projects relate to either improving levels of service (LoS) or maintaining levels of service (Renewal – R).

LoS improvements are sought in three key areas:

- planning of wastewater upgrades to ensure this is undertaken at an appropriate time and is in an affordable manner
- improvement in compliance with effluent discharge conditions and other matters highlighted in National and Regional policies and plans
- Maintain levels of customer satisfaction.

Council proposes to achieve these improvements by:

- reviewof a draft Wastewater Strategy which highlights current performance of Council discharges and well as compliance with appropriate Water Quality Standards and provides a proposed upgrade to ensure that future needs are met. This has largely developed and staff have undertaken a follow on piece of work to investigate feasibility of applying for global consents based on catchment limits once these have been set
- liaison with key stakeholders during the development of operational and capital improvement plans to improve the quality of our effluent discharges
- maintain healthy contractor relationship and ensure KPI's around customer service are being met.

Proposed wastewater strategy

At present the future requirements for each scheme are considered on an individual basis, generally as resource consents expire. This is leading to concerns such as:

- uncertainty on the conditions of new resource consents and any upgrades that may be required to meet these conditions
- lack of prioritisation of scheme upgrades on a holistic, District-wide perspective to minimise the overall adverse environmental effects in the wider catchments whilst being affordable
- difficulty in planning future capital and operational expenditure, including timing and extent of future scheme upgrades.

The Wastewater Strategy will detail wastewater treatment plant (WWTP) infrastructure, the associated regulatory environment, and capital works required over a 30-year horizon and will propose the development of global based consents based on reduction in loads from each Freshwater Management Unit (FMU).

This Wastewater Strategy is developed for SDC internal planning purposes. Its development will include consultation with internal stakeholders including staff, Councillors and Community Boards and key external stakeholders, such as Environment Southland, Ngai Tahu, Public Health South and Fish and

Game. Consultation with the public will be through its incorporation into the Infrastructure Strategy and Plans required under the LGA.

It is envisioned that the Wastewater Strategy project be undertaken in two stages as outlined below.

Stage 1 - Information summary and development of method

This stage will involve:

- reviewing existing information available about the current SDC wastewater schemes
- outlining the statutory framework and compliance of current wastewater schemes with existing and potential future water quality standards
- identifying potential issues for wastewater discharge in the District
- summarising the above in a draft Stage 1 report
- establish approach to development of Wastewater Strategy
- consulting with internal and key external stakeholders to confirm scope and accuracy of the draft Stage 1 report and to seek agreement on proposed approach for developing the Wastewater Strategy.

This stage is now largely complete although required some revision to reflect agreed outcomes of consultation.

Stage 2 – The Wastewater Strategy

This stage will involve:

- developing high-level options, costs and implementation timeframes for each scheme based on the scheme rankings from the final Stage 1 report
- summarise the above in a draft Stage 2 report (the Wastewater Strategy)
- consulting with internal and key external stakeholders to confirm approach of developing options, costs and timeframes in the draft Stage 2 report and to seek agreement on proposed implementation timeframes for each scheme (and hence Southland District as a whole)
- revising Stage 2 report (the Wastewater Strategy) to reflect agreed outcomes of consultation.
- move towards global consents based on contaminant load reduction across Freshwater Management Units.

The following provides a summary of the compliance of each scheme with the potential future water quality standards using existing monitoring data held by SDC.

The schemes that have been assessed are the ones that discharge to water or discharge to land where there is a potential for an impact on nearby water course which is required to be monitored under the current resource consents. Two schemes have not been assessed - the scheme that SDC does hold a consent for (Wallacetown) and the scheme that has been recently constructed (Curio Bay). The table also clearly indicates the locations where it will be difficult to undertake a discharge to land which is the preferred route under iwi and Environment Southland policies and objectives.

The table uses a ranking in the form of a traffic light system as described below. It is noted that the colour orange has been used when the receiving water quality downstream of the wastewater discharge exceeds the standards, but the upstream water quality also exceeds the standards to the same degree. In these situations, it means other upstream activities are adversely impacting the receiving water quality, and the wastewater discharge does not worsen the water quality.

Scheme	FMU	Discharge Route	Ease of Land Disposal	Popn 2018	Popn 2048	Consent Compliance 2015/16	Existing WQS - Other	Existing WQS – micro/NH$_3$	Future WQS - micro/N/P	Overall Ranking
Stewart Island	Fiordland and Islands	Land	• poor infiltration • overland flow		↑ 24%	DIN, E.coli			DRP, TIN (recent) No upstream data	
Nightcaps	Aparima	Water	• poor infiltration • ltd contam. removal • overland flow			Flow	QMCI	Micro	DRP, TN, E.coli	
Otautau	Aparima	Land	• aquifers linked to rivers		↑ 11%	discharge to aquifer			DRP, TIN, E.coli	
Riverton	Aparima	Land	• nitrogen in gdwater		↑ 11%	Flow			Missing DRP, TIN, TN & upstream data	(TBC)
Riverton Rocks	Aparima (coastal)	Land	• nitrogen in gdwater		↑ 11%		DO		Missing DRP	
Balfour	Mataura	Water	• nitrogen in gdwater		↑ 27%	TSS		micro	DRP, TIN, TN, E.coli	
Curio Bay	Mataura	TBC	• poor infiltration • overland flow			recently constructed	recently constructed	recently constructed	recently constructed	recently constructed
Edendale-Wyndham	Mataura	Water	• nitrogen in gdwater					micro	DRP, TIN, E.coli	
Gorge Road	Mataura	Water	• poor infiltration • ltd contam. removal • overland flow	↑ 19%, pretreated	↑ 72%, pretreated		pH, DO	micro	DRP, TIN, E.coli	
Riversdale	Mataura	Land/Water	• nitrogen in gdwater	↑ 11%	↑ 62%	flow, DO, ammonia	DO	NH$_3$, micro	DRP, E.coli Missing TN, TIN	
Tokanui	Mataura	Land/Water	• poor infiltration • overland flow			Flow		micro	DRP, TIN, E.coli	
Browns	Oreti	Land/Water	• poor infiltration • ltd contam. removal • overland flow		↑ 28%	Flow		micro	FC No TIN, TN, DRP, E.coli	
Lumsden	Oreti	Land	• aquifers linked to rivers • nitrogen in gdwater			Flow				(TBC)
Winton	Oreti	Water	• poor infiltration • ltd contam. removal • overland flow	↑ 8%, ind	↑ 31%, ind	Ammonia	DO, MCI & SQMCI	NH$_3$, micro	TIN, TN, DRP, E.coli, FC	
Wallacetown	Oreti	Water	• nitrogen in gdwater	↑ 8%	↑ 38%, non SDC WWTP and consent	non SDC consent	non SDC consent	non SDC consent	non SDC consent	non SDC consent
Manapouri	Waiau	Land/Water	• nitrogen in gdwater		↑ 64%, ind/ com				DRP, TIN, TN	
Monowai	Waiau	Land	• nitrogen in gdwater			faecal coliforms, cBOD$_5$				
Ohai	Waiau	Water	• poor infiltration • overland flow				DO, temp	NH$_3$, micro	DRP, FC No TIN, TN, E.coli	
Te Anau	Waiau	Water	• nitrogen in gdwater • aquifers linked to rivers	↑ 15%, ind	↑ 73%, ind/com	Flow	DO		DRP	
Tuatapere	Waiau	Water	• nitrogen in gdwater • aquifers linked to rivers				DO	micro	DRP, E.coli	

Table 0-2: Summary of scheme assessment

The table clearly identifies the areas where focussing attention on will deliver the most significant environmental benefit. Work is already underway at Oban to undertake improvements to the disposal field to address non-compliance issues. It is expected that completion of the work will address quality issues. Long term solutions have been identified for Riversdale and Te Anau with allowances included in current budgets. It is expected that Ohai will require an upgrade as it moved through the consenting process. With a budget figure included for Nightcaps based around a future upgrade prior to the expiry of its recently granted consent. Budget figures are included in the LTP to undertake an upgrade at Winton ahead of time as the data indicated this will deliver the most significant benefit.

It is also noted that work is now underway to scope out what is required to continue the work to re-consent and upgrade Winton.

Activity and asset management

Overview of management

Overview of the wastewater assets

Asset value and depreciation

The scheme values and depreciation information below is from the 2019 valuation which was prepared externally by Waugh Consultants using Infor (IPS) asset data maintained by SDC. The following assumptions have been made in the preparation of the valuation:

1. That all asset data has been reviewed and updated. Asset data was interrogated by Waugh with all inconsistencies addressed and repaired within IPS.
2. That all valuations are based on the "Modern Equivalent Replacement Cost" (MERC) basis.
3. Where new technology is available or where present assets do not require full replacement, adjustments have been made.
4. That sewer gravity main and rising main rates have been based on recent and extensive sewer contracts in the Southland District as well as across other areas and noting the additional expense associated with any contracts on Stewart Island.

5. That sewer laterals have been included in the valuation.
6. The asset lives have been reviewed and adjusted as required.

Asset Component	Replacement Cost $	Depreciated Asset Value $	Annual Depreciation $
Balfour	1,319,660	415,853	22,003
Browns	654,253	476,202	14,548
Edendale/Wyndham	10,688,168	9,289,062	156,983
Gorge Road	938,762	682,038	17,146
Lumsden	4,773,014	1,967,328	77,762
Manapouri	4,775,930	1,886,532	74,951
Monowai	241,334	112,562	3,180
Nightcaps/Wairio	3,185,313	2,000,575	39,582
Oban	15,578,326	11,025,576	277,039
Ohai	4,131,852	421,848	60,696
Otautau	7,054,963	4,798,371	105,306
Riversdale	3,091,801	1,249,764	46,594
Riverton	18,989,248	10,552,152	275,127
Te Anau	28,803,509	16,853,560	412,002
Tokanui	1,135,101	444,884	18,011
Tuatapere	6,682,350	5,489,132	106,764
Wallacetown	4,460,460	3,815,328	53,164
Winton	12,991,602	3,934,102	188,739

Asset condition and performance

Table 0-1 indicates the general average condition at a scheme level. The condition of the schemes has been rated using the condition and performance table presented in Appendix A. Condition rating is based on local joint inspections undertaken by SDC staff Downers national asset manager and local operations staff.

Condition monitoring of pipes is carried out on sewer pipes and rising mains between two and five years prior to upcoming renewals to help target expenditure. All above ground mechanical and electrical assets are serviced in accordance with the manufacturer's specifications with joint inspections undertaken to agree condition of above ground assets and to prioritise future capital work. The following table highlights overall condition and performance at a scheme level.

Scheme	Installed (date)	Number of Connections	Overall Condition	Overall Performance	Comments
Balfour	1963	86	3	2	Aging reticulation. No known condition or performance issues.
Browns	1971 and 2013	13	3	1	Treatment plant upgraded 2013.
Edendale/ Wyndham	2011	623	1	1	Plant now performing well – fully compliant. No known condition or performance issues.

Scheme	Installed (date)	Number of Connections	Overall Condition	Overall Performance	Comments
Gorge Road	1984	36	2	2	Switchboard raised to mitigate flood risk. No known condition or performance issues.
Lumsden	1973	314	2	2	New plant - performing well. Ageing reticulation, renewal peak expected 2032. No known condition or performance issues.
Manapouri	1988	305	2	1	Growth pressures are driving a review of treatment and disposal options. Aerial rising main to ponds will require replacement within upcoming 3-year period. Consent expires in 2024. Investigation to start 2021. No known condition or performance issues.
Monowai	1979	15	2	2	No significant issues - possible replacement of disposal field may be required when consent renewal applied for in 2027/28. No known condition or performance issues.
Nightcaps	1988	177	2	2	Increasing blockages indicative ageing reticulation. New consent granted 2017 – will require upgrade to be undertaken 2025/26. No known condition or performance issues.
Ohai	1952	217	3	3	Reticulation near end of asset life. Treatment plant and pump station not performing well. Enhancement of treatment plant and pump station being carried out. Effluent quality good but non-compliances noted as a result of discharge environment. Consent renewal application with ES.
Otautau	1998	437	3	1	No compliance issues. No known condition or performance issues.
Riversdale	1975	239	3	4	Consent application granted 2017. Investigation into suitability of rapid infiltration ongoing. No known condition or performance issues.
Riverton	1984	1074	3	3	Infiltration issues. No significant compliance issues. No known condition or performance issues.
Stewart Island/Oban	1988	425	2	2	Pump and electrical renewals ongoing along with upgrade of disposal field. Aeration installed

Scheme	Installed (date)	Number of Connections	Overall Condition	Overall Performance	Comments
					2016. No known condition or performance issues.
Te Anau	1967	2,377	3	2	Consent granted 2016 For discharge to Kepler. Inlet screen and desludging projects undertaken 2015/16. Grinder installed Mokonui Street PS to address blockages. New aeration to be installed. Future upgrade fully scoped and expected to be delivered within next 3 years.
Tokanui	1972	63	3	2	New consent granted 2019. Consent requires installation of new discharge channel which is currently being designed. New section of rising main has been installed under the river to avoid further issues caused by riverbank erosion. No known condition or performance issues.
Tuatapere	2008	357	2	1	No known condition or performance issues.
Wallacetown	2007	265	2	NA	Performing well. Alliance consent granted 2017 requiring upgrades to be undertaken within 15 years. Likely financial impact on SDC for contribution in line with overall impact from the town. No known condition or performance issues.
Winton	1962	1,186	3	3	Compliance issues especially in low flow conditions. Consideration of options underway. Inlet screen and desludging projects undertaken 2015/16. New aeration installed 2017/18. Significant Inflow and Infiltration recorded during rainfall periods.

Table 0-1: Wastewater scheme overview

Pumps also undergo an annual drawdown test to monitor efficiency. This is built into the operations and maintenance contractors work schedules in IPS.

The condition grade of any asset on which work is carried out is to be provided by the contractor to Council for recording in IPS on completion.

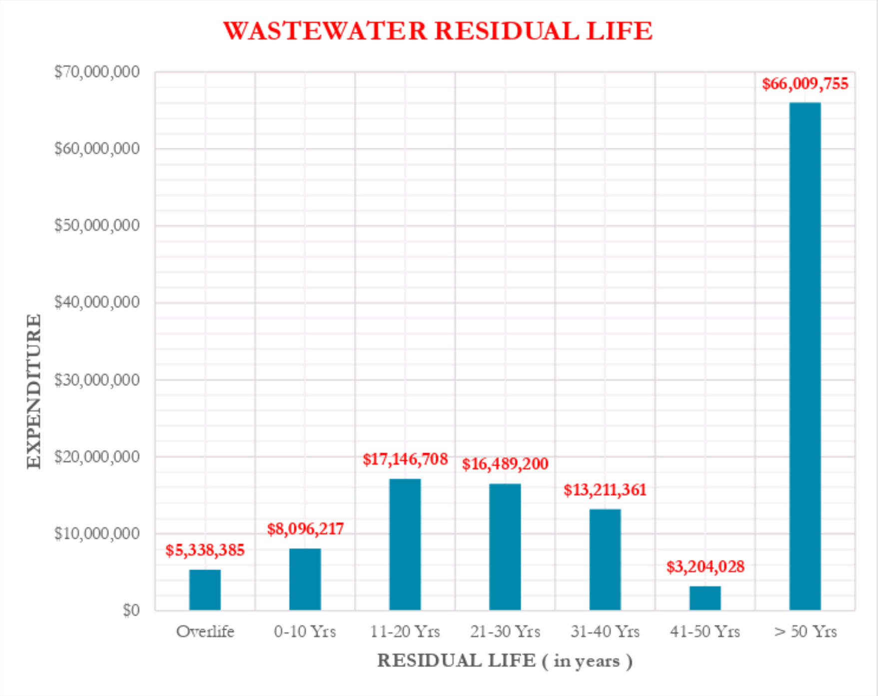
CCTV inspections are established as a project in IPS with condition grades being recorded against the project group rather than the asset. The SDC Geomedia system has presently been adapted to "pin" CCTV footage and condition reports via hyperlink attachment to each piped asset.

All work orders carried out are also recorded on Geomedia. Thematic layers are used to identify areas with high levels of excessive reactive maintenance. This information will be used to plan and prioritise capital expenditure for renewals.

Performance monitoring is carried out in association with AM Plan updates and consent requirements and recorded in Water Outlook. Condition ratings are based on joint inspections undertaken by SDC staff and Downer's National Asset Manager and local operations staff.

Asset age and life expectancy

The following graph provides an indication of the remaining life of all wastewater infrastructure across the District.



The graph indicates that a significant percentage of wastewater infrastructure still has greater than 50 years remaining life which is reflective of the relatively recent construction of a number of wastewater schemes. It is proposed to continue with detailed condition assessment on infrastructure close to reaching identified end of life so as to allow future prioritised renewals.

Data source and confidence

The following table highlights the main source of information used for the development of these plans.

Activity	Current Reliability Rating	Comments
Asset Description	Reliable	Description data is available in IPS and will be reviewed and updated as further information is received following the introduction of the operations and maintenance (O&M) contract.
Valuation	Reliable	Annual valuation now undertaken. As part of the review process we are considering what opportunities are available to refine the valuations process so that more scheme specific information could be utilised, rather than generic information. For example, where it is known that the asset life of asbestos

Activity	Current Reliability Rating	Comments
		cement pipes is adversely affected by ground conditions the valuation process will be altered to reflect this.
Condition and Performance	Reliable	Condition and performance is currently assessed through review of data in IPS relating to planned and reactive maintenance activities. We also rely on local operator knowledge and experience. In addition water quality data is sampled in accordance with ES resource consent requirements and data is stored in TRIM and reported on in Council's quarterly report.
Financial Forecasts	Reliable	Currently estimates have been made based on current market rates, annual asset valuations and direct enquiries. Projects within the first three years should be expected to have an uncertainty of up to +/- 20% with projects in the outer years up to +/- 50%. Currently no capital work will be carried out without Council approval. As part of the current plan review an assessment of funding options will be carried out to address issues of sustainability and affordability especially of a number of smaller schemes.

Table 0-2: Data source and confidence

Approach to operations and maintenance

The purpose of this section is to outline the broad operations and maintenance philosophies for the assets, understand any underlying issues and trends, and set the basis for the O&M financial forecasts.

The operation of collection, treatment and disposal assets includes a limited amount of CCTV inspections, sewer flow monitoring activities, and day-to-day running of plant such as pump stations and treatment plants.

Details of each facility are located in the operations and maintenance Manuals which have been developed for each site. These are maintained by Downer and reviewed by Council staff.

Maintenance is the day to day work needed to keep assets operating at required service levels, and falls into two broad categories:

- scheduled (proactive) maintenance: proactive inspection and maintenance works planned to prevent asset
- unplanned (reactive) maintenance: reactive action to correct asset malfunctions and failures on an as required basis (ie emergency repairs).

There are also a number of services are delivered from other Council units:

- information management department provides assistance with asset management information systems
- rates' department provides assistance with rates collection and trade waste billing.

The contractors' procedures are accepted as the default best practice operations and maintenance practices (in the absence of other information). The purpose of the maintenance is to keep Council's assets at the agreed condition.

In a number of instances Council have elected to defer significant renewal projects (especially in areas of no or negative growth) in place of relying on an increased reliance on both scheduled and reactive maintenance albeit recognising that this approach may not be sustainable over a longer term.

Service delivery

SDC implement performance based contracts to achieve defined service standards for the operation and maintenance of the wastewater system, and undertake monthly audit procedures for monitoring contractor performance and controlling the quality of data (work activity, financial, attribute and spatial data) and physical works.

Historically Council has chosen to contract out the operation and maintenance functions of the water and waste water utilities of the District. The objectives of this contract are to ensure that:

- the principal's drinking water, rural water and wastewater systems are managed and operate in compliance with the requirements of resource consents and the New Zealand Drinking Water Standards as appropriate
- the Levels of Service and Key Performance Indicator target levels contained in the Activity Management Plans and the contract are achieved
- the condition of the principal's drinking water, rural water and wastewater assets is maintained as specified in the contract throughout the contract term
- the operation and maintenance of the principal's drinking water, rural water and wastewater services comprising the contract facilities are delivered safely and in a cost effective manner
- drinking water, rural water and wastewater services are provided reliably in the District
- Requests for Service and incidents are responded to and resolved promptly.

In principle the District is considered as a whole. Levels of Service and responsiveness have been established that are achievable across the district and the contract pricing is designed to smooth the small differences in costs that may occur from town to town.

Service delivery review

Section 17A of the Local Government Act 2002 requires all local authorities to review the cost-effectiveness of its current arrangements for delivering good quality local infrastructure, local public services and performance of regulatory functions at least every six years.

In view of the fact that the contract term expires in two years it is prudent to consider if a further review should be undertaken.

Performance monitoring systems

Council operates IPS asset management system. This computer software records all incidents of repairs done to the water and waste water assets in the district. The types of work (sewer blockages for instance) can then be compared to previous years.

The following applications are utilised by WWS to monitor the performance of asset systems and achievement of service standards, manage risks, and support asset management decision-making:

Operations and compliance monitoring information are stored in Water Outlook.

Infor IPS reporting

Information is stored against each asset in a IPS database including:

- Work Orders (WO) and maintenance records (asset failure and developing an expenditure history)
- customer service (water supply and wastewater) (SR)
- condition reports (recorded by operation and maintenance contractor, critical assets are routinely inspected visually and using CCTV)
- system performance monitoring (flooding, etc)

- facility/equipment parameters
- estimated design life
- valuation information
- any operator comments.

The operations and maintenance contractor have live access to IPS. Their performance is monitored in real-time through development of dashboards to interrogate SR and WO response and resolution times. Other information stored in scheme working folders or SDC's electronic document management system (TRIM Context) includes:

- flow monitoring and network modelling
- demand forecasts
- existing asset information has been transferred from hard copy records and supplemented with specific capture projects over the last few years. The asset register is now believed to be 90% complete. An internal audit for accuracy has been carried out that reinforces asset register accuracy
- condition reports (critical assets are routinely inspected visually and using CCTV)
- maintenance records (asset failure and expenditure history)
- water quality monitoring at various sites (undertaken by Environment Southland)
- request for service records
- demand forecasts.

Geomedia smart client

Council operates Hexagon Geomedia Smart Client. Geomedia is currently linked to Pathway and IPS.

SCADA

Every water and wastewater facility is equipped with telemetry (SCADA Supervisory Control And Data Acquisition). Station RTU's (Radio Transmitter Units) transmit data either on a change in state or on a 60 minute polling rate to the base-station at SDC Head Office, Invercargill.

There are two SCADA systems in operation running on two dedicated computers:

- Datran system: QTech software (Datran RTU) was installed in the 1990. In 2004 SDC were becoming frustrated with the poor service and lack of prompt supply of Datran parts and made enquiries into an alternative SCADA system
- Kingfisher system: Citect software (Kingfisher RTU) was installed as part of the Stewart Island wastewater upgrade and is now being installed in all new stations.

All radio traffic from the mainland is received to the SDC base-station via the Mid-Dome repeater site leased from Jackson & Wills Ltd. Traffic from Stewart Island is received via the SDC owned Peterson's Hill repeater site.

The computers manage the information and page any station alarms via the cellular network. Alarms are set to local operators first and escalate if they are not acknowledged. After hours' alarms are monitored by Council's Answer Service.

Other Applications

- hilltop - used for storing and analysing SCADA data
- system critical incidents such as pumping station failures and sewer blockages are particularly noted. Evidence of increasing numbers (trending up) are further analysed to see if the events are

extraordinary and higher than would be normally expected and require further investigation and/or capital investment.

Costs of operation and maintenance have increased each year for several years. These price increases are partially due to inflation, legislation, and ageing assets that require more maintenance to keep going.

Unplanned (Reactive) Operations and Maintenance Strategy

All unplanned maintenance expenditure below $5,000 is covered within the operations and maintenance Contract.

Where repeated breakdowns occur on an asset the contractor, in agreement with Council will replace the asset to reduce both the risk and cost associated with unplanned maintenance. In addition where Council defers renewals in favour of increased renewals costs for reactive repairs and increased inspections will be agreed between Council and contractors.

Planned (scheduled) Operations and Maintenance Strategy

Council keeps good records of the installation date for all of its assets. This information is stored in IPS. The information is used to predict the likely replacement date (subject to condition assessment) as utilities wear out. In broad terms, planned or scheduled operations and maintenance schedules are designed to get the longest possible service life while meeting level of service targets and legislative requirements.

As time goes by we continue to collect in field information from inspections and condition assessments. This information is used to moderate basic end of life assumptions to get the longest possible life from the utility.

In this respect, the contractor has written new operation and maintenance schedules for all above ground plant, the purpose of which is to keep this plant at the highest level of reliability. These maintenance schedules are programmed into the IPS asset management system and become automatic "scheduled" maintenance items.

The cost of such maintenance is driven by level of service and legislative requirements of the contract.

Condition assessments

The operations and maintenance contract puts particular emphasis on collecting operational information from detailed inspection schedules. As new improved information comes to hand, it is added to the IPS data base so as to allow for better decisions to be made on the (in particular) timeliness of capital expenditure.

The most recent round of condition inspections were undertaken jointly by Council staff and Downer operations and asset management staff. These latest inspections indicate that plant and equipment is being maintained to the agreed level.

Treatment plant inspections

Treatment plants are inspected at intervals that are appropriate to the system criticality of the process going on there. In this respect, pumping stations and wastewater treatment plants are inspected once a week and at times in between when alarms are registered on the SCADA.

Currently the Edendale Wyndham wastewater scheme falls outside the scope of the Downer operations and maintenance contract while a number of operational issues are being addressed. Day to day maintenance and upgrades are carried out in conjunction with Biofiltro (suppliers of the original plant) however this is likely to change in 2020.

CCTV inspections

Close Circuit Television is used to help identify the cause of blockages and visual structural condition. CCTV inspections are crucial when there are problems in drains. Drains block for many reasons and it is essential to really see the problem before taking the next step. CCTV is carried out in areas where there are suspected high levels of infiltration, and also prior to upcoming renewals work to help target expenditure to those areas where it is required the most.

Operations and maintenance trends and forecasts

Wastewater operations and maintenance costs under the Downer contract total $1.2M per annum which is adjusted annually via the contract adjustment formula. There is an allowance from 21/22 for maintenance on the MF plant and SDI field expected for the Te Anau wastewater system budgeted to be constructed during 2018/19 and 2019/20. There are additional costs in relation to the Edendale-Wyndham scheme to enable solid waste to be removed to landfill.

Wastewater operations and maintenance costs constitute approximately 48% of the total operations and maintenance budget.

Figure 0-1 illustrates the historical operations and maintenance cost trends. It is noted that the increase in Repairs and Maintenance costs in 2010/11 is as a result of the new maintenance contract which began in July 2010.

The increased operating costs in 2012/13 to 2015/16 is a reflection of the accounting treatment used to transfer the costs of capital work completed to the district business unit where the work is funded.

There are a number of years starting from 2019/20 where operating costs increase for the interest on loans that have been taken out to complete capital work. This will occur as changes are made to treatment and methods of disposal at Te Anau, Winton and Riversdale.

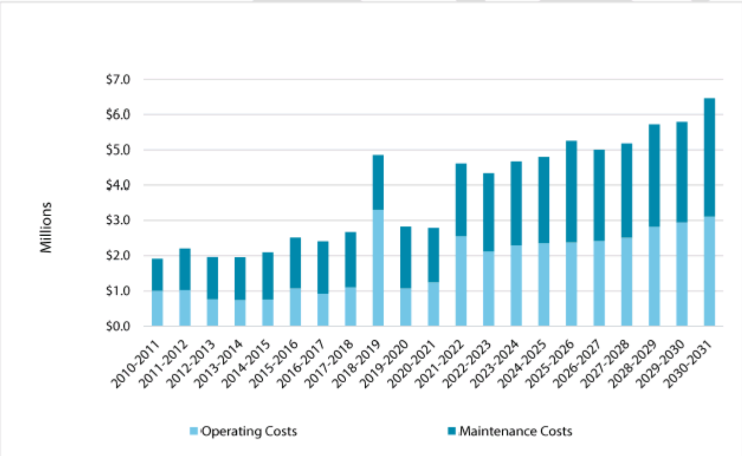


Figure 0-1: Wastewater Opex Forecasts

Approach to renewals

Renewal is the replacement (or rehabilitation) of an existing asset without changing its capacity or level of service beyond the original design.

Renewal strategy

Assets are considered for renewal as they near the ends of their effective working lives, where the cost of maintenance becomes uneconomical, or when the risk of failure of critical assets is sufficiently high.

Renewal decisions are made by Asset Managers based on the performance and condition of existing assets, the economics of renewing the asset, and their assessment of the acceptability of the risk of asset failure. Renewal decisions are supported by the maintenance contractor based on their knowledge of the systems.

The theoretical life expectancies and replacement costs of asset components are used for financial projections. Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during planned maintenance inspections, operational activity and investigation of customer complaints. Indicators of non-performing assets include:

- structural failure
- repeated asset performance failure
- overflows
- ineffective and/or uneconomic operation
- insufficient treatment
- inefficient energy consumption.

The general renewal strategy is to either replace or rehabilitate assets when justified by:

1. Age and Condition - the age or condition of the asset is or will result in a condition based failure.
2. Asset Performance - when it fails to meet the required LoS. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets. Non-performing assets can be identified by:

- repeated asset failure
- inefficient energy consumption
- excessive maintenance requirements.

3. Risk - the risk of failure of the asset and associated financial, environmental and social impact justifies action (eg impact and extent of loss of wastewater treatment, impact on receiving water body, health risk).
4. Economics - the cost of maintenance for that asset component is deemed to be uneconomic to continue repairing the asset when the annual cost of repairs exceeds the annualised cost of renewal. Economic factors may also come into consideration in order to co-ordinate renewals with other major works, eg while a tank is empty for inspection or refurbishment/renewal, the associated channels are refurbished at the same time. Similarly in areas with declining populations the decision has been made to indefinitely defer significant renewals in favour of increased scheduled/unplanned maintenance.
5. To coordinate with work on other utilities, eg a sewer main replacement may be brought forward to coincide with renewals of the footpath under which it runs.
6. Staff Knowledge - staff knowledge and that of contractors is reported through and can result if accelerated renewals.
7. Assets that have reached their predicted expiry date as per IPS asset lives, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

Above ground assets

1. IPS renewal forecasts for years 2021 to 2031 of the LTP are generated and exported to an Excel spreadsheet.
2. Annual Condition Reports are prepared by Downers and imported to the Excel spreadsheet, including Downers "Remaining Life" assessment.
3. A Renewal Programme is developed using:

(a) Downer "Remaining Life" assessment.
(b) Reviewing "Asset Criticality" by extending replacement of low criticality assets and prioritising high criticality assets.

While the foregoing forms the basis of the Renewal Programme it may be modified to:
(a) Spread work out to "smooth" work peaks.
(b) Allow "bundling" of small projects to allow better economies of scale.

4. Comparison between IPS and Downer reports to assess whether global asset lives need changing.
5. Assets that have reached their predicted expiry date as per IPS asset lives, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

Underground assets

At the beginning of LTP Year 1 (July 2021):

1. Develop a Condition Assessment Programme (comprising CCTV and visual manhole inspections) for assets scheduled for renewal in years 2021 to 2031 which meet the following criteria:
   (a) Large diameters or lengths (indicatively more than 500 metres or $75,000 replacement value.)
   (b) High criticality assets - particularly rising mains and pipe bridges.
   (c) Other assets that have historical performance problems, are in aggressive ground conditions or the Contractor is aware of "special" factors relating to premature asset failure.

By the end of LTP Year 1 (30 June 2021):

2. Review renewal budget forecasts, taking into account:
   (a) Asset inspection results (which can accelerate or delay projected renewals).
   (b) Extend asset lives for criticality 1-3 assets for 5 to 10 years beyond IPS renewal date if permitted by the condition assessment.
   (c) Schedule criticality 4-5 asset replacements arbitrarily by 10 years from IPS replacement date based on condition assessment of criticality 1-3 results.

   While the foregoing forms the basis of the renewal programme it may be modified to:
   (a) Spread work out to "smooth" work peaks.
   (b) Allow "bundling" of small projects to allow better economies of scale.

Unplanned wastewater renewal

1. Asset CCTV and visual inspections are undertaken for:
   (a) All blockages / overflows / flooding on criticality 3, 4 and 5 assets or where there is a risk of discharge to water.
   (b) The third pipe collapse or blockage / overflow / flooding on any length of pipe of 100 metres or less.
2. Renewal decisions will be made based on the findings of the inspection results and the criticality of the asset.

Capital works programme prioritisation process

1. Projects from the following sources are included in the CAPEX project list:
   (a) Renewal forecasts from IPS, modified as before described.
   (b) Resource Consent compliance requirements of ES.
   (c) Future demand (Te Anau)
2. Projects are scheduled as follows:
   (a) Renewals as per Renewals Strategy.

(b) Resource consents to meet expiry dates.

(c) Future demand as required by development timing.

3. Prioritisation Rating (1 to 5) applied to projects:

(a) All regulatory projects get a priority rating of 1.

(b) Priority of 1 to 5 is based on staff judgement of project importance.

(c) Priority rating is used to:

(i) Prioritise timing of works within a financial year.

(ii) Reallocate projects to other financial years in the event that the full programme cannot be delivered.

4. Other scheduling constraints (if any) can be applied to the work programme.

Expected asset life and deferral of renewals

Historically renewals expenditure may have been deferred if the total cost of renewal works is beyond the communities' current ability to fund it. With such deferral of renewal work is necessary, the impact of this deferral and the ongoing achievement of LoS would be assessed. Typically, wastewater schemes have been installed more recently than stormwater schemes however it is recognised that Council now has a more ageing infrastructure. It is considered that continued deferral of renewals is no longer sustainable and/or appropriate and that renewal planning take affordability issues into account when developing capital works programmes in order to smooth out any significant increases in costs as a result of continued deferral.

Emphasis is placed on lifecycle planning although the deferral of some renewal works may have no immediate or short term impact on operations, continued deferral of renewals will eventuate in a liability in the long term. If work is deferred for any reason, this work will be re-prioritised alongside the next year's renewal projects and a revised programme established. Renewals will also be deferred in areas showing significant negative growth.

Renewals may also be deferred to undertake in conjunction with roading upgrades or reseals.

Assets that have reached their predicted expiry date as per IPS asset lives shown in the following table, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

Asset Code	Asset Name	Life (years)		Asset Code	Asset Name	Life (years)
Wastewater						
SPL/ARTK	Aerator Tank	20		SWR/SEWER/AC-C	Gravity and rising Main (all diameters)	70
SPL/ARTR	Aerator	20		SWR/SEWER/CC	Gravity and rising Main (all diameters)	70
SPL/BAFF	Pond Baffle	30		SWR/SEWER/CC-SR	Gravity and rising Main (all diameters)	70
SPL/BFPR	Backflow Preventer	50		SWR/SEWER/EW	Gravity and rising Main (all diameters)	80
SPL/BIOF	Biofiltro Processing Bed	80		SWR/SEWER/PE	Gravity and rising Main (all diameters)	80
SPL/BLGS	Buildings	80		SWR/SEWER/PE-H	Gravity and rising Main (all diameters)	80
SPL/BUND	Bund	80		SWR/SEWER/PE-M	Gravity and rising Main (all diameters)	80
SPL/CABT	Cabinet	30		SWR/SEWER/PVC	Gravity and rising Main (all diameters)	100

Asset Code	Asset Name	Life (years)		Asset Code	Asset Name	Life (years)
SPL/DRYW	Dry Well	80		SWR/SEWER/PVC-M	Gravity and rising Main (all diameters)	100
SPL/EQTK	Equalization Tank	80		SWR/SEWER/PVC-U	Gravity and rising Main (all diameters)	100
SPL/FLMT	Flow Meter	20		SWR/SEWER/ST-C	Gravity and rising Main (all diameters)	60
SPL/HDTK	Header Tank	80		SWR/SEWER/ST-CLW	Gravity and rising Main (all diameters)	60
SPL/HMTK	Humus Tank	80		SWR/SEWER/UNKW N	Gravity and rising Main (all diameters)	40
SPL/IMHF	Imhoff Tank	80		SWR/SEWER/VC	Gravity and rising Main (all diameters)	80
SPL/INFL	Infiltration Pond	50		SWR/SHAFT	Sewer Maintenance Shaft	80
SPL/INLT	Pond Inlet Structure	50		SWR/SSL	Gravity Sewer Lateral	80
SPL/MTPD	Maturation Pond	50		SWR/SSL/PUMP	Sewer Lateral Pumped	80
SPL/OTFL	Outfall	60		SPL/SWBD	SWITCH BOARD	30
SPL/OVMP	Over impound-ment bed	80		SPL/TRFT	TRICKLING FILTER	60
SPL/OXPD	Oxy Pond	50		SPL/UVTK	UV DISINFECTION	25
SPL/PEZO	Piezo Bore	80		SPL/VLVC	VALVE CHAMBER	60
SPL/PIPE	Pipework	60		SPL/VLVM	MECHANICAL VALVE (RADIAL)	50
SPL/POXY	Primary Oxidation Pond	50		SPL/VLVS	VALVES	60
SPL/PWRL	Power Line (Supply)	40		SPL/WDDT	WEEDED DITCH	50
SPL/RADA	Radio/Aerial	20		SPL/WETW	WET WELL	80
SPL/RMSR	Remote Sensors	20		SPL/WTLD	WETLAND	50
SPL/SCRN	Screen	50		SWR/CE	Sewer Cleaning Eyes	60
SPL/SDTK	Sediment Tank	50		SWR/MH/C	Concrete Manholes	70
SPL/SGEN	Standby Generator	40		SWR/MH/P	Polypropylene Manhole	60
SPL/SKFD	Soak Field	50		SWR/SEWER/AC	Gravity and rising Main (all diameters)	70
SPL/SLDY	Sludge Drying	80		SPL/SPMP	SEWER PUMP	20

Table 0-3: Asset codes and life

Renewal trends and forecasts

Renewal requirements have increased over the past few years and are largely associated with the replacement of mechanical equipment and other above ground assets. No significant reticulation renewals have yet been required as schemes have yet to reach the end of their asset life. A number of schemes will begin to reach the end of their asset life in the 30 years included in the infrastructure strategy, most notably in Ohai.

Renewals are currently planned based on age and condition data which is stored in IPS. Additional condition assessments and CCTV work will be undertaken prior to renewals work being undertaken. Data from IPS as well as local operator knowledge about the condition and performance of assets will also be taken into account when considering future renewals strategies.

Further details on the capital projects for each scheme can be found in the appendices.

Figure 0-2 compares the renewal profile to depreciation in the LTP. A number of wastewater plants have been upgraded during the last ten years (refer *Table 0-1*) and will not be due for replacement until after 2031. As underground pipe infrastructure has an expected life of up to 100 years there is limited requirement for renewals over until 2031. In the period from 2031 to 2051 there is an increased level of renewals required.

At this stage there is a less pressing need to accelerate the replacement of asbestos cement wastewater pipes as the failure rates are int indicating the same trends as the failing water mains.

To ensure that today's ratepayers are contributing to the assets being used Council has implemented a policy during the 2015-25 LTP to phase in the funding of depreciation. Funding of wastewater deprecation is increasing by 10% per annum from 2015-16 to 2020-21 with 5% after that to 2028-29 when 100% depreciation is being funded.

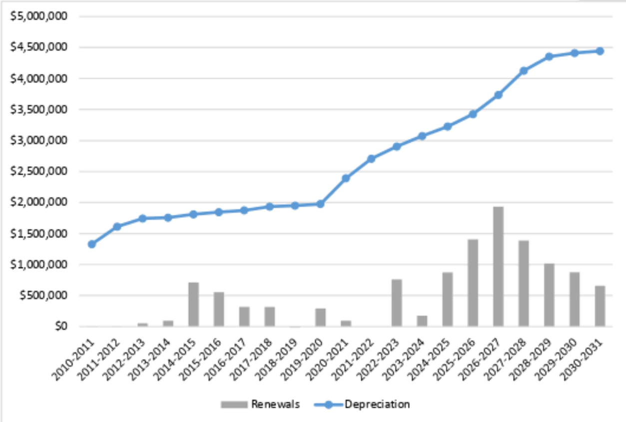


Figure 0-2: Wastewater Renewal Forecasts

Future improvements

Projects within the first three years should be expected to have an uncertainty of up to +/- 20% with projects in the outer years up to +/- 50%. The philosophy with projects in the 10 to 30 year period are that they are flags that work is likely to be needed but it is very much at the concept phase.

Upgrading and developing new assets for levels of service and demand

Capital Investment Strategy – LoS and demand

The current overall strategy is to comply with Environment Southland resource consent conditions and any upgrades required on renewal of consents, and to maintain the current LoS.

A number of upgrades previously planned to meet increased demand will be reviewed where required to determine if there is still a need for them to be included in future plans. No upgrades or new assets will be undertaken where they are not required therefore the current overall strategy is to maintain and renew the existing asset network.

Capital investment trends and forecasts – LoS and demand

In the upcoming 10-year period the following schemes have resource consents which are due to expire; Balfour, Edendale/Wyndham, Winton, Manapouri, Oban. As well as a re-consenting process a number of these sites will require consideration of land disposal of treated wastewater discharges.

Key expenditure is currently planned at Winton, Te Anau, Riversdale, Nightcaps, Ohai and ongoing work at Oban as highlighted through the proposed Wastewater Strategy.

A number of these projects were identified as per the previous LTP, however, with a slow down in the rate of developments in these communities, especially Te Anau the timing of them has been deferred until later in the 10-year period (with the exception of some expenditure at Te Anau) which is required as part of the overall scheme upgrade. Further detailed investigations will be undertaken prior to the work being carried out.

If the demand still remains to be identified the projects will be further deferred. Work scheduled to be funded through development contributions will initially have no impact on rates from deferring any work. In some instances, (most notably Te Anau) the contributions available do not cover the total demand portion with loans, repaid by rates being used to fund any difference. Development contributions previously collected in Te Anau will be used to partially fund the planned upgrade.

Historically there has been a number of level of service projects completed when new schemes have been built or older ones improved. In the next 10 years the level of service (via improved discharges) is being improved in relation to Te Anau, Riversdale and Winton.

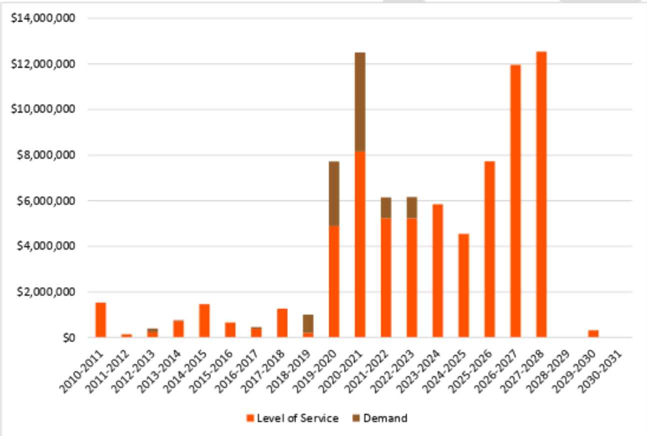


Figure 0-3: Wastewater LoS and demand forecasts

Community board area context

The wastewater activity is currently district funded ie funded by those communities connected to Council owned and operated reticulation. There are a number of other communities across the district where there are currently no Council wastewater services provided for example a number of communities in Northern Southland. In the event that communities wish to receive reticulated wastewater services it is anticipated that they will show the appropriate level of commitment by funding part or all (in the absence of Government or Council subsidy) of initial upfront costs for construction after which the ongoing operational costs would be funded through the district rate. No new wastewater systems will be constructed without significant community consultation.

It is noted that Community Boards have not been specifically through the development of this plan however they will have the opportunity to be heard through the upcoming Long Term Plan 2021/2031 process.

Asset management improvement

This section summarises the AM practices (data, systems, processes) applied to AM planning. It assesses the current and desired level of practice in relation to the 'AM Maturity Index' and identifies an improvement programme for the next three years. The status of this plan has been self-assessed as being of 'core' status in all areas and 'intermediate' in some areas. SDC will be working towards 'advanced' status for the larger (>2,000 people) communities of Riverton, Te Anau, and Winton.

Progress against previous asset management improvement programme

The following table summarises the status of improvement projects identified in the previous improvement plan. While many projects have had some work undertaken, a number are incomplete. To support improved delivery of this AMP improvement plan, it will be subject to formal project management and regular reviews.

AM Area	Improvement Project	Task	Status
Capacity Data. **Demand Forecasting Processes.** **CAPEX** **Contract Management.**	Capital development works planning.	Understand network capacity.	Flow meters have been installed at all plants (Historical volumes are recorded and reported monthly by Downer.
		Document process for determining demand projections considering all demand influences and analysing usage/capacity trend information and identifying implications.	At this stage demand is considered stagnant and considered of minor concern until beyond 2025.
		Develop Project Management Manual/Code, workflows and tools predominantly through CAMMS and in relation with Project Delivery Team and Downer.	This document is in progress and is a collaboration between Downer and SDC.

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AM Area	Improvement Project	Task	Status
Condition Data. **Performance Data.** **Asset Life Data.** **Financial Data.** **Failure Prediction.** **Risk Management Strategy.** **Optimised Decision Making.**	Capital renewal works planning	Develop and document process for monitoring critical assets.	Requirements for Critical Asset Monitoring are incorporated into the operations and maintenance document with Downer.
		Develop process for predicting condition decay based on pipe failure records	Pipe failure records are maintained in IPS with "Rules" adopted eg, more than three breaks in 100 m of main will trigger detailed assessment prior to replacement.
		Identify critical assets and undertake more detailed risk assessment. Develop process for routine review of risk	Criticality index in preparation.
		Develop process to analyse maintenance/renewal options	This process is rationalised formally through "Working Together" Annual and monthly status meetings.
Asset Categorisation. **Location Data.** **Physical Attributes Data.** **O & M Data.** **O & M Monitoring.** **Asset Register System.** **Maintenance Management System.**	Data collection and processes.	Develop documented procedures for collection, entry and quality assurance.	Completed - process developed and being implemented.
		Develop standard reports from IPS to readily analyse operations and maintenance information.	Completed -
		Utilise IPS database.	Completed - IPS is utilised.
		Encourage operations and maintenance Contractor to utilise maintenance function.	Completed - operations and maintenance contractor using function and monitored by SDC.
Risk Management Data. **AM Improvement.**	AM improvement.	Review the completeness of the operations and maintenance plans and update as required.	Completed - Plant sheets revised when major change to facility.

AM Area	Improvement Project	Task	Status
		Develop project task sheets for each planned improvement activity.	This requirement is strictly adhered to under the operations and maintenance contract.
Legislative Compliance.	AM staff resources.	Review processes in place to keep staff abreast of legislative change.	Completed - Library system developed and implemented.

Assessing current and desired asset management practices

Understanding and defining requirements

	Current Status	Future Status and Identified Improvements
The AM Policy	Core. Council wide Asset Management Policy has been developed.	Intermediate. Annual reviews.
Levels of Service and Performance Management	Core. Key levels of service have been identified and are monitored and reported against. Performance framework in place and appropriate. LoS have been agreed with the community using the consultative process and communicated through the LTP2012-2022 processes. Regular monitoring against LoS is carried out through quarterly and annual reporting. LoS have customer agreed service levels underpinned with technical measures.	Intermediate. Develop processes for evaluation of economic, social, environmental impact of offering different levels of service. Develop data collection/reporting process for new measures.
Demand Forecasting	Core demand forecast includes latest population projections. Demand drivers are understood.	Intermediate/advanced quantify the key factors that make up demand (eg infiltration and inflow I/I) especially in peak-sensitive areas.
Asset Knowledge and Condition Assessment	Core. Physical attribute and financial information is good for all schemes. All data recorded in IPS. Remaining life information and financial description well understood.	Medium. Development of detailed condition assessment programmes and understanding of performance and capacity is required. Align IPS age and condition data with future renewal programmes (new AMIS required).
Risk Management	Minimum activity level key risks identified by operational staff, contractors and consultant. Identification of critical assets is at a very basic level.	Core. Development of Council corporate risk framework and register. Development for framework for identification of critical assets and subsequent maintenance and recovery plans.

Developing asset lifecycle strategies

	Current Status	**Future Status and Identified Improvements**
Operational decision making	Core service level gaps have been identified and projects programmed to address these gaps. Options have been identified to address different issues. Projects have been prioritised (ranked) based on risk and affordability.	Intermediate/advanced. Develop systems and processes for predicting condition decay based on pipe failure records. Develop processes to analyse maintenance/ renewal options based around information within IPS.
Capital planning and decision making	Core - all physical work identified for the 20 year period with the 10 year programme included in the budgeting system.	Medium develop longer term renewals programme based on renewals data and unit rates. Review and develop plan for improvement of asset valuation process.
Financial Management	As above.	As above.

Asset management enablers

	Current Status	**Future Status and Identified Improvements**
The AM Team	Core Asset manager leads AMP process with co-ordination occurring across Council. This AM plan has been prepared based on information held within previous plans. The plan has been prepared by SDC with assistance from local operators (Downer), consultants (MWH, Waugh Consultants, and other SDC staff such as Area Engineers.	Medium: Continue with three yearly AM Plan review cycle to flow into the LTP 2021-31. Internal review (currently underway) to review/clarify asset owner, service provider roles. This will be documented in reviewed job descriptions.
AM Service Delivery	Core Council staff, in conjunction with Governance bodies, determine operations and maintenance practices and develop capital programmes in support of these. Provided by a combination of internal and external service providers.	Medium. Develop capability around IPS as an asset management tool
AM Information Systems	Core. Information stored in IPS. Other systems are available to assist with the decision-making process including SCADA, contractors tool (water outlook) and financial information is based in JDE and Fulcrum.	Medium. Review IPS/Fulcrum link to refine and develop new process to assist with annual valuation. Develop IPS capability within the organisation in order to allow for more efficient optimised decision-making.
Quality Management	Core. Three year improvement plan has been prepared.	Medium. Develop better KPIs for monitoring against the delivery of the improvement plan.

	Current Status	Future Status and Identified Improvements
Improvement Planning	Core. AMP improvement developed based on analysis of current/desired practice.	Medium. Formal Annual Reports on AMP improvement progress and interim informal reviews.

Financial summary

Budgets across the wastewater activity have been developed based on the following assumptions

- upgrade costs for wastewater treatment upgrades have been increased as a result of decisions released under the Water and Land Plan and the need to consider disposal to land over water. The budgets for Winton in particular have been increased significantly on that basis. Costs have been based on Te Anau costs
- significant work will also be required at Edendale Wyndham and Manapouri where upgrades are required following consent renewal and need to remove discharges from water
- SCADA plant and software is reaching end of life and in some cases software and programming is no longer supported and it is proposed to replace existing equipment with latest technology which will also deliver additional benefit of helping achieve improved compliance through greater ability to respond remotely.

10-year financial forecast

Example from the LTP 2018:

The following graphs/table summarise the financial forecasts for the activity over the 10 years.

Financial Summary

Wastewater	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	-	-	-	654	677	703	717	734	760	765	791	824	824
Targeted rates	4,186	4,116	4,153	3,903	5,169	5,732	6,346	6,690	7,381	7,455	8,084	8,920	8,964	9,613
Subsidies and grants for operating purposes	-	-	-	-	500	-	-	-	-	-	-	-	-	-
Fees and charges	12	14	16	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	134	140	127	139	178	182	185	188	191	195	198	202	206	210
Local authorities fuel tax, fines, infringement fees, and other receipts	59	29	39	33	33	34	35	36	37	37	38	39	41	42
Total operating funding	**4,392**	**4,299**	**4,335**	**4,075**	**6,535**	**6,685**	**7,268**	**7,630**	**8,343**	**8,447**	**9,085**	**9,953**	**10,034**	**10,689**
Applications of operating funding														
Payments to staff and suppliers	2,154	4,335	2,248	1,952	3,011	2,732	2,941	3,020	3,465	3,191	3,290	3,540	3,504	4,029
Finance costs	-	-	-	-	357	399	496	571	630	760	978	1,192	1,155	1,116
Internal charges and overheads applied	517	522	579	840	1,600	1,638	1,733	1,782	1,789	1,811	1,890	2,184	2,287	2,435
Other operating funding applications	485	(0)	0	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding	**3,156**	**4,857**	**2,827**	**2,791**	**4,967**	**4,740**	**5,170**	**5,373**	**5,884**	**5,762**	**6,158**	**6,916**	**6,946**	**7,531**
Surplus (deficit) of operating funding	**1,236**	**(558)**	**1,507**	**1,283**	**1,568**	**1,945**	**2,098**	**2,258**	**2,458**	**2,685**	**2,927**	**3,036**	**3,088**	**3,108**
Sources of capital funding														
Subsidies and grants for capital purposes	-	-	4,000	2,000	1,450	-	-	-	-	-	-	-	-	-
Development and financial contributions	-	64	343	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	234	1,042	1,584	10,174	2,712	5,431	4,534	3,875	7,472	12,155	12,234	-	-	-
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**234**	**1,106**	**5,926**	**12,174**	**4,163**	**5,481**	**4,534**	**3,875**	**7,472**	**12,155**	**12,234**	**-**	**-**	**-**
Applications of capital funding														
Capital expenditure														
- to meet additional demand	-	805	2,827	4,340	905	937	-	-	-	-	-	-	-	-
- to improve the level of service	1,264	202	4,890	8,157	5,235	5,222	5,841	4,543	7,728	11,959	12,536	-	315	-
- to replace existing assets	315	(135)	292	94	-	759	176	874	1,405	1,934	1,387	1,017	876	657
Increase (decrease) in reserves	(110)	(349)	(575)	867	362	557	663	764	846	996	1,286	2,067	1,945	2,499
Increase (decrease) in investments	-	25	0	-	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)
Total applications of capital funding	**1,470**	**548**	**7,434**	**13,457**	**5,730**	**7,426**	**6,632**	**6,133**	**9,931**	**14,841**	**15,161**	**3,036**	**3,088**	**3,138**
Surplus (deficit) of capital funding	**(1,236)**	**558**	**(1,507)**	**(1,283)**	**(1,568)**	**(1,945)**	**(2,098)**	**(2,258)**	**(2,458)**	**(2,685)**	**(2,927)**	**(3,036)**	**(3,088)**	**(3,108)**
Funding balance	**-**	**0**	**-**	**0**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

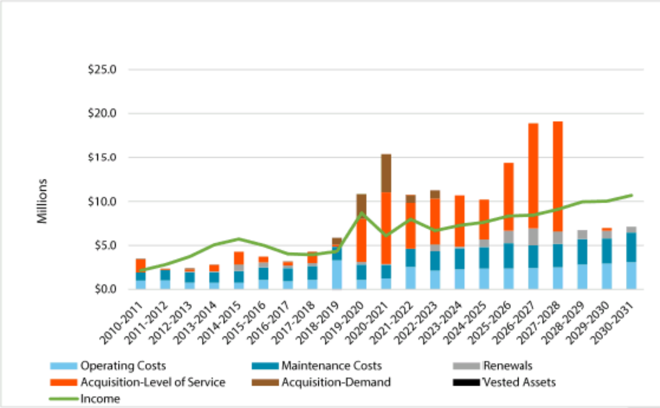

Figure 0-1: Wastewater total expenditure

1.1.1. Total income

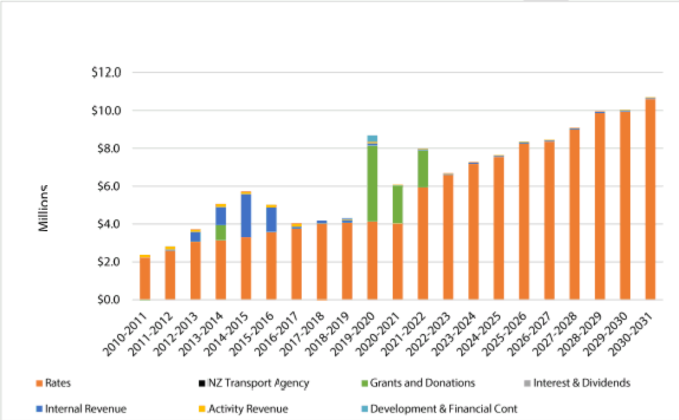

Figure 0-2: Wastewater Total Income

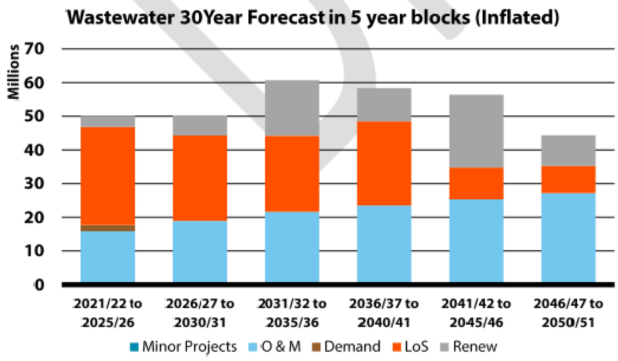

Figure 0-3: 30 year expenditure forecasts (from Infrastructure Strategy)

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Financial forecast summary

The following section contains financial information for the activity which has been generated from Council's Fulcrum budget platform as at February 2021. All of the financial shown includes inflation (unless otherwise stated). The costs associated with the Wastewater activity are included in the Wastewater Activity Statement in Council's LTP.

The following graphs/table summarise the financial forecasts for the activity over the last ten years along with the forecast for the next ten years.

Summary of key financial assumptions

The current activity plan has been developed on the assumption that forecast renewals within the 10-year period will be subject to additional condition surveys and detailed investigations.

Future changes to operating costs will be influenced by changes to inflation and as a result of scheme upgrades to meet LoS requirements, most notably resource consent applications to meet new discharge quality standards in line with the Catchment Limit setting process allowed for under the proposed Draft Water and Land Plan.

Future demand is likely to remain unchanged and as such any upgrades to meet future demand have been deferred to the last years of the 10-year period and will be further deferred if this demand does not exist.

Key factors that may influence future operating costs that have currently not been considered for include:

- significant increase in transportation costs. Transportation costs are recalculated on an annual basis as part of the escalations process for re-baselining contract costs. Increases in transport costs are largely dependent on oil and diesel prices which are outside Council control. Currently budgeted operational costs allow for an increase based largely on historical trends
- the impact of ES's approach to future consent renewals for wastewater schemes (most notably a preference that effluent be disposed of to land where possible) could have a significant impact on costs depending on future operating costs which have not been fully budgeted for.

Key factors that have been budgeted for

Opex

New operations and maintenance contract will result in likely increase in budget from 2022.

Upgrades of Te Anau, Winton, Manapouri and Edendale Wyndham WwTW.

Capex

National and regional preferences for land disposal of treated wastewater.

Valuation approach

Statutory financial reporting requirements require SDC to revalue its fixed assets triennially. Wastewater supply infrastructure assets were last valued as at 30 June 2019 in accordance with Public Benefit Entity International Public Sector Accounting Standard 17 Property, Plant and Equipment (PBE IPAS17).

All assets have been valued at the component level (maintenance managed item-MMI) where appropriate.

Funding principles

Section 102(4) (a) of the Local Government Act 2002 requires each Council to adopt a Revenue and Financing Policy. This Policy must state Council's policies in respect of the funding of both capital and operational expenditure for its activities.

In summary, for Wastewater, operational and capital expenditure will be funded as follows:

- operating funding is 100% District rate funded, via a targeted rate based on household equivalent use or pans
- smaller projects may be funded through loans. The rationale is that there is a high degree of private benefit in wastewater systems, therefore a level of user pays is appropriate. Consistent with a user pays approach, this activity is rated for distinctly. It also enhances transparency about the service ratepayers are receiving and paying for.

Fees and charges

Fees and charges are detailed in Councils Annual Fees and Charges schedule which is reviewed and updated annually.

Appendix

Scheme plans

Introduction

This section introduces the headings found in the following Appendices offering explanations and definitions of information sources, methodologies and terminology common to all supplies.

The financial reports provided in this section incorporate the business units that fund the operating activities but exclude business units which contain existing township/ratepayer loans and depreciation.

Description

This area describes the current physical scope, condition and performance (measured against target standards) of the assets used in the Wastewater Activity. This information is the basis for determining future maintenance and capital programmes, and developing appropriate management strategies. Information has been collated from the databases held in SDC's asset.

Connection information has been provided by the Rates Department as a query of how many water rates or units of water are charged for each scheme.

Asset information has been sourced from historical AMPs, IPS, and scheme working folders.

Asset condition, capacity and performance

Measuring

Assessment of condition and performance has been made using grades defined by the New Zealand Water Industry National Asset Grading Standards (see tables below). This revision does not re-grade each asset but instead updates grades based on recent information. These act as a reference for the condition, performance and confidence of individual schemes as discussed in the following sections.

Condition and performance grades

Grade	Condition	Performance	Description
1	Very Good	Always meets technical LoS.	No significant adverse short term impact.
2	Good	Almost always meets technical LoS.	Failure will cause localised and serious disruptions to service delivery.
3	Moderate	Generally meets technical LoS.	Failure will cause localised and serious disruptions to service delivery, possible health and safety effects and/or loss of critical data.
4	Poor	Does not generally meets technical LoS.	Failure will cause serious disruption to service delivery over a substantial area, possible health and public safety effects.
5	Very Poor	Never meets technical LoS.	Widespread and serious disruption to service delivery, possible health and public safety effects.

Table 0-1: Asset condition and performance grades (Courtesy of Maunsell Limited)

Confidence grades

Grade	Confidence	Description
A	Highly reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented and recognised as the best method of assessment.
B	Reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented but has minor shortcomings; for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain	Data is based on sound records, procedures, investigations and analysis that is incomplete or unsupported, or extrapolation from a limited sample for which Grade A or B data is available.
D	Poor	Data is based on unconfirmed verbal reports and/or cursory inspection and analysis.

Table 0-2: Data source and confidence gradings (Courtesy of Maunsell Limited)

Assets that have reached their predicted expiry date as per IPS asset lives, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

The condition and performance results in these appendices will be correlated against 2016/17 inspection results - Scheme Tours. A number of assets have reached the end of predicted life in IPS yet are still operable. In such circumstances these haven been replaced but their condition re-verified through the recent condition assessment, for example switchboard and telemetry at Balfour.

Appendix A: Balfour

Description

The Balfour community has an estimated 2013 usual resident population of 126 with a projected 2018 usual resident population of 145. The scheme has 90 total equivalent connections (86 full, 8 half units).

History

Prior to 1963 Balfour's wastewater consisted of standard reticulation and a conventional treatment plant.

1990s - Pre-screen removed from pump station.

1995 - Telemetry and new switchboard installed at pump station.

1999 - New pump was installed in pump station.

2000 - Structural repairs undertaken with trickling filter.

2003 - Condition assessment carried out of trickling filter.

2004 - CCTV carried out in parts of Kruger and Queen Streets.

- Extension along Queen Street and Old Balfour Road considered by the Community Board but did not proceed.

2006 - Radio replaced.

2007 - New Pump 2 (Flygt 3058 2 kW).

2011 - Replacement blower installed and SCADA and switchboard upgrade carried out.

2014 - Sludge storage extended

Process description

The Balfour wastewater network consists of service connections, gravity mains, manholes and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to pump station 1 (PS1) where the wastewater enters the treatment process. The Balfour system is known as a mechanical system utilising facilities which enable wastewater treatment over a smaller area of land.

(a) Wastewater reticulation

The sewer gravity mains are concrete spun, reinforced earthenware, uPVC, and AC pipes.

The pipes should have been installed with rubber-ring joints, but these are believed to have been left out on at least some of the pipes. Service connections known to be mostly earthenware. Most manholes are fabricated from concrete pipes, with circular lids. Many manholes have in the past been noted as being broken around the base, which in turn has allowed significant infiltration and inflow and the entry of gravel into the network. The majority of manholes with problems have had holes patched.

CCTV inspection of the sewer has shown that the condition of many connections is poor and in many places protrudes into the main creating the potential for blockages.

Poor condition of laterals is also expected to cause infiltration problems. There are significant amounts of infiltration and inflow is increasing the volume of wastewater reaching the treatment plant to such an extent that the effectiveness of the treatment plant is now being compromised.

(b) Pump stations

There is a single pump station that services the whole town located in the grounds of the treatment plant. The pump station has been converted to a wet well with two submersible pumps. The pumps elevate wastewater through a flexible hose to the surge chamber above the Imhoff tank. Wastewater gravitates through the treatment plant to the outlet. The pump station is monitored by a SCADA system that records information at Council's office in Invercargill.

- **Design**: The pump station is a wet well with submersible pumps.
- **Catchment**: The whole township gravitates to the single pump station.
- **Pump Controls**: Pump control is by a multi-level sensing probe with a back-up high-level float switch. The station is monitored by Council's Datran SCADA system.
- **Storage**: Storage is sufficient for the current demand.
- **Standby Power**: No standby power supply is incorporated at the pump station.

(c) Wastewater treatment

Wastewater treatment is carried out by a mechanical plant consisting of an Imhoff tank, a trickling filter and a humus tank. Sludge is drawn off from the Imhoff and dried for disposal.

(d) Discharge

Resource Consent No. 201674 granted to discharge 250 m^3/day of treated wastewater to a weeded ditch and into the Longridge Stream. Consent expires 2 February 2024.

Asset condition and performance

Condition and performance

The condition of the reticulation was last inspected under contract in 2004 by Delta Civil Dunedin. A total of 383 m was inspected with filming and grading carried out in accordance with the Pipe Inspection Manual. The township was given an overall pipe grading 3.0 or Moderate (where 1.0 is Excellent and 5.0 is Fail).

The trickling filter walls have been banded to provide additional support as previous inspections identified structural concerns with the trickling filter. However, the condition is not deemed to be affecting performance of the treatment plant. Accordingly, the replacement of the trickling filter has been deferred until 2020 upon which time it will be re-assessed and further deferred if possible.

The current condition and performance grading of the wastewater system is shown in the table below:

Discharge quality is monitored in compliance with the conditions of the resource consent.

Flow is not currently monitored on the outfall but can be estimated from pump run hours.

Operation and maintenance trends

No issues.

Planned capital costs over the next 10 years are included in the following table:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	2	B	2022
	Cleaning eyes	3	2	B	2022
	Service connections	3	3	C	Unknown
	Gravity mains	3	3	B	2043
Pump station	Wet well	2	2	B	Unknown
	Pump No. 1	2	2	B	2015
	Pump No. 2	1	1	A	2027
	Switchboard	1	1	B	2037
	Telemetry	1	1	A	2037
	Flowmeter (2)	1	1	A	2037
Treatment Plant	Blower	3	2	B	2028
	Pipework	4	2	B	2019
	Imhoff tank	3	2	B	2019
	Trickling Filter	4	2	B	2020
	Humus tank	3	2	B	2022
	Sludge drying bed	3	2	B	2022
	Weeded Ditch	3	2	B	Unknown
	Outlet	3	2	B	Unknown

** Deferred based on SDC assessment that condition not adversely affecting performance.

Table A: Balfour Condition and Performance

Critical assets

Critical assets identified are:

The rising main from PS1 to the imhoff tank.

Key issues

It is possible that a variation may be required to the discharge permit if inflow and infiltration is not brought under control.

On the horizon is the majority of reticulation coming to the end of its design life in 2022 of significant assets though these will be reassessed at that time.

A reticulation condition assessment is programmed prior to end of design life to fully assess the scope of the renewal.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Balfour

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WW16	Statutory MS Project WW16	REN	22/23	54,976	District Funding

Modify pump station pump & upgrade trickling filter	WW1617	addtional project 18-28 LTP	REN	24/25	203,118	District Funding

Appendix B: Browns

Description

The Browns community has an estimated 2013 usual resident population of 141 with a projected 2018 usual resident population of 145 the majority of which are outside the scheme boundary. The scheme has 13 total equivalent connections (13 full, 0 half units) including the local primary school.

History

1971 - Browns wastewater scheme was constructed to service the school

1996 - An application was made to ES to renew discharge consent for a modified plant by converting the package plant to a septic tank with evapo-transpiration trenches. Application was declined due to lack of supporting information.

2004 - Reapplied for discharge consent with supporting information.

2004 - Discharge consent granted for five years.

2005 - Power supply reinstated and the blower recommissioned.

2006 - Novaflow drainage installed to replace open ditch between plant and discharge.

2010 - Short term 18-month consent granted by ES.

2012 - 20-year consent granted and plant upgraded.

2014 - New trickling filter and disposal fields added.

Process description

The network is a septic tank effluent drainage system gravitating to a small treatment plant.
The wastewater reticulation consists of service connections, gravity mains, manholes and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages caused by material from the connected property within the service connection are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to an activated sludge package plant. Treated effluent is discharged into the Otapiri Stream.

(a) Wastewater reticulation

The gravity mains are uPVC. The plant services 11 private dwellings, a church, and Hillside Primary School. The reticulation is in moderate condition. All connections gravitate to the treatment plant.

(b) Pump stations

There are no pump stations in this scheme.

(c) Wastewater treatment

Effluent treatment is carried out in an activated sludge plant with secondary trickling filter. Treated effluent from the plant is discharged to an unnamed tributary of the Otapiri Stream, with a discharge to forestry block as a secondary disposal route.

(d) Discharge

Resource Consent No 202550 granted to discharge treated wastewater to an unnamed tributary of the Otapiri Stream. Consent expires February 2032.Post 2015 a land based discharge to a nearby forestry block was finalised. This is now the preferred disposal route when conditions allow.

Condition and performance

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	3	B	2046
	Cleaning eyes	3	3	B	2046
	Service connections	3	3	C	Unknown
	Gravity mains	3	3	B	2070
Treatment Plant	Package Plant	2	2	A	2050
	Switchboard	4	5	B	2024
	Telemetry	N/A	N/A	N/A	2024
	Outfall	4	4	B	Unknown
	Filter	1	1	A	2063

Table B: Browns Condition and Performance

Note: Asset will require re-evaluation plant upgraded, new switchboard, extra pumps, second outlet and disposal field.

Operation and maintenance

Prior to the recent upgrade performance had been poor with repeated non-compliances. This has been reversed since the 2014 upgrade whereby the plant is fully capable of meeting all monitoring conditions.

Critical assets

Critical assets identified are:

Process blower.

Key issues

An upgrade of the treatment and disposal is with the planned addition of a trickling filter arrangement, has seen a significant improvement of performance.

Capital expenditure plan

Asset Management

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Inflow project to comply with Consent limits	WW1530	In Browns; Tokanui; Nightcaps; Winton; Riversdale	LoS	18/19	150,000	District Funding

Appendix C: Edendale-Wyndham

Description

The Edendale-Wyndham community has an estimated 2013 usual resident population of 1,162. The estimated peak population for Edendale-Wyndham is 1,162 in 2013. The scheme has 565 total equivalent connections (672 full, 48 half units), as at 2017/18 year.

History

Process description

Most of the township is served by wastewater reticulation consisting of service connections, gravity mains, rising mains, manholes, and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility and cost to clear blockages.

The new sewerage system to the Edendale and Wyndham townships replaces a septic tank/shared sewer/stormwater system in place since the 1950s.

(a) Wastewater reticulation

Wastewater reticulation to both Edendale and Wyndham was majority installed in 2010 with UPVC rubber ring mains and UPVC rising mains.

(b) Pump stations

Edendale has a total of three pump stations located at:

10 McKinnon Road, Edendale

23 Salford Street, Edendale

154 Seaward Road, Edendale.

Wyndham has two pump stations located at:

Redan Street, Wyndham

Pera Street, Wyndham.

All stations are monitored remotely by Council's SCADA system. When pre-set conditions (such as pump stations failures) occur, alarms are automatically activated through SCADA to urgently address the issue.

There are a number of private household pump stations on George Street in Edendale that pump into Council reticulation. Council is responsible for the mains and laterals up to the property boundary. The Ratepayer is responsible for the maintenance and operation of the private pump stations.

(c) Wastewater treatment

Wastewater from the townships of Edendale and Wyndham is reticulated via pump stations and rising mains to the treatment plant located on Edendale Wyndham Road accessed off the corner of Coal Pit Road.

Effluent receives a screening process by passing over one of two coarse (3mm) screens at the initial inflow point.

Effluent gravitates via splitters to one of two 100 m^3 inclined settlement tanks.

Discharge from tanks proceeds to two (duty and standby) reticulating pumps. There are a further four (4) 30 m^3 emergency holding tanks (normally empty) that are utilised in event of power or motor failure.

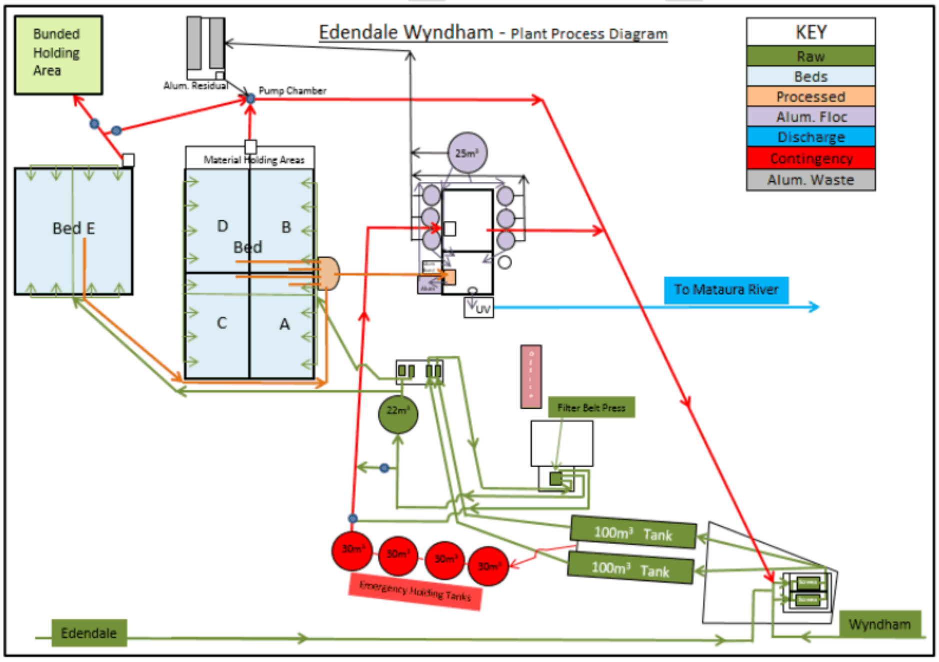
The two (2) pumps before mentioned reticulate liquor to a 250 micron filter belt press to separate any finer sediment. Outflow from the press feeds to a 22 m^3 holding tank and then pumps to filter beds A to E via spray heads to evenly distribute the liquid.

After mechanical and biological filtration that occurs, approximately 50-60% of the outflow is piped to alum dosing tanks to reduce the dissolved reactive phosphorus.

Outflow from this area passes through UV treatment prior to final discharge to the Mataura River in accordance with discharge consent.

Alum residual and overflow from the filtration beds (that feeds to a bunded holding area) is reticulated in a pumped rising main to the screens at the start of the process to "recycle" through full treatment process.

Edendale-Wyndham plant process diagram is attached which visually details the process.



(d) Discharge

Resource Consent No 204630-VI was granted to discharge treated sewerage to water from the Edendale-Wyndham scheme.

Discharge permit expires 10 September 2023.

Average Daily Dry Weather Flow - 264m^3/day

Maximum Daily Flow - 528 m^3/day.

Condition and performance

As this scheme is new (2010) all in ground reticulation has maintained:

Condition: 1

Performance: 1

Confidence: A.

All other plant and equipment is graded for condition and performance on a prorata basis of expected life as detailed in the 2017 valuation report – all of those assets have an "A" confidence level.

Operation and maintenance

When the Resource Consent for the discharge is renewed a more robust system to remove or lower the DRP (Dissolved Reactive Phosphorus) concentrations will need to be included if discharge to the river is to be continued.

Critical assets

Critical assets identified are:

Rising mains from Edendale and Wyndham.
Holding capacity of emergency holding tanks at plant in times of extended power outage or pump breakdown. Note there is a generator at the site for back up power.

Key issues

There are no key issues at this point in time.

Capital expenditure plan

There are no capital expenditure items within the 2018-2028 period.

Appendix D: Gorge Road

Description

Gorge Road township has a usual resident population of approximately 50. The Community Development Area Subcommittee boundary area has an estimated 2013 usual resident population of 192 with a projected 2018 usual resident population of 218. The scheme has 36.5 total equivalent connections (36 full, 1 half units).

History

Until 2005 the oxidation pond (constructed 1984) and wetland (constructed 1998) were owned and operated by the Gorge Road Country Club. The private scheme serviced the Country Club, the Community Centre and the Gorge Road Swimming Pool. Other properties had on-site treatment and disposal.

A sanitation survey was commissioned in 2003 and concluded there to be a risk to public health should the township continue with on-site disposal of wastewater. A provisional application was made to the MOH to assist with a Sanitary Works Subsidy for a reticulated wastewater treatment system.

Following community and government approval of the design and costs the construction began. The scheme was officially commissioned in August 2005.

2005 - New wastewater scheme constructed (C04-62). The scheme received 50% funding from the MOH through SWSS.

2014 - Introduction of phased cleaning of septic tanks.

2014 - Base of control kiosk raised to above flood level

Process description

The network is a septic tank effluent drainage system. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages caused by material from the connected property within the service connection are considered to be the property owner's responsibility.

Septic tank effluent gravitates to pump station 1 before being pumped to the treatment plant. The system discharges through a wetland before entering Gorge Creek.

(a) Wastewater reticulation

The sewer gravity and rising mains are uPVC and PE. Service connections are uPVC. Most manholes precast concrete or PE inspection chambers.

The reticulation is in good condition.

(b) Pump stations

A single pump station located on the Tokanui Gorge Road Highway and services the whole reticulated network. The pump station is a package Fibrecon TK5000 wetwell 2 m in diameter and an operating level of about 0.35 m. There are two ABS Piranha S17-2 D 50 Hz pumps that send effluent 1,020 m to the oxidation pond. A non-return valve on the rising main prevents wastewater re-entering the pump station from the main.

(c) Wastewater treatment

Treatment is provided by an oxidation pond and wetland before exiting to the Gorge Creek via overland flow.

(d) Discharge

Resource Consent No 202712 granted to discharge treated wastewater into Gorge Creek. Consent expires 6 December 2029.

Condition and performance

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	1	1	B	2080
	Cleaning eyes	1	1	B	2065
	Service connections	1	1	C	2105
	Gravity mains	1	1	B	2105
	Rising main	1	1	B	2085
Pump station	Wet well	1	1	B	2065
	Pump No. 1	1	1	B	2025
	Pump No. 2	1	1	B	2025
	Switchboard	1	1	B	2025
	Telemetry	1	1	B	2025
Treatment Plant	Oxidation Pond	3	-	B	2085
	Wetland	3	-	B	2025
	Outfall	3	-	B	2025

Table C: Gorge Road Condition and Performance

Parts of the original rising main are now starting to show signs of age. The scheme connected into an existing pipeline from the school which is now thought to be nearing the end of its effective operating life.

Operation and maintenance

Difficulties ensuring private tank filters are cleaned on a regular basis. This is causing issues with carryover of solids into the system and well as occasional overflows on private property as filters block.
Wetlands and ditch will need maintenance carried out at some stage.

Critical assets

Critical assets identified are:

The rising main from PS1 to the oxidation pond.

Key issues

Biofilter cleaning programme is required through operations budget.
Increasing problems with the older section of rising main (from the school).

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Gorge Road

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Pump station pumps	WW1623	Additional project for 18-28 LTP	REN	25/26	23,456	District Funding
Scheme Management Plan	plw26	Compile scheme management plan	REN	27/28	62,626	Reserves

Appendix E: Lumsden

Description

The Lumsden community has an estimated 2013 usual resident population of 453 with a projected 2018 usual resident population of 465. The scheme has 345.3 total equivalent connections (314 full, 7 threequarter units and 52 half units).

History

The Lumsden wastewater system was built in 1972/73. Shortly after the scheme was built a significant number of stormwater connections from private dwellings were made to the sewer network.
These stormwater connections were made with the approval of a local government engineer at the time.

1995 - SCADA telemetry is installed.

1997 - New pump is installed in pump station to replace failed pump.

1999 - Council applied to ES to renew resource consent.

2004 - Renewal of sewer trunk main (estimated cost $5,000 every second year commencing 2002).

2004 - CCTV work carried out.

2006 - Pump 1 overhauled.

2006 - New resource consent granted for 25 years. Max dry weather flow 140 m^3/day.

2007 - Replaced Pump 2 (Flygt 3085-183 2 kW).

2008 - WWTP upgrade (Contract 08/09) including reinstatement of baffles in pond, construction of rapid infiltration basins and upgrade of pump station switchboard and SCADA. The project received 50% funding from the MOH through SWSS.

- Sludge survey carried out by Conhur (msc/08/5/5604).

2014 - Flowmeter installed at Pump Station 1.

Process description

Most of the township is served by wastewater reticulation consisting of service connections, gravity mains, rising mains, manholes and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages caused by material from the connected property within the service connection are considered to be the property owner's responsibility.

Wastewater gravitates to a single pump station which pumps to the oxidation ponds before being discharged to land via rapid infiltration basins.

(a) Wastewater reticulation

Gravity mains are mostly AC with a small amount of PE and PVC. Pipelines have been constructed with rubber-ring joints. Lateral connections are also asbestos-cement or PVC. Most manholes are fabricated from concrete pipes, with circular lids.

(b) Pump stations

A single pump station services the whole reticulated network, providing the lift needed for gravitated wastewater to reach the oxidation pond. The pump station is a 2 metre diameter wet well, with an operation height of about 0.9 metres. There are two pumps with SCADA telemetry recording pump hours and providing pump failure and high level alarms to SDC in Invercargill. A non-return valve on the rising main prevents wastewater re-entering the pump station.

(c) Wastewater treatment

Treatment is provided by an oxidation pond with a re-established central baffle in order to effectively operate as two ponds in series. The pond has concrete wave bands to minimise erosion. The pond was sealed using a combination of local imported clays and coal tarseal.

Treated effluent is discharged to land via one of six rapid infiltration basins. Basin rotation is controlled by a hydraulic radial gate control valve.

The original pond dividing wall (baffles) had collapsed allowing the pond to operate as one large pond increasing the possibility of short-circuiting and poor microbial contaminant reduction. Treated wastewater was discharged into an intermittently flowing watercourse that runs along a low terrace on the farm paddock between the pond and the Oreti River stopbank.

(d) Discharge

Resource Consent No. 204085 granted to discharge treated wastewater to land at a rate of 140 m^3/day. Consent expires 20 November 2031.

Condition and performance

The township was given an overall pipe grading 3.0 or Moderate (where 1.0 is Excellent and 5.0 is Fail).

A total of 34% of the township has been inspected however grades are not assigned to the asset (held against group project work order) in IPS.

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	2	B	2032
	Cleaning eyes	3	2	B	2032
	Service connections	3	2	C	Unknown
	Gravity mains	4	4	B	2053
	Rising main	3	2	B	2043
Pump station	Wet well	3	3	B	2005
	Pump No. 1	1	1	B	2022
	Pump No. 2	1	1	A	2027
	Switchboard	1	1	A	2038
	Telemetry	1	1	A	2028
Treatment Plant	Oxidation Pond	3	4	B	2025
	Actuating Valve	1	2	A	2058
	RI Basins	1	2	A	2058
	Weeded Ditch	N/A	N/A	-	-
	Outfall	N/A	N/A	-	-

Table D: Lumsden Condition and Performance

Operation and maintenance

No issues identified.

Critical assets

Critical assets identified are:

The rising main from PS1 to the oxidation pond.

Key issues

The issue for Lumsden is elements of reticulation coming to the end of its design life in 2032. Reticulation condition assessments are programmed to fully assess the scope of the renewals. Approximately 2% of the network has been already been replaced with PVC.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Lumsden

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WW144	MS Prject WW144 in 24/25	REN	27/28	62,626	District Funding

Appendix F: Manapouri

Description

The Manapouri community has an estimated 2013 usual resident population of 228 with a projected 2018 usual resident population of 332. The estimated peak population for Manapouri is 684 in 2013, projected to 915 in 2023. The scheme has 331 total equivalent connections (305 full, 52 half units).

History

Built in 1969-70 the Manapouri wastewater system was installed at the same time as the first town water supply. The reticulation consist mostly 100-150 mm diameter uPVC pipes which all fall to pump stations. Three satellite pump stations lift wastewater into a gravity sewer network which falls to the View Street pump station located at the east end of View Street.

1969 - Construction.

1970 - Scheme commissioned.

1996 - View Street pump station (PS1) pumps replaced.

1997 - SCADA installed to all pump stations.

1998 - New pump installed at the Glade pump station (PS4) to overcome a long running smell complaint in Waiau Street.

2001 - Valve pits built at View Street (PS1) and Main Road (PS3).

2004 - Discharge Permit granted for 20 years.

2004 - Installed ADS flow meter on discharge.

2005 - New pump, switchboard and cabinet installed at Main Road (PS3).
- Activity Management Plan produced.
- Work starts on the Te Anau Basin Wastewater Strategy.

2007 - Switchboard condition assessment.

2008 - View Street pump station upgraded.
- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

Process description

Most of the township is served by wastewater reticulation consisting of service connections, gravity mains, rising mains, manholes, and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

A strategy is currently being developed to determine the direction for future treatment and disposal of wastewater in the Te Anau Basin (including the townships of Te Anau and Manapouri).

(a) Wastewater reticulation

Council's knowledge of the reticulation system is improving through CCTV inspections. Records show that the majority of the reticulation pipework is 150 mm diameter and the balance is a mixture of 225 mm and 100 mm diameter. It is understood that most of the 150 mm diameter

pipes are uPVC and the larger diameter pipes are concrete. The rising main over Home Creek is not AC as previously thought but bitumen wrapped
spiral-welded steel.

(b) Pump stations

Three minor pump stations collect wastewater from localised catchments and elevate it to gravity mains which flow to the main station in View Street (PS1). Wastewater from the whole reticulation network is received at the PS1 and is pumped through a rising main to the oxidation pond approximately 300 m to the south of Home Creek.

All stations are monitored remotely by Council's SCADA system. When pre-set conditions (such as pump start failures) occur alarms are automatically activated through SCADA and if necessary resources can be immediately mobilised to investigate/correct the fault. Council maintains a 24 hour a day monitoring service and operations staff are available 24 hours a day.

(c) Wastewater treatment

Treatment is provided by a single 1.85 ha oxidation pond which is approximately round and is located to the south east of Manapouri. The pond forms an attractive environment, it does not have any wave bands and is surrounded by vegetation.

The pond has been formed in a natural hollow above Home Creek. A below ground discharge pipe conveys any surface discharge from the pond to Home creek.

Any surface discharge from the pond enters home creek approximately 500 metres upstream of its confluence with the Waiau River which is approximately 2,000 metres upstream of Lake Manapouri. It is very common that the pond level will be well below the outlet weir/pipe level. During these periods no pond effluent is discharged into Home Creek. It is expected the pond effluent is mostly (cf evaporation) discharging to land through the base of the pond because the pond base and walls were not sealed at the time of construction. A young Eucalyptus tree plantation has recently been planted on the adjacent private land.

(d) Discharge

Resource Consent No 201812 granted to discharge stormwater and treated wastewater to land via seepage from the base of the pond and to water from the surface of the pond into Home Creek. Consent expires 6 September 2024.

The sizes of both the Te Anau and Manapouri WWTPs are unlikely to adequately cater for the anticipated population growth and peak populations. With this in mind a working party has been established to develop a Te Anau Basin Wastewater Strategy.

The strategy will investigate wastewater treatment and disposal options for the Te Anau (and Manapouri) townships. At present the preferred option is land disposal near the Te Anau Airport. Land has recently been purchased for this purpose.

Condition and performance

The condition of the reticulation was last inspected under contract in 2004 by Delta Civil Dunedin. A total of 401 m was inspected with filming and grading carried out in accordance with the 1999 Pipe Inspection Manual. Inspection results from the five completed surveys showed 26 faults recorded as follows:

Workmanship:	No faults involving joint problems; displaced faulty and open and lateral problems.

Condition of Asset:	25 faults involving problems with pipe cracked and holed, surface damaged, dips in pipe water levels.
Maintenance of System:	One fault involving debris in pipes, silt, gravel or fats and encrustation deposits caused by dissolved salts from soil or obstructions from tree roots.
Abandoned Inspection:	None because of gravel.

The township was given an overall pipe grading 1.0 or Excellent (where 1.0 is Excellent and 5.0 is Fail).

A total of 19% of the township has been inspected however grades are not assigned to the asset (held against group project work order) in IPS making analysis difficult.

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	3	B	2028
	Cleaning eyes	3	3	B	2028
	Service connections	3	3	C	Unknown
	Gravity mains	3	3	B	2044
	Rising mains	3	3	B	2044
View Street (PS1)	Wet well	2	2	B	2028
	Pump No. 1	2	2	B	2023
	Pump No. 2	2	2	B	2021
	Switchboard	2	2	A	2023
	Telemetry	1	1	A	2033
Waiau Street (PS2)	Wet well	2	2	B	2028
	Pump No. 1	2	2	B	2023
	Pump No. 2	2	2	B	2023
	Switchboard	2	2	A	2023
	Telemetry	1	1	A	2033
Main Road (PS3)	Wet well	2	2	B	2064
	Pump No. 1	2	2	B	2024
	Switchboard	2	2	A	2025
	Telemetry	1	1	A	2033
The Glade (PS4)	Wet well	2	2	B	2028
	Pump No. 1	2	2	B	2023
	Switchboard	2	2	A	2023
	Telemetry	1	1	A	2033
Treatment Plant	Oxidation Pond	3	2	C	2048
	Outfall	N/A	N/A	N/A	-

Table E: Manapouri Condition and Performance

An assessment was carried out prior to the replacement of pumps at pumps at PS2 and it was discovered that although the pumps have met the end of their economic life they are performing well and as such will not be replaced until required.

Operation and maintenance

No significant issues identified.

Critical assets

Critical assets identified are:

The rising main from PS1 to the oxidation pond.

Key issues

Renewal of supports to rising main from the town to the oxidation ponds planned for 2018.
On the horizon for Manapouri is the renewal of the discharge consent in 2024.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Manapouri

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WW181	MS Project WW181	LoS	20/21	131,072	District Funding
Consent Renewal Preparation	WW181	MS Project WW181	LoS	21/22	134,218	District Funding
Construction of Resource Consent requirements	WW185	Construction of Resource Consent requirements	LoS	23/24	676,199	District Funding
Construction of Resource Consent requirements	WW185	Construction of Resource Consent requirements	LoS	24/25	693,780	District Funding

Appendix G: Monowai

Description

The Monowai community has an estimated usual resident population of 27. The scheme has 15 total equivalent connections (15 full).

History

The scheme was originally owned and operated by the Power Company and was transferred to the SDC in 1998. It is thought to have been constructed in 1973.

1970s - Monowai wastewater scheme was constructed to service the township.

1998 - Scheme report written prior to ownership transfer.

1998 - Ownership and operation transferred to the SDC.

2008 - Application for renewal of discharge consent submitted.

2009 - OPERATIONS AND MAINTENANCE of scheme removed from District Contract.

2012 - Septic tank cleaned out.

2017 - OPERATIONS AND MAINTENANCE undertaken by Council/Downer

Process description

The township is served by wastewater reticulation consisting of service connections, gravity mains, manholes and cleaning eyes. The network gravitates the treatment plant consisting of a communal septic tank and effluent soakage field. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

(a) Wastewater reticulation

The gravity mains are constructed polyethylene (100%). The plant services 12 private dwellings, a hall, a single mens' quarters, and a public toilet. All connections gravitate to the treatment plant.

(b) Pump stations

There are no pump stations in this scheme.

(c) Wastewater treatment

Treatment is carried out in a communal twin chamber septic tank approximately 30 m3 in volume. Treated wastewater is discharged through an effluent soakage field consisting of a single 100 m run of 150 mm field tiles.

(d) Discharge

Resource Consent No 97402 transferred from the Power Company to discharge up to 25 m3/day of treated wastewater to land.

Condition and performance

No CCTV inspections have been carried out. The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	2	2	B	2054
	Cleaning eyes	2	2	B	2054
	Service connections	2	2	C	Unknown
	Gravity main	2	2	B	Unknown
Treatment Plant	Septic Tank	2	2	B	Unknown
	Disposal Field	2	2	B	2029

Table F: Monowai Condition and Performance

Operation and maintenance

Until recently the Committee were currently carrying out maintenance activities on the scheme although overall responsibility for scheme compliance lies with Council. OPERATIONS AND MAINTENANCE responsibility has now been transferred to Downer

Critical assets

Critical assets identified are:

None identified.

Key issues

The issue for Monowai is the disposal field has met the end of the design life, however, there are currently no significant issues or concerns raised by ES and as such will continue current operation. A sum has been set aside for renewal of the discharge consent at the end of the planning period. .

Small diameter monitoring bore/piezometer holes are required to assist with discharge monitoring.

On the horizon for Monowai is the majority of the reticulation will meet the end of the design life in 2038 however given that it is very lightly loaded it is not anticipated that significant upgrades will be required at this stage.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Monowai Sewerage Scheme

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WW279	MS Project WW279 in 23/24	REN	27/28	62,626	District Funding

Appendix H: Nightcaps

Description

The Nightcaps community has an estimated 2013 usual resident population of 306 with a projected 2018 usual resident population of 299. The scheme has 196 total equivalent connections (177 full, 3 three quarter, 34 half units).

History

The Nightcaps scheme was built in 1988 by Provincial Contracting.

1996 - Telemetry installed at pump station.

1998 - New grinder type pump installed (Pump 2).

2000 - Rock filter added.

2000 - Resource consent renewed for a further 15 years.

2003 - Asset Management Plan revised.

2004 - CCTV inspections carried out.

2005 - New Pump 1 installed (ABS Piranha 26/2).

2008 - Sludge survey carried out by Conhur (msc/08/5/5604).

2010 - Review of wastewater scheme performance undertaken as part of consent condition.

2014 - Consent application submitted to Environment Southland.

2017 - Consent granted for 10-year period after which upgrade will be required

Process description

Most of the township is served by wastewater reticulation consisting of service connections, gravity mains, rising mains, manholes and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owners' responsibility.

Inflow from the reticulation gravitates to pump station 1 where the wastewater enters the treatment process.

(a) Wastewater reticulation

All of Nightcaps is served by gravity wastewater reticulation. Manholes are located at each change in pipe gradient or alignment. They are mostly 0.4 to 4.6 metres deep conventional circular concrete structures with heavy-duty cast iron lids and frames. Cleaning eyes were installed as a low cost alternative to manholes at the end of lines, permitting rodding from above ground but not providing man entry and mostly located at the end of short dead end streets. The rising main from the pump station is 100 mm PVC pipe.

(b) Pump stations

There is a pump station located at the rear of a property at 27 Dryfe Street on Council owned land. It consists of two 2.4 m diameter below ground reinforced concrete tanks containing two pumps. If the pumps fail to operate when the high level alarm is reached wastewater overflows into the second.

(c) **Wastewater treatment**

Treatment is provided by an oxidation pond with a concrete wave band. A rock filter (50 m x 1.5 m) was added to provide additional polishing of the effluent. Discharge flows through a 300 m long vegetated ditch comprising of natural weeds managed for optimum polishing of effluent.

(d) **Discharge**

Resource Consent No. 20147390 granted to discharge up to 350 m3/day of treated wastewater into the Wairio Stream.

Condition and performance

The condition of the reticulation was last inspected under by Delta Civil Dunedin. A total of 732 m was inspected with filming and grading carried out in accordance with the
Pipe Inspection Manual.

The township was given an overall pipe grading 3.0 or Good (where 1.0 is Excellent and 5.0 is Fail).

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	2	2	B	2063
	Cleaning eyes	2	2	B	2063
	Service connections	2	2	C	Unknown
	Gravity mains	2	2	B	2087
	Rising main	2	2	B	2087
Pump station	Wet well	2	2	B	2047
	Pump No. 1	1	1	A	2025
	Pump No. 2	2	2	B	2018
	Switchboard	2	2	B	2018
	Telemetry	1	1	A	2030
Treatment Plant	Oxidation Pond	2	3	B	2067
	Rock Filter	2	3	B	2053
	Outfall	2	3	B	2047

Table G: Nightcaps Condition and Performance

Operation and maintenance

There are increasing occurrences of blockages in the mains which will be subject to future CCTV work to determine if future capital work is required.

There are increasing maintenance costs surrounding vegetation control adjacent to the access track into the oxidation pond. Currently these are covered under the OPERATIONS AND MAINTENANCE Contract.

Critical assets

Critical assets identified are:

The rising main from PS1 to the oxidation pond.

Key issues

Improvements to the treatment and disposal may be required in the future to meet new consent conditions.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Nightcaps

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Switchboard and pumps	WW1631	Additinal porject in 18-28 LTP	REN	23/24	86,351	District Funding
Upgrade of sewerage ponds	WW1528	Additional project in 18-28 LTP	REN	26/27	365,519	District Funding
Upgrade of sewerage ponds	WW1528	Additional project in 18-28 LTP	REN	27/28	375,753	District Funding

Asset Management

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Inflow project to comply with Consent limits	WW1530	In Browns; Tokanui; Nightcaps; Winton; Riversdale	LoS	18/19	150,000	District Funding

Appendix I: Ohai

Description

The Ohai community has an estimated 2013 usual resident population of 303 with a projected 2018 usual resident population of 307. The scheme has 233 total equivalent connections (217 full, 33 half units).

History

The Ohai wastewater system was built in 1953 and consists of standard reticulation and a conventional biological filter treatment plant with UV disinfection.

1997 - New pumps installed in pump station.

1998 - Telemetry and new switchboard installed at pump station.

1999 - Latest resource consent issued for 15-year term.

2001 - Alterations to reticulation to cure overflow problem at 127 Birchwood Road - connected to Hastings Street main.

2004 - UV disinfection installed.

2004 - CCTV inspections carried out.

2006 - Both pumps reconditioned.

2008 - Dual trickling filter operation installed.

2012 - CCTV survey of reticulation undertaken.

2013 - Discharge consent application lodged with Environment Southland.

Process description

The Ohai wastewater network consists of service connections, gravity mains, rising mains, manholes and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages caused by material from the connected property within the service connection are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to pump station 1(PS1) where the wastewater enters the treatment process. The Ohai system is known as a mechanical system utilising facilities which enhance stabilisation over a smaller area of land.

(a) Wastewater reticulation

Most of the reticulation mains are concrete and glazed earthenware pipes and the laterals are earthenware. The rising main is AC pipes. Most manholes are square cast in-situ concrete structures with badly corroded steel ladder rungs. The haunching in many of the manholes is poor. Approximately 2,312 m of the reticulation has been CCTV inspected. CCTV inspection of the sewer has shown that the conditions of many of the connections to the reticulation network are also poor.

Connections in many places protrude into the gravity main, creating the potential for blockages. The poor lateral connections are also expected to be the source of infiltration problems. Significant amounts of infiltration and inflow is increasing the volume of wastewater reaching the treatment plant to such an extent that the effectiveness of the treatment plant is compromised.

(b) Pump stations

There is one pump station located to the north of Birchwood Road, at 134 Birchwood Road.

Design: The pump station has been converted to a wet well type, with submersible pumps located in the wastewater they pump. The pump station contains two pumps installed in 1997 and reconditioned in 2006.

(c) Wastewater treatment

Wastewater enters the Ohai treatment plant after passing through a screen.

Solids material then settles out in two Imhoff tanks and is removed and dried prior to being disposed of in forestry block. Biological treatment is provided by two stone media filters prior to a secondary settlement stage in two rectangular humus tanks.

A UV disinfection chamber was installed in 2004 to polish effluent before discharge into receiving waters.

(d) Discharge

Resource Consent No 97009 granted to discharge treated effluent into an unnamed tributary of the Orauea Stream at a dry weather rate of 120 m3/day and wet weather rate of 480 m3/day. Consent expires 15 April 2014. A discharge consent application is being processed by Environment Southland.

Condition and performance

The condition of the reticulation was last inspected under contract in 2012/13 by Hydrotech Services A total of 3.5 km was inspected with filming and grading carried out in accordance with the 1999 Pipe Inspection Manual. Inspection results from the 17 completed surveys showed 174 faults recorded as follows although none were considered significant. Overall the survey identified that the condition was consistent with others townships with similarly aged reticulation.

The township was given an overall pipe grading 3.0 or Moderate (where 1.0 is Excellent and 5.0 is Fail). Performance of the pump station is declining as inflow and infiltration increases with ageing pipework.

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	3	B	2027
	Cleaning eyes	3	3	B	2027
	Service connections	3	3	C	Unknown
	Gravity mains	3	3	B	2022
	Rising main	3	3	B	2022
Pump station	Wet well	3	3	B	2011
	Pumps No. 1	3	5	B	2017
	Pumps No. 2	3	5	B	2017
	Switchboard	3	3	B	2015
	Telemetry now Kingfisher flowmeter	1	1	A	2035

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Treatment Plant	Imhoff tank	3	4	B	2032
	Trickling Filter	3	4	B	2032
	Humus tank	3	4	B	2032
	Compressor	3	4	B	Unknown
	Sludge drying bed	3	4	B	2020
	Sludge pump	3	4	B	Unknown
	UV chamber	3	4	B	2029
	Weeded Ditch	3	4	B	Unknown
	Outfall	3	4	B	Unknown
	UV Switchboard	2	2	B	2034
	Telemetry (SALCOM)	1	1	A	2035

Table H: Ohai Condition and Performance

Operation and maintenance

UV bulbs need replaced every year.
WWTP in need of major maintenance: concrete pathway, plastering of intake channel, leaking trickling filter, walkways on Imhoff tank, paint Imhoff tank.
Issues with high wells during wet weather.
Poor compliance record for faecal coliforms.

Critical assets

Critical assets identified are:

The rising main from PS1 to the treatment plant.

Key issues

The major issue for Ohai is that the majority of the reticulation begins to meet the end of the design life within the 10 year plan period and will require condition assessments prior to any renewals being carried out. Council has indicated its preferred strategy is to undertake an increased frequency of planned / unplanned maintenance rather than a complete renewal.
Reticulation strategy is required prior to major renewals.
Due to the declining population future capital work will be deferred in favour of increased planned and unplanned maintenance.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Ohai

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source

New UV/Treatment Plant upgrade	WW336	MS Project WW336 Amount changed from $60K to $150K as a result of discussion on 3/11/14 as PLW86A will not have everything completed in 13/14.	LoS	18/19	64,148	District Funding
Seals and arms to both trickling filters	WW1543	Additional project in 18-28 LTP	REN	19/20	61,500	District Funding

Appendix J: Otautau

Description

The Otautau community has an estimated 2013 usual resident population of 798 with a projected 2018 usual resident population of 892. The scheme has 460 total equivalent connections (437 full, 6 three quarter, 37 half units).

History

The sewer reticulation system was built in 1998.

2005 - Installed bar screen at oxidation pond.

2005 - River protection work carried out to protect disposal field.

2006 - Repairs carried out to rising main after pipe was exposed by floodwaters and severed at PE to PVC joint.

2007 - New resource consent granted (previous expired in 2006).

2008 - Monitoring wells (piezos) installed in accordance with resource consent.

- Additional pump installed to PS4 (electrical and pipework improvements as well).
- River protection work carried out.
- Irrigation review and upgrades to WWTP carried out.

2017 - District Metered Areas (DMA) installed to assist water loss programme.

Process description

The Otautau wastewater network consists of service connections, gravity mains, rising mains, manholes, and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages caused by material from the connected property within the service connection are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to six pump stations before entering the treatment process.

(a) Wastewater reticulation

The reticulation system comprises 150 mm, 200 mm and 225 mm diameter uPVC rubber-ring jointed pipes with 100 mm diameter household laterals, installed at appropriate grades. Access to the sewers for rodding purposes is provided by manholes constructed where mains intersect and elsewhere by rodding eyes. Manholes are 600 mm diameter and of polypropylene construction. Approximately 91 m of the reticulation has been CCTV inspected.

The rising main from PS1 passes under the Aparima River to the WWTP. The section under the river was renewed in 2006 in PE and anchored with railway irons below the bottom of the river.

Land Use Consent No. 97547 granted to place a wastewater pumping main in the bed of the Aparima River and the Otautau Stream. Consent expires 10 April 2031.

(b) Pump stations

Except for the surface mounted electrical control cabinets and backflow preventers all pumping station components are located below ground. Each pumping station comprises a circular concrete pipe chamber extending to the required depth and containing submersible type wastewater pumps of the required capacity together with the associated delivery pipework, level control and alarm system hardware.

The rising mains installed as part of each pumping system are sized in accordance with the duty requirements of each station. The rising mains are both 80 mm diameter and 150 mm diameter Class C uPVC, with a 150 mm HDPE 9 bar pipe for the river crossings.

The discharge pipes from the pumps pass through a valve chamber constructed adjacent to but separate from the pump well. The valve chamber contains a non-return valve and isolating valve on each of the pump discharge lines prior to the lines joining and connecting to the rising mains. Access to the pump well and valve chamber at each station is by way of aluminium hatches cast into the roof slab of each structure.

An emergency pump connection part exists at each station allowing each well to be pumped out by ancillary equipment. A spare pump compatible with all stations is available in the event of pump failure.

(c) Wastewater treatment

The treatment plant is located adjacent to the stopbanks on the eastern side of the Aparima River. The plant consists of a 1.2 ha single stage earth embankment oxidation pond constructed by conventional cut to fill methods. The pond is lined with high density polyethylene lining. Effluent passes through a single bar screen before entering the treatment process.

At the pond outlet effluent passes through a level control manhole before being discharged to pasture through sprinklers. Eight irrigation cells are dosed in rotation across a total area of 12 ha.

(d) Discharge

Resource Consent No. 203450 granted to discharge treated effluent to land at a dry weather rate of 460 m3/day. Consent expires 16 January 2032.

Condition and performance

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	1	4	B	2078
	Cleaning eyes	1	4	B	2058
	Service connections	1	4	C	Unknown
	Gravity mains	1	4	B	2098
	Rising mains	1	4	B	2098
King Street (PS1)	Wet well	1	1	B	2028
	Pump No. 1	1	1	B	2017
	Pump No. 2	1	1	B	2017
	Switchboard	1	1	B	2022
	Telemetry	1	2	A	2035
Nantwich Street (PS2)	Wet well	1	1	B	2057
	Pump No. 1	1	1	B	2017
	Switchboard	1	1	B	2022

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
	Telemetry	1	2	A	2035
Clitheroe Street (PS3)	Wet well	1	1	B	2057
	Pump No. 1	1	1	B	2017
	Switchboard	1	1	B	2022
	Telemetry	1	5	A	2035
Main Street (PS4)	Wet well	1	1	B	2057
	Pump No. 1	1	1	B	2017
	Pump No. 2	1	1	A	2029
	Switchboard	1	1	B	2022
	Telemetry	1	2	A	2035
Liemen Street (PS5)	Wet well	1	1	B	2057
	Pump No. 1	1	1	B	2017
	Switchboard	1	1	B	2022
	Telemetry	1	2	A	2035
George Street (PS6)	Wet well	1	1	B	2057
	Pump No. 1	1	1	B	2017
	Switchboard	1	1	B	2022
	Telemetry	1	2	A	2035
	Spare pump	1	1	B	2017
Treatment Plant	Oxidation Pond	3	4	B	2028
	Dosing pump/filter	3	4	B	2017
	Irrigation Field	3	4	B	2022
	Outfall	3	4	B	Unknown
	Switchboard	3	4	B	2022
	Telemetry	3	3	B	2025

Table I: Otautau condition and performance

Expired equipment has been subject to annual inspection and still has operational functionality agreed between Downer and Council staff.

There have been problems in the past with the performance of the irrigation field especially in times of peak/wet weather loads. A rigorous operation and maintenance review has been carried out with further upgrade works programmed in this planning period.

Although this is a relatively new scheme, there are major problems with inflow and infiltration. Studies have been carried out in the past but no conclusions were made. Investigations indicate that the majority of groundwater is getting into the sewers through poorly sealed manholes and direct connections from private stormwater lines.

Operation and maintenance

There are currently major issues with the operation of the irrigation field. An assessment was carried out by MWH in 2006 and identified the need to increase pressure to the sprinkler heads. The proposed solution involved installing an 80 mm pipeline to the far irrigation cells and upgrading the dosing pump/filter system in 2008.

Critical assets

Critical assets identified are:

The rising main from PS1 to the oxidation pond.

Key issues

Some parts of the reticulation are performing poorly with indications of high levels of infiltration.
Ongoing river protection works are required to protect the disposal field.
Additional pumps are required at single pump installations.
A mechanical screen is required to improve the performance of the sprinkler irrigation system.
Renewal of all pumps due in 2017 and all switchboards/cabinets in 2022 deferred subject to a annual condition assessment.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Otautau

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Disposal fields flushing poinston disposal lines	WW1540	Additional project in 18-28 LTP	LoS	18/19	35,000	District Funding
Consent Renewal Preparation	WW429	MS Project WW429	REN	27/28	62,626	District Funding
Switchboards	WW1634	Additional project in 18-28 LTP	REN	27/28	577,866	District Funding

Appendix K: Riversdale

Description

The Riversdale community has an estimated 2013 usual resident population of 456 with a projected 2018 usual resident population of 505. The scheme has 254 total equivalent connections (239 full, 2 three quarter, 28 half units). However, in anticipation of potential growth the local community is looking at mechanisms for development.

History

The Riversdale wastewater system was installed in 1975 by the Southland County Council. Sections outside the town drainage area continue to be served by septic tank.

1995 - SCADA telemetry installed.

1998 - Significant upgrade to electrical switchgear.

1999 - Resource consent obtained. Land disposal required as a condition.

2000 - Wetland, land disposal system constructed adjacent south and east banks of existing oxidation pond.

2002 - Two new pumps installed at pump station.

2002 - Attempted repairs of main in Liverpool Street proved too difficult and expensive due to high ground water levels.

2003 - A 150 mm diameter bypass main installed from Newcastle Street to Chester Street.

2004 - CCTV inspections carried out.

- New Pump 1 (ABS AFP 0381 2.2 kW).

2005 - Work carried out on wetland to eliminate ponding.

2006 - Remedial work carried out to wetland.

2007 - New Pump 2 (ABS AFP 0381 2.2 kW).

2008 - Sludge survey carried out by Conhur (msc/08/5/5604).

2013 - Consent application lodged with Environment Southland.

2017 - Consents granted.

2017 - Investigations in support of long term solution progressing

Process description

The Riversdale wastewater network consists of service connections, gravity mains, rising mains, manholes, and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to pump station 1 (PS1) where the wastewater enters the treatment process.

(a) Wastewater reticulation

Pipes have been laid, wherever possible, within roadside verges, the grades of which should have been designed in accordance with good engineering practice. No recurring blockages have been identified indicating the pipework has at least sufficient capacity for its current loading rates.

Manholes are located at each change in pipe gradient or alignment. They are mostly 1.3 to 2.5 metres deep conventional circular concrete structures with heavy duty cast iron lids and frames. There are cleaning eyes, mostly located at the end of short dead end streets. Approximately 2,394 m of the reticulation has been CCTV inspected.

(b) Pump stations

The Liverpool Street pump station (PS1) services the whole reticulated network, providing the lift needed for gravitated wastewater to reach the oxidation pond. The pump station comprises a circular concrete pipe chamber extending to an unconfirmed depth. The wet well contains two submersible pumps operated as one duty and one standby.

(c) Wastewater treatment

The wastewater treatment plant is located on the eastern side of the Riversdale township. It consists of an oxidation pond and a wetland land disposal area.

The oxidation pond is thought to be lined with low permeability clays. Wave bands are constructed of cast in-situ concrete slabs.

In 2000 a wetland disposal area was constructed comprising of a 5 metre wide area excavated to the south and east side of the pond. The first half of the area has native plants while the final area contains a large gravel infiltration area.

(d) Discharge

Resource Consent No. 20147220 granted to discharge oxidation pond effluent to land via a soakage channel and Meadow Burn at a dry weather rate of 92 m3/day and wet weather rate of 276 m3/day.

Condition and performance

The condition of the reticulation was last inspected under by Delta Civil Dunedin. A total of 189 m was inspected with filming and grading carried out in accordance with the 1999 Pipe Inspection Manual.

The township was given an overall pipe grading 3.0 or Moderate (where 1.0 is Excellent and 5.0 is Fail).

A total of 36% of the township has been inspected however grades are not assigned to the asset (held against group project work order) in IPS making analysis difficult.

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	3	B	2034
	Cleaning eyes	3	3	B	2034
	Service connections	3	3	C	Unknown
	Gravity mains	3	3	B	2034
	Rising main	3	3	B	2034
Pump station	Wet well	3	3	B	2034

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
	Pump No. 1	1	1	A	2024
	Pump No. 2	1	1	A	2027
	Switchboard	3	3	B	2005
	Telemetry	1	1	A	2025
Treatment Plant	Oxidation Pond	3	4	B	2054
	Wetland disposal	3	4	B	2060
	Outfall	3	3	B	2034

Table J: Riversdale condition and performance

Discharge to Meadow Burn was occurring more frequently than allowed under the consent. Upgrades are programmed to improve infiltration from the wetland.

Riversdale suffers from a very high water table. There is a major problem with inflow and infiltration. Renewals have been programmed once the worst areas have been identified.

Investigation and design work continues in relation to land purchase for siting a Rapid Infiltration Basin (RIB).

Operation and maintenance

Very high water table leading to increased maintenance costs associated with dewatering excavations to work.

Significant sludge build up in the pond was confirmed in a survey carried out by Conhur in 2008.

Issues during winter time with pumps pumping 24 hours per day.

Critical assets

Critical assets identified are:

The rising main from PS1 to the oxidation pond.

To meet the projected future demand, it is estimated that the following projects will be required:

A scheme extension has been planned in anticipation of growth.

Key issues

The switchboard has met the end of the design life and the telemetry unit (RTU) requires upgrading to Kingfisher/Citect the SCADA system.

Sludge is building up in the pond causing performance issues.

Pond requires desludging

On the horizon is the majority of the reticulation meets the end of the design life in 2034. A reticulation assessment has been programmed.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Riversdale

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Treatment Upgrade Stage 2	WW501	MS Project WW501	LoS	18/19	300,000	District Funding
Treatment Upgrade Stage 2	WW501	MS Project WW501	LoS	19/20	410,000	District Funding
Treatment Upgrade Stage 2	WW501	MS Project WW501	LoS	21/22	1,717,985	District Funding
Wet Well replacement	WW1636	Additional project in 18-28 LTP	REN	27/28	275,368	District Funding

Asset Management

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Inflow project to comply with Consent limits	WW1530	In Browns; Tokanui; Nightcaps; Winton; Riversdale	LoS	18/19	150,000	District Funding

Appendix L: Riverton

Description

The Riverton community has an estimated 2013 usual resident population of 1,506 with a projected 2018 usual resident population of 1,540. The estimated peak population for Riverton is 5,089 in 2013, projected to 5,524 in 2018. The scheme has 1,153 total equivalent connections (1,074 full, 12 three quarter, 140 half units).

History

The Riverton Wastewater Scheme was constructed between 1982 and 1984 under the governance of the Wallace County Council.

1998 - SCADA telemetry installed to all pump stations.

1997 - Land disposal treatment system installed adjacent Rocks oxidation pond.

2000 - Land use and discharge resource consents obtained for Rocks land disposal system.

2001 - Townside oxidation pond inlet modified to discharge above water level.

2002 - 50% (ten in total) of the submersible pumps renewed.

2004 - CCTV inspections carried out.

2005 - Renewal of PS5 Pump 1 (ABS AFP 1049 9 kW).

- Activity Management Plan produced.

2006 - Mono pump at Rocks WWTP overhauled.

- Townside WWTP upgrade (Contract 05/36) including refurbishment of the two existing settling basins, the installation of a pump station (2x ABS AFP 1041 3 kW), a 6-port sequencing valve (Mark Hely/Hugh Murray Special) and six rapid infiltration basins. The project received 50% funding from the MOH through SWSS.
- Condition assessment of remaining original pumps (Pumps and Electrical).
- Renewal of PS2 Pump 1 (ABS AFP 0832 4 kW), PS3 Pump 2 (ABS AFP 0832 4 kW), and PS7 Pumps 1 and 2 (both ABS AFP 1049 9 kW).

2008 - AC rising main across bridge renewed (C07-40).

- Sludge survey carried out by Conhur (msc/08/5/5604).
- New pumps installed at pump station 9.

2012 - Upgrade of SCADA and switchboards at 10 pump stations and Rocks treatment plant.

2014 - Resource consent for Rocks plant lodged with Environment Southland.

2016 - Consent granted for 25 years

2016 - Bay road sewer renewed following collapse

- Replacement of droppers to manholes scheme wide

Process description

The Riverton wastewater network consists of service connections, gravity mains, rising mains, manholes, and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

Riverton has two wastewater treatment plants due to topographical constraints. The eastern side of the township feeds the town side WWTP and the western side feeds the Rocks WWTP.

(a) Wastewater reticulation

The sewer gravity mains are primarily 150 mm uPVC but range up to 375 mm.

Manholes are located at each change in pipe gradient or alignment. They are mostly 1.3 to 2.9 metres deep conventional circular concrete structures with heavy duty cast iron lids and frames. Cleaning eyes have been installed as a low cost alternative to manholes at the end of lines, permitting rodding from above ground but not providing man entry and are mostly located at the end of short dead end streets. Approximately 7,483 m of the reticulation has been CCTV inspected.

(b) Pump stations

There are two main stations taking wastewater from minor stations as well as the reticulation.

Main pump stations

- The Bay Road pump station (PS5) receives wastewater from the central area of Riverton as well as PS4 and PS6. The two pumps lift wastewater into a rising main across the bridge and into the common rising main to the townside oxidation pond.
- The Evelyn Street pump station (PS9) receives wastewater from western Riverton as well as PS8 and PS9. The two pumps lift wastewater to the Rocks oxidation pond.

(c) Wastewater treatment

The town side oxidation pond is of standard construction including a concrete wave band in good condition. The pond has an area 1.4 ha. A small pump station is located at the far end of the pond pumping treated effluent to one of six rapid infiltration basins.
The sequence is controlled by SCADA. The existing settling basins have been retained in case any storage is required in the event of maintenance to the rapid infiltration basins.

The Rocks oxidation pond is of standard construction including a concrete wave band in average condition. A 30 m section was replaced with riprap as a trial in September 2003. The pond has an area 1.0 ha. Effluent is conveyed by a progressive cavity pump to the top of the wetland. Treated effluent migrates through a series infiltration contact ponds (20 ponds of approximately 2 ha in total) before discharging to the ocean.

(d) Discharge

Resource consent No. 202175 granted to discharge up to 530 m3/day of treated wastewater to land via rapid infiltration basins. Consent expires 9 August 2039.

Coastal permit No. 99083 granted to discharge up to 525 m3/day of treated wastewater to land and into Foveaux Straight. Consent expires 7 August 2015.

Condition and performance

The condition of the reticulation was last inspected under contract Delta Civil Dunedin. A total of 189 m was inspected with filming and grading carried out in accordance with the 1999 Pipe Inspection Manual.

The township was given an overall pipe grading 3.0 or Moderate (where 1.0 is Excellent and 5.0 is Fail).

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	3	B	2042
	Cleaning eyes	3	3	B	2042
	Service connections	3	3	C	Unknown
	Gravity mains	3	3	B	2042
	Rising mains	4	3	B	2042
Palmerston Street (PS1)	Wet well	2	2	B	2043
	Pump No. 1	2	2	B	2023
	Pump No. 2	2	2	B	2023
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Bath Street (PS2)	Wet well	2	2	B	2043
	Pump No. 1	2	2	B	2021
	Pump No. 2	1	1	A	2026
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Jetty Street (PS3)	Wet well	2	2	B	2043
	Pump No. 1	2	2	B	2023
	Pump No. 2	1	1	A	2026
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Orepuki Highway (PS4)	Wet well	2	2	B	2043
	Pump No. 1	2	2	B	2023
	Pump No. 2	2	2	B	2018
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Bay Road (PS5)	Wet well	2	2	B	2043
	Pump No. 1	1	1	B	2025
	Pump No. 2	2	2	B	2022
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Towack Street (PS6)	Wet well	2	2	B	2043
	Pump No. 1	2	2	B	2022
	Pump No. 2	2	2	B	2022

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Townside Treatment Plant	Oxidation Pond	3	4	B	2063
	Settling Basins	3	4	B	2063
	Wet well storage	1	1	B	2088
	Pump 1	1	1	B	2026
	Pump 2	1	1	B	2026
	Switchboard	1	1	B	2026
	Telemetry (now Kingfisher)	1	1	B	2026
	Sequencing Valve	4	5	B	2058
	RI Basins	3	4	B	2043
	Weeded ditch	3	4	B	2043
	Outfall	-	-	-	-
Taramea Bay (PS7)	Wet well	2	2	B	2043
	Pump No. 1	1	1	B	2026
	Pump No. 2	1	1	B	2026
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
120 Rocks (PS8)	Wet well	2	2	B	2043
	Pump No. 1	2	2	B	2022
	Pump No. 2	2	2	B	2022
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Evelyn Street (PS9)	Wet well	2	2	B	2043
	Pump No. 1	1	1	A	2029
	Pump No. 2	1	1	A	2029
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
216 Rocks (PS10)	Wet well	2	2	B	2043
	Pump No. 1	2	2	B	2022
	Pump No. 2	2	2	B	2021
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Rocks Treatment Plant	Oxidation Pond	3	4	B	2063
	Pump 1 (mono)	2	3	B	2025
	Infiltration Ponds	3	3	B	2063
	Wetland	3	3	B	2043
	Outfall	3	3	B	2043

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
	Switchboard	2	2	B	2025

Table K: Riverton condition and performance

Conhur survey and report highlighted areas where the sludge depths may cause problems in the future. At this stage sludge is not causing performance problems with either of the treatment plants.

Operation and maintenance

No significant issues.

Critical assets

Critical assets identified are:

The rising main from PS5 to the townside of oxidation pond.
The rising main from PS9 to the Rocks oxidation pond.

Key issues

Both ponds will require desludging.

The reticulation suffers from inflow and infiltration during wet weather. Reticulation renewals are programmed subject to the outcome of I/I investigations.

On the horizon is the discharge consent for the townside oxidation pond in 2039.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Riverton/Aparima

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Treatment Upgrade and Sewer Pumps	WW520	MS Project WW520 in 18/19	REN	18/19	31,728	District Funding
Treatment Upgrade and Sewer Pumps	WW520	MS Project WW520 in 18/19	REN	23/24	167,114	District Funding
Remove and dispose of sludge off-site	WW524	MS Project WW524 in 20/21	LoS	23/24	135,240	District Funding

Appendix M: Stewart Island

Description

The Oban community has an estimated 2013 usual resident population of 378 with a projected 2018 usual resident population of 434. The estimated peak population for Stewart Island is 1,095 in 2013, projected to 1,165 in 2018. The scheme has 483 total equivalent connections (425 full, 114 half, 6 quarter units).

History

The scheme was completed in 1997 with most consumers being connected by 1999.

2000 - Significant water infiltration was discovered at stormwater manhole near PS1. Subsequent sealing of manhole followed.

2003 - I/I property inspections carried out - no major issues.

2004 - Discharge consent granted for 20 years.

2005 - Construction commenced on scheme extension under the Sanitary Works Subsidy.

2005 - Extension commissioned in August (C04-54). The extension received 50% funding from the MOH through SWSS.

2005 - Major repairs carried out to PS1 and PS2.

2012 - Scheme extended to Thule Road

2013 - Pump station upgrades completed.

2016 - Soakage field extension undertaken (ongoing into 2018).

2016 - Additional aeration installed to cope with high tourist numbers from cruise ships.

Process description

The Stewart Island wastewater network consists of service connections, gravity mains, metres of rising mains, manholes, and cleaning eyes. An extension and upgrade of the scheme was completed in August 2005. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to one of the 20 pump stations flowing to one of two main stations. From the main stations wastewater is pumped to the treatment plant.

(a) Wastewater reticulation

The reticulation system is 100 mm and 150 mm uPVC rubber-ring jointed pipes.

The pipes have generally been laid in roadside verges wherever possible however in some situations pipes have been laid in private properties to provide outfall for neighbouring properties which otherwise could not be serviced.

Venting manholes, air relief valves, scour valves and water hammer control devices have been installed where necessary.

Coastal Permit No. 202649 granted to occupy an area of Butterfield Beach with sewer mains. Consent expires 2 November 2024.

(b) Pump stations

Eighteen minor pump stations collect wastewater from localised catchments and elevate it to gravity mains which flow to the two main stations in Elgin Terrace (PS1) and Hicks Bay (PS17). Wastewater is then pumped through a rising main to the oxidation pond.

All stations are monitored remotely by Council's SCADA system.

When pre-determined conditions (such as pump start failures) occur alarms are automatically activated through SCADA and if necessary resources can be immediately mobilised to investigate/correct the fault. Council maintains a 24 hour a day monitoring service and operations staff are available 24 hours a day.

(c) Wastewater treatment

The oxidation pond located on Back Road is of standard construction with a clay wave band in excellent condition and an area of 0.8 ha. Attached to oxidation pond are two maturation ponds with an area of 0.06 ha. Included at the pond site is a pump station containing two surface pumps that pump treated wastewater to the disposal field.

Effluent is pumped from the treatment works into a 24,750 litre fibreglass tank which discharges its contents by siphon into three fibreglass distribution tanks. The capacities of the distribution tanks have been sized at 4,950 litres, 9,000 litres and 11,250 litres to provide a uniform rate of effluent disposal onto land through the pipeline systems connected to each tank.

Each pipeline system comprises LDPE dispersal pipes surface laid to follow the contour of the ground and which are connected to the distribution tanks by uPVC supply pipes laid underground. Supply pipelines are sized in diameters of 50 mm, 65 mm, 200 mm and dispersal pipelines are sized in 40 mm and 50 mm diameters with holes drilled at appropriate centres.

(d) Discharge

Resource consent No. 202648 granted to discharge up to 300 m3/day of treated wastewater to land. Consent expires 2 November 2024.

Condition and performance

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	1	1	B	2078
	Cleaning eyes	1	1	B	2058
	Service connections	1	1	C	Unknown
	Gravity mains	1	1	B	2098
	Rising mains	1	1	B	2098
Elgin Terrace Pub(PS1)	Wet well	2	1	B	2057
	Pump No. 1	2	1	B	2017
	Pump No. 2	2	1	B	2017
	Switchboard	2	1	B	2022
	Telemetry	2	5	A	2012
	Odour Filter	3	3	B	Unknown

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Back Road (PS2)	Wet well	2	1	B	2057
	Pump No. 1	2	1	B	2030
	Pump No. 2	2	1	B	2030
	Switchboard	2	1	B	2022
	Telemetry	2	5	A	2020
Elgin Terrace South (PS3)	Wet well	2	1	B	2057
	Pump No. 1	2	1	B	2030
	Pump No. 2	2	1	B	2030
	Switchboard	2	1	B	2022
	Telemetry	2	5	A	2012
Thule (PS4)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Mill Creek (PS5)	Wet well	2	1	B	2057
	Pump No. 1	2	1	B	2030
	Pump No. 2	2	1	B	2030
	Switchboard	2	1	B	2022
	Telemetry	2	5	A	2012
Mill Court (PS6)	Wet well	2	1	B	2057
	Pump No. 1	2	1	B	2030
	Pump No. 2	2	1	B	2030
	Switchboard	2	1	B	2022
	Telemetry	2	5	A	2012
Golden Bay (PS7)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Leask Bay (PS8)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Elgin Terrace (PS9)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
	Telemetry	2	1	B	2020
Lee Bay Road (PS10)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Horseshoe 1 (PS11)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Horseshoe 2 (PS12)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Horseshoe Pt (PS13)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Butterfields (PS14)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Mapua (PS15)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Hicks Road (PS17)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Deep Bay (PS21)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Ringaringa (PS22)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Wohlers 1 (PS23)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Wohlers 2 (PS24)	Wet well	2	1	B	2065
	Pump No. 1	2	1	B	2045
	Pump No. 2	2	1	B	2045
	Switchboard	2	1	B	2030
	Telemetry	2	1	B	2020
Portable generator	Portable generator	3	3	B	Unknown
Treatment Plant	Oxidation Pond	2	2	B	2077
	Maturation Ponds	2	2	B	2077
	Pump 1	2	2	B	2017
	Pump No. 2	2	2	B	2017
	Switchboard	2	2	B	2012
	Telemetry	2	2	B	2012
Disposal Field	Receiving Tank	2	2	B	Unknown
	Distribution Tanks	2	2	B	Unknown
	Disposal Field	2	2	B	2022
	Outfall	2	2	B	Unknown

Table L: Stewart Island condition and performance

Operation and maintenance

Mains power is supplied by a Council controlled organisation called SIESA that operates and distributes the diesel generated electricity. The price of electricity is vulnerable to fluctuating fuel prices and accentuated by the added cost of barging to the Island.

There is an increasing frequency of communication breakdown between the SDC SCADA base station and the Island caused by a combination of increasing radio traffic and weak signal strength. This can cause increasing operations and maintenance costs as the operator has to check stations manually to ensure there are no problems with conveyance.

Critical assets

Critical assets identified are:

The rising main from PS1 to PS2.

The rising main from PS2 to the oxidation pond.

The rising main from PS17 to the oxidation pond.

To meet the projected future demand, it is estimated that the following projects will be required:

Additional aerators at the oxidation ponds.

Upgrade to the disposal field.

Additional storage capacity at pump stations or on-site generation.

Network upgrades spread over two years.

Key issues

The issues for Stewart Island are:

A refit of the Petersons Hill Repeater will be required.

Visitor numbers from cruise ships increasing short term demand of infrastructure.

There have been odour complaints in the past. Investigations are planned to identify and control emissions.

Investigations will be undertaken to upgrade disposal area.

Additional storage is required at key locations to reduce the likelihood of overflows.

On the horizon are switchboards at PS1, PS2, PS3, PS5, and PS6 meet the end of their design life in 2022.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Stewart Island/Rakiura

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Scheme Capacity Upgrade	plw150	Additional stand-by generation/storage at critical station	LoS	18/19	51,714	Rates
Pumps to stage 1 sewer pump stations	WW363	MS Project WW363 in 16/17	REN	18/19	57,541	District Funding
Consent Renewal Preparation	WW581	MS project WW581 in 22/23	REN	21/22	107,374	District Funding
Switchboards, cabinets and sewer pumps	WW1643	Additional project in 18-28 LTP	REN	26/27	1,001,782	District Funding

Disposal plan

There is currently no disposal plan in place for assets.

Appendix N: Te Anau

Description

The Te Anau community has an estimated 2013 usual resident population of 2,628 with a projected 2018 usual resident population of 2,938. The estimated peak population for Te Anau is 6,732 in 2013, projected to 7,472 in 2018. The scheme has 2,621 total equivalent connections (2,377 full, 6 three quarter, 479 half units).

Over the last seven years, significant subdivision development has occurred in Te Anau. Large numbers of residential lots have been created. Many of these properties have not been built on to date, hence creating a significant number of half connections that are currently included in the scheme's total equivalent connections.

History

Initially built in 1967 to service the commercial area of town, the reticulation was extended in 1975 to service the north western residential area and has continued to expand as further development occurs. Significant developments on the scheme since 2000 include:

2000 - Additional land purchased adjacent to oxidation ponds to give future options around land disposal.

2001 - Mokonui Street standby pump renewal. One pump replaced at each of Matai Street and Terrace Street pump stations.

2001 - New 475 mm diameter falling main in construction.

2003 - New pump station at Hawea Place (PS5) commissioned.

2004 - CCTV inspections carried out.

- New Pump 2 at PS1.
- New pump station at Aparima Drive (PS6) commissioned.
- Sewer main extension along Sandy Brown Road.
- Discharge Permit granted until 2014.
- Screen, aerators, and wetland installed at the treatment plant (C04-44).

2005 - New pump stations at Heritage (PS90) and Delta (PS91) subdivisions accepted by SDC.

- Work starts on the Te Anau Basin Wastewater Strategy.

2006 - The second pump station in the Delta subdivision, Lakeside (PS93), accepted by SDC.

2008 - 120 m of rising main renewed from PS1 in 300 mm uPVC (C07-25).

- PS1 pumps optimised to two instead of five with new switchboard and SCADA.
- Public meetings held to discuss Te Anau Basin Wastewater Strategy.
- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).
- Waiuna pump station (PS92), accepted by SDC.

2011 - Replacement of SCADA/switchboards at a number of pump stations on the scheme.

2012 - Replacement generator at Mokonui Street PS

2013 - Resource consent application submitted to Environment Southland.

2014 - Short term consent submitted for continued discharge to Upukerora.

2015 - Long term consent granted for irrigation at Kepler Block

2015 - Inlet screen installed and ponds desludged

2016 - Peer review identifies no significant flaws with consented option

2016 - Grinder installed at Mokonui PS

2017 - Additional aeration to be installed.

Process description

The Te Anau wastewater network consists of service connections, gravity mains, rising mains, manholes, and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to minor pump stations delivering to one of three main stations.

(a) Wastewater reticulation

The reticulation mains, which all operate under gravity, range in size from 50 mm to 525 mm in diameter and are generally at a flat grade. The majority of pipelines are uPVC and asbestos cement. Approximately 8,786 m of the reticulation has been CCTV inspected.

Manholes are located at each change in pipe gradient or alignment. They are mostly 1.3 metres to 3.5 metres deep conventional circular concrete structures with heavy duty cast iron lids and frames. Cleaning eyes have been installed as a low cost alternative to manholes at the end of lines, permitting rodding from above ground but not providing man entry. There are 50 cleaning eyes, mostly located at the end of short dead end streets.

The Mokonui Street rising main is a 300 mm diameter uPVC PN12, which is connected to a 475 mm diameter falling main approximately 900 m from treatment plant. The rising main was renewed in two stages: the first coincided with resealing work in the Town Centre in 2003, the final section in Mokonui Street was completed in 2007.

(b) Pump stations

Five minor pump stations collect wastewater from localised catchments and elevate it to gravity mains which flow to the main station in Mokonui Street (PS1). Matai Street (PS4) and Aparima Drive (PS6) receive wastewater from other stations. Wastewater is pumped through a common rising main to the treatment plant in the north east of the township.

(c) Wastewater treatment

The treatment plant consists of a series of oxidation ponds and discharging through a wetland into the Upukerora River.

There are three oxidation ponds. The two smaller ponds (1.4 ha in total) were built in 1966 as part of the initial wastewater scheme. The larger pond (3.3 ha) was built in 1984 to cater for increased demand. The ponds operate in series with the large pond initially receiving all wastewater through a bar screen and then flowing through the two smaller ponds to the wetland. The ponds are fenced off and well maintained.

With the commissioning of the falling main into the south west corner of the pond there is a possibility of effluent short circuiting across the south end of the large pond.

Aerators have been installed in the large pond in conjunction with a wetland to increase performance. The wetland discharges through a piped outlet extending from the wetlands under the access track to the Upukerora River.

Air Discharge Permit No. 202637 granted to discharge contaminants (odour) into the air from the Te Anau WWTP. Consent expires 8 October 2014.

(d) Discharge

Resource Consent No. 202636 granted to discharge an average dry weather flow of up to 2,500 m3/day to land and the Upukerora River. Consent expired 8 October 2014 with a new consent (AUTH-20157778-01) expiring in November 2020.

The current location of the wastewater treatment plant is not consider sustainable in that the site adjacent to the Upukerora River without further protection work to prevent risk of future flowing.

From 2006 a working party investigated a number of options for treatment and disposal before developing the current preferred option of improved treatment at the current site prior to disposal to land around Kepler Farm by centre pivot irrigators. The proposal involves the following elements:

(a) Pond upgrade to include inlet screen, additional aeration and sludge survey/desludging
(b) 19 km pipeline no greater than 300 m diameter to be lain in road reserve
(c) Development of land at Kepler farm north of airport runway to allow for irrigation of the treated wastewater by centre pivot.

Consent for this proposal was granted in January 2015 and subsequently appealed to the Environment Court, with all appeals settled in December 2017.

Work is currently under way on detailed design of the pipeline to Kepler while an option of irrigation by sub surface driplines is being evaluated against the consented centre pivot option.

Condition and performance

The condition of the reticulation was last inspected under contract in 2004 by Delta Civil Dunedin. A total of 1,225 m was inspected with filming and grading carried out in accordance with the 1999 Pipe inspection manual.

The township was given an overall pipe grading 3.0 or Moderate (where 1.0 is Excellent and 5.0 is Fail) with no areas of significant concern identified.

A total of 69% of the township has been inspected however grades are not assigned to the asset (held against group project work order) in IPS making analysis difficult.

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	3	B	2026
	Cleaning eyes	3	3	B	2026
	Service connections	3	3	C	Unknown
	Gravity mains	3	3	B	2026
	Rising mains	3	3	B	2026

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Mokonui Street (PS1)	Wet well	3	3	B	2046
	Pump 1	1	1	A	2029
	Pump 2	1	1	A	2029
	Standby Generator	1	1	B	2060
	Switchboard	2	1	A	2035
	Telemetry		1		2035
Dusky Street (PS2)	Wet well	3	3	B	2025
	Pump No. 1	3	3	B	2022
	Pump No. 2	3	3	B	2022
	Standby generator	3	3	B	2025
	Switchboard	3	3	B	2020
	Telemetry	1	1	A	2020
The Terrace (PS3)	Wet well	3	3	B	2025
	Pump No. 1	3	3	B	2022
	Pump No. 2	3	3	B	2022
	Standby generator	3	3	B	2015
	Switchboard	3	3	B	2020
	Telemetry	1	1	A	2020
Matai Street (PS4)	Wet well	3	3	B	2025)
	Pump No. 1	3	3	B	2022
	Pump No. 2	3	3	B	2022
	Standby generator	3	3	B	2025
	Switchboard	1	1	A	2010
	Telemetry	1	1	B	2020
Hawea Place (PS5)	Wet well	3	3	B	2063)
	Pump No. 1	3	3	B	2023
	Pump No. 2	3	3	B	2023
	Switchboard	1	1	B	2028
	Telemetry	1	1	B	2020
Aparima Drive (PS6)	Wet well	3	3	B	2064
	Pump No. 1	3	3	B	2024
	Pump No. 2	3	3	B	2024
	Switchboard	1	1	B	2029
	Telemetry	1	1	A	2020
The Heritage (PS90)	Wet well	1	1	B	2065
	Pump No. 1	1	1	B	2045
	Pump No. 2	1	1	B	2045
	Standby generator	1	1	B	2045
	Switchboard	1	1	B	2030

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
	Telemetry	1	1	A	2020
The Delta (PS91)	Wet well	1	1	B	2065
	Pump No. 1	1	1	B	2045
	Pump No. 2	1	1	B	2045
	Switchboard	1	1	B	2029
	Telemetry	1	1	A	2020
Lakesides (PS93)	Wet well	1	1	B	2089
	Pump No. 1	1	1	B	2029
	Pump No. 2	1	1	B	2029
	Switchboard	1	1	B	2039
	Telemetry	1	1	A	2029
Waiuna (PS92)	Wet well	1	1	B	2089
	Pump No. 1	1	1	B	2029
	Pump No. 2	1	1	B	2029
	Switchboard	1	1	B	2039
	Telemetry	1	1	A	2029
Portable generator	Portable generator	3	3	B	2030
Treatment Plant	Screen	2	3	B	Unknown
	Oxidation Pond	2	3	B	2045
	Aerators	2	3	B	2040
	Wetland	2	3	B	Unknown
	Outfall	2	3	B	2043
	Switchboard	2	3	B	2008
	Telemetry	2	1	A	2025

Table M: Te Anau Condition and Performance

Operation and maintenance

Increasing problems with blockages in the reticulation caused by roots and debris, especially in the area of Matai Street.

Planned capital costs over the next 10 years are included in the following table:

Critical assets

Critical assets identified are:

Pumps at PS1 and PS6.

The rising main from PS1 to the oxidation pond.

The rising main from PS6 to the oxidation pond.

Key issues

The issues for Te Anau are:

In order to comply with resource consent conditions major work is required to upgrade the treatment and disposal (T and D) system.

Reticulation renewals are required due to poor condition in Matai Street and Cleddau Street.

The switchboards in PS1, PS2, PS3, and PS4 have met the end of design life (including Kingfisher/Citect upgrade), PS5 and PS6 need the Kingfisher/Citect upgrade. .

The generators are due for reconditioning and assessment.

The majority of the reticulation will begin to meet the end of the design life in 2026 but given the incremental nature that the town developed renewal will be phased over a 20 plus year period.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Te Anau

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Scheme Capacity Upgrade Demand Portion	WW596	MS Project WW596 in 17/18 will be partially funded by development contributions, remainder from district funding	DEM	18/19	1,887,801	Dev Cont and Loan
Scheme Capacity Upgrade	WW603	MS Project WW603 in 18/19	LoS	18/19	3,009,219	District Funding
Oxidation Pond	WW634	MS Project WW634 in 15/16	REN	18/19	247,902	District Funding
Compactor for screen	WW1548	introduced in LTP 18-28	LoS	18/19	65,000	District Funding
Scheme Capacity Upgrade Demand Portion	WW596	MS Project WW596 in 17/18 will be partially funded by development contributions, remainder from district funding	DEM	19/20	3,676,493	Dev Cont and Loan
Scheme Capacity Upgrade	WW603	MS Project WW603 in 18/19	LoS	19/20	5,860,453	District Funding
Caswell Road Upgrade	WW614	MS Project WW604 in 18/19	LoS	21/22	214,748	District Funding
Remove and dispose of sludge off-site	WW623	MS Project WW623 in 21/22	O&M	21/22	193,273	District Funding
Switchboards and pumps	WW1652	Added in 18-28 LTP	REN	25/26	376,163	District Funding

Appendix O: Tokanui

Description

The Tokanui community has an estimated 2013 usual resident population of 150 with a projected 2018 usual resident population of 147. The scheme has 67 total equivalent connections (63 full, 1 three quarter, 6 half units).

History

The scheme was built in 1972 under the initiative of the Southland Education Board in conjunction with the construction of a new school. The scheme was jointly funded between the Southland County Council and Southland Education Board.

1993 - 10-year discharge permit obtained.

1995 - SCADA telemetry and controller installed.

2000 - Infiltration inflow survey was undertaken.

2003 - Two new pumps purchased.

- New 10-year discharge permit granted.

2005 - Aerial mounted onto power pole due to frequent comms failure with the SCADA.

- Activity Management Plan produced.

2006 - Wave band repairs to oxidation pond.

2008 - Both control floats replaced in well.

2010 - SCADA upgrade.

2017 - Rising main replacement proposed following failure of pipe bridge due to riverbank erosion

2017 - Discharge consent application initiated

Process description

The Tokanui wastewater network consists of service connections, gravity mains, rising mains, manholes, and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to pump station 1 (PS1) where the wastewater enters the treatment process.

(a) Wastewater reticulation

All of the reticulation mains and laterals are 100 mm diameter uPVC. All manholes are round pre-cast pipes with cast in-situ bases. Manhole inverts are haunched. At least one manhole invert is significantly eroded. Most manholes are shallow and do not have ladders/rungs. No CCTV inspection has been carried out.

(b) Pump stations

A single pump station is the termination point for all of the town's gravity reticulation. The pump station transfers the wastewater to the oxidation ponds. The pump station consists of two pumps in an underground wet well. No emergency well storage is provided outside the pump operating levels. The pump station is connected to Council's SCADA network which monitors a high level alarm and pump operation.

(c) **Wastewater treatment**

Treatment is provided by a series of two oxidation ponds. Pond levels are commonly 100-200 mm below the outlet levels. It is very seldom that treated effluent from the oxidation ponds is to discharge directly to the Tokanui Stream.

The net water balance resulting in consistent pond levels being below outlet level is a combination of low inflow volumes, possible/likely gradual pond base/wall exfiltration and surface evaporation in warm weather.

(d) **Discharge**

Resource Consent No. 201599 granted to discharge up to 55 m3/day of treated wastewater to land and the Tokanui Stream. Consent expires 8 September 2018.

Asset condition and performance

Condition and performance

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	2	2	B	2031
	Cleaning eyes	2	2	B	2031
	Service connections	2	2	C	2031
	Gravity main	2	2	B	2071
	Rising main	2	2	B	2071
Pump station	Wet well	2	2	B	2030
	Pump No. 1	2	2	B	2023
	Pump No. 2	2	2	B	2023
	Switchboard	1	1	A	2035
	Telemetry	1	1	A	2035
Treatment Plant	1 Oxidation Pond	4	4	B	2050
	2 Oxidation Pond	4	4	B	2050
	Outfall	4	4	B	2030

Table N: Tokanui Condition and Performance

Operation and maintenance

No significant issues.

Critical assets

Critical assets identified are:

The rising main from PS1 to the oxidation pond which will be replaced following failure of pipe bridge due to river bank erosion..

Key issues

The switchboard meets the end of design life in 2010 (including Kingfisher/Citect upgrade).

Aging reticulation.

Treatment and disposal upgrades may be required.

The surrounding land does not appear to be suitable for land disposal. A condition of consent was to investigate options for land disposal. A disposal options review is programmed.

The discharge consent expires in 2018.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Tokanui

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Embankment work to ponds	WW1541	Additional project in 18-28 LTP	REN	18/19	70,000	District Funding
Disposal to Land Investigation	WW1542	Project added in 18-28 LTP	LoS	18/19	50,000	District Funding

Asset Management

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Inflow project to comply with Consent limits	WW1530	In Browns; Tokanui; Nightcaps; Winton; Riversdale	LoS	18/19	150,000	District Funding

Appendix P: Tuatapere

Description

The Tuatapere community has an estimated 2013 usual resident population of 561 with a projected 2018 usual resident population of 557. There is accommodation in the township for up to 209 visitors.
The scheme has 364 total equivalent connections (357 full, 14 half, 1 quarter units).

History

A sanitation survey was commissioned in 2003 and concluded there to be a risk to public health should the township continue with on-site disposal of wastewater. A provisional application was made to the MOH to assist with a Sanitary Works Subsidy for a reticulated wastewater treatment system.

In response to negative community feedback an independent Drainage Management Team was set up in 2005 with representatives from residents, the Community Board and Council, to monitor the inspections and consider the findings. The inspections indicated that a high proportion of properties had problems with effluent disposal.

Following community and government approval of the design and costs the construction began.
The scheme was officially commissioned on 29 April 2008.

2008 - New wastewater scheme constructed (C06-36). The scheme received 50% funding from the MOH through SWSS based on the 2003 budget estimate.

Process description

The Tuatapere wastewater network consists of service connections, gravity mains, rising mains, manholes, inspection chambers and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to one of three pump stations before being pumped to the treatment plant.

(a) Reticulation

The sewer mains are 150 mm and 225 mm uPVC rubber-ring jointed pipes. The pipes have generally been laid in roadside verges wherever possible however in some situation pipes have been laid in private properties to provide outfall for neighbouring properties which otherwise could not be serviced and reduce the number of pump stations.

(b) Pump stations

Two minor pump stations collect wastewater from localised catchments and pump in series to the main station on Half Mile Road (PS134). All stations are monitored remotely by Council's SCADA system. When pre-set conditions (such as pump start failures) occur alarms are automatically activated through SCADA and if necessary resources can be immediately mobilised to investigate/correct the fault. Council maintains a 24 hour a day monitoring service and operations staff are available 24 hours a day.

(c) Wastewater treatment

The Tuatapere WWTP consists of a PVC lined oxidation pond and maturation pond discharging to wetlands which then discharge to an upper and lower weeded drain (separated via a rock passage) into the Waiau River. Effluent passes through a mechanical screen before entering the oxidation pond.

(d) Discharge

Resource Consent No. 204086 granted to discharge a dry weather flow of 243 m3/day of treated wastewater into the Waiau River. Consent expires 20 November 2031.

Condition and performance

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	1	1	A	2088
	Cleaning eyes	1	1	A	2068
	Service connections	1	1	A	2108
	Gravity mains	1	1	A	2108
	Rising mains	1	1	A	2088
					2108
Orepuki Highway (PS132)	Wet well storage	1	1	A	2088
	Pump 1	1	1	A	2028
	Pump 2	1	1	A	2028
	Flow Meter	1	1	A	2028
	Switchboard	1	1	A	2038
	Telemetry	1	1	A	2035
Bridge Street (PS133)	Wet well storage	1	1	A	2088
	Pump 1	1	1	A	2028
	Pump 2	1	1	A	2028
	Flow Meter	1	1	A	2020
	Switchboard	1	1	A	2038
	Telemetry	1	1	A	2035
Orepuki Highway (PS134)	Wet well storage	1	1	A	2088
	Pump 1	1	1	A	2028
	Pump 2	1	1	A	2028
	Flow Meter	1	1	A	2020
	Switchboard	1	1	A	2038
	Telemetry	1	1	A	2028
Treatment Plant (PS131)	Screen	1	1	A	2058
	Oxidation Pond	1	1	A	2058
	Maturation Pond	1	1	A	2058
	Wetlands	1	1	A	2058
	Weeded Drains and Rock Passage	1	1	A	2058
	Flow Meter	1	1	A	2028

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
	Switchboard	2	2	A	2035
	Telemetry	2	5	A	3035

Table O: Tuatapere Condition and Performance

Operation and maintenance

As this is a newly commissioned scheme there are currently no known operation and maintenance trends. During construction some areas were very wet and could lead to higher than expected repair costs in the future due to ground condition.

Critical assets

Critical assets identified are:

Rising main to treatment works.

Key issues

None identified.

Capital Expenditure Plan

The issues discussed above have been addressed with the following projects:

Tuatapere

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Plant and Equipment	WW1665	Additional project in 18-28 LTP	REN	24/25	55,342	District Funding
Consent Renewal Preparation	WW706	MS Project WW706 in 24/25	REN	27/28	125,251	District Funding

Appendix Q: Wallacetown

Description

The Wallacetown community has an estimated 2013 usual resident population of 681 with a projected 2018 usual resident population of 680. The scheme has 281 total equivalent connections (265 full, 31 half units).

History

A scoping study was carried out in 2000/2001 in conjunction with Alliance Freezing Works to ascertain options available to the township.

In 2003 central government announced that a subsidy would be available for sanitary wastewater projects through the MOH. The subsidy is dependent upon funds being provided toward the project by Council.

Support for the project lead to a period of community consultation in 2003/2004. A decision to proceed along with securing funds from the subsidy, lead to design in 2004/2005 and construction planned in 2005/2006. The project is currently subject to the outcome of an Environment Court proceeding due to an appeal against the resource consent hearing decision.

Following community and government approval of the design and costs the construction began.
The scheme was officially commissioned on 19 April 2007.

2007 - New wastewater scheme constructed (C05-31). The scheme received 50% funding from the MOH through SWSS.

Process description

The Wallacetown wastewater network consists of service connections, gravity mains, a rising main, manholes and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages within the service connection caused by material from the connected property are considered to be the property owner's responsibility.

Inflow from the reticulation gravitates to pump station 1 (PS135) where the wastewater is pumped under the Makarewa River to the Alliance Lorneville WWTP.

(a) Reticulation

The sewer mains are 150 mm uPVC rubber-ring jointed pipes. The pipes have generally been laid in roadside verges wherever possible however in some situation pipes have been laid in private properties to provide outfall for neighbouring properties which otherwise could not be serviced.

The rising main from PS135 is 140 mm OD PE to the banks of the Makarewa River. Here the rising main was sleeved inside a 160 mm OD PE PN8 and pulled under the river approximately 5 metres below the bed. Rationale for sleeving the pipe was to act both as a contingency measure against any burst under the river (burst under
Aparima River in Otautau at time of design/construction) and also in case any future capacity is required.

(b) Pump stations

There is only one pump station collecting all wastewater: Wallacetown (PS135).
The station is monitored remotely by Council's SCADA system. When pre-set conditions (such as pump start failures) occur alarms are automatically activated through SCADA and if necessary

resources can be immediately mobilised to investigate/correct the fault. Council maintains a 24 hour a day monitoring service and operations staff are available 24 hours a day.

(c) Wastewater treatment

Wallacetown has no dedicated treatment plant but pumps into the Alliance Group Limited's Lorneville Meat Processing Plant. An annual service charge is paid to Alliance. The Alliance discharge consents expire in 2015. Consultation has begun to identify issues associated with renewal of these consents. Currently it is assumed that there will be no impact on the Wallacetown scheme through the consenting process.

(d) Discharge

The discharge conditions are met by the Alliance Group.

Condition and performance

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	1	1	A	2067
	Cleaning eyes	1	1	A	2067
	Service connections	1	1	A	2107
	Gravity mains	1	1	A	2107
	Rising mains	1	2	A	2087
Pump station	Wet well storage	1	1	A	2087
	Pump 1	1	1	A	2027
	Pump 2	1	1	A	2027
	Flow Meter	1	1	A	2047
	Switchboard	1	1	A	2037
	Telemetry	1	1	A	2027
Treatment Plant	Pumps to Alliance Group	N/A	N/A	N/A	N/A

Table P: Wallacetown Condition and Performance

Operation and maintenance

The Alliance's discharge permit expires in 2011. It is likely that if the costs of holding the resource consent increase that some of these costs will be passed on to the Wallacetown scheme.

Critical assets

Critical assets identified are:

Rising main to Alliance Group's treatment works from PS135.

Key issues

Alliance discharge consent granted 2017 requiring upgrade of their treatment plant within 15 years. Under the agreement with Alliance Wallacetown is required to make a contribution based on their overall loading. This is anticipated to be around $100K.

Capital Expenditure Plan

The issues discussed above have been addressed with the following projects:

Wallacetown

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Sewer Pumps	WW1521	Additional project in 18-28 LTP	REN	27/28	24,763	District Funding
Sewer Consent Contribution to Alliance	WW1525	Project added in 18-28 LTP	LoS	27/28	125,251	District Funding

Appendix R: Winton

Description

The Winton community has an estimated 2013 usually resident population of 2,436 with a projected 2018 usually resident population of 2,430. The scheme has 1,233 total equivalent connections (1,186 full, 13 three quarter, 74 half units).

The scheme is governed by the Winton Community Board under the guidance of technical staff at the SDC.

History

The sewer reticulation system was constructed in 1962 shortly after Winton's water supply was built. Previously the townships wastewater had discharged into a combined stormwater system. Key milestones since 2000 include:

2002 - Winton Community Board endorses wetland treatment as the preferred treatment improvement option.

2003 - Council take over ownership of PS4 from the Power Company.

- Discharge permit granted until 2023.

2004 - CCTV inspections carried out.

2005 - Construction commenced on wetlands.

- Activity Management Plan produced.

2006 - An extension of Springfield Street to the new commercial subdivision was constructed in association with Winton Water Supply AC Renewals Project (C06-15).

2007 - New rising main with flow meter constructed from PS1 to WWTP in association with Winton Water Supply AC Renewals Project (C06-15).

- New pump station from Welsh Road (PS135) subdivision accepted by SDC.

2008 - Sludge survey carried out by Conhur (msc/08/5/5604).

- Screen at PS1 replaced.

2015 - New inlet screen installed and pond desludged

2016 - Additional aeration installed.

Process description

The Winton wastewater network consists of service connections, gravity mains, rising mains, manholes and cleaning eyes. Council owns and maintains the service connections from the trunk main to the boundary of each property. Blockages caused by material from the connected property within the service connection are considered to be the property owner's responsibility.

Wastewater flows under gravity to three minor pump stations. After passing through bar screens at the main pump station wet well, wastewater is pumped to the oxidation pond, which is located to the south of Winton. From the oxidation pond treated effluent flows along a weeded outlet ditch to the Winton Stream.

(a) Wastewater reticulation

The reticulation mains, which all operate under gravity, range in size from 150 mm in diameter up to 400 mm in diameter and are generally very flat. Sewer mains are constructed primarily of asbestos cement. All of Winton is served by gravity wastewater reticulation except five properties at the east end of De Joux Road, which discharge to private septic tanks. There are several privately pumped connections at the west end of Welsh Road. Approximately 5,696 m of the reticulation has been CCTV inspected, which have not identified any areas of significant concern.

Manholes are located at each change in pipe gradient or alignment. They are mostly 1.3 to 2.9 metres deep conventional circular concrete structures with heavy duty cast iron lids and frames. Cleaning eyes were installed as a low cost alternative to manholes at the end of lines, permitting rodding from above ground but not providing man entry.

The PS1 rising main is a 250 mm diameter mPVC PN9 pipe, which transfers wastewater under pressure from the main pump station to the oxidation pond 938 metres south of Dejoux Road. PS2 and PS both have 100 mm diameter asbestos cement rising mains. PS4 has 50 m length of 50 mm PVC which then connects to the disused 50 mm diameter rising main in Gerrard Road. PS135 discharges though 183 m of 50 mm MDPE.

(b) Pump stations

Three minor pump stations collect wastewater from localised catchments and elevate it to gravity mains which flow to the main station in Dejoux Road (PS1). Wastewater from the whole reticulation network is received at the PS1 and is pumped through a rising main to the treatment plant.

All stations are monitored remotely by Council's SCADA system. When pre-set conditions (such as pump start failures) occur alarms are automatically activated through SCADA and if necessary resources can be immediately mobilised to investigate/correct the fault. Council maintains a 24-hour a day monitoring service and operations staff are available 24 hours a day.

(c) Wastewater treatment

The Winton treatment plant consists of an oxidation pond with two aerators and a wetland into the Winton Stream. There is an emergency overflow via a weeded ditch to the Winton Stream.

The oxidation pond is thought to be lined with local low permeability clays. Wave bands in the banks at the effluent surface level are intended to inhibit wave erosion.

These wave bands consist of individual concrete slabs and need repairs. In 1993 two 3 kW floating aerators were installed on the pond. There is provision to install a further two aerators. From the oxidation pond treated effluent discharges into an open shallow ditch, which has a gradual fall over 100 metres to an outlet at the Winton Stream.

A 13.4 ha wetland was constructed in 2006 to improve the quality of the discharge.

The wetland is divided into six operating cells. Treatment plant performance is poor with investigations ongoing to determine how this can be improved. Currently planning is underway to install a 3 mm fine screen, desludge the ponds and install additional aeration, at which point performance will be re-assessed and further improvements undertaken if necessary (trickling filter). However if this results in the desired level of improvement the trickling filter will be deferred until the consent is due for renewal (at the earliest).

(d) Discharge

Resource Consent No. 202026 granted to discharge an average flow of 750 m3/day of treated wastewater into the Winton Stream. Consent expires 8 December 2023.

Condition and performance

The condition of the reticulation was last inspected under contract in 2004 by Delta Civil Dunedin. A total of 1,759 m was inspected with filming and grading carried out in accordance with the 1999 Pipe Inspection Manual.

The township was given an overall pipe grading 3.0 or Moderate (where 1.0 is Excellent and 5.0 is Fail).

A total of 38% of the township has been inspected however grades are not assigned to the asset (held against group project work order) in IPS making analysis difficult.

The current condition and performance grading of the wastewater system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Reticulation	Manholes	3	3	B	2021
	Cleaning eyes	3	3	B	2021
	Service connections	3	3	C	Unconfirmed
	Gravity mains	3	3	B	2021
	Rising mains	5	5	A	2021
De Joux Road (PS1)	Dry well	2	3	B	2041
	Wet well	2	3	B	2021
	Pump No. 1	2	3	B	2020
	Pump No. 2	2	3	B	2025
	Pump No. 3	2	3	B	2025
	Magflo Meter	1	1	A	2027
	Switchboard	1	1	B	2025
	Telemetry	1	1	A	2025
Gerrard Road (PS2)	Wet well	2	3	B	2036
	Pump No. 1	2	3	B	2021
	Switchboard	1	1	B	2025
	Telemetry	1	1	A	2025
Moore Road (PS3)	Wet well	2	3	B	2023
	Pump No. 1	2	3	B	2005
	Switchboard	1	1	B	2025
	Telemetry	1	1	A	2025
Substation Road (PS4)	Wet well	2	3	B	2021
	Pump No. 1	2	3	B	2023
	Switchboard	1	1	B	2025
	Telemetry	1	1	A	2025
Welsh Road (PS135)	Wet well	1	1	A	2087
	Pump No. 1	1	1	A	2027
	Pump No. 2	1	1	A	2027
	Switchboard	1	1	A	2037
	Telemetry	1	1	A	2027

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End Of Life IPS
Treatment Plant	Oxidation Pond	3	4	B	2028
	Aerators x2	3	3	B	2010
	Wetland	3	4	B	2056
	Weeded Ditch/Outfall	3	3	B	2005
	Switchboard	3	3	B	Unconfirmed

Table Q: Winton condition and performance

Operation and maintenance

Sludge build up in ponds is starting to cause problems with pond operation decreasing pond capacity especially during times of wet weather. A number of discharge samples are failing to meet required consent conditions. This is further exacerbated by insufficient dilution in receiving waters during low flows. Winton also suffers from high inflow and infiltration.

Moore Road pump station well lid (manhole) causing operational issues as the pumps cannot be adequately lifted: Manhole lid.

Critical assets

Critical assets identified are:

The rising main from PS1 to the oxidation pond.

Key issues

Develop a strategy to cater for future upgrade and demand without compromising the existing infrastructure.

On the horizon is the renewal of the ageing asbestos cement reticulation. At present the reticulation meets the end of the design life in 2021 however will be subject to condition assessment to allow more accurate prioritisation of replacements.

Capital Expenditure Plan

The issues discussed above have been addressed with the following projects:

Winton

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WW786	MS Project WW786 in 21/22	REN	18/19	100,000	District Funding
Compactor for screen	WW1549	Additional project 18-28 LTP	LoS	18/19	65,000	District Funding
Stormwater infiltration project	WW781	MS Project WW781 in 20/21	LoS	21/22	85,899	District Funding
Treatment Upgrade	WW771	added 4-11-14 as project 29491D will not be started in 13/14 so will be part of 15/16 LTP work to be completed in 24/25	LoS	23/24	2,253,997	District Funding
Treatment Upgrade	WW771	added 4-11-14 as project 29491D will not be started in 13/14 so will be part of 15/16 LTP work to be completed in 24/25	LoS	24/25	2,428,231	District Funding

Switchboards and aerators	WW1670	Additional project in 18-28 LTP	REN	25/26	465,271	District Funding

Asset Management

Sewerage

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Inflow project to comply with Consent limits	WW1530	In Browns; Tokanui; Nightcaps; Winton; Riversdale	LoS	18/19	150,000	District Funding

SOUTHLAND
DISTRICT COUNCIL

Stormwater Activity Management Plan

2021-2031

Southland District Council
Te Rohe Pōtae o Murihiku

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Table of Contents

Quality assurance statement				
Draft AMP template				
Southland District Council	Version:		Record No:	
15 Forth Street	Status:			
Invercargill 9840	Project Manager:			
Telephone	Prepared By:			
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Fax	Approved for issue:			
0800 732 329				

Executive summary

The services provided

The stormwater activity in Southland District (SDC) is focused on the achievement of the following objective:

"To provide a reliable stormwater system with adequate capacity, to protect people and property from flooding and minimises the impact of any discharges on the environment?

There are 25 towns in the District that with varying levels of reticulation with Council owned and maintained infrastructure. These public stormwater systems are intended to carry out three main functions:

- protection of property, public safety and access
- protection of public health
- creation of productive land.

Based on current information the schemes have a current replacement cost valuation in excess of $35M.

While Council is the legal entity for the ownership of the asset, the day-to-day operations are delegated to nine community boards as separate governance groups.

The scope and extent of assets varies significantly throughout the District with larger townships such as Winton and Te Anau having areas of large reticulated catchments to smaller townships where open ditches and drains and soakholes are the only means of controlling stormwater.

Council owned and provided facilities are Balfour, Browns, Colac Bay, Dipton, Edendale, Limehills, Lumsden, Manapouri, Monowai, Mossburn, Nightcaps/Wairio, Ohai, Otautau, Riversdale, Riverton, Stewart Island, Te Anau, Thornbury, Tokanui, Tuatapere, Waikaia, Wallacetown, Winton, Woodlands and Wyndham.

Stormwater networks protect buildings, roads and structures from rainfall run off and ponding. Effective management of these systems is critical to limiting erosion and property damage, as well as ensuring public amenity of open spaces and protection of the environment

A key change to this activity for 2021-2031 (form 01 July 2021) is the move to fund the activity on a district wide basis in a similar manner to district funded wastewater and community water supplies and as set out in Councils 2021 Revenue and Financing Policy. Historically the activity has been locally funded which has resulted in a number of communities struggling with costs such as maintenance and renewals. And as a result continued deferral of some works has resulted in a significant backlog of this type of work.

What we aim to achieve

Council's levels of service (LOS), performance measures and targets are illustrated in Table 1. Over the next 30 years, Council's intention for this activity is generally to maintain the current performance in relation to flooding complaints and improve performance in the following areas:

- the delivery of projects
- response to customer requests (improving performance in this area is mainly attributable to a more timely closing out of service requests in the customer service system)
- compliance with resource consent conditions as required by Environmental Southland's (ES) Discharge Plan. Currently the cost of meeting this compliance is not fully understood as further monitoring is required to understand which areas require further investment.

STORMWATER: The level of service (LoS) we provide	LoS 7: Provide a reliable stormwater system that protects public health and the environment				
How we measure performance	Current performance (19/20)	Future performance targets			
		Yr 1 (21/22)	Yr 2 (22/23)	Yr 3 (23/24)	Yr 4-10 (25-31)
KPI 7.1: **System adequacy** - Overflows resulting from the stormwater system that result in the flooding of a habitable floor[1] a) The number of "flooding events" that occur within the district. b) For each flooding event, the number of habitable floors affected (expressed per 1000 properties connected to the council stormwater system).	a) 0 b) 0	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1
KPI 7.2: **Response to stormwater issues** - The median response time between the time of notification and the time when service personnel reach the site when "habitable floors" are affected by flooding resulting from faults in the stormwater system.	There were no flooding events to habitable floors in the year	≤ 2 hours	≤ 2 hours	≤ 2 hours	≤ 2 hours
KPI 7.3: **Customer satisfaction** – The number of complaints received about the performance of the stormwater system, expressed per 1000 properties connected to the Council's stormwater system.	9 per 1000 properties	≤ 15 per 1000 properties	≤ 15 per 1000 properties	≤ 15 per 1000 properties	≤ 15 per 1000 properties
KPI 7.4: **Management of environmental impacts -** Compliance with the resource consents for discharge from the stormwater system, measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders (d) successful prosecutions, received in relation to those resource consents.	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0
KPI 7.5: Percentage of monitoring results that show compliance with resource consent conditions.	Not measured (awaiting Environment Southland consent requirements)	100%	100%	100%	100%
1 – Habitable floor refers to a floor of a building (including a basement) but does not include ancillary structures such as stand-alone garden sheds or garages. A flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor.					

Table 1: Stormwater Performance Management Framework

Managing future demand

Continued steady growth in townships such as Te Anau is projected and future upsizing of assets in these communities may be required if these growth projections eventuate, although none is anticipated in the Long Term Plan and Infrastructure Strategy. Demand for stormwater services in other areas is not expected to change significantly over the plan period. Developer driven demand will be funded privately prior to any assets potentially being vested into Council

Some work will be undertaken to understand the impact of climate change driven demand on the activity.

Lifecycle asset management

To achieve Council's intentions, the general asset management strategy is to:

- maintain the assets to a level fit for purpose

- improve knowledge around age condition and performance of networks through increased condition assessment programme
- work with Council contractors and governance bodies to identify capital or maintenance requirements
- ensure that the asset management requirements (operational and capital) are appropriately funded, prioritised and scheduled
- develop and refine renewal strategies, based on age, condition and best available local knowledge
- ensure appropriate resource consent conditions are met.

The graph below highlights expected capital expenditure and renewals dates for stormwater reticulation across the District based on current expected asset life and level of service expectation. Where differences occur between planned renewals data in Infor (IPS) and capital expenditure planned in the LTP this is generally at the request of the governing board or based on local knowledge and to date, community affordability, however this will continue to be reviewed as Council moved to a district funded approach.

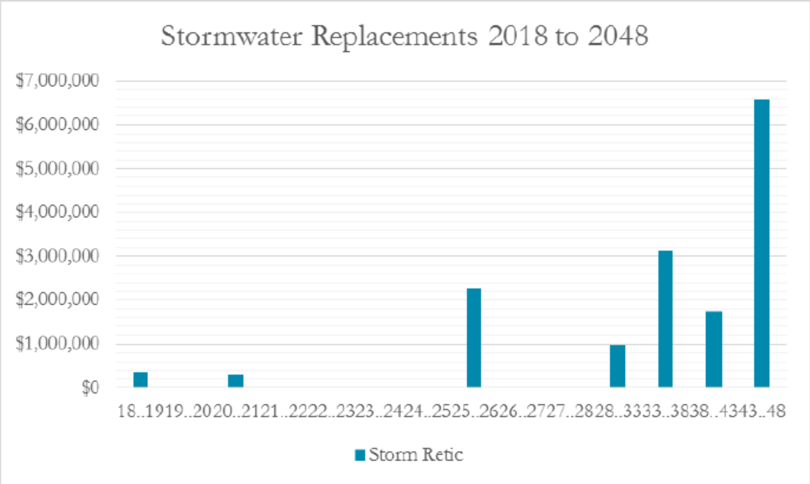

Figure 1: Stormwater Replacements 2018 to 2048

Financial summary

The stormwater activity has historically been funded by each local community through the relevant local general rate; from 2021/2022 the activity is being funded through a district wide rate.

Historically operating expenditure has been consistently low for stormwater, with limited maintenance and capex budgets. With the Water and Land plan being implemented and a better understanding of resource consent requirements operating costs for a number of communities were increased from 2019-20 onwards, however this will need to be reviewed every planning cycle as future information is available. Operating costs also increased in 2019/20 due to the interest costs for the replacement of underground infrastructure in Winton which occurred 2018-19.

Future capital projects have been included to increase levels of service in a number of communities where it is expected that the Water and Land Plan combined with resource consents will require an improvement in the discharge quality to the environment.

Renewal of exiting assets has been occurring over the past few years where there has been issues with failing infrastructure. However this has been typically limited and further investment is required across all networks as they reach end of life. A further area of attention is around our knowledge of the condition and performance of some of the networks. It is planned to address this through an increase in opex budgets to fund additional condition survey work which will ultimately help inform the capital works programme. Infrastructure in Wyndham is the oldest in the district and based on the standard estimated useful life it is programmed for replacement beginning in 2021/22 with further stages is 2025/26 and 2026/27. A significant portion of the stage one work will be undertaken with the aid of Central Government Stimulus funding.

The following graph compares the capital expenditure to depreciation. There are some years where the capital expenditure is greater than depreciation largely as a result of historic deferral or maintenance and renewals. Affordability will be an issue for many communities when the assets need to be replacement or there is a higher cost due to regulatory requirements.

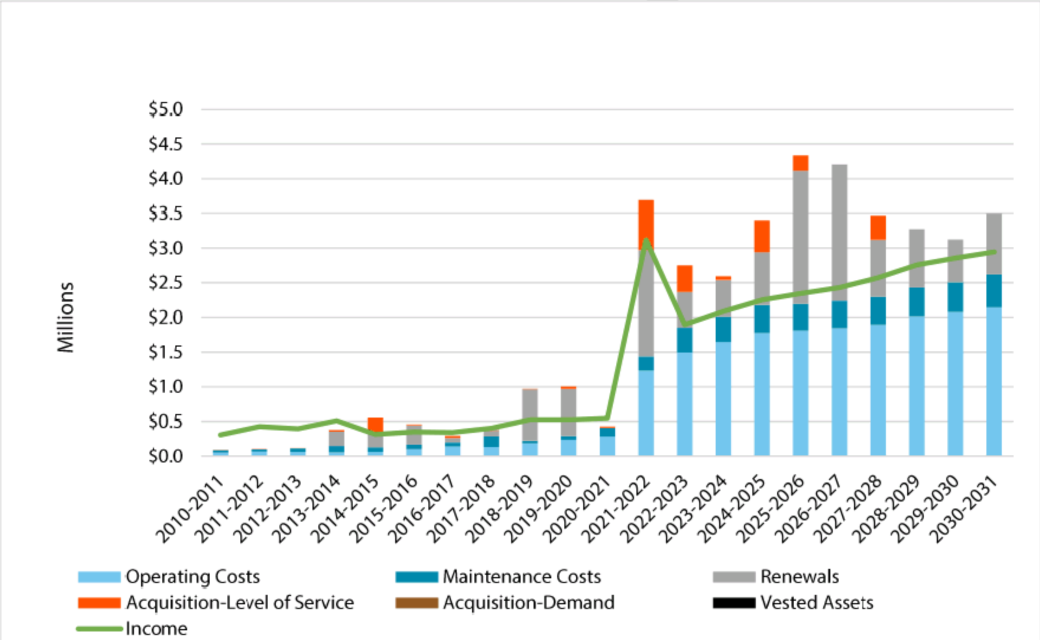

Figure 2: Depreciation comparison

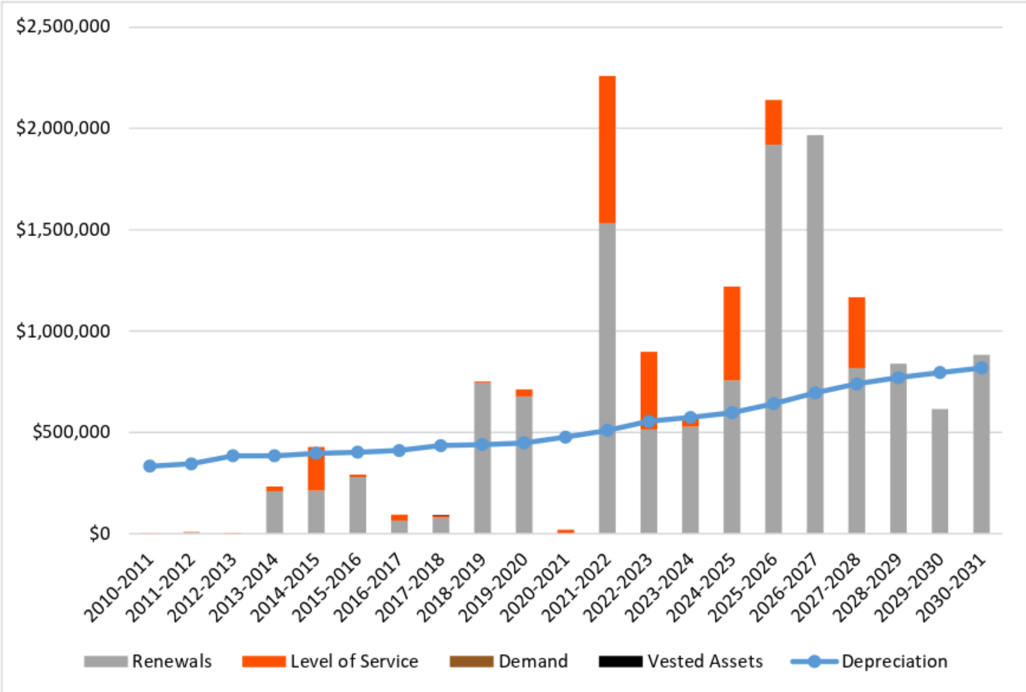

Figure 3: Renewals, LoS, Demand, Vested Assets and Depreciation

Purpose of the activity management plan

This activity management plan (AMP) describes the strategies and works programmes for the stormwater activity so as to meet the objective of delivering the required level of service for Southland District. It will be reviewed every three years. This AMP informs the Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity
- the strategic context for the activity, the key activity management strategies and policies adopted within this environment and the main issues identified for the activity
- a statement of the intended levels of service and performance targets.

This AMP covers a period of 10 years commencing 1 July 2021. The main focus of the analysis is the first three years and for this period specific projects have been identified in more detail. Beyond this period work programmes are generally based on trends or predictions and should be taken as indicative only. All expenditure is based on unit costs as at 1 July 2021.

Plan limitations

- 3 waters review
- key assumptions are correct
- Land and Water Plan costs still to be confirmed.

A status review out of all AMPs for services provided by the water and waste services department was carried out in 2015. The review found that the plans were core status, however annual improvement in data is still proceeding and continued measures are currently programmed for further enhancement of data.

This AMP attempts to address significant stormwater asset management issues in the district. It is a living document which will undergo a formal review every three years to make amendments to reflect changes in LOS, demand projections, risk profile, lifecycle information, or financial information.

This AMP has been developed with the following key limitations:

- projects have been identified and scheduled based on the best information available at the time
- budgets for these projects have been assessed based on the best information available at the time
- projects towards the end of the 10 year period are flagged that work is likely to be needed but it is very much at the concept phase. Options and detailed estimates will be carried out closer to the time
- if an asset fails earlier than planned then emergency works may be required these will be unbudgeted expenditure
- to date there has been limited impact on how the activity is managed as a result of Covid-19.

The completion of projects is limited to resourcing of both Council staff and external engineering support.

Plan framework

The AMP framework is illustrated in below. The strategic context, significant forecasting assumptions and any activity-specific issues are documented in the main body of this plan. Information on locally funded activities and services are included in the appendices to this plan.

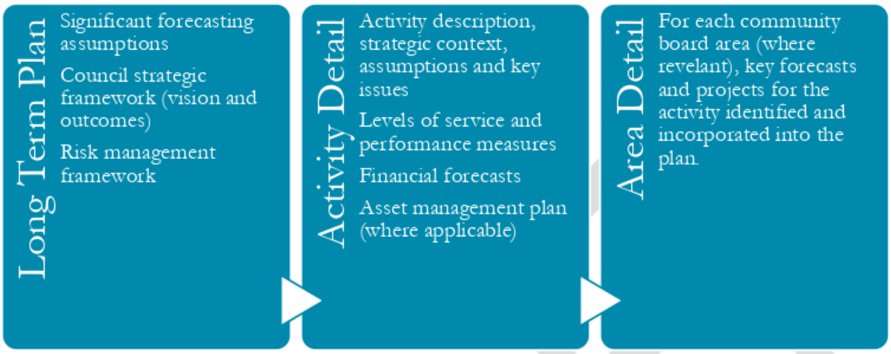

Figure 4: Plan Framework

Activity description

What we do

Council aims to provide a stormwater system that is reliable, has adequate capacity and aims to protect people and property (mainly urban roading networks) from flooding.

The stormwater infrastructure spans across 25 towns in the district. The scope and extent of assets varies significantly throughout the district. Bigger towns have large reticulated catchments while smaller towns have open ditches, drains and soakholes.

Council owned and provided facilities are Balfour, Browns, Colac Bay, Dipton, Edendale, Limehills, Lumsden, Manapouri, Monowai, Mossburn, Nightcaps/Wairio, Ohai, Otautau, Riversdale, Riverton, Stewart Island, Te Anau, Thornbury, Tokanui, Tuatapere, Waikaia, Wallacetown, Winton, Woodlands and Wyndham.

Based on current information the schemes have a current replacement cost valuation in excess of $35M.

While Council is the legal entity for the ownership of the asset, the day-to-day operations are delegated to separate governance groups which are community boards and, with operational work undertaken through roading and township maintenance contracts.

Urban areas serviced by public stormwater system

There are 25 towns in the district that are reticulated with SDC owned and maintained infrastructure as highlighted in the following map. In a number of smaller communities, the infrastructure provided is limited with a focus on minimising the risk of road flowing. Infrastructure is limited to sumps soakholes and/or open ditches. More extensive reticulation exists in larger townships. These public stormwater systems are intended to carry out three main functions:

Protection of property, public safety and access by the interception of surface and groundwater flows generated by rainfall run-off, conveying a point of discharge and the containment of flood flows within natural and man-made watercourses:

- surface channels and swales
- sumps and inlets
- pipes, culverts and open drains
- secondary flow paths; and
- stop banks (more a function of the regional council).

Protection of public health by controlling the level of pollutants and sediment in stormwater discharged into receiving waters used for recreational and food gathering activities:

- grass swales
- soakage systems; and
- constructed wetlands.

Creation of productive land by managing the level of the natural watertable:

- open drains; and
- sub-soil drains.

A number of other smaller towns have partial services, and Council manages open watercourses in several rural catchments.

In managing the stormwater activity, Council also undertakes:

- planning and building controls such as restrictions on building in high flood risk areas and minimum floor heights for residential buildings
- public education programmes intended to minimise the entry of pollutants to the stormwater system and a variety of traps in the stormwater system designed to reduce the quantities of debris that can be conveyed in the stormwater drains.

It is impractical to provide a primary stormwater system with the capacity to fully accommodate the run-off from all possible storms. The historic design standard for most of the primary Council stormwater system was to transport run-off resulting from a storm with a 10-year return period or with a 10% chance of being exceeded in any year. It is inevitable that the parts of the piped system will be overloaded to varying degrees whenever rainfall with a return period in excess of 10 years occurs.

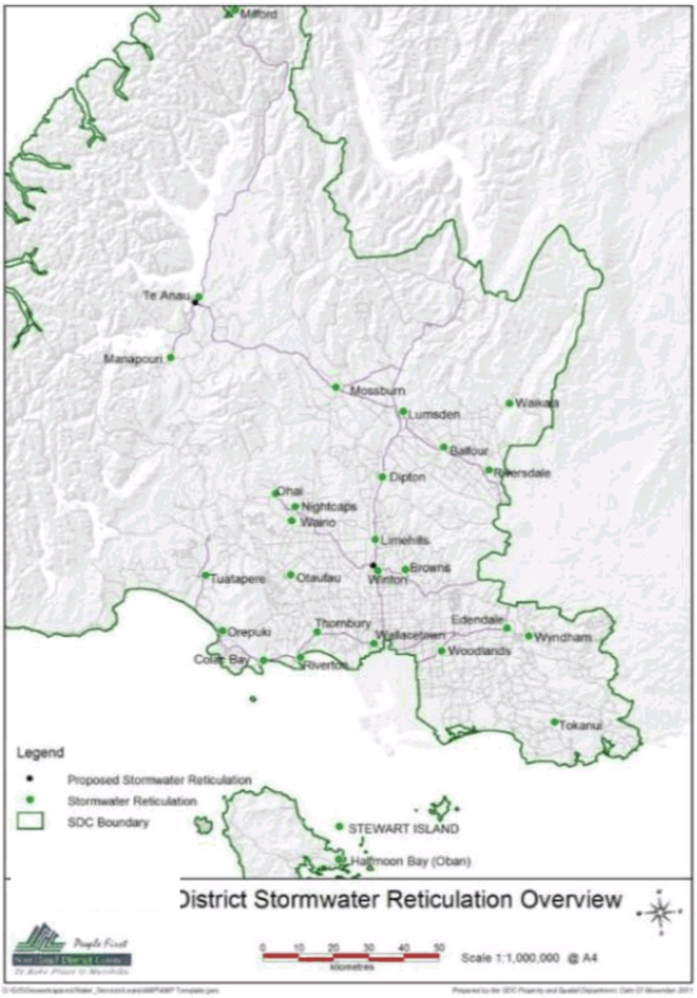

Figure 5: Town Stormwater Reticulation Locations

Rural areas and isolated towns

In small towns and rural areas, it is not as practical to provide piped stormwater systems because of the inability to spread the cost of the infrastructure required across a sufficient number of customers. On-site stormwater disposal is usually acceptable in these areas due to the low density of development. Reticulated stormwater systems are provided when the land use in these areas changes and they are developed for urban housing.

Council versus land owner role

The point of service for stormwater drainage is the junction connection on the Council stormwater main. Where a property is serviced by a pipeline draining to the road kerb, the point of service is the road kerb. Council owns and maintains all stormwater pipelines and public drains up to and including the point of service.

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All stormwater drains, pipework and plumbing upstream of the point of service and private watercourses within private property are owned by and are the responsibility of the property owner. This AMP does not cover private stormwater systems.

Why we do it

Stormwater networks are provided to reduce the impact of flooding due to rainfall. The activity protects people's property, improves road safety and mitigates against accessibility/safety issues which may otherwise be caused during flooding events.

The collection, treatment and disposal of stormwater also helps to protect public health and controls the level of pollutants in stormwater discharged to waterways.

Objectives of the stormwater activity

The stormwater activity in Southland District (SDC) is focused on the achievement of the following objective:

To provide a reliable stormwater system with adequate capacity, to protect people and property from flooding and to ensure that the roading network is managed is as safe and efficient manner as possible, and that the impact of discharges on the receiving environment is minimised.

The standard to which this objective will be delivered is outlined by the LOS detailed in a later section of the document.

Strategic considerations

Strategic framework

Council has adopted a strategic framework that identifies where Council wants to be in the future (vision) and the outcomes it aims to achieve to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions (community outcomes). The framework also outlines how it will achieve these (mission and approach) along with the key challenge it faces in doing so and its resulting strategic priorities.

STRATEGIC FRAMEWORK COMPONENT	PROPOSED 2021-2031 STRATEGIC FRAMEWORK
MISSION	Working together for a better Southland
VISION	"Southland – one community offering endless opportunities"
COMMUNITY OUTCOMES	Kaitiakitanga for future generations
	Inclusive connected communities
	A diverse economy creating healthy and affordable lifestyles
	Empowered communities with the right tools to deliver the best outcomes
STRATEGIC PRIORITIES	Improve how we work to build resilience
	Provision of appropriate infrastructure and services
	Better preparing our communities and Council for future changes
	Support healthy environments and sustainable communities

Figure 6: Strategic Framework

The framework guides staff and informs future planning and policy direction and forms the basis for the performance framework. The table below outlines how the Stormwater activity contributes to the Council's community outcomes using a benefits mapping diagram. The full levels of service and performance management framework is presented in a further section later in the document.

Outcomes	Activity contributions	Outcome objective	Benefit	Levels of service (LoS) and key performance indicators (KPI)	
Activity objective:: Reliable stormwater collection, treatment and disposal that protects people and property from flooding and minimises the impact of any discharges on the environment					
				LoS 7: Provide a reliable stormwater system that protects public health and the environment	
Kaitiakitanga for future generations	Stormwater collection, treatment (where required) and disposal helps to control the level of pollutants and sediments in stormwater discharged to waterways or coastal areas used for recreation and food gathering	2c. Consider the impact on the environment	Reduced environmental Impact	KPI 7.1: **System adequacy** - Overflows resulting from the stormwater system that result in the flooding of a habitable floor- a) The number of "flooding events" that occur within the district b) For each flooding event, the number of habitable floors affected (expressed per 1000 properties connected the council stormwater system) KPI 7.4: **Discharge compliance** - Compliance with the resource consents for stormwater system discharges, measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders (d) successful prosecutions, received in relation those resource consents.	KPI 7.2: **Response times** – The median response time to attend a flooding event, measured between the time of notification to the time when service personnel reach the site. KPI 7.3: **Customer satisfaction** – The number of complaints received about the performance of the Council's stormwater system, expressed per 1000 properties connected to the stormwater system 7.5: Percentage of monitoring results that show compliance with resource consent conditions.
Inclusive, connected communities	Stormwater collection, treatment (where required) and disposal also helps to protect public health by providing for general sanitation.	1c. People can enjoy a safe and fulfilling life in our unique and natural environment	Improved public safety		
A diverse economy creating healthy and affordable lifestyles	Stormwater helps to prevent flooding which otherwise may	1a. People have everything they need to live, work, play and visit	Improved public safety		

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Outcomes	Activity contributions	Outcome objective	Benefit	Levels of service (LoS) and key performance indicators (KPI)	
	affect the safety and accessibility of homes,				
Empowered communities with the right tools to deliver the best outcomes	Stormwater helps to prevent flooding which otherwise may affect the safety and accessibility of homes, businesses and public places	1a. People have everything they need to live, work, play and visit	More convenient and reliable services		

Table 2– Benefits table

Council has identified four priority areas in response to the key strategic challenges facing Council and the community to achieve the vision and community outcomes. The contribution that the activity makes to these strategic priorities are shown in the following table

STRATEGIC PRIORITIES ▸ CONTRIBUTION AREA ▾	1. IMPROVE HOW WE WORK TO BUILD RESILIENCE	2. PROVIDE APPROPRIATE INFRASTRUCTURE/SERVICES	3. BETTER PREPARING OUR COMMUNITIES AND COUNCIL FOR FUTURE CHANGES	4. SUPPORT HEALTHY ENVIRONMENTS AND SUSTAINABLE COMMUNITIES
WHAT WILL BE DONE IN THE LONG-TERM (NEXT 10 YEARS)	Contribute introduction of appropriate technology to improve how best to deliver service for example mobile field working	Ensure compliance with appropriate national and regional plans	Manage upgrades and renewals in a structured, prioritised programme that can demonstrate value for money.	Applications for new sub divisions will be considered with encouragement for developers to consider a range of measures for management of stormwater
WHAT WILL BE DONE IN THE SHORT-TERM (NEXT 3 YEARS)	Review and improve systems and procedures around data capture, management and storage Understand and implement business case approach during project development Understand implications of climate changes to our communities and how this will impact on the service we deliver Map critical processes	Understand implications of the Proposed Water and Land Plan and how this impact on the service we provide Review contractual arrangements	Review and improve systems and procedures around data capture, management and storage. Consider appropriate funding models that will best deliver improvements	Applications for new sub divisions will be considered with encouragement for developers to consider a range of measures for management of stormwater
KEY ACTIONS AND PROJECTS	Continued development of draft wastewater Strategy document with key stakeholders	Regional stormwater consents now operative	Develop proposals around future funding arrangements for the	None identified

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STRATEGIC PRIORITIES ▸ CONTRIBUTION AREA ▾	1. IMPROVE HOW WE WORK TO BUILD RESILIENCE	2. PROVIDE APPROPRIATE INFRASTRUCTURE/SERVICES	3. BETTER PREPARING OUR COMMUNITIES AND COUNCIL FOR FUTURE CHANGES	4. SUPPORT HEALTHY ENVIRONMENTS AND SUSTAINABLE COMMUNITIES
	and look at benefits of incorporating stormwater discharges as well. Continue embedding Infor (IPS) IPS		stormwater activity	
RELATED STRATEGIES / PLANS / POLICIES	Draft wastewater strategy	Proposed Water and Land Plan National policy statement for freshwater management	Draft wastewater strategy as a reference starting point	Sub Division and Land Development Bylaw 2012.

Table 3: Strategic Priorities

Strategic context

The purpose of the Southland District Council Long Term Plan 2031 is to:

- provide a long term focus for Council decisions and activities
- provide an opportunity for community participation in planning for the future
- define the community outcomes desired for the district
- describe the activities undertaken by Council
- provide integrated decision-making between Council and the community
- provide a basis for performance measurement of Council.

Strategic direction setting encompasses Council's high-level goals, particularly the vision for the District, what the outcomes for the community may be, and what the strategic priorities will be for delivering work to the community.

Representation framework

Community representation was amended prior to the 2018 triennial elections. There are now nine community boards that provide representation across the district. These are:

ARDLUSSA	**FIORDLAND**	**NORTHERN**	**ORAKA APARIMA**	**ORETI**
STEWART ISLAND/RAKIURA	**TUATAPERE TE WAEWAE**	**WAIHOPAI TOETOE**	**WALLACE TAKATIMU**	

It is important that Council is seen as a leader in service delivery across the district and through this AMP, will ensure its stormwater services are fit purpose, in appropriate locations and managed cost effectively. Doing so enables Council to provide and deliver quality, professional services to the ratepayer.

Council aim to have a high level of engagement with its customers and elected members to ensure that the minimum levels of service set out in this document represent their expectations.

Key risks, issues and assumptions for the activity

Key strategic risks

The most important issues relating to the stormwater activity for the next ten years are shown in the following tables.

It is noted that the key issues and risks for the stormwater activity align closely with a number of key strategic risks identified at a corporate level the most relevant ones being

- inaccurate data leading to bad decisions/asset failure
- underinvestment in infrastructure
- infrastructure not fit for purpose to withstand climate change
- natural or biosecurity event impacts the wellbeing of the district
- health and safety controls fail to protect staff and contractor safety
- difficulty retaining or recruiting staff affects service levels
- over-commitment leads to inability to deliver agreed work programme

Key Issues

Key issues impacting on the stormwater activity are highlighted below.

KEY ISSUES	OPTIONS	IMPLICATIONS
COMPLIANCE WITH REQUIREMENTS OF DISCHARGE CONSENTS AND UNDERSTANDING THE IMPLICATIONS OF THE PROPOSED WATER AND LAND PLAN FOR SOUTHLAND	Limited options are available given the regulatory requirement, however there may be scope available to prioritise timings of required upgrades and improvements.	Four consents covering 17 townships have now been issued and conditions around monitoring, auditing and reporting are being met. At this stage implications are still not fully understood however it is extremely likely that upgrades will be required across a number of locations. It is widely understood that there will be a need to undertake improvements to discharges from industrial areas such as Winton and Te Anau and as a result allowances have been made in the budgets. Improvements to soakholes in Mossburn and Riversdale have also been budgeted for.
IMPACT OF CLIMATE CHANGE	Climate change will affect the district over the medium to long term in line with predicted	Infrastructure planning will need to ensure that future assets are of sufficient standard and have

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KEY ISSUES	OPTIONS	IMPLICATIONS
	national changes such as increased temperatures, increasing sea levels and more extreme weather conditions characterised by extreme heavy rainfall events as well as prolonged drought periods. Climate change and its impacts will be considered as capital programmes are developed and further information is understood around the implications of this. Upcoming LiDAR survey across the whole region will help give a much better understanding of some of the potential impacts across 3 waters activities.	adequate capacity to cater for predicted climate change. Any future infrastructural building work including renewals in coastal areas will be considered against projections of sea level risk. Relocation of assets will also considered if it is believed they are at risk. From a three waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Curio Bay. Through the development of the 2021-31 Long Term Plan, Council staff from across a range of activities along with external expertise will more fully evaluate the risks associated with climate change with further planning allowed for in future LTPs/AMP's. At present there has been no change to future work programmes to address climate issues arising through climate change.
AGEING INFRASTRUCTURE APPROACHING OF LIFE LIKELY TO REQUIRE EXTENSIVE RENEWALS ACROSS A NUMBER OF TOWNSHIPS.	Undertake renewal (subject to further condition assessment), or defer renewal and manage assets through increased maintenance activities.	There is likely to be significant renewals costs associated which will have impact on rates which are reflected in the latest capital programme and a driver towards moving to a district funded model.
FUNDING OF THE ACTIVITY GIVEN THE IMPLICATIONS OF THE TWO ABOVE ISSUES.	Funding options are based around either locally funded or district funded models. Where there is a requirement for compliance with regional or national standards there is certainly more of an argument that this justifies the move to district funding.	District funding will help spread the burden of potentially significant upgrades across a wider rating base, however irrespective of funding models the overall implications of the upgrades need to consider the overall benefit to communities relative to the costs these will incur.
STRATEGIC DIRECTION	While change around how the sector is managed is anticipated the AMP has been developed on	It is difficult to anticipate what changes are likely to arise following the national 3 waters

KEY ISSUES	OPTIONS	IMPLICATIONS
	the basis of building on the previous AMP rather than trying to understand the implications of ongoing reviews and inquiries.	review. At this stage it is understood that the greater impact will be on the water supply and wastewater activities. In anticipation of the outcome of the reviews the AMP adopts a 'holding pattern' while also noting the need to significantly invest in both opex and capex budgets in order to maintain current level of service.
ASSET DATA KNOWLEDGE	While Council has asset registers and many digital systems, processes and records, we do not have complete knowledge of the assets under our ownership. To varying degrees Council has incomplete knowledge of asset location, asset condition, remaining useful life and asset capacities. This shortfall requires assumptions to be made on the total value of the assets owned, the time at which assets will need to be replaced and when new assets will need to be constructed to provide better service.	Council considers these assumptions and uncertainties constitute risk and proposes to address this by introducing an annual budget for condition assessment of assets to improve knowledge around age and condition of stormwater assets. As levels of understanding improve, a better forecast of capital expenditure will be incorporated into future forecasts.
STORMWATER DISCHARGE QUALITY	The current documentation on discharge water quality and receiving environment quality is variable and not collated as sampling in support of consent requirements has only commenced very recently. The quality required of stormwater discharges to at least maintain the existing conditions in receiving waters is therefore not yet fully understood	Money has been allocated for retrofitting stormwater quality devices however in a number of towns, the quantity and spread of the programme will need to be reassessed monitoring results increase. As such the budget allocation for water quality improvements is considered to be sufficient until this level of reporting further develops.

Table 4: Key issues for the activity

Key risks are summarised in the following table. It is noted that issues and risks are broadly similar across all 3 waters activities and align closely with Council corporate risks.

RISK EVENT	CURRENT TREATMENT DETAILS	PROPOSED TREATMENT DETAILS
EVENT - NATURAL DISASTER CAUSING SHORT TERM DISRUPTION TO SERVICE PROVISION.	Identification of alternative short term response and recovery arrangements.	Council and contractor to develop business continuity plans to cover natural disasters.

RISK EVENT	CURRENT TREATMENT DETAILS	PROPOSED TREATMENT DETAILS
EVENT EG NATURAL DISASTER CAUSING WIDESPREAD UNAVAILABILITY OF ACTIVITY STAFF.	Temporary or agency staff either from within Council or through external resourcing	Council and contractor to develop contingency plans to cover natural disasters.
NATURAL DISASTER CAUSES SIGNIFICANT WIDESPREAD DAMAGE TO COUNCIL ASSETS AND INFRASTRUCTURE.	As Council assets are widespread across the District the risk of significant widespread damage is relatively low however the impact on those areas can be relatively high.	Identify strategic sites at risk and develop plan for their maintenance and return to service. Development of wider emergency management plan. Understand location of vulnerable landfill sites and develop plan for their future management.
FUNDING OF ACTIVITIES WILL RESULT IN SIGNIFICANT RATES INCREASES IMPACTING ON COMMUNITY AFFORDABILITY.	Decisions made with based on a trade-off between 'sweating' assets and targeting investments. Has potential to result in a large number of unbudgeted projects required through the course of the planning cycle.	Development of a well informed capital works programme based on known condition and performance of assets.
RISK TO PUBLIC HEALTH AS A RESULT OF COUNCIL ACTIVITY	Installation of multi-barrier protection on all community water supplies along with review and up-dating of Water Safety Plans. Wastewater and stormwater risks are mitigated through achieving compliance with discharge consent conditions and any investigations that may arise as a result.	As current along with any further requirements that may arise following formation of new drinking water regulator.
HEALTH AND SAFETY RISKS (TO STAFF, CONTRACTORS AND PUBLIC) ASSOCIATED WITH OPERATION OF COUNCIL ACTIVITY	All Council sites are secure, fenced off and have appropriate signage warning of multiple risks. Higher risk sites have recently been identified and expenditure approved for increasing security.	Further review of fencing and security arrangements will require additional expenditure through future planning cycles.
BREAKDOWN IN RELATIONSHIP/COMMUNICATION BETWEEN COUNCIL AND CONTRACTOR	Regular communications and partnering approach.	More frequent partnering meetings. Review stakeholder management arrangements through new contract. Possible opportunity to develop Alliance type approach.
FAILURE OF CO-OPERATION WITH OTHER COUNCILS THAT MAY IMPACT ON FUTURE POTENTIAL SERVICE DELIVERY ARRANGEMENTS	New risk that may arise following requirement for councils to work together to review and consider future	Agree working protocols among councils and ensure early and regular engagement with elected members to ensure consistent

RISK EVENT	CURRENT TREATMENT DETAILS	PROPOSED TREATMENT DETAILS
	potential service delivery arrangements.	messaging is being fed through to all councils.
LACK OF RESOURCING IMPACTS ON ABILITY TO DELIVER SERVICES THROUGH FAILURE TO ATTRACT APPROPRIATELY TRAINED STAFF INTO THE SECTOR.	This is an issue of concern nationally and is currently not one that is well managed. On a local level Council have participated in careers events that succeeded in attracting some graduates into the organisation.	Continue to support local careers based events while pushing at a more national level (eg through Water NZ) for a co-ordinated approach to help attract appropriately skilled people into the sector.
LOSS OF ORGANISATIONAL KNOWLEDGE DUE TO SUDDEN LOSS OF KEY ACTIVITY STAFF RESULTING IN INEFFICIENT OF INADEQUATE MANAGEMENT OR OPERATION.	Staff training and succession planning will mitigate risk of frequent staff turnover.	Identify individual staff needs and formulate appropriate training, in conjunction with consultant assistance until skills at appropriate level. Detailed succession planning to ensure institutional knowledge is retained.

Table 5: Key risks

Impact of climate change

Climate change will affect the district over the medium to long term in line with predicted national changes such as increased temperatures, increasing sea levels and more extreme weather conditions characterised by extreme heavy rainfall events as well as prolonged drought periods.

Over the medium to long term as the impact of climate change becomes more prevalent Council will need to be proactive in considering implications on communities and infrastructure.

Infrastructure planning will need to ensure that future assets are of sufficient standard and have adequate capacity to cater for predicted climate change.

Any future infrastructural building work including renewals in coastal areas will be considered against projections of sea level risk. Relocation of assets will also considered if it is believed they are at risk.

From a 3 waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Orepuki and Curio Bay.

Through the development of the 2021-2031 Long Term Plan, Council staff from across a range of activities along with external expertise will more fully evaluate the risks associated with climate change with further planning allowed for in future LPT/AMP's. The proposed regional LIDAR mapping project will greatly assist with planning and mapping particularly for the stormwater activity in relation to management of protection of secondary flow paths for example.

The Climate Change Impact Assessment Report ('the report') was one of the studies commissioned. NIWA (National Institute of Water and Atmosphere) was appointed to undertake the work which commenced in 2017 and was finalised at the end of 2018. The report utilised a comparable methodology to the Climate Change Projections for New Zealand report and the Intergovernmental Panel on Climate Change scenarios. It used two climate change predictions being RCP (Representative Concentration Pathways) 4.5 – meaning that a large reduction in global carbon emissions is achieved and RCP 8.5 - where no reduction in carbon emissions is achieved.

It is widely accepted that the global climate system is changing and so is New Zealand's. In addition to the impacts on weather there will be impacts on water availability and natural hazard exposure. The report calculated the potential impacts of climate change on a range of components of climate, hydrology and coastal process across Southland.

Issues

The key findings of the report are summarised as follows:

Temperature

- the projected Southland temperature changes increase with time and emission scenario. Future annual average warming spans a wide range: 0.5-1°C by 2040, and 0.7-3°C by 2090
- autumn is the season where most of the warming occurs across all time periods and scenarios
- the average number of hot days (maximum temperature >25°C) is expected to increase in a range spanning from 0-10 days by 2040 to 5-55 days by 2090
- the related number of heatwave days (ie, number of consecutive days where the temperature is higher than 25°C) is projected to increase (largest increase with elevation)
- as expected, the number of frost days is expected to decrease by 0-5 days by mid-century, and by 10-20 frost days by the end of the century.

Projected changes in rainfall

- a marked seasonality and variability across the Southland region. Annual rainfall is expected to slightly increase by mid-century (0-5%), while the increase spans 5-20% at the end of the century
- seasonally the largest increases are projected during winter, while summer precipitation is expected to decrease in the Waiau catchment (by up to 10% at the end of the century)
- by mid-century, the number of wet days is expected to decrease by up to 10 days across most of the region. However, wet days are then expected to increase by the end of the century for most of the region, except the Waiau catchment where 10-20 fewer wet days are expected
- by mid-century, decreases in annual maximum 5-day rainfall are projected for the centre of the Southland Region (up to 15 mm) and increases are projected for the rest of the region, with Fiordland facing the largest increases of 15-30 mm in some parts.
- however, at the end of the century, almost the whole Southland region (except the eastern Waiau catchment under mid-range emission scenario) is projected to experience increases in annual maximum 5-day rainfall of up to 15-30 mm and parts of Fiordland facing possible increases 45 to 105mm.

Dry days

- by mid-century the number of dry days are expected in increase up to 10 more days for much of the region
- the central part of the region and northern and western Fiordland can expect up to 10 fewer dry days are expected (ie will remain wetter)
- by the end of century, a decrease in dry days (up to 10-20 days) is projected for most of the region except for the Waiau catchment (increase up to 10-20 days), eastern Fiordland, and Stewart Island

- meteorological drought (a period with abnormal rainfall deficit) – where soil moisture content is reduced and vegetation/pasture growth is hindered. During periods of potential evaporation deficit farms are more likely to need irrigation to maintain crop or pasture growth
- central-northern part of the Southland region is projected to experience the largest increases in potential evaporation deficit in the future across both time slices and all emission scenarios
- by mid-century, potential evaporation deficit is expected to increase by 40-80mm per year for most of the regions, rising to over 100 m per year for the highest emission scenario by 2090.

Changes in sea level-rise

- sea level rise is expected to be between 0.2-0.3 m above present levels by 2040 and increasing to 0.4-0.9 m by 2090
- a present day 1 percent annual exceedance probability (AEP) coastal flood (that is a flood of a size and depth that has a 1 percent chance of happening in any year), will become much more frequent as seas continue to rise, with such large events occurring on average on a yearly basis (100 percent AEP) once sea level rise reaches 0.45 m expected between 2055-2060 and 2100
- moderate coastal flooding events will become even more common, occurring several times a year for that same sea-level rise
- these floods have effects such as salt water on roads and therefore vehicles, saltwater intrusion in underground infrastructure, temporary inundation of open space, agricultural land or natural vegetation. Over time this can the fertility of soils, change plant species or cause accelerated deterioration of public and private infrastructure
- considering tides only, putting aside storm events, the rising sea level will result in an increasing percentage of normal high tides exceeding given present day design for coastal infrastructure and roads
- the replacement costs of buildings exposed in areas where such high resolution LiDAR surveys are already available (mainly low-lying parts of Invercargill City) is considerable at ~$0.6–1.2B (2011 NZ$) for a range from present exposure to 1 percent AEP coastal floods up to a 1.2 m sea-level rise.

The report models the effect of climate change on the "mean annual flood" which is a standard measure of floods likely to occur every 2.33 years. The modelling suggests that the mean annual flood is likely to become larger and this may mean an increase in volume for flooding generally. This requires further detailed consideration.

This regional study is a high level starting point for understanding how our climate is likely to change over the next 50 to 90 years. Given the high level of this report additional more targeted reports and internal work will be required to better understand how these assumptions are going to impact the management of Council assets and what makes Southland an attractive place to live, do business and visit. These detailed studies will help identify any future demand driven climate change work required across all three waters activities.

Regulatory considerations

Legislation, regulation and Council's existing strategies and policies mandate or influence some of the LOS and performance targets we set, as illustrated in the table below for the wastewater activity. A full description of Council policy and planning framework impacting AMPs is included in the LTP.

Below is a list of legislation and regulations that are specific to the stormwater activity. The table also includes relevant bylaws and policies linked to the activity.

LEGISLATION / REGULATION / PLANNING DOCUMENTS	HOW IT (AND ANY CHANGES PROPOSED OR IMPLEMENTED SINCE THE LAST PLAN) AFFECTS LEVELS OF SERVICE AND PERFORMANCE STANDARDS
LOCAL GOVERNMENT ACT 2002	The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and to meet the current and future needs of communities for good quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost effective for households and businesses.
	Changes: None.
REGIONAL POLICY STATEMENT 1997 AND 2014, 2017	This documents purpose in relation to stormwater is to ensure the quality of water and the environment is not contaminated by discharges and that waterways show an incremental increase in water quality over time. It aims to provide for current and future generations while aiming to improve the quality of the environment.
	Changes: None.
REGIONAL WATER PLAN FOR SOUTHLAND 2008	While the 2017 Water and Land Plan remains under appeal this plan remains operative. The purpose of this plan is to promote the sustainable management of Southland's rivers, lakes, groundwater and wetland resources. The plan is aimed at enabling the use and development of fresh water where this can be undertaken in a sustainable way, providing a framework for activities such as discharges to water.
	Changes: None.
REGIONAL COASTAL PLAN FOR SOUTHLAND2013	Fundamental principles in the management of the CMA are set out and then sections of the plan deal with discharges that have a range of environmental, social and cultural effects. Environment Southland have indicated the plan is due to be updated however we are currently uncertain of the timing.
	Changes: The plan is currently undergoing a review which takes part in three stages with stages 1 complete and stage2 (pre-notification policy development under way and stage 3 (formal consultation) to follow.
DISTRICT PLAN 2018	Sets out Council's resource management strategy, including how Council will control the effects from a range of activities to ensure that the adverse effects on the environment are avoided.
	Changes: None.
INFRASTRUCTURE STRATEGY	Sets long term direction for the management of assets and infrastructure
	Changes: 2021 Strategy signals the need for greater investment in stormwater from both capex and opex spending as well as condition assessment work required.
UTILITIES ACCESS AMENDED ACT 2010	The purpose of the code is to enable access by utility operators to transport corridors to be managed in a way that disruptions to roads by wastewater pipe installations are kept to a minimum while maintaining safety and maximising the benefits to the public.

LEGISLATION / REGULATION / PLANNING DOCUMENTS	HOW IT (AND ANY CHANGES PROPOSED OR IMPLEMENTED SINCE THE LAST PLAN) AFFECTS LEVELS OF SERVICE AND PERFORMANCE STANDARDS
	Changes: None.
SUBDIVISION AND LAND DEVELOPMENT STANDARDS BYLAW 2012	Specifies Council's minimum requirements for subdivision and land development while promoting sustainable development.
	Changes: None although it may be opportune to review ahead of its proposed date.
TRADE WASTE BYLAW 2008 WITH 2018 REVISION	Requires persons on trade premises to apply for a permit to discharge to the sewer network and allows conditions to be placed on the wastewater parameters before discharge.
	Changes: None.
STORMWATER DRAINAGE BYLAW 2017	Requires all persons to make application before connecting to the stormwater network and outlines conditions for accepting stormwater into Council owned stormwater infrastructure.
	Changes: None.
NZ WATER INDUSTRY NATIONAL ASSET GRADING STANDARDS AND INTERNATIONAL INFRASTRUCTURE MANAGEMENT MANUAL	Provides guidelines on asset grading and asset management
	Changes: None.
PIPE INSPECTION MANUAL	Provides guidelines on CCTV survey procedures and pipe asset grading.
	Changes: Staff work to most up to date version available
HAZARDOUS SUBSTANCES AND NEW ORGANISMS ACT 1996	The purpose of this act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms.
	Changes: None.
RESOURCE MANAGEMENT ACT 1991	Promotes the sustainable management of natural and physical resources. Regulates land use and subdivisional activity. Regulates discharges to land, air and water. Recognises the principles of the Treaty of Waitangi. Compliance with district and regional plans.
	Changes: None.
NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT	Sets national policies and bottom line standards for freshwater management and provides Regional Council with the authority and responsibility to develop policies, objectives and rules around how freshwater is managed across the country
	Changes: An updated NPS was released in 2020 and precedes a NES focussing on wastewater and stormwater discharges which is likely to impact on the way that activities are delivered.
PROPOSED WATER AND LAND PLAN	Recent or expected changes: The proposed Water and Land Plan was notified in 2016 with hearings held through 201. Decisions were released in 2018 with a number of appeals (including councils) to a

LEGISLATION / REGULATION / PLANNING DOCUMENTS	HOW IT (AND ANY CHANGES PROPOSED OR IMPLEMENTED SINCE THE LAST PLAN) AFFECTS LEVELS OF SERVICE AND PERFORMANCE STANDARDS
	number of objectives policies and rules. Following the first stage of appeals in June 2019 an interim ruling was released by the Environment Court in late 2019 with a second round of appeals expected to be heard in 2021. Essentially the plan builds on the provisions of the current active plan but also indicates a strong preference for wastewater discharges to be land based rather than to water. The objectives and policies are very explicit on this point with a specific rule identifying water based discharges as non-complying activity status.
	Changes: While sections of the plan are still under appeal provisions relating to water discharges are operative at this stage but may change depending on appeal outcomes.
TAUMATA AROWAI – WATER SERVICES REGULATOR BILL	The bill establishes Taumata Arowai the water services regulator as a new crown agent and provide for its objectives functions and operating principles. The Bill is part of a broader package of reforms to the regulatory system for 3 waters. The government has indicated a separate bill will be proposed to give effect to decisions to implement system wide reforms to the regulation of drinking and source water and targeted reforms to improve the regulation and performance of wastewater and stormwater networks and will include consideration of future service delivery arrangements.

Table 6: Key regulatory and statutory drivers.

Regulatory reforms

Reform in the three waters sector has been progressing for some time. However, since the Havelock North incident in 2016 it has become an area of high priority for central government.

Following the Havelock North incident, the government commenced a formal inquiry, which recommended a 3 waters review be undertaken. The review considered options for improving regulatory and service delivery arrangements for drinking water, wastewater and stormwater services (Three Waters) to better support New Zealand's prosperity, health, safety and environment. Most three waters assets and services, but not all, are owned and delivered by local authorities.

The government's 3 waters review highlighted that, in many parts of the country, communities cannot be confident that drinking water is safe, or that good environmental outcomes are being achieved. This work also raised concerns about the regulation, sustainability, capacity and capability of a system with a large number of localised providers, many of which are funded by relatively small populations.

Taumata Arowai - the Water Services Regulator Bill has now passed into law with significant work well advance with the establishment of the crown entity. . The bill is relatively simple in that its focus is on establishing the new water regulator as a crown entity, under the Crown Entities Act 2004. The bill also outlines the agencies objectives, functions, operating principles and governance arrangements and is expected to be enacted by mid-2020.

A separate bill will give effect to the decision to implement system-wide reforms to drinking water regulation, alongside targeted reforms to improve the regulation and performance of wastewater and stormwater networks.

The regulatory components of this work are well progressed with the development of new legislation and the creation of Taumata Arowai, the new, independent water services regulator. This new crown entity is currently being built, and will become responsible for drinking water regulation once a separate Water Services Bill, which is currently before parliament, is passed (anticipated mid 2021).

Following the onset of Covid-19, central government have reviewed the approach being followed to three waters reform. This review has in part been driven by a number of factors including:

- a risk that a number of local authorities may look to defer operating and capital expenditure in an attempt to manage rate increases in a post Covid-19 environment
- the desirability of creating a broader economic stimulus for local economies in a post Covid-19 environment.

This process led, in July 2020, to the government announcing a funding package of three waters (drinking water, wastewater, stormwater) infrastructure, and to support the reform of local government water services delivery arrangements.

Council has been allocated $7.03 million by the crown, if it opts in to the reform programme. A further $11.15 million has been allocated to the region to agree an appropriate distribution between participating councils. This funding has been provided as a grant, which does not need to be repaid if Council does not ultimately commit to reform at later stages of the process. The funding must be expended by 31 March 2021. This stimulus funding is centrals government s approach to kick start economic growth post Covid-19.

Since then Council has developed a delivery plan identifying projects that could be grouped to develop a delivery plan which has ultimately been approved by the Department of Internal Affairs and consists of both capital work as well as investing a significant amount to improve knowledge of the condition of assets including wastewater and stormwater condition assessment across targeted networks where known issues have been identified. Further information on work identified under the delivery plan is highlighted in further sections within the plan.

In moving into this environment, the government has indicated that its starting intention is public multi-regional models for water service delivery to realise the benefits of scale for communities and reflect neighbouring catchments and communities of interest. There is a preference that entities will be in shared ownership of local authorities. Design of the proposed new arrangements will be informed by discussion with the local government sector.

In addition in an endeavour to proactively address the range of service delivery options that might exist the Otago Mayoral Forum has initiated a working group process, with external consultant assistance, to explore the range of delivery options that might exist in relation to the delivery of water services across the Otago region. They have also invited the Southland councils to participate in this work with work well progressed in identify future potential service delivery arrangements.

Demand management strategies

Given that changing demand is primarily driven by changing land use, this is a potential key means of managing future demand. However, the predominantly low population and rural nature of Southland has meant that to date there has been very little requirement for land use control. There are one or two exceptions to this, primarily Te Anau and Manapouri, but also potentially Winton. Consideration of demand management for these towns primarily relates to ensuring development is appropriate to the function rather than limiting traffic growth per se. However, there is still a need to ensure that land use planning continues to consider impacts on road networks as part of the overall scheme.

This section describes how demand for stormwater is likely to change over the 10 year period of the plan, the impact any changes are likely to have and whether Council is planning to make any changes to the activity as a result.

Predicting future demand for the service

Demand drivers

The factors influencing demand for the service are summarised in the table below. Council has prepared corporate wide assumptions/projections for growth drivers (population, land use, dwellings, tourism) which have been used as the basis for assessing future demand for the service.

Demand for the stormwater service can be measured in theory in terms of cubic metres in run-off (though this data is not collected). It can also be measured by the length of stormwater reticulation (which is available in Infor (IPS) though not formally reported).

The factors influencing demand for Council's stormwater services are summarised below.

DEMAND DRIVER	IMPACT ON FUTURE DEMAND
CLIMATE	Increase in total stormwater volumes from climate change. Further work will be undertaken in the next three year period to more fully understand the impact of climate change driven demand and is likely to encompass all 3 waters activities.
POPULATION	Growth projected in urban areas can create the need for extensions to the stormwater reticulation however given low growth projections this is not seen as a significant driver.
DEVELOPMENT	Increase in impermeable surfaces cause increase in stormwater run-off and is considered the greatest driver in towns such as Te Anau where there is steady growth. An identified future area of improvement around changing land use and development lies in understanding and protecting secondary overland flow paths to avoid risk of flooding of property. This information will be more readily available following the upcoming (within two years) LIDAR survey of the region.

Table 7: Demand Drivers, Stormwater

Demand forecasts

It has previously been suggested that population will increase by about 10.73% during the period from the 2013 Census to 2031. This is not expected to drive a significant increase in stormwater flows growth may not occur in areas serviced by Council infrastructure..

New subdivisions will require a stormwater network within the subdivision and upgrading of pipes required to increase the capacity of pipes to transport stormwater from new subdivisions. This is generally the responsibility of the developer and must be undertaken following sign off from Council.

Councils 2012 Subdivision and Land Development Bylaw promotes where practicable the construction of low impact infrastructure as an alternative to pipelines.

Through the 2021 LTP, Council plans to undertake investigations into the impact of climate change driven demand of a range of Council services including stormwater resilience.

Implications of growth/demand

Urban growth will require extensions to the stormwater reticulation to service new residential subdivisions and, in some cases, upgrading the capacity of existing pipes.

More stringent environmental standards relating to the quality of stormwater discharges to natural watercourses may require Council to consider options such as:

- management of silt run-off from development earthworks areas
- management of contaminants associated with urban run-off in the urban areas
- management of point source contamination risk from commercial and industrial areas
- management of other point source contamination risk.

Council will continue to work proactively with key stakeholders in this regard, to advocate sensible solutions on behalf of the community and implement strategies and programmes as appropriate.

There are no major projects required to meet increased demand in the 30 year period.

Demand management strategies

Public education

Although there is no formal education programme, WWS publish articles on a regular basis in the Council's "First Edition" quarterly newsletter. The newsletter is distributed to all residents and ratepayers. No specific public education programmes are planned in relation to stormwater.

Low impact design

Rain gardens and swales can provide a mix of storage/detention and soakage. There may be the opportunity in the future to use non-pipe solutions for stormwater issues in some areas. Council reviewed its Subdivision and Land Development Bylaw which enables the implementation of such technologies where appropriate however it is noted that few developers have yet to consider them in much detail. This is also an area that Council will consider in more detail as existing infrastructure reaches the end of its useful asset life.

Detention and retention tanks

Many larger city councils are now insisting on the installation of detention or retention tanks on new houses to take the pressure off infrastructure by removing peak flows. Detention tanks collect stormwater in a rain event and release into the network by a restrictor, thereby preventing excessive return rates or volumes at peak flows.

A retention tank collects stormwater so that it can be used for household use. Many households in rural Southland already collect roof water for drinking but there are opportunities in urban areas to collect roof water for non-potable purposes. This will be further considered through the next review of the Subdivision and Land Development Bylaw where the appropriateness of such measures, especially in areas with limited reticulated assets will be considered. It is noted that a number of Councils are now making this a mandatory requirement for new developments.

Plans programmed to meet growth/demand changes

Given the limited nature of Council stormwater infrastructure and considering that the primary purpose is to manage surface water flooding primarily of the urban roading network, and the limited expected growth it is not anticipated that a specific programme will be required to manage people related growth.

Further work will be undertaken in the upcoming three years to more fully understand the impact of climate change related demand.

Sustainability

The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and to meet the current and future needs of communities for good quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost effective for households and businesses..

At the stormwater activity level, this approach is demonstrated by the following:

- promotion of low impact stormwater design for new developments where appropriate
- further develop an understanding the implications of climate change on the management of the stormwater activity
- undertake appropriate improvements to ensure any consenting requirements are met for the activity in an affordable, sustainable manner

The ability to improve the sustainable outcomes in the provision of infrastructural services is highest during the planning and design phase. Asset type, location and design can significantly impact sustainability outcomes, eg accessibility, urban form, land-use, heritage, health and wellbeing. Good planning and design can lead to improved economic and social benefits.

The operation of infrastructure has ongoing impacts - particularly as they relate to energy use and emissions, runoff, noise, light, ecological impacts, safety, etc. Operation can provide ongoing employment and economic benefit.

The stormwater activity contributes to the sustainable development across the district by provision of:

- adequately sized stormwater collection system to ensure properties are protected from flooding.
- adequate protection of stormwater from contamination with sewage and other contaminants to enhance public and environmental health.

Social and cultural considerations

The stormwater activity provides one of the building blocks for safe, healthy communities. This activity management plan aims to provide a system that is continuously available for the drainage of stormwater. The Plan utilises maintenance and renewal strategies to replace assets prior to failure, and to upgrade capacity where required and to minimise times when the service is unavailable to any property.

Environmental considerations

Council holds consents for the discharge of stormwater to rivers and streams across the district.

The consents include conditions requiring Council to monitor the discharges and where contamination is found, to trace this to source and to have corrected. Further conditions require industrial properties to be audited to ensure production practices are not contaminating stormwater and the hazardous substances are appropriately contained.

Council seeks to operate the activity in ways that minimise the use of resources and effects on the environment. Strategies include:

- selection of plant and pipe material to maximise useful service life
- minimisation of wastage during construction
- where appropriate encourage on site soakage as a means of stormwater management
- use of low impact stormwater designs including attenuation ponds where appropriate to reduce the risk of stormwater contamination.

Economic and financial considerations

Council's goal is to continue to provide the stormwater activity in ways which achieve the desired levels of service in the most effective manner by:

- recognising the consumption of assets over their lifetime and funding renewal through depreciation
- separately itemising capital versus operational expenditure
- allocating costs and preparing forecasts over the long term (30 years and beyond)
- reporting on financial performance
- researching and identifying practical and cost effective alternative service delivery options

Key projects

The following table identifies key projects that it is proposed to undertake through the ten year period of the 2021/31 LTP

LOCATION	DESCRIPTION	BUDGET	YEAR (S)
Riverton	Investigate Havelock St-Kerb and channel	$50K	21/22 - 22/23
Lumsden	Reticulation upgrade Southeast catchment and pre-investigation	$483K	21/22 – 24/25
Various	Coastal Plan Resource Consent preparation Riverton,Waikawa,Stewart Island, Orepuki,Colac bay	$150K	30/31
**Edendale/Wyndham	Investigation - Mains & Manholes renewal - Subsoil drainage required Wyndham	$3190K	21/22 25/26 – 26-27
Limehills	Mechanical cleaning of open drains	$57K	24/25 30/31
Mossburn	Change of soakholes to comply with Discharge Consent	$104K	22/23 – 23/24
Nightcaps	Investigation & stormwater renewals	$444K	24/25 26/27
Ohai	Investigation & stormwater renewals	$455K	25/26 27/28
*Orepuki	Upgrade stormwater main to main road	$240K	22/23
Otautau	Investigation & stormwater renewals	$492K	28/29 30/31
Riversdale	Renew soakholes to comply with Discharge Consent.	$53K	22/23 – 23/24

Riverton	Taramea Bay- outfall improvement investigation	$51K	21/22 – 22/23
*Riverton	Towack Street Upgrade	200K	
*Stewart Island	Stormwater improvement Town Centre, Main St, Ayr St, Argyle Sts	$407K	21/22
Te Anau	Stormwater discharge improvements to surface water	$222K	25/26
*Te Anau	Stormwater improvements to Mokonui Street / Towncentre junction	$60K	21/22
*Waianawa	Replacement of stormwater main	$400K	21/22
Winton	Investigate & replace Storm main.	$5.6M	21/22 – 30/31
Winton	Longwood road to Price Road	$350K	27/28
*Woodlands	Stormwater Upgrade	$400K	21/22
*District Wide	Condition and performance assessment of piped assets	$500K	

Table 8: Key projects

*Denotes funder through Government Stimulus Funding Programme.

** At this stage the stimulus funding will cover the cost of the first tranche of upgrades in Wyndham with others funded through other mechanisms predominantly loans. Further stages are programmed for 2025/26 and 2026/27.

Our levels of service

Levels of service, performance measures and targets

Levels of service (LOS), performance measures and targets form the performance framework for the activity detailing what Council will provide, and to what level or standard:

LOS are the outputs that are expected to be generated by the activity. They demonstrate the value being provided to the community or reflect how the public use or experience the service. A key objective of activity planning is to match the level of service provided with agreed expectations of customers and their willingness to pay for that level of service.

- performance measures are quantifiable means for determining whether a LOS has been delivered
- performance targets are the desired levels of performance against the performance measures.

The levels of service provide the basis for the management strategies and works programmes identified in the AMP. By clarifying and defining the levels of service for the activity (and associated assets), Council can then identify and cost future operations, maintenance, renewal and development works required of the activity (and associated assets) to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

Table 0-8 details the levels of service, performance measures and performance targets for the stormwater activity. The italicised/grey measures are monitored for internal management/self-assessment purposes and as such are not reported publicly in the LTP. The table sets out Council's current performance and the targets it aims to achieve within the next three years and by the end of the next 10 year period.

Removal of LOS category

The main points covered in the LOS below are:

- minimise impact of urban flooding
- promote the environment by using sustainable services
- provide a reliable, efficient stormwater service.

Over the next 10 years, Council's intention for this activity is generally to maintain the current performance in relation to flooding complaints and improve performance in the following areas:

- the delivery of projects
- understand implications of resource consent conditions and prioritise any upgrades in a sustainable manner that delivers best environmental outcomes in an affordable manner.

Response to customer requests (current low performance in this area is mainly attributable to closing out of service requests in the customer service system). Compliance with resource consent conditions as required by Environmental Southland's Discharge Plan. (As the overall cost of meeting this compliance is not fully understood it is only being forecasted to meet 70% compliance by the end of this 10 year period as Council must also consider affordability issues for some of these communities. Agreement will be reached with ES over timing and prioritisation of improvement works).

Changes to the performance framework

- the levels of service and key performance indicators have been reviewed following a benefits mapping exercise to ensure Council's performance framework is focussed on measuring the activity benefits at the outcome and objective level. As a number of measures are mandatory they cannot be significantly altered. Other non-mandatory measures are considered fit for purpose.

STORMWATER: The level of service (LoS) we provide	**LoS 7: Provide a reliable stormwater system that protects public health and the environment**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI 7.1: **System adequacy** - Overflows resulting from the stormwater system that result in the flooding of a habitable floor[1] c) The number of "flooding events" that occur within the district. d) For each flooding event, the number of habitable floors affected (expressed per 1000 properties connected to the stormwater system).	a) 0 b) 0	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1
KPI 7.2: **Response to stormwater issues** - The median response time between the time of notification and the time when service personnel reach the site when "habitable floors" are affected by flooding resulting from faults in the stormwater system.	There were no flooding events to habitable floors in the year	≤ 2 hours	≤ 2 hours	≤ 2 hours	≤ 2 hours

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KPI 7.3: **Customer satisfaction** – The number of complaints received about the performance of the stormwater system, expressed per 1000 properties connected to the stormwater system.	9 per 1000 properties	≤ 15 per 1000 properties	≤ 15 per 1000 properties	≤ 15 per 1000 properties	≤ 15 per 1000 properties
KPI 7.4: **Management of environmental impacts -** Compliance with the resource consents for discharge from the stormwater system, measured by the number of: (e) abatement notices (f) infringement notices (g) enforcement orders (h) successful prosecutions, received in relation to those resource consents.	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0
KPI 7.5: Percentage of monitoring results that show compliance with resource consent conditions.	Not measured (awaiting Environment Southland consent requirements)	100%	100%	100%	100%

1 – Habitable floor refers to a floor of a building (including a basement) but does not include ancillary structures such as stand-alone garden sheds or garages. A flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor.

Table 9: What we plan to do and out levels of service (LoS)

Plans Programmed to meet the Level of Service

The list below details any projects, initiatives, programmes or expenditure that Council is planning to undertake to ensure that the level of service is achieved and/or to address any gaps between the targets and current performance. Where there are capital works projects related to improving levels of service (LoS) or maintaining levels of service (Renewal – R), these are identified in the Activity and Asset management section under the heading: Upgrading and developing new assets for levels of service and demand.

Over the next 10 years, Council's intention for this activity is generally to maintain the current performance in relation to flooding complaints and improve performance in the following areas:

- the delivery of projects
- compliance with expected national and regional plan requirements
- response to customer requests (current low performance in this area is mainly attributable to closing out of service requests in the customer service system)
- comply with resource consent conditions as required by Environmental Southland's Discharge Plan. As the overall cost of meeting this compliance is not fully understood it is only being forecasted to meet 70% compliance by the end of this 10 year period as Council must also consider affordability issues for some of these communities. Agreement will be reached with ES over timing and prioritisation of improvement works.

Stormwater consenting

Applications for resource consent for discharges from 17 townships have recently been finalised and granted by Environment Southland. Four global consents covering 17 townships were issued in late 2018 and take a risk based approach to sampling and monitoring. The applications are being processed based on risk. When considering risk Environment Southland have taken into account the following factors

- scale of discharge

- nature of discharge eg urban, rural, industrial etc
- sensitivity of receiving environment.

Monitoring to date has identified a number of areas where non-compliances indicate areas where further investigation is required – these include Te Anau, and Winton where high levels of E. Coli indicated potential cross connections. The following table summarises the monitoring results of each township (current as of May 2020).

TOWN	NUMBER OF SAMPLE/TEST	NUMBER COMPLIANT	NUMBER NON-COMPLIANT
Balfour	6	6	0
Browns	2	1	1
Dipton	4	3	1
Edendale	12	12	0
Lumsden	6	6	0
Manapouri	8	8	0
Mossburn	9	2	7
Nightcaps	6	5	1
Ohai	6	6	0
Otautau	6	6	0
Riversdale	6	6	0
Te Anau	27	26	1
Tokanui	3	3	0
Tuatapere	4	4	0
Waikaia	2	2	0
Wallacetown	9	9	0
Winton	31	27	4
Totals	**147**	**132**	**15**

Table 10: Monitoring data

Monitoring results have identified a number of areas where further investigation work will be required and potentially drive the need to undertake upgrades in certain areas, particularly in Winton and Mossburn.

Once conditions are more fully understood options for upgrades will be considered. These include attenuation ponds, filtration chambers, grass swales, sub soil drainage and upgraded soak pits. Forecasts include extra costs for monitoring where appropriate and also some capital projects for improvement of the water being discharged.

Activity and asset management

Overview of management

Lifecycle asset management means considering all asset management options and strategies to deliver the agreed level of service and to inform decision-making for asset renewal, replacement, upgrade and disposal. Effective lifecycle planning is about making the right investment at the right time to ensure that the asset delivers the desired level of service over its full-expected life, at the minimum total cost. This section explains the approach for:

Providing new or upgraded assets to improve service levels, providing for growth and demand

Operating and maintaining assets

Renewing or replacing assets

Disposing of assets at the end of their useful life.

All asset data has been extracted/reported as at July 2019.

Overview of the stormwater assets

Southland District Council manages a number of stormwater networks across the district totalling some of 113 km of pipe, most of which is earthenware, concrete or asbestos cement, and estimated to have a design life of 80-100 years. In addition there are approximately 24 km of open drains, mostly situated in the rural areas such as Limehills as well as towns such as Otautau, Lumsden, Winton and Te Anau.

Asset value and depreciation

The scheme values and depreciation information below is from the 2020 valuation.

ASSET COMPONENT	REPLACEMENT COST $	DEPRECIATED ASSET VALUE $	ANNUAL DEPRECIATION $
BALFOUR	487,293	129,690	5,504
BROWNS	150,237	61,250	1,639
COLAC BAY	84,972	48,135	932
DIPTON	106,868	60,104	1,189
EDENDALE	802,927	593,311	9,151
LIMEHILLS	215,442	139,570	2,572
LUMSDEN	961,674	317,899	10,748
MANAPOURI	1,568,311	913,405	17,626
MONOWAI	89,093	52,940	1,048
MOSSBURN	54,546	22,434	609
NIGHTCAPS/WAIRIO	1,467,358	781,134	16,356
STEWART ISLAND	1,359,251	1,035,900	15,257
OHAI	1,282,959	242,015	15,398
OTAUTAU	1,282,740	302,162	14,562
RIVERSDALE	417,337	134,807	4,871

ASSET COMPONENT	REPLACEMENT COST $	DEPRECIATED ASSET VALUE $	ANNUAL DEPRECIATION $
RIVERTON	2,373,192	1,293,803	28,287
TE ANAU	11,363,284	6,912,421	134,185
THORNBURY	130,767	37,450	1,574
TOKANUI	107,458	32,978	1,229
TUATAPERE	1,048,519	456,487	12,208
WAIKAIA	103,975	28,915	1,261
WALLACETOWN	991,372	677,591	10,766
WINTON	8,578,046	3,622,939	98,486
WOODLANDS	23,698	4,323	278
WYNDHAM	3,059,270	164,120	34,265
TOTAL	38,110,600	18,065,759	440,103

Table 11: Asset Value and Depreciation

Information relating to remaining asset lives is available through the Infor (IPS) database and summarised in Council's annual valuation report.

The following assumptions have been made in the preparation of the valuations:

1. That all asset data has been reviewed and updated.
2. That all valuations are based on the "Modern Equivalent Replacement Cost" (MERC) basis.
3. Where new technology is available or where present assets do not require full replacement, adjustments have been made.
4. That stormwater laterals have not been included in the valuation.
5. The asset lives have been reviewed.

Asset condition and performance

Information on condition of the pipe network is limited, with knowledge of condition based on limited maintenance records, and the knowledge and experience of staff and contractors. While there are a relatively small number of pipe system blockages it is considered that given the age of some of the networks that replacement of pipes will be required in the upcoming ten-year periods and that previous deferment of significant renewals is no longer a sustainable asset management option.

The main causes of pipe failure are:

- root intrusion
- open joints on pipes laid prior to 1980 allow the intrusion of roots which can restrict capacity and eventually block the pipe, and is a major maintenance cost, particularly in areas with street trees and stormwater pipes laid in grass berms. Areas of Wyndham and Winton are known to suffer as a result of excess tree route intrusion.
- manholes - many of the manholes constructed before 1950 were of brick construction, and some of these have partially collapsed, with subsequent slumping of road surfaces and have, therefore, required replacement. There is a potential of more of these manholes collapsing.
- open drains - the open drainage system is inspected regularly and maintained in good condition through an active operational maintenance programme which includes control of vegetation by

trimming or spraying, regular inspection and removal of rubbish, and annual programme to remove silt as necessary.

The following strategies are used to monitor the condition of stormwater assets to feed into upgrading and renewal programmes, and to ensure that levels of service are maintained, and assets upgraded or renewed in the most timely and cost effective manner. Monitoring of the various assets clauses include:

Pipe networks

- maintenance records: request for service, records of maintenance activities and inspections of pipes during repair are analysed to assist in rating of pipe condition.
- CCTV inspections: critical assets are inspected by CCTV and condition is graded in accordance with the guidelines in the New Zealand Pipe Inspection Manual
- pipe material testing: Samples of pipe are physically tested to determine condition and decay rates.

Future operations and maintenance (O&M) budgets will be increased across the district to allow for an expanded condition assessment programme of works to help gain a better understanding of our networks and to help define, manage and prioritise capital works programmes. As a starting point it is proposed to allow a budget within each year of the plan to undertake condition assessment work across 7.5% of the network per year to allow a more thorough indication of performance and condition of the stormwater networks and use this information to develop more robust capital works renewals programmes.

Open drains are periodically visually inspected with appropriate repair undertaken on damaged sections. In addition regular programmed mechanical cleaning of open drains is undertaken in areas where they are known to silt up. These include Limehills/Centre Bush and areas such as Orepuki and Colac Bay. In addition stormwater outfalls in Riverton require mechanical cleaning following high tide events in order to prevent them filling with sand and gravel.

At present there is limited information available on the current condition of our stormwater assets. In 2015 a district-wide investigation fund was established to help better understand data requirements and improve data integrity. Significant work was undertaken in Lumsden, Manapouri and Winton in support of this work with data updated in both Infor (IPS) and GIS as a result. This will continue through successive plans. For the 2021 LTP it is proposed to increase the district funded budget to $100K per year (subject to Council approval and noting a move to district funding of the activity as a whole).

The following table provides a high level overview of the age and performance of the networks noting that for a number of schemes there is limited if any information on condition. It is proposed to address this across the life of the LTP by increasing operational budgets to allow for additional condition assessments across all networks.

SCHEME	INSTALLED (DECADE)	COMMENTS
BALFOUR	1950	Resource consent required. No known performance issues. Limited information on condition available.
BROWNS	1955	Potential cross contamination issues require further investigation. Resource consent now operative. Limited information on condition available.

SCHEME	INSTALLED (DECADE)	COMMENTS
COLAC BAY	1980	No known performance issues. Network condition unknown.
DIPTON	1980	Cross connection issues require further investigation Resource consent now operative. Limited information on condition available.
EDENDALE	Est 1935	Location of a number soakholes are unknown. Known soakholes were re-drilled in June 2011 to remove blockages. Resource consent now operative. Limited information on condition available.
LIMEHILLS/ CENTRE BUSH	1994	Potential contamination from septic tank connections to open ditches. Open channels have programmed cleaning included in budgets.
LUMSDEN	1970	Flooding in certain areas of the southern catchment. Investigation to scope out potential solution will be undertaken 2020/21. Resource consent now operative. Limited information on condition available.
MANAPOURI	1960	No known performance issues Resource consent now operative. Limited information on condition available
MONOWAI	1979	No known issues. Network condition unknown.
MOSSBURN	1966	Soakholes on state highways known to flood in heavy rain Resource consent now operative. Monitoring indicates contamination potentially from run-off from state highway.
NIGHTCAPS	1953	Resource consent now operative. Upgrades undertaken Dryffe Street 2015. Condition information available for parts of the network.
OHAI	1950	Resource consent now operative. Future renewals require planning before end of life. Limited

SCHEME	INSTALLED (DECADE)	COMMENTS
		information on network condition available.
OREPUKI	1980	Potential that stormwater discharge is contributing to erosion which may encroach on neighbouring private property.
OTAUTAU	1949	Resource consent now operative. Limited information on network condition available.
RIVERSDALE	1960	High watertable may be contributing to infiltration in certain areas of the catchment. Resource consent now operative. Future renewals require planning.
RIVERTON	1974	Future renewals require planning. Condition information available for parts of the network.
OBAN	1955	Areas of mixed pipe size/material around village and localised areas of surface flooding around Ayr Street and Main Road-Argyle Street where stormwater system inadequate. Limited information on network condition available.
TE ANAU	1960-70	Localised flooding around town centre under heavy rain Resource consent now operative. Condition information available for parts of the network.
THORNBURY	1980	No known issues.
TOKANUI	1958	Resource consent now operative. Limited information on network available
TUATAPERE	1960	No known performance issues Resource consent now operative. Limited information on network condition available
WAIKAIA	1960	Potential contamination from septic tank connections. Resource consent now operative.
WAIKAWA	Unknown	No known issues.
WAIRIO	1953	No known issues
WALLACETOWN	1988	Resource consent now operative. Limited information on network condition available.

SCHEME	INSTALLED (DECADE)	COMMENTS
WINTON	1930	Further investigations of industrial discharges will be undertaken as part of new consent requirements. Condition information available for parts of the network.
WOODLANDS	1950	Limited Council infrastructure Potential contamination from septic tank connections.
WYNDHAM	1935	Extra drainage work will be required due to ponding after recent sewer upgrade works. Resource consent now operative. Future renewals will need to be phased to ensure affordability. Recent CCTV work has identified areas of priority. Condition information available for parts of the network known to be in poor condition.

Table 12: Stormwater Networks Condition and Performance

The table indicates where there is limited information available to fully understand the age, condition and performance of stormwater assets in a number of areas across the district. As a consequence a key focus of the proposed plan is to improve knowledge in areas through development of a detailed condition assessment programme which will be funded partially through introducing a condition assessment budget as well as utilising the Stimulus funding grant money received from central government.

Asset age and life expectancy

Typical asset lives are detailed in the following table. Where appropriate aged assets will continue to remain operational beyond end of life as a means of deferring significant capital expenditure. This is certainly seen as a prudent strategy in areas with static or declining populations. Where renewals are required consideration will be given to use of 'no dig' technologies including structural liners and pipe bursting.

ASSET TYPE	ASSET DESCRIPTION	LIFE (YEARS)
STORMWATER CLEANING EYE	Cleaning Eye	60
STORMWATER CHANNEL	Channel	80
STORMWATER CULVERT	Culvert	60
STORMWATER MANHOLE	Concrete Manhole	60
STORMWATER SOAKHOLE	Lined Soakhole	35
	Unlined Soakhole	25
STORMWATER GRAVITY MAIN	AC	80
	Concrete	80
	Concrete RRJ	80

ASSET TYPE	ASSET DESCRIPTION	LIFE (YEARS)
	Concrete SR	80
	EW	90
	Plastic	80
	Plastic Slotted	80
	PVC	100
	PVC-FT	90
	PVC-M	100
	PVC-U	100
	Steel	90
	Unknown	65
	VC	90
	Wood	60
STORMWATER SUMP	Sump	60

Table 13 Asset type

Based on these projected lives the following graph provides an indication of expected remaining lives of all stormwater network infrastructure

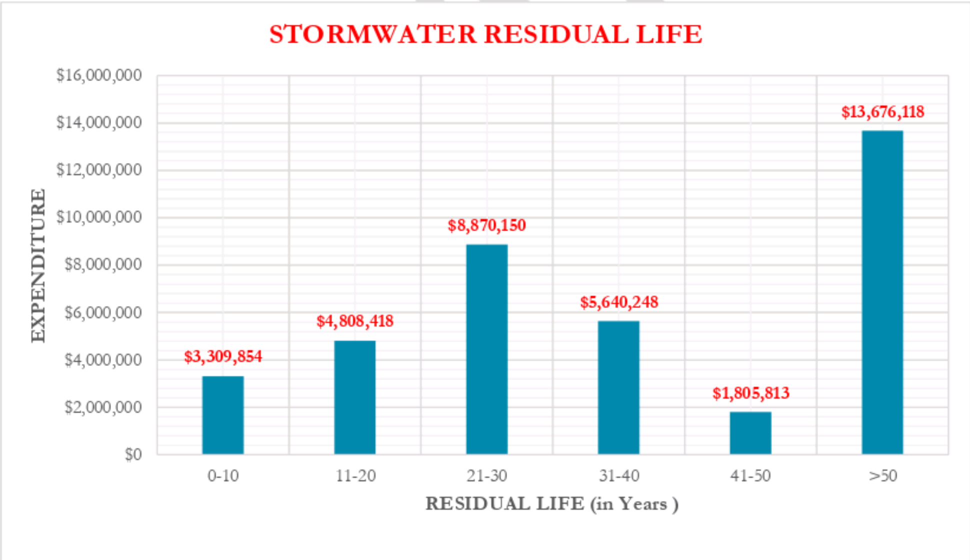

Figure 7: Stormwater residual life

Based on these expected lives and the known age of networks across the district it is apparent that it is appropriate to consider a step change in capital investment required to replace these ageing assets and maintain the current levels of service. This is particularly relevant in older townships including Winton and Wyndham where the oldest infrastructure dates back to the 1930s, and should therefore be considered as aged and therefore ready for replacement.

Where investigations indicate assets are due for renewal Council will consider what if any options are appropriate to consider. It is noted that alternative 'no dig' technologies such as structural lining of existing pipework is becoming a more popular method of extending the life of the pipework. It is noted that such techniques should be undertaken by specialist contractors which may add additional cost. When considering this approach, it is noted that a lining programme is likely to require a reasonably extensive lining programme to be able present itself as a viable alternative to the more traditional open trenching.

Data source and confidence

ACTIVITY	RELIABILITY	COMMENTS
ASSET DESCRIPTION	Uncertain	Description data is available in Infor (IPS) and will be reviewed/updated as further information is received via maintenance contractors
VALUATION	Uncertain	Annual valuation now undertaken. As part of the review process we are considering what opportunities are available to refine the valuations process so that more scheme specific information could be utilised, rather than generic information. For example, where it is known that the asset life of asbestos cement pipes is adversely affected by ground conditions the asset life of these pipes will be altered to reflect this, this will have an impact on the valuation for that scheme. In addition, stormwater laterals have not been included in valuations to date.
CONDITION AND PERFORMANCE	Uncertain	There is limited data regarding performance of stormwater systems compared with the information available for water and sewerage. Some stormwater sampling is now required through recently issued resource consents. Reactive maintenance will be recorded in Pathway by the roading contractors. Investigation work has been undertaken in Lumsden and Manapouri and with Infor (IPS) and GIS updated as a result.

ACTIVITY	RELIABILITY	COMMENTS
FINANCIAL FORECASTS	Uncertain	Currently estimates have been made based on current market rates, annual asset valuations and direct enquiries. Projects within the first three years should be expected to have an uncertainty of up to +/- 20% with projects in the outer years up to +/- 50%. Currently no capital work will be carried out without the permission of the local CB however new Boards have been warned of the risk to service from further deferment of capital work to minimise rate impacts. There is also uncertainty around the additional costs associated with meeting consent requirements. To date these have not been included in the AMP review.

Table 14: Data Source and Confidence

Approach to operations and maintenance

The purpose of this section is to outline the broad operations and maintenance philosophies for the assets, understand any underlying issues and trends, and set the basis for the O&M financial forecasts.

Operation and maintenance (O&M) of the stormwater network is carried out by two different mechanisms and administered through roading contract managers and Water and Waste team engineers:

- district funded roading contracts
- future district funded stormwater maintenance budgets.

In places there is limited information available on stormwater assets with a need to invest if future condition assessment programmes to help inform future capital works renewals.

Specific information regarding operation and maintenance trends is discussed in the scheme sections.

There are three road maintenance contracts in operation covering the entire Council road network:

- north-west contract (Waimea Alliance) covering the Mararoa-Waimea Ward and parts of the Waiau-Aparima Ward. Currently awarded to SouthRoads
- central area contract (Central Alliance) covering the Winton-Wallacetown Ward and parts of the Waiau-Aparima Ward. Currently awarded to SouthRoads
- south-eastern area contract (Foveaux Alliance) covering the Waihopai-Toetoes Ward and the Stewart Island Rakiura Ward. Currently awarded to Fulton Hogan.

The road maintenance contracts allow for a sump cleaning schedule in order to protect the roading assets.

Pipework maintenance currently tends to be more reactive in response requests for service and generally arises following flooding events. It is noted that a reliance in reactive maintenance is no longer a sustainable option (especially as more assets approach the end of their asset life) and that maintenance budgets will be increased to develop a planned maintenance schedule based on the output from condition assessment work.

Service delivery review

Section 17A of the Local Government Act 2002 requires all local authorities to review the cost-effectiveness of its current arrangements for delivering good quality local infrastructure, local public services and performance of regulatory functions at least every six years.

In 2016 a review was carried out on how the stormwater service is currently delivered. The overall findings of the review are that the 3 waters activities are managed through long term contracts with more than five years left to run and that the current arrangements were appropriate.

As the current operations and maintenance contract for water and wastewater comes up for renewal it is an opportune time to re-consider how O&M activities across the stormwater networks are delivered. While no decision has been made on the contractual model for new arrangements it is considered an opportune time to also include the stormwater activity within new contract arrangements. Work to start developing the most appropriate contract model will get under way in late 2021 with a new contract extended to include stormwater operations and maintenance now expected to commence in July 2023.

Asset performance monitoring

Information related to the stormwater activity is stored in a number of corporate systems. Information relating to the physical assets are stored in Infor (IPS) and displayed spatially on GIS. An exercise is currently under way to evaluate the integrity of the data within each system and identify critical areas where this can be improved. Information relating to customer service requests (RFS) are recorded in the Infor Pathways system. Requests for Service are updated by the maintenance contractor once actioned. Information supplied by the contractors will help identify any follow up work required.

Operations and maintenance strategy

O&M is primarily reactive, responding to flooding incidents and other requests for service. Generally, this just involves clearing obstructions such as pipe or sump blockages or cleaning open drains. There are a number of areas that may have a planned maintenance schedule where a local contractor will routinely inspect and clear problem areas for example desilting of outfalls in Riverton.

Maintenance response time may vary depending of the level of flooding severity or where a risk to public safety (for example from displaced manhole covers) has been identified.

There has been an increase in CCTV inspections to date to several communities, with associated condition reporting, with work undertaken at Wyndham, Riverton, Nightcaps, and Ohai. Generally CCTV work has indicated that the pipework is in a condition consistent with the age of the network.

Operations and maintenance trends and forecasts

Typically, the level of maintenance carried out on stormwater assets is low. Local stormwater systems are funded through local rates at present. Roading stormwater systems (not in townships) are funded through the roading rate (refer to the Roading and Transport section). Rates are used for both capital and operating expenditure, loans and reserves may also be used.

Figure presents the 10 year O&M forecasts. O&M costs in the future will rise because of the requirement to meet discharge consent conditions, increased planned maintenance and additional condition assessments across all networks that are yet to be finalised.

Operating costs increase in through the life of the plan. This is in response to the need for an increased level of planned maintenance and investigation work to help develop a fuller understanding of the age and condition of stormwater assets.

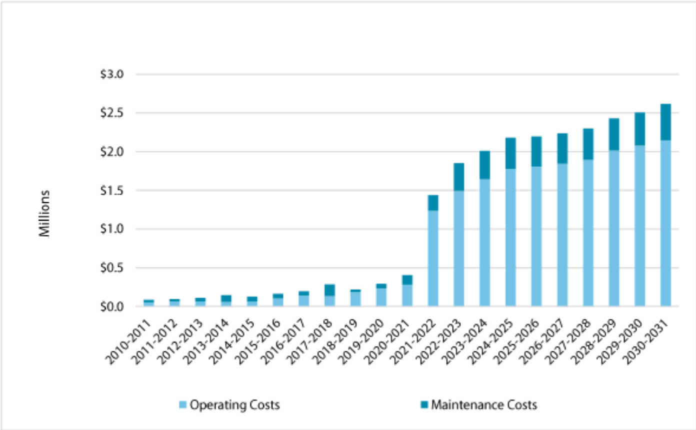

Figure 8: Stormwater Opex Forecasts

Future improvement

There has been an inclusion made in the LTP for ongoing condition assessment and investigation projects. This will be funded as a district wide project to ensure its viability and continued inclusion in future budgets. Assessment and investigation of the condition of Council owned stormwater assets is viewed as a strategic investment to ensure more thorough and correct data is available to enable future stormwater projects to be properly prioritised.

It is further expected that a number of improvements to discharge arrangements to meet consent requirements.

Approach to renewals

Renewal is the replacement (or rehabilitation) of an existing asset without changing its capacity or level of service beyond the original design.

Renewal strategy

Historically there has been some reluctance to fund significant upgrades with communities citing affordability reasons or a desire to keep local rates as low as possible. This has resulted in a renewals backlog which cannot continue in the same vein.

The ongoing replacement or rehabilitation of the stormwater network is carried out as they reach the end of their useful lives and following condition survey. The remaining life and valuation data is stored in the Infor (IPS) database and is used for budgeting purposes. At present the Infor (IPS) database does not adjust the remaining life to reflect condition and performance so decisions for renewal are made by SDC staff following based on staff and contractor local knowledge

Assets are considered for renewal as they near the end of their effective lives, where the cost of maintenance becomes uneconomical, or when the risk of failure of assets is sufficiently high.

Assets that have reached their predicted expiry date as per Infor (IPS) asset lives, but are still serviceable will not be automatically replaced without a detailed condition survey. They may continue to be operated with a greater inspection frequency to ensure they remain fit for purpose.

Renewal decisions are made by asset managers based on the performance and condition of existing assets, the economics of renewing the asset, and their assessment of the acceptability of the risk of asset failure. Renewal decisions are supported by the maintenance contractor based on their knowledge of the systems. The theoretical life expectancies and replacement costs of asset components are used for financial projections.

Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during planned maintenance inspections, operational activity and investigation of customer complaints. Indicators of non-performing assets include:

- structural failure
- repeated asset performance failure
- Overflows
- ineffective and/or uneconomic operation
- insufficient treatment.

The general renewal strategy is to either replace or rehabilitate assets when justified by:

- age and condition - the age or condition of the asset is or will result in a condition based failure
- asset performance - when it fails to meet the required level of service. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets.
- risk - the risk of failure of the asset and associated financial, environmental and social impact justifies action (eg impact and extent of loss of stormwater assets, impact on receiving water body, health risk)
- economics - the cost of maintenance for that asset component is deemed to be uneconomic to continue repairing the asset when the annual cost of repairs exceeds the annual cost of renewal. Economic factors may also come into consideration in order to co-ordinate renewals with the other major works, eg while a tank is empty for inspection or refurbishment/renewal, the associated channels are refurbished at the same time
- to co-ordinate with work on other utilities, eg watermain replacement may be brought forward to coincide with renewals of the footpath under which it runs
- staff knowledge - staff knowledge of the condition may differ to what is stored in the database.

Renewals expenditure may be deferred if the total cost of renewal works is beyond the community's current ability to fund it noting this is not a sustainable approach to sound asset management. If deferral of renewal work is necessary, the impact of this deferral and the ongoing achievement of LOS is assessed. Emphasis is placed on lifecycle planning although the deferral of some renewal works may have no immediate or short-term impact on operations, continued deferral of renewals will eventuate in a liability in the long term. If work is deferred for any reason, this work will be reprioritised alongside the next year's renewal projects and a revised programme established.

Previously some minor renewals have been deferred to undertake through a combined contract with upcoming road works.

Replacement of small items such as culverts and sumps are undertaken by the roading contractor. Major work is designed by engaging appropriate engineering consultants and work undertaken by competitive tender. When looking at renewals, consideration will be given to use of 'no dig' techniques as an alternative to open trench pipe laying.

Renewal past trends and forecasts

The figure below illustrates that historical capital expenditure has not exceeded $500,000 pa. Future renewal expenditure will be dependent on age, condition, affordability and resource consent requirements.

Renewal forecasts are based on age of asset and known information on condition and performance of assets. Condition assessments, CCTV and/or infiltration/inflow assessments will be carried out on any schemes prior to renewal work being undertaken. Expenditure will be deferred where the assessments indicate this is possible to do so.

With the inclusion in the LTP of recurring condition assessment and investigation projects, a more detailed plan will begin to be formed after a number of years of data collection. The collection of the data will enable more specific analysis of remaining asset life to be conducted, this could potentially bring forward or defer planned renewals of stormwater assets based on the findings of the analysis.

The significant expenditure currently forecast in through this ten year plan based on standard estimated useful life shows Wyndham has $3 million renewal in 2027/, this is subject to confirmation from condition assessment of the system in 2025/26 however a number of areas are known to be in poor condition and may be targeted to spread these costs across a number of years.

The graph compares the capital expenditure to depreciation. There are some years where the capital expenditure is greater than depreciation, but in most instances the capital expenditure is lower. Some communities have funds available in reserves, however these reserves are not significant when large replacements such as Winton and Wyndham are required. Affordability will be an issue for many communities when the assets need to be replacement or there is a higher cost due to regulatory requirements. It is also noted that for each year of the Long Term Plan $500K renewals programme has been identified for the replacement of stormwater mains in Winton. This has been programmed at the request of the Oreti Community Board.

The following graph shows capital expenditure trends and forecasts over the past ten years and the next 10 years for renewals.

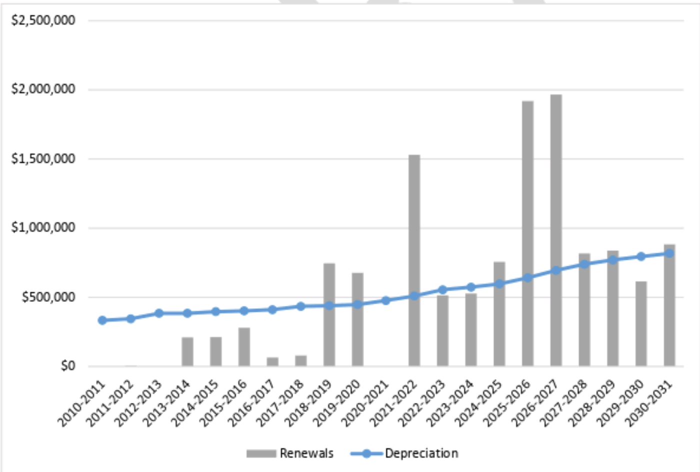

Figure 9: Stormwater Renewal Forecasts (showing depreciation)

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Upgrading and developing new assets for levels of service and demand

Capital investment strategy - level of service and demand

The construction of new assets or increases in capacity of existing assets are carried out in order to close the gap between target service standards and the existing standard being delivered. The gaps may increase or decrease independent of capital works due to the growth in townships, changes in demand on the system, changes in LOS, or changes in the capability of the system. Asset development programmed in this activity plan is based on SDC's current understanding of the requirements to meet the target LOS and predicted future demand which is largely as a result of anticipated resource consent conditions and the upgrades that may be required as a result.

Although the overall strategy is to maintain and renew the existing asset network, demand projects were previously included for Te Anau and Manapouri though are unlikely to be undertaken during the 30 year period as economic growth has resulted in a slowdown in the numbers of developments going ahead. No demand related capital expenditure has been identified over the ten year life of the plan.

Capital investment past trends and forecasts - level of service and demand

Most of the recent past expenditure has been incurred in resource consent applications at 17 schemes across the district. In addition, investigation work has also been carried out into poor bacterial levels in Lake Te Anau, with recently identified cross connection issues rectified. More recent work has been undertaken in Te Anau, Nightcaps and Riverton to address localised flooding issues.

Currently all planned LOS expenditure relates to resource consenting requirements for 17 schemes. Previously all stormwater schemes were unconsented, however, these consents are now imminent and investment may be required to comply with conditions. These will likely be in regards to monitoring and treatment. The requirement to have resource consents for our stormwater schemes is driven by changes to ES Regional Water Plan which took effect from 2010, and the currently notified proposed Water and Land Plan.

There are amounts forecasted in Winton and Te Anau to allow for improvements required due to consent conditions.

LOS expenditure across individual schemes is illustrated in

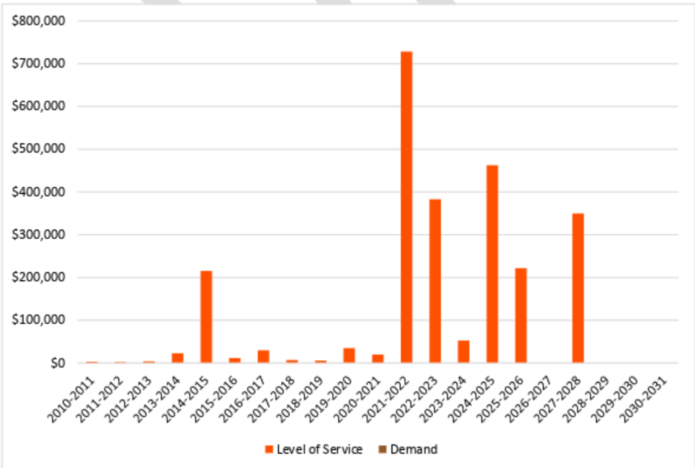

Figure 10: Stormwater LoS and Demand Forecasts

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Future improvement

Future improvement will be driven by the requirements of Environment Southland Regional Water Plan, particularly around potential improvement works required as a result of resource consent conditions. Significant investment may be required to meet the conditions imposed by the resource consents. A review of Environment Southlands Coastal Plan may also require discharges from coastal stormwater schemes to be consented in the future. At present the timing of this still remains uncertain. The impacts of the latter requirements are currently unknown and as such no allowance has been made for capital improvements.

Community board area feedback

Through June 2020 to September 2020 staff presented a high level overview of this activity management plan to each of the nine community boards across the district. The aim of the workshops was to flag the key issues affecting the activity and seek feedback from the boards as to how any issues should be reflected in the plans.

At a high level the following key issues were raised with the boards:

- assets are ageing and in some cases reaching the end of their useful lives
- communities need to plan to renew these strategic assets across the life of the 2021-2031 LTP and beyond
- it is not good asset management practice (or appropriate) to continue to 'sweat' the assets further opting to defer replacement thus passing the issue on the next generation
- capital budgets will need to be increased to enable funding of infrastructure that has or will reach the end of life across the current plan period (Oreti CB request to undertake $500K each year of the LTP period).
- operational costs will need to increase to fund planned maintenance and condition surveys across all of our networks
- recent resource consents are now in place for 17 towns across the district. these will require additional operational budgets to undertake necessary auditing and monitoring as well as following up on any non-compliances
- ongoing reviews at national and regional levels may require further (more stringent) discharge conditions

While feedback was well received a number of concerns were raised. These were relatively consistent across each of the boards and included:

- competing priorities with other activities
- stormwater is a locally funded activity (currently)
- increasing operational and capital budgets
- upgrades may not be affordable across some communities
- availability of government subsidy?
- does asset replacement have to be like for like or is new technology considered when planning renewals

- does this present an opportunity for reviewing funding models local v's district. (It is noted that this discussion also formed a part of separate community board workshops based around the Revenue and Financing Policy.

Asset management improvement

This section summarises the AM practices (data, systems, processes) applied to AM planning. It assesses the current and desired level of practice in relation to the 'AM Maturity Index'[1] and identifies an improvement programme for the next three years. The status of this plan has been self-assessed as being of 'core' status in all areas. SDC will be working towards 'intermediate' status for the larger (>2,000 people) communities of Riverton, Te Anau and Winton.

The following table summarises the status of improvement projects identified in the previous improvement plan. While many projects have had some work undertaken, a number are incomplete. To support improved delivery of this AMP improvement plan, it will be subject to formal project management and regular reviews by respective asset managers.

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
CAPACITY DATA **DEMAND FORECASTING PROCESSES** **CAPEX CONTRACT MANAGEMENT**	Capital development works planning	Understand network capacity.	Partially completed for larger communities. Build knowledge and understanding across next 3 years and beyond.
		Document process for determining demand projections considering all demand influences and analysing usage/capacity trend information and identifying implications.	Partially completed though requires review in light of climate change predictions. Ongoing
CONDITION DATA **PERFORMANCE DATA** **ASSET LIFE DATA** **FINANCIAL DATA** **FAILURE PREDICTION** **RISK MANAGEMENT STRATEGY** **OPTIMISED DECISION MAKING**	Capital renewal works planning	Develop and document process for monitoring critical assets. Review CCTV programme.	Partially complete 10 year programme developed
		Document data capture process.	Partially complete – review 2021/22 following implementation of asset meta data standards.
		Review and document processes for capturing and analysing lives, incorporating factors which influence asset lives.	Not completed though asset lives have previously been amended within IPS where data failure rates indicate assets

1 NAMS International Infrastructure Management Manual, 2011

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
			are likely to fail before the end of their useful lives.
		Include unit rates used in current contracts (incorporating factors which influence costs)	Completed.
		Develop process for predicting condition decay based on pipe failure records	Not completed. Consider through 2022
		Identify critical assets and undertake more detailed risk assessment. Develop process for routine review of risk	Partially completed. This will be updated through a future criticality workshop
		Develop process to analyse maintenance/renewal options	Will be updated based on need to start planning for renewals at end of life. To be developed across life of this AMP
ASSET CATEGORISATION **LOCATION DATA** **PHYSICAL ATTRIBUTES DATA** **O & M DATA** **O & M MONITORING** **ASSET REGISTER SYSTEM** **MAINTENANCE MANAGEMENT SYSTEM**	Data collection and processes	Develop documented procedures for collection, entry and quality assurance.	Partially completed with draft Asset Master Data Specification released. Ongoing – complete 2021
RISK MANAGEMENT DATA **AM IMPROVEMENT**	Asset management improvement	Review risk data routinely.	Partially completed - reviewed annually (Estimates process) but not formally recorded.
		Develop project task sheets for each planned improvement activity.	Not completed. To be completed 2021
LEGISLATIVE COMPLIANCE	AM staff resources	Review processes in place to keep staff abreast of legislative change.	To be completed 2021 - library system to be developed and implemented.

Table 15: Improvement projects

Financial summary

Significant issues impacting on stormwater budgets across the life of this plan include:

- there have been significant increases in both opex and capex budgets to allow development of a condition assessment programme to help better understand condition and performance of the networks as well as an increased level of routine maintenance
- it is also proposed to increase the current district funded budget from $33k per year to $100k per year to allow further data quality improvements to be undertaken
- opex budgets also include funding to undertake auditing and investigation of networks where consent monitoring indicates potential non-compliances
- capex budgets have been increased where performance and age profiling indicate that the networks have reached or are close to reaching end of their useful asset lives.

Ten year financial forecast

Example from the LTP 2018:

The following graphs/table summarise the financial forecasts for the activity over the ten years.

1.1.1. Financial summary

Stormwater	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	-	-	-	365	377	391	398	408	421	424	439	456	457
Targeted rates	342	335	446	485	757	1,484	1,666	1,823	1,905	1,973	2,113	2,284	2,363	2,452
Subsidies and grants for operating purposes	-	-	-	-	250	-	-	-	-	-	-	-	-	-
Fees and charges	2	1	1	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	51	52	46	62	35	35	35	35	35	35	35	35	36	36
Local authorities fuel tax, fines, infingement fees, and other receipts	-	-	8	-	-	-	-	-	-	-	-	-	-	-
Total operating funding	**395**	**388**	**502**	**547**	**1,406**	**1,896**	**2,092**	**2,256**	**2,348**	**2,429**	**2,573**	**2,758**	**2,855**	**2,944**
Applications of operating funding														
Payments to staff and suppliers	172	109	163	274	727	1,135	1,257	1,408	1,418	1,455	1,494	1,536	1,579	1,653
Finance costs	-	-	-	-	19	27	43	53	75	99	135	155	162	169
Internal charges and overheads applied	112	109	130	154	711	718	756	772	778	735	806	897	929	966
Other operating funding applications	-	(0)	-	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding	**284**	**218**	**293**	**428**	**1,458**	**1,880**	**2,055**	**2,233**	**2,271**	**2,339**	**2,436**	**2,587**	**2,671**	**2,788**
Surplus (deficit) of operating funding	**111**	**170**	**209**	**119**	**(51)**	**16**	**36**	**23**	**77**	**91**	**137**	**171**	**184**	**156**
Sources of capital funding														
Subsidies and grants for capital purposes	-	135	20	-	1,708	-	-	-	-	-	-	-	-	-
Development and financial contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	- 16	398	647	- 33	443	851	580	1,181	1,317	1,967	1,166	599	615	891
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**(16)**	**532**	**667**	**(33)**	**2,152**	**851**	**580**	**1,181**	**1,317**	**1,967**	**1,166**	**599**	**615**	**891**
Applications of capital funding														
Capital expenditure														
- to meet additional demand	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- to improve the level of service	7	6	35	20	728	383	53	463	222	-	350	-	-	-
- to replace existing assets	80	745	677	-	1,530	515	527	757	1,919	1,967	817	839	615	884
Increase (decrease) in reserves	8	(49)	164	65	- 134	- 6	60	8	- 723	115	161	- 45	208	188
Increase (decrease) in investments	-	-	-	-	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)
Total applications of capital funding	**95**	**703**	**876**	**85**	**2,100**	**867**	**616**	**1,204**	**1,394**	**2,058**	**1,304**	**770**	**799**	**1,047**
Surplus (deficit) of capital funding	**(111)**	**(170)**	**(209)**	**(119)**	**51**	**(16)**	**(36)**	**(23)**	**(77)**	**(91)**	**(137)**	**(171)**	**(184)**	**(156)**
Funding balance	-	-	(0)	-	-	- 0	- 0	-	-	0	-	0	0	0

Figure 11: Stormwater budgets

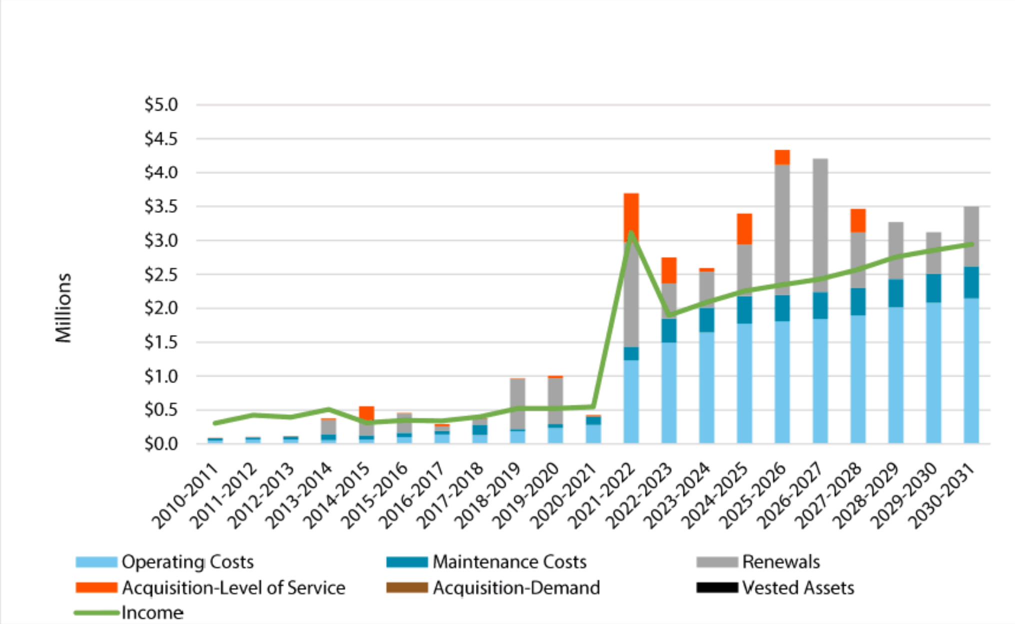

Figure 12: Stormwater total expenditure (district-wide)

1.1.2. Total income

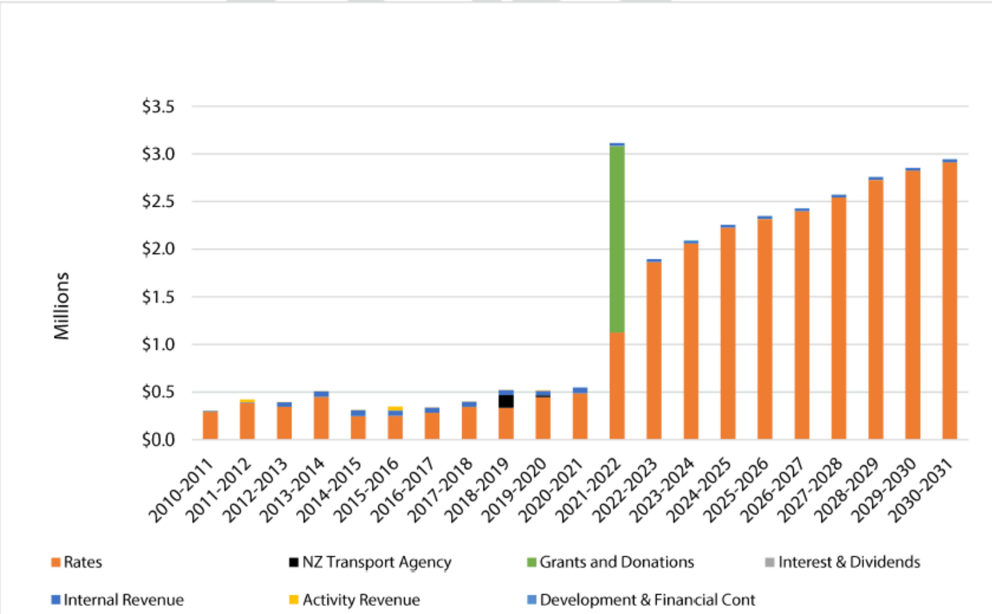

Figure 13: Stormwater total income

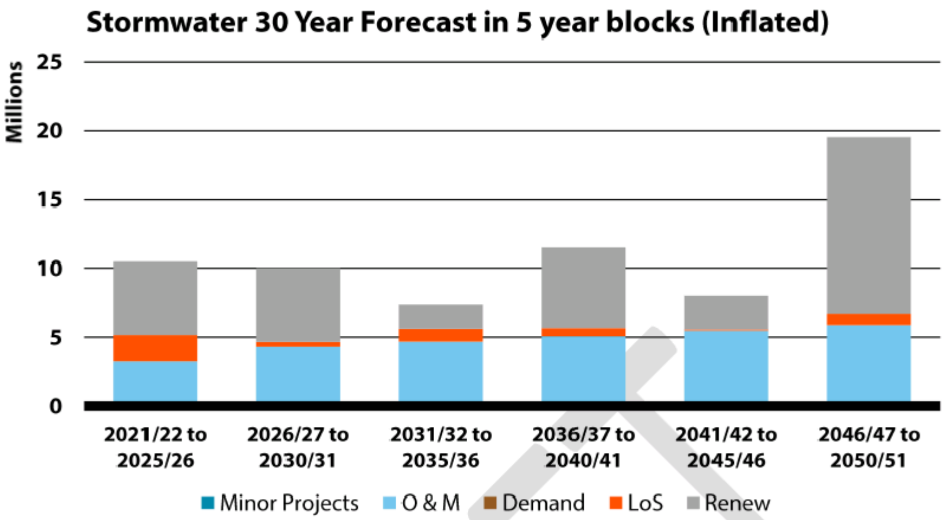

Figure 14: 30 Year Expenditure Forecasts (from Infrastructure Strategy)

Financial forecast summary

In order to ensure the long term sustainability of a number of these schemes future renewals will be planned and prioritised on the basis of age and condition and known issues. As a matter of priority renewals will be planned for the Wyndham and Winton townships – those being the oldest networks.

The following assumptions have been made in the preparation of this activity plan:

1. That information held in the INFOR (IPS) asset register is of a level of accuracy that does not fully allow a programme of works to be established and also relied on staff and contractor knowledge and experience.
2. That all communities strive to achieve the LOS set out within this document.
3. That the options for addressing issues identified during the course of the AMP process should be assessed and that the respective community would prefer the most economically efficient option to be shortlisted against the "do nothing" option. The most economically efficient option was therefore included in the financial programmes.
4. That there will be no material price increases or price increases due to any other industry demands.
5. That legislation will not change during the planning period.

Longer term, renewal requirements will continue to rise as the networks age and level of service expenditure is likely to increase as consent conditions are imposed and more users are required to connect to the system, this is illustrated in the graph below. The graph gives an indicative cost of renewals and LOS based on information related to asset life and capacity predictions. All renewal works will be subject to prior condition assessments and also any other available information including local knowledge.

Given that funding of stormwater improvements is via a local rate, and that some of the communities have a low population base the long-term affordability and sustainability of some these schemes is a high risk to Council.

Future funding options for the delivery of the stormwater activity will be considered through the 2021LTP and will look at a full range of options from fully locally funded through to fully district funded.

Summary of key financial assumptions

This plan has been developed on the assumption that forecast renewals within the ten year period will be subject to additional condition surveys and detailed investigations.

Future changes to operating costs will be influenced by changes to inflation and as a result of scheme upgrades (LOS) to meet resource consent requirements as identified by ES.

Future demand is likely to remain unchanged.

In places there is limited information available on stormwater assets, hence the proposal for at district funded stormwater investigation budget to fund future investigation work to allow improvement in information and thus improve the quality of data in certain areas.

Through the development of the 2021/31 and future LTPs there is an opportunity to review the funding model for the stormwater activity and potentially move more towards a district funded model.

Valuation approach

Statutory financial reporting requirements require SDC to revalue its fixed assets triennially.
Water supply infrastructure assets were last valued as at 30 June 2019 in accordance with New Zealand Accounting Standard 16 (NZIAS-16).

All assets have been valued at the component level (maintenance managed item-MMI) where appropriate.

Funding principles

Section 102(4) (a) of the Local Government Act 2002 requires each Council to adopt a Revenue and Financing Policy. This Policy must state Council's policies in respect of the funding of both capital and operational expenditure for its activities.

In summary, for stormwater, operational and capital expenditure will be funded as follows:

Local stormwater systems are funded through local rates. Roading stormwater systems (not in townships) are funded through the roading rate (refer to the Roading and Transport section). Rates are used for both capital and operating expenditure, loans and reserves may also be used. Changes to the 2021 Revenue and Financing Policy have resulted in funding for the stormwater activity to move from a local rate to a district rate with a full charge for serviced areas and unserviced areas paying a quarter charge.

New developments may also contribute to capital works, or financing costs, through financial or development contributions where applicable. Council's policy around development contributions currently only covers Te Anau, however the policy is currently in remission.

Appendix

Introduction

This section introduces the headings found in the following chapters offering explanations and definitions of information sources, methodologies and terminology common to all networks.

Description

This area describes the current physical scope, condition and performance (measured against target standards) of the assets used in the stormwater activity. This information is the basis for determining future maintenance and capital programmes, and developing appropriate management strategies.

Information has been collated from the databases held in SDC's asset registers and will be reviewed in the development of the next AMP.

There is limited information surrounding the number of connections to the stormwater network.

Asset information has been sourced from historical AMPs, Infor (IPS), and scheme working folders.

Asset condition, capacity and performance

Measuring

During the development of the AMP an assessment of condition and performance was made using grades defined by the New Zealand Water Industry National Asset Grading Standards (see tables below). This revision does not regrade each asset but instead updates grades based on recent information. Projected failure dates have been reviewed with Area Engineers and where appropriate have been adjusted based on local knowledge and experience. It is acknowledged that there is a lack of detailed information on condition and performance of stormwater networks. This will be addressed through this and future plans and will provide the platform for a better developed capital works programme.

Condition and performance grades

GRADE	CONDITION	PERFORMANCE	DESCRIPTION
1	Very good	Always meets technical LOS	No significant adverse short-term impact.
2	Good	Almost always meets technical LOS	Failure will cause localised and serious disruptions to service delivery.
3	Moderate	Generally meets technical LOS.	Failure will cause localised and serious disruptions to service delivery, possible health and safety effects and/or loss of critical data.
4	Poor	Does not generally meets technical LOS.	Failure will cause serious disruption to service delivery over a substantial area, possible health and public safety effects.
5	Very poor	Never meets technical LOS.	Widespread and serious disruption to service delivery, possible health and public safety effects.

Table 16: Condition and performance grade: Courtesy of Maunsell Limited

Confidence grades

GRADE	CONFIDENCE	DESCRIPTION
A	Highly reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented and recognised as the best method of assessment.

GRADE	CONFIDENCE	DESCRIPTION
B	Reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented but has minor shortcomings; for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain	Data is based on sound records, procedures, investigations and analysis that is incomplete or unsupported, or extrapolation from a limited sample for which Grade A or B data is available.
D	Poor	Data is based on unconfirmed verbal reports and/or cursory inspection and analysis.

Table 17: Confidence grades: Courtesy of Maunsell Limited

Grades have been assigned by considering information from a number of different sources. Where a piece of information has a primary contributor it has been assigned a number as follows:

1. INFOR (IPS) database.
2. Advice from staff and contractors.
3. Previous Asset Management Plans 2015 and 2018.
4. Assigned by Council staff based on institutional knowledge.

Assets that have reached their predicted expiry date as per Infor (IPS) asset lives, but are still serviceable will not be automatically replaced without a detailed condition survey. They may continue to be operated with a greater inspection frequency to ensure they remain fit for purpose.

Appendix A: Balfour

Description

The Balfour community had a 2013 usually resident population of 126 with a projected 2018 usually resident population of 145. The number of service connections is unknown.

The scheme is governed by the Ardlussa Community Board under the guidance of technical staff at SDC.

History

1950s - The stormwater system was constructed in the 1950s.

1963 - Wastewater reticulated to separate treatment plant.

1987 - Reticulation extended.

2009 - Consent application lodged with ES.

2019 - Consent granted.

Process description

Balfour's stormwater system consists of pipelines, service connections, manholes, sumps, culverts and open drains.

(a) Reticulation

Balfour's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Balfour, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Balfour's total catchment area is approximately 14 ha and for reference purposes has been broken down into three sub-catchment areas. These sub-catchments feed into three defined outlet channels or ditches as follows:

REF.	CATCHMENT	SIZE	DESCRIPTION
A	Queen Street Central	7 ha	Watercourse east of town.
B	Kruger Street	4 ha	Watercourse at east end of Kruger Street.
C	Queen Street South	3 ha	Roadside drain along Glenure Road.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

The three catchments discharge into the watercourse on the east of Balfour (combined with WWTP) and a roadside drain on the western end of the township along Glenure Road.

Balfour has service connections and therefore requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.92 km	Various	Sufficient
Open drains	0.934 km	Unknown	Sufficient
Sumps	31	Unknown	Sufficient
Manholes	7	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	12	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Asset condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

The number and condition of connections is unknown.

(b) Sumps

The overall grading of Balfour's sumps is good with the majority located on kerbs and having single cast iron grate inlets. All sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

All manholes are circular with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. The manholes are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Pipes

Pipes in the Kruger Street sub-catchments are ageing significantly and their condition should be evaluated by CCTV inspection. There are no CCTV records.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years. All open ditches are maintained in association with the roading asset, with the exception of the open drain east of the sewerage treatment plant.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	4	B	2027+
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	2027
	Manholes	3	3	C	2027
	Soakholes	-	-	-	-
	Culverts	3	3	C	2027
Treatment	N/A	-	-	-	-

This table shows that the reticulation in Balfour will begin to meet the end of economic life in 2027.

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

No critical assets have been identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

The issue for Balfour is the reticulation begins to meet the end of the design life in 2027 and will be subject to a condition assessment prior to this time.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten-year period.

Appendix B: Browns

Description

The Browns community had a 2013 population of 141 with a projected 2018 population of 142 most of which are outside of the township boundary. There are no service connections.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

It is not known when the Browns scheme was constructed (though it is estimated to be around the mid 1950s) and no events have been recorded.

2009 - Resource consent application lodged with ES.

2019 - Resource consent granted.

Process description

The Browns stormwater system consists of pipelines, manholes, and sumps. There are no service connections.

(a) Reticulation

Reticulation is limited. Some information has been captured in GIS. Descriptions below have come from historical AMPs and historical knowledge.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge is likely to flow into an unnamed tributary of the Otapiri Stream.

Discharge from the reticulation is very small and unlikely to have adverse effects on the receiving environment. There are very few service connections in Browns. This township requires a discharge permit under the SRWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

(a) Primary system capacity

The primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Browns act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

The total catchment area is unknown.

Neither the capacity of the ES' flood protection works nor the consequence on Browns of flooding from the failure of these protection works have been considered as part of this plan.

(b) Secondary system capacity

The secondary system capacity (which is the system's ability to avoid flooding of "protected areas") has not been uniquely identified in Browns. Protected areas are those areas where the target level of service limits the desirable probability of flooding for a particular area/usage, ie road, house, yard garage etc.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Browns' sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(b) Manholes

There are approximately eight manholes which are square with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(c) Pipes

The existing condition of the Main Street stormwater main is known to be very poor. These poor performing sections are likely to be repaired within the 2014/15 year. The conditions of the other pipes in the network are unknown but assumed to be poor.

(d) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years. All open ditches are maintained by the community board with the only exception, which is maintained by ES.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	4	D	2048
	Open drains	3	3	D	Unknown
	Sumps	3	3	D	2048
	Manholes	4	3	D	2048
	Soakholes	3	3	D	Unknown
	Culverts	3	3	D	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

No critical assets have been identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix C: Colac Bay

Description

The Colac Bay community had a 2013 population of 186 with a projected 2018 population of 184.

The scheme is governed by Oraka Aparima Community Board under the guidance of technical staff at SDC.

History

1980s - The stormwater system was constructed.

2000 - New sumps installed on Foreshore Road in conjunction with the protection works contract.

2001 - New sump installed at end of 525 mm diameter line in Colac Bay Road.

Process description

Colac Bay's stormwater system consists of pipelines, manholes, sumps, and open drains. There are no service connections.

Huraki Creek which flows through the centre of the township is maintained by the adjacent land owners. There is no rating for work on this creek by either SDC or ES.

(a) Reticulation

Colac Bay's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/stream.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Colac Bay, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Colac Bay's total catchment area is approximately 15 ha.

ES has no flood protection works in the township area. Huraki Creek is maintained by the adjacent land owners. There is no separate rating district within the ES programmes for the creek.

The maintenance of the outfall is the responsibility of Council.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge of stormwater is into the Huraki Creek and to sea (Coastal Marine Area). Colac Bay has no service connections and is therefore unlikely to require a discharge permit under the Southland Regional Coastal Plan.

Asset capacity

The service provided by the system is generally accepted as being adequate.

(a) Primary system capacity

Stormwater systems are designed for rainfall run-off for storms of a particular probability of occurrence.

This probability is expressed as the Average Recurrence Interval (ARI) in years. The probability is based on historical information and does not consider changing weather patterns.

(b) Secondary system capacity

The secondary system capacity (which is the system's ability to avoid flooding of "protected areas") has not been uniquely identified in Colac Bay. Protected areas are those areas where the target level of service limits the desirable probability of flooding for a particular area/usage, ie road, house, yard garage etc.

Along Colac Bay Foreshore Road in high tide, easterly on-shore conditions cause overlapping of protection works. This generally causes ponding for a period of two-three hours at the peak of the tide and can disrupt sumps along foreshore road with gravel accumulation, requiring the sumps to be cleared out.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.251 km	Various	Sufficient
Open drains	0.377 km	Unknown	Sufficient
Sumps	23	Unknown	Sufficient
Manholes	1	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Asset condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Colac Bay's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(b) Manholes

The manholes are round with heavy duty cast-iron lids. Depths range from 1.5 - 2.5 metres. They have sumps on the bottom. Step irons are in good condition.

(c) Pipes

Pipes in the catchment are in good condition. No CCTV recording has been carried out in the township.

(d) Ditches

Outlet ditches are regularly cleared of accumulated sediment. The outlet of Haraki Creek under Council control has been cleaned within the previous two years. Haraki Creek is maintained by the adjacent land owner. There is no separate rating District for maintenance within the ES programmes.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2044
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	2039
	Manholes	3	3	C	2039
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

Critical assets

No critical assets have been identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

The open drain above and below Manuka Street requires a more regular maintenance schedule. Negotiations with adjoining land owners may be required.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix D: Dipton

Description

The Dipton community has an estimated 2013 population of 153 with a projected 2018 population of 154. The number of service connections is unknown.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

Dates of major works on the stormwater system are not known though it is estimated that the majority of work began around 1980.

2009 - Resource consent application lodged with ES.

2019 - Resource consent granted.

Process description

Dipton's stormwater system consists of pipelines, manholes, sumps, and open drains.

(a) Reticulation

Dipton's primary stormwater system consists of below ground sumps, very limited service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Dipton, act as basins to store run-off until the primary system has the capacity to drain them.
In other areas, run-off bypasses inlet sumps and continues to flow overland.

Dipton's total catchment area is approximately 16 ha.

ES has no flood protection works in the township area. The Level Street open drain is maintained yearly by vegetation control as the vegetation requires it.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

The discharge or disposal is uncertain. Staff understand that any discharge will eventually flow into the nearby Oreti River.

Although Dipton collects stormwater from a small number of houses the discharges are likely to have a negligible effect on the receiving environment but currently still understood to require a resource consent under the SRWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

(a) Primary system capacity

Stormwater systems are designed for rainfall run-off for storms of a particular probability of occurrence. This probability is expressed as the Average Recurrence Interval (ARI) in years. The probability is based on historical information and does not consider changing weather patterns.

(b) Secondary system capacity

The secondary system capacity (which is the system's ability to avoid flooding of "protected areas") has not been uniquely identified in Dipton. Protected areas are those areas where the target level of service limits the desirable probability of flooding for a particular area/usage, ie road, house, yard garage etc.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Dipton's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(b) Manholes

The manholes are round with heavy duty cast-iron lids. Depths range from 1.5 - 2.0 metres. They have sumps in the bottom. Step irons are in fair condition.

(c) Pipes

Pipes in the catchment have not been identified for condition. No CCTV recordings have been carried out in the township. Level Street has a problem conveying stormwater away indicating the pipe may have collapsed.

(d) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment.
The outlet under Council control has been cleaned within the previous two years.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	3	C	2044
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	2039
	Manholes	3	3	C	2039

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

No critical assets have been identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Investigations are required in Level Street to identify a potential drainage issue.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix E: Edendale

Description

The Edendale community has an estimated 2013 population of 558 with a projected 2018 population of 491. There are no recorded service connections.

The earliest parts of the scheme were constructed around 1935 and is governed by the Waihopai Toetoes Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in response to flooding over many years.

1985 - Salford Street catchment serviced.

2005 - Seaward Road catchment serviced.

2009 - Extension of system along Seaward Road to Hunter Street.

2009 - Resource consent lodged with ES.

2014 - New soakholes constructed.

2019 - Consent granted.

Process description

Edendale's stormwater system consists of pipelines, manholes, sumps, soakholes and open drains.

(a) Reticulation

Edendale's primary stormwater system consists of below ground sumps, soakholes, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Edendale, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Edendale's total catchment area is closely related to Salford Street (State Highway 1) and Seaward Road drainage and for reference purposes has been broken down into four sub-catchment areas. These sub-catchments feed into soakholes or the Oteramika Stream as follows:

REF.	CATCHMENT	DESCRIPTION
A	Salford Street catchment	Covers the east-west leg of State Highway 1 and consists of a piped system with an outlet to the Oteramika Stream at the eastern boundary of the town.
B	Seaward Road catchment	Covers the majority of the town and is based around Seaward Road as far south as Grange Street. A piped system constructed in 2003 runs through "Herberts Transport" to an open drain alongside the railway line, this drain joins the Oteramika Stream east of Grange Street.
C	Seaward Down Road catchment	The area south of Grange Street is more rural in nature and is served by an open drain alongside Seaward Road. This drain discharges to the Oteramika Stream via field tile through a farm paddock.

REF.	CATCHMENT	DESCRIPTION
D	Ferry Road catchment	The road towards Wyndham has no formal system and water flows overland or soaks away through constructed soakholes.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Oteramika Stream, overland or to soakaways. Although Edendale has no recorded service connections it requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.804 km	Various	Sufficient
Open drains	unavailable	Unknown	Sufficient
Sumps	70	Unknown	Sufficient
Manholes	18	Unknown	Sufficient
Soakholes	17	Unknown	Sufficient
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

There are no property connections. With the installation of the new water supply there have been instances of inadequate capacity due to increased loading on the stormwater system. The construction of additional soakholes has been a response to this. Most properties have stormwater flowing overland to kerb.

(b) Sumps

The overall grading of Edendale's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Many sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

A majority of the manholes are circular with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Soakholes

There is a combination of lined and unlined soakholes in the township. These silt up over time and only the lined ones can be cleaned out.

(e) Pipes

Pipe ages vary throughout the town and little is known at this stage. There are no CCTV records.

(f) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, as required. All open ditches are maintained by the community board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2044
	Open drains	-	-	-	-
	Sumps	3	3	C	2044
	Manholes	3	3	C	2044
	Soakholes	3	3	C	2044
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget. There are no emerging trends caused by increased maintenance costs.

Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Instances of surface flooding on the corner of Melvin Street and Ferry Road affecting private property.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Edendale-Wyndham
Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Investigation	STO960	Investigation of pipework to determine what replacements will be required	REN	25/26	58,799	Reserves
Pipework mains and manholes - Wyndham	STO1674	Pipework mains and manholes - Wyndham	REN	27/28	3,084,957	Loan & Reserves

Appendix F: Limehills/Centre Bush

Description

The Limehills/Centre Bush community has an estimated 2013 population of 165 with a projected 2018 population of 167. There are no service connections.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

1994 - Open drains constructed.

2008 - Cleaning of open drains carried out.

Process Description

Limehills/Centre Bush stormwater system consists of pipelines, soakholes and open drains.

(a) Reticulation

Limehills/Centre Bush primary stormwater system consists of open drains.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Limehills/Centre Bush act as basins to store run-off until the primary system has the capacity to drain them.

ES has not implemented flood protection works in the Limehills/Centre Bush area other than the Oreti River stopbanks.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

It is believed a general southern flow direction of the open drains, these discharge to a small creek on Pisa Road.

Limehills has service connections to open drains via field tiles and therefore may require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Urbanisation of Limehills/Centre Bush has not impacted on the drain capacity.

A summary inventory of the stormwater assets is given below:

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

There are numerous property connections. These discharge to open drains via field tiles.

(b) Sumps

Condition is uncertain.

(c) Manholes

Condition is uncertain.

(d) Pipes

No CCTV work has been carried out in the pipe network - mainly culverts.

(e) Ditches

All drains require yearly weed spraying and mechanical cleaning is carried out when required.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	D	2080
	Open drains	3	3	D	2070
	Sumps	3	3	D	Unknown
	Manholes	3	3	D	2050
	Soakholes	3	3	D	2025
	Culverts	3	3	D	2050
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Limehills

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Mechanical cleaning of open drains	726	Mechanical cleaning of open drains	O&M	20/21	22,456	Reserves
Mechanical cleaning of open drains	726	Mechanical cleaning of open drains	O&M	24/25	24,643	Reserves

Appendix G: Lumsden

Description

The Lumsden community has an estimated 2013 population of 453 with a projected 2018 population of 465. There are no service connections recorded.

The scheme is governed by the Northern Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in the 1950s and largely upgraded in 1970.

1970-80s - Upgraded old pipes to PVC.

2000 - Farm Street drain renewed with PVC.

2008 - New soakholes installed.

2009 - Application lodged with ES for resource consent.

2019 - Resource consent granted.

Process description

(a) Reticulation

Lumsden is served by a limited piped stormwater primary network. The majority of the stormwater network consists of localised sumps, culverts and open channels which feed natural watercourses to the south and west of the town. The open channels are largely modified from the original watercourses which ran through the town. A large rural catchment to the north east of town is drained through Lumsden to the south. The topography flattens out on the south side of Lumsden near the Hedley Transport Yard.

Lumsden's total catchment area is approximately 82.4 ha and for reference purposes has been broken down into three sub-catchment areas. These sub-catchments feed into three defined outlet channels or ditches as follows:

REF.	CATCHMENT	SIZE
A	Diana Street/Town Centre	4.8 ha
B	Pluto Street Outfall	36 ha
C	Lydia Street Outfall	41.6 ha

Much of the stormwater from dwellings is understood to be disposed of into the sewer, or to piped drains/open ditches. It is understood that residents were asked to connect their stormwater to the sewers to aid the establishment of the oxidation pond (1972/73) but that these connections were never removed. The northern parts of the town are largely served by cut-off ditches which convey stormwater away via open channels. Occasional surface ponding on properties occurs after heavy rain. More regular flooding has occurred in the vicinity of Hedley Transport's yard.

ES has implemented flood protection works in the area north of the township to protect the township from high levels of the Oreti River.

Neither the capacity of the ES' flood protection works nor the consequence on Lumsden of flooding from the failure of these protection works have been considered as part of this plan.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the local streams and the Oreti River.

Although Lumsden has no recorded service connections they are known to exist. It therefore requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.879 km	Various	Sufficient
Open drains	0.492 km	Unknown	Sufficient
Sumps	76	Unknown	Sufficient
Manholes	38	Unknown	Sufficient
Soakholes	4	Unknown	Sufficient
Culverts	13	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Very little information has been captured in GIS. The following description has come from historical AMPs and historical knowledge. Confidence in the service connection information is low.

The condition of most connections is good. All new and replacement connections are 100 - 150 mm diameter uPVC and are estimated to be about 10% of all connections. It is estimated that 50% of connections discharge directly into the piped system and the remaining 50% either have no connection or discharge ground recharge or open ditches.

(b) Sumps

The overall grading of Lumsden's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Approximately 80% of the manholes are square with heavy duty cast iron lids and frames. Typically, depths range from 1.5 to 2.5 metres. About 30% of manholes have sumps in the base, and the remaining 70% are haunched with straight through inverts.

(d) Pipes

Based on limited knowledge of the network in Lumsden, pipes are thought to be in moderate to good condition. Problems due to blockage are not common except where sections of ditches have been filled in over 44 gallon drums. These sections of the network are in very poor condition and are at risk of collapse due to corrosion.

No CCTV records have been carried out.

(e) Ditches

Lumsden has an extensive network of ditches as part of the stormwater network. The ditches are systematically cleaned either by excavator or by hand. The condition of the ditches is known to vary widely. All open ditches from A to C catchments are maintained by the community board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2021
	Open drains	3	3	C	2035
	Sumps	3	3	C	2018
	Manholes	3	3	C	2018
	Soakholes	3	3	C	2035
	Culverts	3	3	C	2035
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs:

Critical assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

The pipework begins to meet the end of the design life in 2021. A condition assessment is programmed prior to the failure dates. Approximately 439 m of pipe ranging from 375-825 mm diameter.

Periodical flooding issues in the southern catchment.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Lumsden

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Reticulation Upgrade SE Catchment	STO173	MS Project detail: Proj Prefix: X Project Number: 173	LOS	19/20	428,112	Loan & Reserves

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Appendix H: Manapouri

Description

The Manapouri community has an estimated 2013 population of 228 with a projected 2018 population of 332. The peak population for Manapouri is estimated at 836 in 2018. The number of service connections is unknown however it is believed that most of the township is served by stormwater reticulation.

The scheme is governed by the Fiordland Community Board under the guidance of technical staff at SDC.

History

1960s	-	Stormwater system was constructed.
1995/96	-	Home and View Streets improvements were carried out.
1996	-	Asset Management Plan completed.
2003	-	Asset Management Plan revised.
2005	-	Motu-au Close subdivision completed.
	-	Activity Management Plan produced.
2009	-	Resource consent lodged with ES.
2010	-	Upgrade of View Street reticulation.
2019	-	Resource consent granted

Process description

The Manapouri stormwater system consists of pipelines, manholes, sumps, and open drains.

(a) Reticulation

Manapouri's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

Manapouri's total catchment area is approximately 80 ha and for reference purposes has been broken down into five sub-catchment areas as follows:

REF.	CATCHMENT	DESCRIPTION
A	Te Aika Block	
B	NZED Village	
C	Home Street area	
D	View Street area	Includes Motu-au Close
E	Murrell Peninsular	

These sub-catchments feed into two outfall areas, which flow to Lake Manapouri and the Waiau River. Manapouri has three natural watercourses which receive stormwater run-off being: Lake Manapouri, Home Creek, and Waiau River.

The southern catchments (C and D) generally fall/drain to the Waiau River, the lakeside catchments (A and E) generally fall/drain to the lake and the central catchment (B) generally falls/drains to Home Creek.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Waiau River, Home Creek and Lake Manapouri.

Manapouri has service connections and will therefore requires a discharge permit under the RWP. Lake Manapouri is a Natural State Water as defined by the RWP since it is within a National Park. This could mean more stringent water quality demands for any discharge permit.

Asset capacity

The service provided by the system is generally accepted as being adequate, although there have been instances of surcharging of manhole covers.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	4.818 km	Various	Sufficient
Open drains	0.025 km	Unknown	Sufficient
Sumps	68	Unknown	Sufficient
Manholes	51	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Council currently has limited knowledge about the condition and extent of Manapouri's service connections. It is estimated that three fifths of all connections discharge to an open drain system such as watertable drains or ditches. Based on the low level of reactive maintenance repairs undertaken in response to consumer complaints and a limited number of visual inspections the condition of the connections is thought to be moderate.

(b) Sumps

Most sumps are thought to have siphon type traps which assist in the point source collection of sediment and floating debris. New sumps are in good condition and the other older sumps are in a moderate condition and some are thought to be not siphoned. The condition data confidence is not high. The verge sumps along View Street East collect a heavy sediment load and require frequent cleaning.

(c) Manholes

Most manholes are thought to be in moderate to good condition based on Council's experience and the results of recent (1996/97) asset inspection surveys (which recorded data on sizes, depth, direction of flow, and any obvious faults). Specific condition data (except for faults) is not currently available for these assets.

(d) Pipes

Based on Council's limited knowledge, the pipes are generally thought to be nearing end of life sooner than predicted.

(e) Ditches

Ditches and outlets are regularly cleared of vegetation, accumulated sediment and gravel build up as required.

(f) Safety

Most of the original manholes are either without ladder, step irons or the step irons are dangerously corroded. Current practice is not to provide fixed step irons in manholes. Access is gained by using portable ladders and appropriate surface barricades.

The occasional displacement or removal of sump grates or manhole lids creates a potential safety hazard for tripping and falling. By using heavy duty well seated grates and lids, the risk of accidental dislodgment or removal is limited. However, the malicious removal of lids and grates is very difficult to combat and at this time mechanically fixing the lids and grates down to the frames is not seen as a viable option. This will be reviewed if the incidence or risk of grate lid removal increases.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	4	B	2029
	Open drains	3	3	C	2051
	Sumps	3	3	C	2024
	Manholes	3	3	C	2024
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

The issue for Manapouri is that the reticulation meets the end of its design life in 2024-2029 however, it is believed that the condition of the reticulation may not be as good as predicted in places. A programme to renew the will be established.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix I: Monowai

Description

The Monowai community has an estimated 2005 usually resident population of 27. There is no update on this estimate in the census data.

The scheme is governed by the Tuatapere Te Waewae under the guidance of technical staff at SDC.

History

It is estimated that the stormwater system in Monowai was constructed in the late 1970s with sumps/soakholes constructed to accept stormwater run-off from the road.

Process description

There is limited stormwater infrastructure in Monowai.

(a) Reticulation

All stormwater assets located within the Monowai settlement have developed either in association with roading asset or the realignment of ditches that drain low-lying areas.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge is to ground.

Monowai has no service connections and therefore currently does not require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

(a) Primary system capacity

There is no piped system beyond the culverts that exist where watercourses bisect the roading network.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate in that there are no known issues. The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	3	Unknown
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	Unknown
	Manholes	3	3	C	Unknown
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

No issues.

No planned expenditure.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix J: Mossburn

Description

The Mossburn community has an estimated 2013 population of 201 with a projected 2018 population of 222. There are no service connections.

The scheme is governed by the Northern Community Board under the guidance of technical staff at SDC.

History

Dates of major works on the stormwater system are not known though it is believed that construction began in the mid 1960s.

2008 - New soakhole constructed within private property at 47 Devon Street.

2009 - Resource consent application lodged with ES.

2019 - Consent granted

Process description

The Mossburn stormwater system consists of pipelines, manholes, sumps, and soakholes.

(a) Reticulation

The Mossburn township is situated on an elevated terrace adjacent to the Oreti River.
The stormwater systems are intended to receive and dispose of stormwater to avoid surface flooding within the urban area of Mossburn.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into soakaways.

Asset capacity

The service provided by the system is generally accepted as being adequate.

From inspection of the township and discussions with the it appears that the GIS drawings correctly show the sumps and manholes but may be incomplete regarding soakaways and underground pipework.
The drawings show a total of 11 soakaways but it is understood there may be more.

A general principle of one soak-away per two sumps has been followed throughout the town. The sumps feed the soakaways by underground pipework.

There is an indication from complaints that the stormwater facilities are substantially under capacity only on State Highway 94 (Devon Street) when measured against the desired level of service. This includes that localised flooding should not remain for longer than two hours under typical annual return period rain storms. Monitoring of the performance of the stormwater system against the desired LOS will provide a qualitative assessment of the system capacity.

There has been some localised flooding outside the RSA.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.191 km	Various	Sufficient
Open drains	Nil	N/A	N/A

ASSET TYPE		CAPACITY	
Sumps	51	Unknown	Sufficient
Manholes	2	Unknown	Sufficient
Soakholes	8	Unknown	Sufficient
Culverts	1	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. Mossburn is situated on very free draining soils only requiring a small amount of stormwater infrastructure.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2031
	Open drains	-	-	-	-
	Sumps	3	3	C	2026
	Manholes	3	4	B	2026
	Soakholes	3	3	C	2030
	Culverts	3	3	C	2026
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs:

Critical assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work. Resource consent has now been granted with associated monitoring and reporting under way.

High water table means that soakholes will discharge directly into the aquifer and likely require some remediation to mitigate against contamination of groundwater. Money has been included in the LTP to address highest risk soakholes.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Mossburn
Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source

Change of soakholes to comply with ground water requirements	STO1500	Estimated amount included in 18-28	LOS	22/23	27,300	Reserves

Appendix K: Nightcaps

Description

The Nightcaps community has an estimated 2013 population of 306 with a projected 2018 population of 299. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Wallace Takitimu Community Board under the guidance of technical staff at SDC.

History

It is believed the stormwater system was constructed in the 1950s.

1998 - Major investigation work and installation of six new manholes.

1999 - Renewal of 127 m section in Moffat Street to 250 diameter PVC line renewed along with two new manholes.

1999 - Two manholes installed in existing line Evan Street.

2009 - Resource consent application lodged with ES.

2014 - Reticulation upgrade Dryffe Street.

2019 - Resource consent granted.

Process description

The Nightcaps stormwater system consists of pipelines, manholes, sumps, and soakholes.

(a) Reticulation

Nightcaps primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

Nightcaps total catchment area is approximately 109 ha which is broken down into a number of sub-catchments.

These sub-catchments feed into five defined outlet channels or ditches, which flow into the Wairio Stream on the west side of the township and the Waicola Stream on the east side of the township. Both these streams flow into the Otautau Stream north of Otautau.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the ditch adjacent to the WWTP and then into the Wairio Stream. There is also discharge into the Waicola Stream.

Nightcaps has service connections and therefore requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Urbanisation of Nightcaps and increase in impervious areas have resulted in significant drain under-capacity, which in turn has resulted in some minor flooding following heavy rainfall. This surface flooding does recede quickly upon the cessation of rain.

There has been localised flooding recorded in High Street West.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	6.106 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	69	Unknown	Sufficient
Manholes	46	Unknown	Sufficient
Soakholes	1	N/A	Sufficient
Culverts	3	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

The condition of most connections is good.

(b) Sumps

The overall grading of Nightcaps sumps is not good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are not syphoned.

(c) Manholes

To date no manhole rating has been carried out.

(d) Pipes

CCTV work has been carried out in and around 75% of the pipe network indicating that the pipework is in a reasonable condition and may not need replacing at end of life.

(e) Ditches

There are no outfall ditches that require regular maintenance.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2020
	Open drains	-	-	-	-
	Sumps	3	3	C	2025
	Manholes	3	3	C	2025
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	2025
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

The issue for Nightcaps is that the reticulation meets the end of its design life in condition assessments indicate that pipework life can be extended.

There has been localised flooding in High Street West.

Capital expenditure plan

The community board have identified localised renewals are required with funding programmed across the second half of the plan.

Appendix L: Ohai

Description

The Ohai community has an estimated 2013 population of 303 with a projected 2018 population of 307. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Wallace Takitimu Community Board under the guidance of technical staff at SDC.

History

It is believed the stormwater system was constructed around 1950. Since 1990 the only major work was the realigning of the Milton Street outfall piped drain.

2009 - Application for resource consent lodged with ES.

2013 - CCTV survey.

Process description

The Ohai stormwater system consists of pipelines, manholes, sumps, soakholes and open drains.

(a) Reticulation

Ohai's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Ohai, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses and inlet sumps and continue to flow overland.

Ohai's total catchment area is approximately 78.9 ha which can be broken down into a number of sub-catchments.

These sub-catchments feed into three defined outlet channels or ditches, which flow through farm drainage systems. These farm drains flow to either the Morley Stream at the north or to the Orauea Stream to the south. Both these streams flow into the Orauea River.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Morley Stream at the north and Orauea Stream to the south, both flow into Orauea River.

Ohai has service connections and requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	4.106 km	Various	Sufficient
Open drains	0.916 km	Unknown	Sufficient
Sumps	107	Unknown	Sufficient
Manholes	21	Unknown	Sufficient
Soakholes	2	Unknown	Sufficient
Culverts	32	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

The condition of most connections is good.

(b) Sumps

The overall grading of Ohai's sumps is not good with the majority located directly over the pipe system and having single cast iron grate inlets. Most sumps are not syphoned.

(c) Manholes

To date no manhole rating has been carried out.

(d) Pipes

CCTV work has been carried out in around 50% of the pipe network and rating of the system is yet to be carried out.

(e) Ditches

Outlet ditches are cleared of vegetation and accumulated sediment when required.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2035
	Open drains	3	3	C	2030
	Sumps	3	3	C	2030
	Manholes	3	3	C	2035
	Soakholes	3	3	C	2005
	Culverts	3	3	C	2030
Treatment	N/A	-	-	-	-

** SDC staff assumption (Not assessed during technical assessment).*

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

None identified.

Key issues

A condition assessment is programmed prior to the end of life dates. The reticulation renewal will be carried out in stages the first stage of which is programmed in this planning period.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Capital expenditure plan

Renewals are programmed across the second half of the plan period.

Appendix M: Orepuki

Description

The Orepuki community has an estimated 2013 population of 54 with a projected 2018 population of 51. There are no connections to the scheme. The scheme is governed by the Oraka Aparima Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in the 1980s.

1997 - New soakhole installed in Bolton Street.

2000 - New sump and connection to existing sump in Oldham Street West.

2001 - New sump and connection to outfall Bolton/Denbigh Streets.

Process description

The Orepuki stormwater system consists of pipelines and sumps. There are no plans to extend the stormwater system.

(a) Reticulation

Orepuki's primary stormwater system consists of below ground sumps, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Orepuki, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Orepuki's total catchment area is approximately 5 ha.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge is via a coastal outlet.

Orepuki has no service connections and therefore currently does not require a discharge permit under the RWP.

Asset Capacity

The service provided by the system requires investigation into the performance due to the limited information available on the scheme.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

Asset Type		Capacity	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Nil	N/A	N/A
Sumps	17	Unknown	Sufficient

Asset Type		Capacity	
Manholes	Nil	N/A	N/A
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Orepuki's sumps is good with 16 located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system. The remainder have concrete lids. Discharge from the majority of these sumps is through a soakage system with very little inter-connection.

(b) Pipes

Pipes in the catchment are in good condition. No CCTV recording has been carried out in the township.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	-	-	-	-
	Open drains	-	-	-	-
	Sumps	3	3	C	2039
	Manholes	-	-	-	-
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	Nil	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work. Investigation required to determine any location of cross contamination.

Critical assets

None identified.

Key issues

There is serious erosion around the pipe outfall at the coast. This requires stabilising to ensure no further undermining of the pipeline occurs for the future protection of the asset.

Occurrences of surface flooding on Stratford Street (SH 99), due to low point in water channel without sump or discharge flow path.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix N: Otautau

Description

The Otautau community has an estimated 2013 population of 798 with a projected 2018 population of 892. There are no recorded service connections.

The scheme is governed by the Wallace Takitimu Community Board under the guidance of technical staff at SDC and was constructed around 1949/50.

History

1998 - Chester Street from Queen Street to Main Street. Queen Street at Chester Street intersection.

2000 - Rochdale Street upgrade from Main Street to Queen Street.

2006 - Soakholes installed on the northern side of town.

2009 - Resource consent application lodged with ES.

2010 - Open ditch piped from Clitheroe Street to Devon Street.

2019 - Consent granted

Process description

The Otautau stormwater system consists of pipelines, manholes, sumps, soakholes and open drains.

(a) Reticulation

The general topography of Otautau is flat. Stormwater from approximately 60% of the roads and properties in the township is disposed of by way of strategically placed sumps draining localised catchment areas which discharge to soakaways. Stormwater from the remainder of the township area is conveyed by open drains and various sized pipe drains to flap gated outfalls laid through the stopbanking system which surrounds the township.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows to ground soakage and the Otautau Stream.

Although Otautau has no recorded service connections they are known to exist.
As a result a resource consent is required under the RWP. The application for this was lodged in 2009.

Asset capacity

The service provided by the system is generally accepted as being adequate.

ES has implemented flood protection works in the area including flood banks to the Aparima River and Otautau Stream. These measures are intended to protect property, including Otautau township, from inundation from upstream floodwaters. Otautau's stormwater asset is intended to cope with run-off from the town's catchment only.

Neither the capacity of the ES' flood protection works nor the consequence on Otautau of flooding from the failure of these protection works have been considered as part of this plan.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	3.310 km	Various	Sufficient
Open drains	3.189 km	Unknown	Sufficient
Sumps	94	Unknown	Sufficient
Manholes	33	Unknown	Sufficient
Soakholes	31	Unknown	Sufficient
Culverts	34	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Very little information on service connections has been captured in GIS. The following description has come from historical AMPs and historical knowledge. Confidence in the service connection information is low.

The condition of most connections is good. Several blockages per year occur as a result of root intrusion. Connection pipes are mostly earthenware (estimated 90%). All new and replacement connections are 100 - 150 mm diameter uPVC and are estimated to be about 10% of all connections. It is estimated that 98% of connections discharge directly into the piped system and the remaining 2% either have no connection or discharge to the street kerb.

(b) Sumps

The overall grading of Otautau's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps constructed since 1995 are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

No information available at this stage.

(d) Pipes

Based on Council's limited knowledge, the pipes are generally thought to be in reasonably good condition.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years. Open ditches maintained by the community board are:

Holt Park to south end.

Harbison/Russell Esplanade drain.

Some of these ditches are starting to become dangerous especially where there are crossings for driveways into houses.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2029
	Open drains	3	3	C	2029
	Sumps	3	3	C	2009
	Manholes	3	3	C	2029
	Soakholes	4	4	B	2029
	Culverts	3	3	C	2029
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Intermittent surface flooding during heavy rain on footpaths on Rye Street, between Orderly and Chester Streets.

Capital expenditure plan

The community board have identified the need for targeted renewals across the life of the plan.

Appendix O: Riversdale

Description

The Riversdale community has an estimated 2013 population of 456 with a projected 2018 population of 505. In anticipation of potential growth, the local community is looking at mechanisms for growth. There are no service connections.

The scheme is governed by the Ardlussa Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in the 1960s.

1975 - Separate sewerage scheme installed.

2009 - Resource consent application lodged with ES.

2019 - Consent granted.

Process description

The Riversdale stormwater system consists of pipelines, manholes, and street sumps.
The good natural drainage in the area means the pipe systems drain only large areas of road.

(a) Reticulation

Riversdale's primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams, which are the first intended flow paths for rainfall run-off that is directed into the system. There are also a number of shallow soakholes which perform very well. The primary stormwater system makes up the majority of the stormwater asset.

Riversdale's total catchment area is approximately seven ha and for reference purposes has been broken down into two sub-catchment areas as follows:

REF.	CATCHMENT	SIZE	DESCRIPTION
A	Berwick Street	3.5 ha	
B	Newcastle Street	3.5 ha	Drainage for State Highway 94

These sub-catchments feed a piped drain through the golf course.
The Newcastle Street catchment serves as drainage for State Highway 94.

ES has implemented flood protection works in the greater area including floodbanks on the Mataura River.

Neither the capacity of the ES' flood protection works nor the consequence on Riversdale of flooding from the failure of these protection works have been considered as part of this plan.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into a drain through the golf course. It is uncertain where this drain discharges.

Riversdale has no service connections but does require a discharge permit under the RWP. The application for the consent was lodged in 2009.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Situated on free-flowing gravels Riversdale has very good drainage. Soakholes can be easily established at less than two metres in depth to provide drainage for isolated areas. Accordingly, the only two areas where a piped system is required is where there are large areas of road formation. To date the performance of these systems has been very satisfactory.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years. However, sandbagging of properties has been required during major flood events.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.39 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	40	Unknown	Sufficient
Manholes	18	Unknown	Sufficient
Soakholes	6	Unknown	Sufficient
Culverts	5	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

There are no service connections. Most properties deal with surface water on site and collect roof water for drinking.

(b) Sumps

The overall grading of Riversdale's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Approximately half of the manholes are square with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Pipes

There is little information known about the condition of the pipework and limited CCTV has been undertaken.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2024

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
	Open drains	-	-	-	-
	Sumps	3	3	C	2029
	Manholes	3	3	C	2019
	Soakholes	3	3	C	2025
	Culverts	3	3	C	2029
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

Critical assets identified are:

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

High watertable leads to infiltration issues in areas of the town.

High water table means that soakholes will discharge directly into the aquifer and likely require some remediation to mitigate against contamination of groundwater. Money is included in LTP within the first five years to address highest risk soakholes.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Riversdale

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Change of soakholes to comply with ground water requirements	STO1502	estimate introduced as part of 18-28 LTP	LOS	22/23	27,300	Loan & Reserves

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Appendix P: Riverton

Description

The Riverton community has an estimated 2013 population of 1,506 with a projected 2018 population of 1,655. The estimated peak population for Riverton is projected to be 5,524 in 2018. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Oraka Aparima Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in 1974 carrying on from piecemeal installations dating back to pre-war times. This construction covered Taramea Bay Road, Delhi, Havelock, Leader, Morton, Napier, Palmerston, Princess, Trotter, Verdun and Walker Streets and also Thames, Solent, Shrewsbury, Herbert, Milton, Osborne, Dallas, Brooke and Richard Streets, Orepuki-Riverton Highway and Bay and Bath Roads. Dates of major works on the Riverton stormwater system are as follows:

1994 - Addition in Bates Street.

1995 - Addition in Roy Street and Rocks Highway. System extended in Walker and Leader Streets.

1996 - Addition in Hamlet and Marne Streets.

1996 - System extended in Walker Street.

1997 - System extended in Upper Marne and Walker Streets.

2003 - Upgrade of systems in Walker, Church and Leader Streets.

2013 - Renewal of stormwater pipe from corner Napier and Ngarimu Streets to estuary.

2014 - CCTV survey - Palmerston and Jetty Streets.

2015 - Renewal of stormwater pipework – Palmerston street

Process description

The Riverton stormwater system consists of pipelines, manholes, sumps, soakholes and open drains.

(a) Reticulation

Riverton's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Riverton's total catchment area is approximately 85 ha which can be broken down into a number of sub catchments.

These sub-catchments feed into defined outlet channels or ditches, which flow to either the Aparima River or the sea. Outlets to the Aparima River from the New Windsor Catchment are good while those from either side of the river below the state highway bridge are subject to tidal influences. The outlet drains to Taramea Bay are also subject to tidal factors and have to be physically cleared at regular intervals.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Aparima River or to the sea (Coastal Marine Area) or to ground. The townside goes into the estuary near the Rugby Club. Riverton has service connections and is therefore likely to require a discharge permit under the Southland Regional Coastal Plan.

Asset capacity

The service provided by the system is generally accepted as being adequate although a number of localised problems are known to exist.

The progressive urbanisation of Riverton and increase in impervious areas have resulted in significant drain under-capacity, which in turn has resulted in repeated surface flooding in several areas following heavy rainfall. The surface flooding does recede quickly upon the cessation of rain. High tides occurring during rainfall events delay the reduction in surface flooding because of restrictions to outfalls.

The area of Lucknow Street is showing signs of surface flooding.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years. Five occurrences of garage inundation are thought to have occurred over the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	6,181 km	Various	Sufficient
Open drains	0.188 km	Unknown	Sufficient
Sumps	311	Unknown	Sufficient
Manholes	78	Unknown	Sufficient
Soakholes	1	Unknown	Sufficient
Culverts	11	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

The condition of most connections is good. Connection pipes are mostly earthenware. All new and replacement connections are 100 - 150 mm diameter uPVC.

(b) Sumps

The overall grading of Riverton's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Approximately 75% of the manholes are square with heavy duty cast iron lids and frames. The remainder are of round concrete construction. Typically depths range from 1.5 to 2.5 metres. Few manholes have step irons.

(d) Pipes

Pipe conditions have not been rated but are considered to be in reasonable condition. The majority of the pipes are close to 50 years old and are therefore well through their life cycle.

CCTV records undertaken prior to 1994 relate to the townside catchment. An area of the Church Street catchment was done in 2003.

(e) Ditches

Outlet ditches are regularly cleared of vegetation/accumulated sediment, with all under Council control and cleaned within the previous two years. All open ditches are maintained by the community board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	4	B	2038
	Open drains	3	3	C	2053
	Sumps	3	3	C	2033
	Manholes	3	3	C	2033
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	2033 -
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

Outlets in some areas discharging into the estuary are becoming more frequently blocked by sand.

Critical assets

None identified.

Key issues

The reticulation near the sound shell is in poor condition and needs renewal.

Limited accurate information is available regarding scheme condition and details.

Open drain between Palmerston Street and Lucknow Street which runs out to the estuary creates a potential hazard and would a safer, more reliable asset if it were to be piped.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Ongoing issues with stormwater main on Shrewsbury Street between Church Street and Herbert Street.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Riverton/Aparima
Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Investigate Stormwater discharge around Soundshell area due to blocked outlets	STO1508	Additional project 18-28	LOS	18/19	10,000	Reserves

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Convert ditches to piped services	STO551	Convert ditches to piped services	LOS	23/24	111,822	Loan & Reserves

Appendix Q: Stewart Island

Description

The Stewart Island community has an estimated 2013 population of 378 with a projected 2018 population of 434. The estimated peak population for Stewart Island projected to be 1,165 in 2018. Most of the township is served by stormwater reticulation.

The scheme is governed by the Stewart Island/Rakiura Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in the mid 1950s.

1992 - New pipes laid in Ayr Street.

1994 - Upgrade of part of Main Road drain.

1996 - Asset Management Plan completed.

2002 - Realignment in front of Museum, Ayr Street.

2003 - Asset Management Plan revised.

2005 - Activity Management Plan produced.

2006 - Oban township stormwater upgrade.

2007 - Upgrade of pipes in Ayr Street to alleviate flooding.

2009 - Asset Management Plan reviewed.

2014 - Main Road upgrade.

Process description

The Stewart Island stormwater system consists of pipelines, manholes, sumps, and open drains.
The majority of the population lives in Stewart Island. Most properties collect roof water for drinking.

(a) Reticulation

Stewart Island's primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. In other areas, run-off bypasses inlet sumps and continues to flow overland. Stewart Island's total catchment area is approximately 50 ha and for reference purposes has been broken down into two sub-catchment areas. These sub-catchments flow to Halfmoon Bay as follows:

REF.	CATCHMENT	SIZE	DESCRIPTION
A	Main Road network		Main Road and Argyle Street area.
B	Ayr Street network		Sub-catchment to south and west of Ayr Street.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Mill Creek or into the sea (Coastal Marine Area). Stewart Island has service connections and is therefore likely to require a discharge permit under the Southland Regional Coastal Plan. However Halfmoon Bay is defined as a Natural State Water outside a National Park in the RWP. This could mean more stringent water quality demands for any discharge permit under the plans, however, the implications of this are not yet fully understood.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Localised flooding threatens shops in Main Road (approximately annually) and there is frequent surface flooding to footpaths in Argyle Street and Main Road.

Secondary system ponding during and for short periods after moderate to high intensity storms have been observed in the following areas:

- the drain behind Main Road between Morris Street.
- the outlet to the main system in Main Road.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.85 km	Various	Sufficient
Open drains	0.852 km	Unknown	Sufficient
Sumps	30	Unknown	Sufficient
Manholes	31	Unknown	Sufficient
Soakholes	1	Unknown	Sufficient
Culverts	20	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate however there is a mix of conditions of assets due to recent renewals while many areas still suffer from aging infrastructure.

(a) Sumps

The overall grading of Stewart Island's sumps is moderate with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(b) Manholes

Approximately 25% of the manholes are round with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. The remainder are square with wooden lids. The majority do not have step irons.

(c) Pipes

Pipes conditions have not been rated but are considered to be moderate.
The majority of pipes still have a 30 year life span while the newer ones have a 70 year life span.
No CCTV data has been obtained.

(d) **Ditches**

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years. All open ditches are maintained by the Community Board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2054
	Open drains	3	3	C	2067
	Sumps	3	3	C	2049
	Manholes	3	3	C	2054
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	2049
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the Roading Contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Project for CCTV in maintenance.

Critical assets

None identified.

Key issues

Capacity assessment required to improve level of confidence in captured asset data.

Localised flooding on Main Road near DOC office – will be addressed when the new visitor centre construction is under way.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix R: Te Anau

Description

The Te Anau community has an estimated 2013 population of 2628 with a projected 2018 population of 2,938. The estimated peak population for Te Anau is projected to be 7,472 in 2018. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Fiordland Community Board under the guidance of technical staff at SDC.

History

The major areas were installed in the 1960s and 1970s and have expanded significantly as new subdivisions have been completed.

1985	-	Eglinton Place (Luxmore Stage II).
1986	-	Donald Ross Place (Luxmore Stage III).
1987	-	Sylvia Baker Place (Luxmore Stage IV).
1989	-	Blairs Place (Luxmore Stage V).
1990s	-	The Crescent area.
1993	-	Bowen Street South (Luxmore Stage VI).
1994	-	Kepler/Ritchie (Luxmore Stage VII).
1995	-	Dalhousie Place (Kepler Stage I).
1996	-	Jackson, Melland, Dorizac and Pop Andrews (Luxmore Stage VIII).
	-	Asset Management Plan completed.
1997	-	Thomson Place.
2000	-	Town Service Lane.
2002	-	Lawson Burrows Crescent (Luxmore Stage IX).
2003	-	Lawson Burrows and Earl Place (Luxmore Stage X).
	-	Patience Bay Drive (Patience Bay Stage II).
	-	Asset Management Plan revised.
2005	-	Activity Management Plan produced.
2007	-	Heritage (on-site disposal) and Delta subdivisions (reticulated) completed.
2008	-	Alpine Terrace Stage 3 complete (on-site disposal).
	-	Kepler Heights Stage 2 complete (on-site disposal).
	-	Aerial photos and contour model developed as part of strategic assessment.
2009	-	Application for resource consent lodged with ES.
2014	-	Cross connections on lakefront addressed.
2015	-	Flooding issues on Caswell Road – SH 94 junction addressed.
2019	-	Resource consent granted
2020	-	Further cross connections identified and resolved.

Process description

The Te Anau stormwater system consists of pipelines, manholes, sumps, soakholes and open drains. Some newer subdivisions have installed on-site disposal due to well-draining soils as well as a lack of available infrastructure.

(a) Reticulation

Te Anau's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlets to the Lake.

Te Anau's total catchment area is approximately 336 ha and for reference purposes has been broken down into seven sub-catchment areas.

REF.	CATCHMENT	DESCRIPTION
A	Dusky Street outlet	Fergus Square to Bligh Street.
B	Matai Street outlet	Lake to Howden Street.
C	Town centre	Town centre and service lane discharges through a clarifier.
D	Mokoroa Street	Luxmore Subdivision - Quinton Drive to Dalhousie Place.
E	Quintin Drive	Part of Quintin Drive and the Water Park.
F	Industrial Area	Discharge into the Upuk and overland after being piped under the Te Anau Milford Highway.
G	Delta area	Receives stormwater from the Delta subdivision into a detention basin for disposal to ground. There is an overflow swale into Lake Te Anau.

All the catchments discharge into Lake Te Anau. The five main discharge points are supplemented with sumps on the Lakefront streets discharging directly from their own outlets to the lake. Stormwater disposal in the new subdivisions at the Heritage and on the upper terraces is to ground, ie on-site disposal.

(b) Treatment

Catchment C discharges through a filter that removes gross pollutants before reaching the lake. This requires cleaning three times a year with the costs being met from the maintenance budget, which amounts to under $2,000 per annum.

(c) Discharge

Discharge flows into Lake Te Anau, the Upukerora River or to ground.

Te Anau has service connections which will require a discharge permit under the RWP. This was lodged with ES in 2009. Lake Te Anau is a Natural State Water as defined by the RWP since it is within a National Park.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The progressive urbanisation of Te Anau and increase in impervious areas may result in significant drain under-capacity and surface flooding in several areas following heavy rainfall. The surface flooding does recede quickly upon the cessation of rain.

There is localised flooding in Mokonui Street due to inadequate sump spacing. Cleddau Street also suffers from occasional surface flooding.

The industrial area in Caswell Road also suffers from flooding caused by conveyance restrictions in the Pukutahi Boulevard area.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	27.279 km	Various	Sufficient
Open drains	1.432 km	Unknown	Sufficient
Sumps	777	Unknown	Sufficient
Manholes	361	Unknown	Sufficient
Soakholes	91	Unknown	Sufficient
Culverts	9	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Council has limited knowledge of connections. It is estimated that 30% discharges directly to ground or into soakholes on their own property.

(b) Sumps

Most sumps are thought to have siphon type traps which assist in the point source collection of sediment and floating debris. New sumps are in good condition and the other older sumps are in a moderate condition and some are thought to be not siphoned

(c) Manholes

Most manholes are thought to be in moderate to good condition based on Council's experience and the results of recent (1996/97) asset inspection surveys (which recorded data on sizes, depth, direction of flow and any obvious faults). Specific condition data (except for faults) is not currently available for these assets.

(d) Pipes

Based on Council's limited knowledge, the pipes are generally thought to be in reasonably good condition.

(e) Safety

Most of the original manholes are either without ladder, step irons or the step irons are dangerously corroded. Current practice is not to provide fixed step irons in manholes. Access is gained by using portable ladders and appropriate surface barricades.

The occasional displacement or removal of sump grates or manhole lids creates a potential safety hazard for tripping and falling. By using heavy duty well seated grates and lids, the risk of accidental dislodgment or removal is limited. However, the malicious removal of lids and grates is very difficult to combat and at this time mechanically fixing the lids and grates down to the frames is not seen as a viable option. This will be reviewed if the incidence or risk of grate lid removal increases.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	4	B	2031
	Open drains	3	3	C	2046
	Sumps	3	3	C	2026
	Manholes	3	3	C	2026
	Soakholes	3	3	C	2039
	Culverts	3	3	C	2026
Treatment	Filter	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

CCTV inspections have been programmed in the maintenance budget to investigate the flooding issues in Mokonui and Cleddau Streets.

Critical assets

None identified.

Key issues

The issue for Te Anau is that the reticulation meets the end of its design life in 2026-31. Condition assessments are programmed prior to these failure dates. The reticulation renewal will be carried out in stages, the first three stages of which are programmed in this planning period. Preliminary investigations have identified the following areas that will require upgrading:

- Town Centre area.
- DOC area.
- Unconfirmed (pending assessments).

- opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.
- resource consent has now been granted with associated monitoring and reporting under way.

On-going issues with gravel build up at the stormwater discharge into the Upukerora River. This creates issues with stormwater backing up through the pipeline as it is restricted in entering the river.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Te Anau
Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source

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Stormwater discharge improvements to groundwater	STO1503	Estimate introduced as part of 18-28 LTP	LOS	25/26	176,397	Reserves

Appendix S: Thornbury

Description

The Thornbury community has an estimated 2013 population of 126 with a projected 2018 population of 134. There are no service connections.

The scheme is governed by the Oraka Aparima Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in the 1980s.

2000 - Middleton Street - construction of swale on north side of street discharging via a sump into a PVC pipeline that then discharges into open channel.

2000 - Murchie Street - four sumps installed along with PVC pipeline as part of frontage upgrade of new court complex. This line discharges through an established private line to the open channel.

Process description

The Thornbury stormwater system consists of pipelines, sumps and open drains. The open drains are maintained by ES. Most properties collect roof water for drinking.

(a) Reticulation

Thornbury's primary stormwater system consists of below ground sumps, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Thornbury, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Thornbury's total catchment area is approximately 19 ha and three sub-catchments. These sub-catchments feed into one defined outlet channel or ditch, which flows to the Aparima River.

ES has implemented flood protection works in the area including the open drain running through the township.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into a creek and then the Aparima River.

Thornbury has no service connections and is therefore unlikely to require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The drains are of sufficient capacity to meet the requirements of the township.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.424 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	16	Unknown	Sufficient
Manholes	Nil	N/A	N/A
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Thornbury's sumps is good with 50% located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system. The remainder have concrete lids with holes in them.

(b) Pipes

Pipes in all sub-catchments are in good condition. No CCTV recording has been carried out in the township.

(c) Ditches

The outlet ditch is regularly cleared of vegetation and accumulated sediment, having been cleaned within the previous two years by ES.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2034
	Open drains	-	-	-	-
	Sumps	3	3	C	2034
	Manholes	-	-	-	-
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

No operational expenditure identified.

Critical Assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Capital Expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix T: Tokanui

Description

The Tokanui community has an estimated 2013 population of 1502 with a projected 2018 population of 147. There are no service connections.

The scheme is governed by the Waihopai Toetoes Community Board with technical input from SDC staff.

History

The stormwater system was constructed from 1958.

2009 - Application for resource consent lodged with ES.

2019 - Consent granted.

Process description

The Tokanui stormwater system consists of pipelines, manholes, sumps and open drains. Most properties collect roof water for drinking.

(a) Reticulation

Tokanui's primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Tokanui, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Three of the five identified sub-catchments feed into three defined outlet channels or ditches, which flow to the Tokanui Stream, the other two drain directly to the Tokanui Stream.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Tokanui Stream.

Tokanui has no service connections but is required to have a discharge permit under the RWP. This was lodged with ES in 2009.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The progressive urbanisation of Tokanui and increase in impervious areas have resulted in isolated drain under-capacity, which in turn has resulted in some surface flooding in several areas following heavy rainfall. The surface flooding does recede quickly upon the cessation of rain.

Vegetation growth and silting in the outlet ditches are significant capacity limiting factors.

Tokanui has localised flooding in Buckingham Street. Work is continuing to alleviate this by more maintenance of the ditches.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.260 km	Various	Sufficient
Open drains	0.153 km	Unknown	Sufficient
Sumps	20	Unknown	Sufficient
Manholes	3	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	5	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Most properties deal with surface water on site and collect roof water for drinking.

(b) Sumps

The overall grading of Tokanui's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Manholes are circular with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Pipes

A full CCTV survey was completed in Tokanui in September 2014. This is yet to be analysed to determine the current condition of pipes.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned as sediment and vegetation build up. All open ditches are maintained by the Council with the exception of drains through farmland.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2043
	Open drains	3	3	C	2038
	Sumps	3	3	C	2018
	Manholes	3	3	C	2043
	Soakholes	3	3	C	2038
	Culverts	3	3	C	2038
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix U: Tuatapere

Description

The Tuatapere community has an estimated 2013 population of 561 with a projected 2018 population of 557. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Tuatapere Te Waewae Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in approximately 1960 as a best guess.

1996 - Asset Management Plan completed.

1999 - New 200 mm line from Orawia Road at back of properties on south side of Carlyle Street to link to line running south through primary school.

2000 - Replacement of 50% of 200 mm line adjacent to 59 Main Road. This replaced the section of line on the boundary of 57 and 59 Main Road that was capacity-reduced due to tree root intrusion.

2006 - New sump installed in Orawia Road connecting to kerb and channel.

2009 - Resource consent application lodged with ES.

2019 - Consent granted

Process description

Tuatapere's stormwater system consists of pipelines, manholes, sumps, soakholes, and open drains. Only part of the township is serviced by a stormwater system. The remaining area has soakholes.

(a) Reticulation

Tuatapere's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlets.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Tuatapere, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Tuatapere's total catchment area is approximately 125 ha which can be further broken down into five sub-catchments.

These sub-catchments feed into outlets, four of which discharge to the Waiau River and one to Boundary Creek.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Boundary Creek and the Waiau River.

Tuatapere has service connections and will therefore require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Localised flooding is occurring in parts of Orawia Road. This area needs to be investigated to check for conveyance restrictions and for potential upgrade works.

Morton Street where the property at No. 3 is on a secondary flood path has been purchased by Council to prevent it being built on.

There is one well-recorded instance of houses and commercial buildings being inundated with stormwater in the last 25 years. This occurred in 1984 when the Waiau River mouth blocked during a period of high river flow and heavy rainfall.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	3.428 km	Various	Sufficient
Open drains	0.542 km	Unknown	Sufficient
Sumps	135	Unknown	Sufficient
Manholes	22	Unknown	Sufficient
Soakholes	12	Unknown	Sufficient
Culverts	13	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The majority of Tuatapere's sumps are located on kerbs and have single cast iron grate inlets. Many sumps are of the bottomless type and do not trap sediment prior to it entering the system. There is an ongoing process of upgrading of these to the silt trap variety.

(b) Manholes

Approximately 50% of the manholes are square with heavy duty cast iron lids and frames. The remainder are round with concrete lids. Typically depths range from 1.5 to 2.5 metres.

(c) Pipes

No CCTV recording has been undertaken in the township.

(d) Ditches

The outlet ditch in King Street is regularly cleared of vegetation and accumulated sediment. All open ditches are maintained by the community board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2033
	Open drains	3	3	C	2048

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
	Sumps	3	3	C	2028
	Manholes	3	3	C	2028
	Soakholes	3	3	C	2025
	Culverts	3	3	C	2028
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There is an increasing trend in sump cleaning and maintenance. It is understood that the cause may be due to an increasing frequency of logging trucks leaving debris on the road which washes into the sumps.

Critical assets

None identified.

Key issues

There is a lack of historical information on the age and condition of the stormwater system components. This will be rectified by future condition assessment and CCTV survey.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix V: Waikaia

Description

The Waikaia community has an estimated 2013 population of 162 with a projected 2018 population of 169. The estimated peak population for Waikaia is projected to 2,490 in 2018. There are no service connections. Most properties collect roof water for drinking.

The scheme is governed by the Ardlussa Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed from 1960.

1983 - Western end of Newburn Street.

1993 - Eastern end of Newburn Street, Scotswood Street and Westoe Street.

2009 - Resource consent application lodged with ES.

2019 - Consent granted

Process description

The Waikaia stormwater system consists of pipelines, manholes, street sumps and open drains. The system performs well and improvements over time will be related to piping open drains for aesthetic reasons.

(a) Reticulation

Waikaia's primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Waikaia, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

ES has implemented flood protection works in the area including flood banking along the Waikaia River and Winding Creek.

Neither the capacity of the ES' flood protection works nor the consequence on Waikaia of flooding from the failure of these protection works have been considered as part of this plan.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows to ground and to the Waikaia River.

Waikaia has no service connections but will require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The low rainfall in Waikaia combined with good overland flow results in satisfactory performance.

Vegetation growth and silting in the outlet ditches are significant capacity limiting factors. A summary inventory of the stormwater assets is given below.

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

There is little data on the assets.

(a) Connections

Most properties deal with surface water on site and collect roof water for drinking.

(b) Sumps

The overall grading of Waikaia's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Most manholes are concrete with heavy concrete lids. Typically, depths range from 1.5 to 2.5 metres.

(d) Pipes

Pipes are generally considered to be in moderate to good condition. There are no CCTV records for the system.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned as required.

The current condition and performance grading of the stormwater system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	Unknown
	Open drains	4	4	B	2039
	Sumps	3	3	C	2019
	Manholes	3	3	C	2019
	Soakholes	3	3	C	2025
	Culverts	3	3	C	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the Roading Contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

High water table means that soakholes will discharge directly into the aquifer and likely require some remediation to mitigate against contamination of groundwater. Money has been included within the first five years.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Waikaia

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Change of soakholes to comply with ground water requirements	STO1501	estimate introduced in 18-28 LTP	LOS	22/23	3,276	Reserves

Appendix W: Wairio

Description

The scheme is governed by the Wallace Takitimu Community Board under the guidance of technical staff at SDC.

History

1953 - Stormwater network constructed.

Process Description

There is very little stormwater infrastructure in Wairio.

(a) Reticulation

The stormwater network consists of approximately 200 m of 100 diameter pipe complemented by stormwater channels, culverts and sumps.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into an unknown receiving environment.

Wairio has no service connections and does not currently require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

A lack of complaints would indicate that the current system copes adequately.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.2 km	□ 100	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. The current condition and performance grading of the stormwater system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	Unknown
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	Unknown
	Manholes	3	3	C	Unknown
	Soakholes	-	-	-	-
	Culverts	3	3	C	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

No issues.

No expenditure planned.

Critical assets

None identified.

Key issues

None identified.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix X: Wallacetown

Description

The Wallacetown community has an estimated 2013 population of 681 with a projected 2018 population of 680. The number of service connections is unknown. Most of the township is served by stormwater reticulation. Most properties collect roof water for drinking.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed from 1988.

1988 - Ailsa Street/Irvine Street drainage.

1985 - Kirkbride Street soak-holes and pipe under Cumnock Street.

1992 - Girvan and Kirkoswald Streets drainage.

1994 - Kilmarnock Street drainage.

1998 - Soakhole corner Dunlop Street and Kirkoswald Street north-east corner.

1999 - Dalwharn Street pipeline and two sumps replacing soakholes.

2009 - Application for resource consent lodged with ES.

2015 - Proposed outfall improvements deferred by Community Board

2018 - Outfalls refurbished

2019 - Consent granted.

Process description

The Wallacetown stormwater system consists of pipelines, manholes, sumps, and soakholes.
The stormwater system has been constructed in a piecemeal fashion over a number of years. It is predominantly made up of several small isolated networks of sumps and pipelines that discharge into neighbouring water ways. The remainder discharges into soakaways.

(a) Reticulation

Wallacetown's primary stormwater system consists of overland flow by means of kerb and channel on the Main Street and part of Dunlop Street. In other streets swales constructed in the grass areas channel water to soakholes and in around 20% of the township into sumps then pipe network.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows to ground and the Makarewa River.

Wallacetown is reported to have service connections although this is unlikely as there is no town water supply. The majority of properties would be collecting roof water for drinking. The scheme is required to have a discharge permit under the RWP. Application for the consent was lodged in 2009.

Asset Capacity

The service provided by the system is generally accepted as being adequate.

Wallacetown has not been surveyed for catchment areas but the area falls into roughly 10 catchment areas. These catchment areas need to be defined sometime in the future, however there are no known capacity issues with a lot of adequately sized swales and intermittent pipework.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	2.887 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	77	Unknown	Sufficient
Manholes	27	Unknown	Sufficient
Soakholes	6	Unknown	Sufficient
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2052
	Open drains	-	-	-	-
	Sumps	3	3	C	2047
	Manholes	3	3	C	2047
	Soakholes	3	3	C	2032
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

South-east and western catchments require upgrading.

Limited information available for scheme.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Wallacetown

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Outfall Improvement - West & South	STO760	MS Project detail Proj Profile: X Project No: 760	LOS	18/19	25,000	Reserves

Appendix Y: Winton

Description

The Winton community has an estimated 2013 population of 2,436 with a projected 2018 population of 2,430. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in the 1930s depression. About 70% of the existing system dates from the 1930s and consists of earthenware pipes ranging in size from 100 mm to 375 mm in diameter. The gravity piped system functioned as a combined sewer until a separate wastewater system was built in 1956.

1930s	-	Combined system built.
1956	-	Separate wastewater system built.
1960s	-	300 to 375 diameter concrete pipes (no rubbers used) Albert from Durham to Jane Streets and the south end of Great North Road.
1971	-	300 diameter concrete pipe in Arthur Street from McKenzie to outfall.
1978	-	300 - 700 diameter concrete pipes down Welsh Road.
1982	-	150 diameter uPVC along Great North Road from Grange Street to Welsh Road.
1991	-	Park Street South 600 and 750 mm diameter concrete pipes.
1993-95	-	Installation of 24 new manholes, where there were none previously.
1993-95	-	Closed circuit television (CCTV) inspections and water-jetting (1 and 2).
1999-00	-	Western channel deepened from Gap Road to Eglinton Street.
2000-01	-	Pipework upgraded from No. 1 outlet at Eglinton Street to John Street and also along John Street from Durham Street to No. 24.
2006	-	Sections of Grange Street upgraded (from Park to Mackenzie).
2007	-	Emergency renewals carried out in Mackenzie Street (from Arthur to John).
2008	-	Welsh Road subdivision completed.
2009	-	Application for resource consent lodged with ES.
2015	-	CCTV work undertaken around Meldrum street catchment
2017	-	Emergency repair work undertaken Bute Street.
2018	-	Upgrade to Great North Road reticulation
2019	-	Consent Granted

Process description

The Winton stormwater system consists of pipelines, manholes, street sumps, and open drains.

(a) Reticulation

Winton's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Winton, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Winton's total catchment area is approximately 130 ha and for reference purposes has been broken down into 13 sub-catchment areas.

These sub-catchments feed into three defined outlet channels or ditches, which flow to the south of Winton, and eventually into the Oreti River, as follows:

- Outlet 1 drains Sub-catchments 1 - 9 (84 ha or 65% of the township).

  It is formed by an open ditch, which bounds the west of Winton and flows south to eventually discharge into the Winton Creek at the intersection of Substation Road. Within these sub-catchments the oldest and largest area is generally from Eglinton Street to Grange Street, between State Highway 1 (Main Street) and Mackenzie Street. Stormwater pipes in this area are mostly earthenware and range in size up to 375 mm in diameter. The newer areas west of Mackenzie Street, have a mixture of concrete and earthenware pipes, and the area to the north of Grange Street contains mostly uPVC and concrete pipes.
- Outlet 2 drains 40 ha or 31% of the township catchment and is formed by an open ditch south of Park Street, which flows to the south west and joins the Winton Stream prior to discharging into the Oreti River. Sub-catchments 10A, 10B and 11 drain to this outlet and are generally bounded by State Highway 1 to the east, Bute and Eglinton Streets to the north, and to the urban limits to the north. Pipe materials in this area are a mixture of concrete, earthenware and some uPVC. An upgrade programme has been completed along Park Street from Dejoux Road to Essex Street.
- Outlet 3 drains 6 ha or 5% of the township catchment and is formed by an open ditch, which flows into the Winton Stream to the east of Winton. Sub-catchments 12 and 13 to this outlet. The Central Business District and minor eastern catchments make up this small contributory area about State Highway 1, which spans from Bute Street to Grange Street. Pipe materials in this sub-catchment are mostly earthenware, with some concrete in the newer eastern areas.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into three outlets to the south of Winton and then into the Oreti River. Winton has service connections and will therefore require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The progressive urbanisation of Winton and increase in impervious areas have resulted in significant drain under-capacity, which in turn has resulted in repeated surface flooding in several areas following heavy rainfall. The surface flooding does recede quickly upon the cessation of rain.

The primary system capacities vary over a significant range for each of the 13 identified sub-catchments. The system capacities expressed as a percentage of the five year ARI range from 7.5% to 91%.

Vegetation growth and silting in the outlet ditches are significant capacity limiting factors.

Secondary system ponding during and for short periods after moderate to high intensity storms have been observed in the following areas:

- Middle of Arthur Street.
- Durham Street between Homes and Albert Street.
- East end of Union Street.
- East end of Church Street.
- East end of Anne Street.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years. Two or three occurrences of garage inundation are thought to have occurred over the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	25.199 km	Various	Sufficient
Open drains	4.723 km	Unknown	Sufficient
Sumps	431	Unknown	Sufficient
Manholes	195	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	8	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be poor. Winton is beginning to have more problems with ageing infrastructure causing pipe failures and localised flooding. Tree root infiltration is contributing significantly to poor asset performance also.

(a) Connections

The condition of most connections is good. Several blockages per year occur as a result of root intrusion. Connection pipes are mostly earthenware (estimated 90%). All new and replacement connections are 100 - 150 mm diameter uPVC and are estimated to be about 10% of all connections. It is estimated that 98% of connections discharge directly into the piped system and the remaining 2% either have no connection or discharge to the street kerb.

(b) Sumps

The overall grading of Winton's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Approximately 70% of the manholes are square with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Pipes

Pipes in sub-catchments 11 and 12 around the town centre and just to the south of it have a poor condition grading. The central western Sub-catchments 1 - 6 have pipes with a moderate condition grading and pipes to the north and south in Sub-catchments 7, 8, 9, 10 and 13 have a good condition grading.

CCTV records show that an estimated 20% of the old earthenware pipes are misaligned at joints and hold water through dips in vertical alignment. The capacity of these pipes and additional loading from ground water infiltration significantly reduces its capacity to convey stormwater run-off. Pipe material integrity generally appears to be satisfactory with several isolated exceptions identified by the CCTV inspections.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years.
All open ditches from Welsh Road to Dejoux Road are maintained by the Community Board with the only exception being the western channel from Welsh Road to Price Road, which is maintained by ES.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2041
	Open drains	3	3	C	2036
	Sumps	3	3	C	2036
	Manholes	3	3	C	2041
	Soakholes	-	-	-	-
	Culverts	3	3	C	2036
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the Roading Contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There is an emerging trend of increasing maintenance in root cutting and blockage clearing due to failure of pipe joints. Approximately 30% of pipelines are old earthenware with joint failure issues and at least half of all stormwater pipelines less than 150 mm diameter.

Critical assets

None identified.

Key issues

The issue for Winton is that the reticulation meets the end of its design life in 2016-2021. Many of the pipes are earthenware and due for replacement. A programme has been initiated for replacement.

A programme is required to initiate renewal in line with priority areas and the road reseal programme.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Tree root infiltration is having a significant detrimental effect on scheme performance.

Capital expenditure plan

The community board have acknowledged the need for a detailed renewals programme and have requested an allowance of $500K per annum to be included across the life of the plan.

Winton

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Storm Main Replacement	STO1718	Expected replacement as a result of STO789 in the 17/18 financial year. Unsure of amount have used $1,000,000 as an estimate pending investigation.	REN	18/19	1,000,000	Loan
Storm Main Replacement	STO1718	Expected replacement as a result of STO789 in the 17/18 financial year. Unsure of amount have used $1,000,000 as an estimate pending investigation.	REN	19/20	876,518	Loan
Stormwater discharge improvements to groundwater	STO1507	Estimate introduced as part of 18-28 LTP	LOS	25/26	88,198	Loan & Reserves

Appendix Z: Woodlands

Description

The Woodlands community has an estimated 2013 population of 246 with a projected 2018 population of 213. There are no service connections. Most properties collect roof water for drinking.

The scheme is governed by the Waihopai Toetoes Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed from 1950.

2000 - Woodlands South Road (reconstruction and drainage).

Process description

The Woodlands stormwater system consists of pipelines, manholes, sumps and open drains.

(a) Reticulation

Woodlands primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Woodlands, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

An inspection of the network is required to collect information about the components that make up the network and ensure the plan is drawn with the correct connectivity.

Woodlands total catchment area is predominantly rural and for reference purposes has been broken down into five sub-catchment areas as shown in the attached map.
These sub-catchments feed into three defined outlet channels or ditches, which flow to the Waihopai Stream.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Waihopai Stream.

Woodlands has no service connections and does not currently require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Vegetation growth and silting in the outlet ditches are significant capacity limiting factors.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Nil	N/A	N/A
Sumps	19	Unknown	Sufficient
Manholes	10	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	-	-	-	-
	Open drains	-	-	-	-
	Sumps	3	3	C	unknown
	Manholes	3	3	C	unknown
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Significant flooding occurred in spring 2020 with follow up investigation showing the need for large scale replacement of damaged pipework.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix AA: Wyndham

Description

The Wyndham community has an estimated 2013 population of 594 with a projected 2018 population of 555. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Waihopai Toetoes Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in 1935 with various additions since then.

2005 - Consent granted to discharge stormwater and septic tank effluent into the Mataura River.

- Activity Management Plan produced.

2008 - Septic tank effluent removed from the stormwater system. A separate sewerage scheme was constructed under the Ministry of Health's SWSS.

2009 - Application for resource consent lodged with ES.

2013 - CCTV survey completed.

Process description

Wyndham's stormwater system was designed as a combined stormwater and septic tank effluent system consisting of pipelines, manholes and street sumps. The capacity of the stormwater system is difficult to determine based on existing data. It is calculated that capacity would be sufficient to dispose of the run-off from a 10 year return period storm without 'heading up'. It is considered that in a 50 year return period storm there would be surface flooding but it should not be sufficient to flood buildings.

(a) Reticulation

Wyndham's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Wyndham, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Wyndham's total catchment area is approximately 100 ha and is effectively one catchment. The system discharges into a branch of the Mataura River south of Cardigan Road West.

In extreme events the line to the outlet becomes overloaded and the surplus flows overland.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows through a diffuser into the Mataura River. The existing resource consent to discharge stormwater and septic tank effluent expired in 2009. A new consent has been granted by ES to discharge stormwater only through a diffuser into the Mataura River. This new consent expires in 2034. A separate consent for discharge of treated wastewater from Wyndham has been granted, see Wastewater Activity Plan.

Wyndham has service connections and will require a discharge permit under the RWP. The application has been lodged with ES in 2009.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Indicative calculations confirm there is sufficient capacity to pass a ten year storm.

A summary inventory of the stormwater assets is given below.

ASSET TYPE		CAPACITY	
Reticulation	10.977 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	132	Unknown	Sufficient
Manholes	76	Unknown	Sufficient
Soakholes	2	Unknown	Sufficient
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. However, the majority of the network has been the end of the (adopted) economic life and can be expected to begin to show signs of failure.

(a) Connections

The condition of most connections is good. Few blockages per year occur as a result of root intrusion. Connection pipes are mostly earthenware (estimated 90%).
All new and replacement connections are 100 mm diameter uPVC and are estimated to be about 10% of all connections. However, with the installation of the new water supply there may be increasing issues caused by stormwater redirected from household storage tanks.

(b) Sumps

The overall grading of Wyndham's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Most manholes are circular with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe and many manholes do not have step irons.

(d) Pipes

A CCTV survey has now been completed for the whole network. Analysis of the footage has been carried out and a more accurate condition has been applied to the piped assets. A renewals programme has been set to replace assets which are at the end of their functional life.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment. ES maintains flap gates through stopbanks and monitors outlet drains.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	5	5	A	2035
	Open drains	-	-	-	-
	Sumps	3	3	C	2035
	Manholes	3	3	C	2035
	Soakholes	3	3	C	2035
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. The majority of historical maintenance issues were traced back to poor maintenance of private septic tanks. It is expected that this issue will be alleviated by the removal of septic tank effluent from the system.

A CCTV inspection programme has been completed and a renewals programme has been set.

Critical assets

No critical assets have been identified.

Key issues

The issue for Wyndham is the reticulation is expected to meet the end of the design life within the upcoming period of the AMP a current replacement value of the estimated in the region of $3 million..

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Renewals will be subject to analysis of the CCTV condition assessment footage.

During periods of heavy rain which cause the river to rise to high levels, areas of Wyndham surrounding the Wyndham-Mokoreta Road suffer surface flooding. Under certain conditions this can also cause surface flooding issues for Malta Street and the surrounding properties.

Capital expenditure plan

The community board have acknowledged the need to undertake renewal of the aged network which is programmed to occur across the life of the plan.