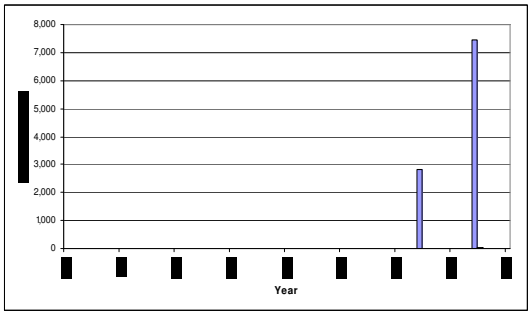
1.0 Southbridge Sewage Scheme

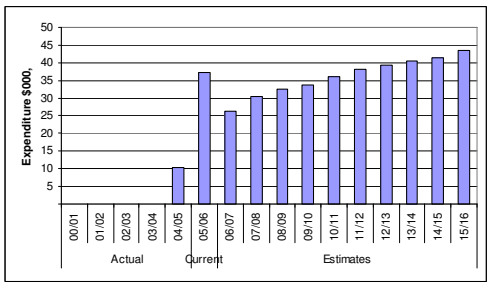
1.1 Executive Summary

Description		Quantity
Population Served		800
Deprivation Index		3
Physical Statistics	Reticulation Length (km)	10.26
	Manholes	86
	Pump Stations	1
Value ($)	Replacement	$2,028,850
	Depreciated Replacement	$2,012,618
Flows	Annual average over last 0 years	Not available
	Average daily	m^3/day
	Peak daily	m^3/day
	Minimum daily	m^3/day
Treatment & Disposal	Via Leeston WWTP	
Infiltration		Low
Properties	Connected (April 2006)	138
	Not connected	228

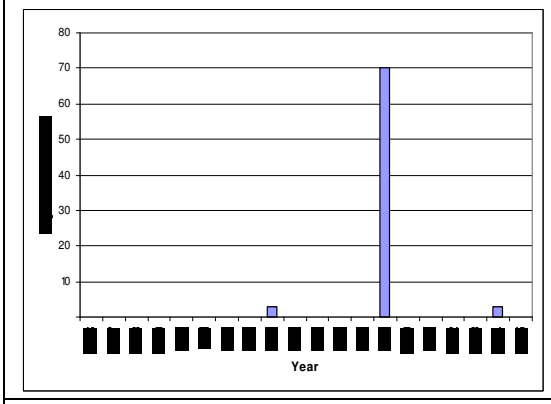
Pipework Replacement Dates



Operating and Maintenance Financial Requirements



Renewals Financial Requirements



New Capital Financial Requirements

There are no capital requirements

There are no key issues for Southbridge wastewater scheme

1.2 Introduction

1.2.1 Overview and History

Southbridge township was served by individual septic tanks with on-site disposal of waste water using field tile systems, injection wells (bores) and boulder holes. Where boulder holes failed wells were installed. There were a number of on-site system failures recorded by Council staff and discharge of septic tank effluent to ground and to local waterways occurred on an ongoing basis. This resulted in significant potential for direct human contact with effluent, as well as possibly of indirect contact, such as rodents, domestic pets etc.

A number of options were investigated for treatment and disposal by a Council sewerage project team. This ranged from the use of wetland reed phragmites australis, oxidation pond and associated land treatment or connection to the Leeston WWTP. The option for connection to the Leeston WWTP was approved in 2003 with construction started in early 2004. The Southbridge sewerage scheme was commissioned in December 2004.

The majority of the township is reticulated by gravity sewers but the low density outlying areas of the township are serviced by a pressurised sewerage system.

Wastewater Map

1.2.2 Knowledge of Assets

The following table details the confidence in information for facilities and reticulation.

Table 1-1: Data Confidence

	Reticulation				Pump Station			
	Age	Condition	Performance	Location	Age	Condition	Performance	Location
Highly Reliable								
Reliable								
Uncertain								
Very Uncertain								

1.2.3 Criticality

The following is a preliminary assessment of the critical assets within the scheme.

Table 1-2: Critical Assets

Facility or Main	Location	Reason
Rising main	Between Southbridge and Leeston	Single main 9.7km long serving all the community

1.3 Treatment and Disposal

1.3.1 Overview

Treatment and disposal of wastewater from Southbridge is via the Leeston Wastewater Treatment Plant. Table 1-3 details the Design Parameters for Combined Leeston, Doyleston, and Southbridge[1].

Table 1-3 Design Discharge Flows (with buffer storage)

Township	Future Design Population	Summer Average Flow		Peak Instantaneous Wet Weather Inflow to WWTP		Sustained Wet Weather Flow to Land Treatment (with buffer storage)	
		m^3/d	l/sec	m^3/d	l/sec	m^3/d	l/sec
Leeston/Doyleston	2,200	710	8.2	4,320	50.0	1,930	22.3
Southbridge	900	240	2.8	900	10.4	320	3.7
Spare Capacity*	500	150	1.7	500	5.8	250	3.0
Combined Totals	3,600	1,100	12.7	5,720	66.02	2,500	29.0

* This was previously for Dunsandel township

[1] Leeston Wastewater Treatment Plant Upgrade Report

1.4 Pump Station

1.4.1 Overview

The rising main is 9.7km long and there for friction losses can be very high for flows that have a flushing velocity (1 m/sec or greater). Standard sewage pumps were not available to have the capabilities required for flushing velocities. The pump station was designed to have a "standard" sewerage pump for normal operation and a Progressive Cavity (PC) pump for maintaining flushing velocities.

The pump station and associated gravity mains have the capacity of storing 4 hours average dry weather flow during power outage or other emergency event.

The standard pump operates as the duty pump with the PC pump starting after 14 cycles of the standard pump or following a period of 12 hours.

1.4.2 Pump Station Details

The following table is an overview of the individual pump stations.

Table 1-4: Schedule of Pump Stations

Pump Station	Description	Year installed	Capacity (m^3/day)	Condition	Performance	Criticality
Broad street	1 high head submersible pump 1 low head submersible pump	2004	80	1	1	High

1 = Very Good (Industry Standard) 2 = Good 3 =Moderate 4 =Poor 5 =Very Poor

1.4.3 Pump Station Issues

The PC pump has the following limitations:

- Not effective at pumping sharp or large hard items as these can damage the stator – ongoing maintenance required to ensure pump sump is kept clear of hard sharp objects
- The PC pump does not have the peak flow requirements to act as standby during peak loading and peak infiltration periods

The above limitations are mitigated by ongoing maintenance and monitoring of the pump station and reticulation.

1.5 Supply Reticulation

1.5.1 Overview

The majority of the township is reticulated by gravity sewers but the low density outlying areas of the township are serviced by a pressurised sewerage system. There are 5 flush manholes located within the system that need to be operated on a weekly basis. Scour valves are located on 4 of the pressure mains that are operated on "as required" basis.

A schedule of the pipe asset statistics is shown in Table 10.5 below.

Table 1-5: Schedule of Pipework

Diameter mm	PE-MD	UPVC	Total

Diameter mm	PE-MD	UPVC	Total
63	1,382	0	1,382
90	351	0	351
100	0	207	207
150	0	7,157	7,157
160	1,090	0	1,090
200	0	112	112
Total	**2,822**	**7,475**	**10,298**

1.5.2 Condition

The condition of the reticulation installed in 2004 will be very good.

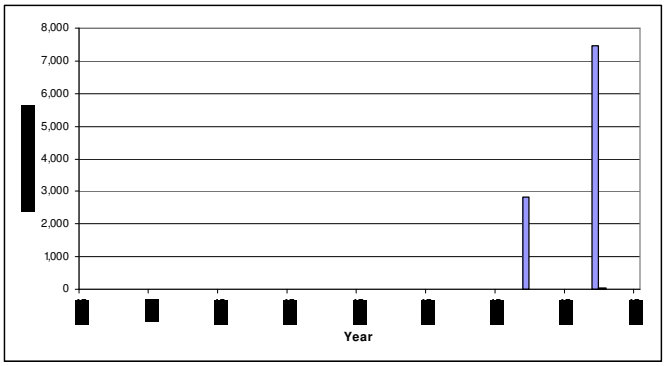
1.5.3 Performance

The performance of the reticulation is considered by Council engineers to be very good[2].

1.5.4 Pipework Age

All mains installed in 2003/04 and have an expected life of 65 to 75 years.

Table 1-6 Pipework Replacement Dates



1.5.5 Property Inspections

Every property is inspected by Councils building inspectors when application for connection to reticulation is made as part of the building consent is made. The next full township property inspection will be in 2009.

1.6 Environmental Management

Resource consents for the Leeston WWTP are detailed in the Leeston township section.

[2] Infrastructure Asset Guidelines 1999

1.7 Maintenance and Operating

1.7.1 Maintenance Contract

Maintenance of the reticulation and general work around the pump station is carried out by SICON Ltd under Maintenance Contract 849. The Southbridge sewerage system Operation Manual has been assessed as good.

1.7.2 Maintenance Issues

There are no maintenance issues for the South Bridge Wastewater Scheme.

1.7.3 SCADA

The pump station is monitored by Council's SCADA system and has the following alarm and monitoring capacity:

Site Name	Phase Failure	Pump Operation	Well Level and High Alarm	Total Outflow
Southbridge Pump Station	Y	Y	Y	Y

1.7.4 Future Maintenance Financial Programme

Table 1-7 details the maintenance and operating costs (excluding depreciation).

1.8 Renewals Capital Expenditure and Depreciation

Table 1-8 details the renewals programme for the period 2006/07 to 2026/27.

Table 1-7: Future Operating and Maintenance Financial Requirements 2006/15

Excluding: Depreciation and Loan Interest

	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Expenses										
Support Services	8660	11946	13009	13868	15183	16371	16954	17264	17423	17927
Consultants Fees	1392	1484	1576	1628	1720	1812	1865	1957	2048	2193
Consultants Fees - other	321	342	364	376	397	418	430	452	473	506
Insurance and Rates	200	200	200	200	200	200	200	200	200	200
Electricity	3212	3424	3636	3758	3970	4182	4303	4515	4727	5061
Maint. - Pump Station	1606	1712	1818	1879	1985	2091	2152	2258	2364	2530
Maint. - Reticulation	2141	2283	2424	2505	2646	2788	2869	3010	3152	3374
Routine Checks	800	800	800	800	800	800	800	800	800	800
Share of Treatment & Disposal	7851	8184	8618	8807	9157	9501	9659	10017	10349	10951
Total Expenses	26184	30375	32445	33820	36059	38162	39231	40472	41536	43542
Scheme Improvements										
Property Inspections					1,500					2,000
Improvement Plan items	12,500									
Total Scheme Improvements	12,500	0	0	0	1,500	0	0	0	0	2,000

Table 1-8: Future Renewals 2006/07 to 2026/27 ($000,)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
MULTITRODE PROBE									3										3	
SCADA SYSTEM														10						
SCADA RT														1						
SUBMERSIBLE PUMP (ONE)														27						
FLUSH PUMP														27						
MAGFLOW METER														5						
TOTAL									3					70					3	

Table 1-9: Future Operating, Maintenance Forecasted Cost Trends

Excluding: Depreciation

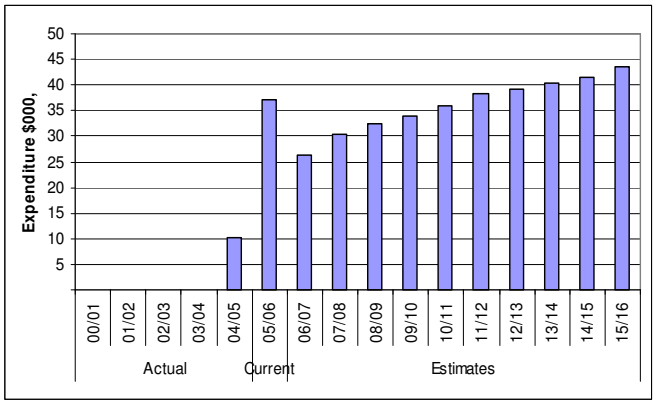
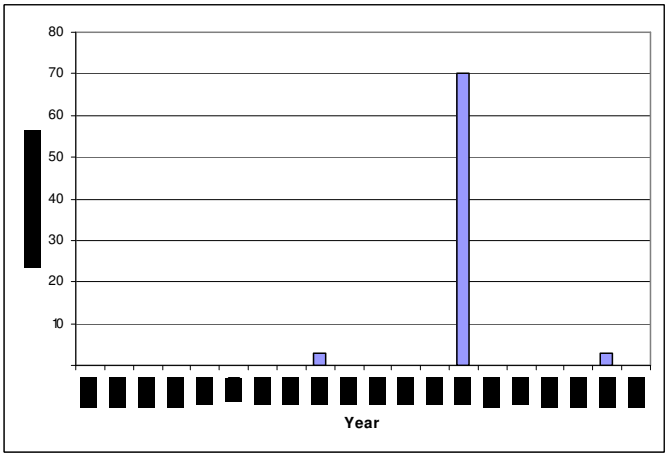


Table 1-10: Projected Renewals Expenditure

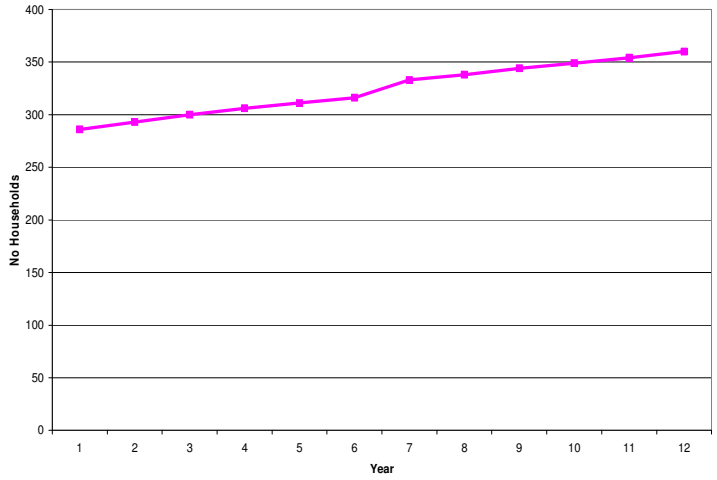


1.9 Future Demand and New Capital Expenditure

1.9.1 Population Projections

Population forecasts for all towns and selected rural-residential areas were developed by Max Barber (Planning Consultant) for the Asset Management Department in late 2005. These population predictions will be considered by Council in early 2006 as the official population predictions for the period 30th June 2005 to 30th June 2016. The following table details the population predictions for Southbridge.

Table 1-11: Population Projections 2005/2016



1.9.2 Future Demand

Table 1-12 indicates that while there is an overall spare capacity in treatment and disposal there is a shortfall in some individual townships. This may be resolved if Dunsandel does not connect to the Leeston WWTP and/or reduction in wet weather flows are achieved in Leeston. Via an extensive review in 2005, its was determined that installing a reticulated network from Dunsandel to Leeston was cost prohibitive compared to onsite

Table 1-12: Predicted Demand and Spare Capacity

Township	Design Population (pe)	Predicted 2015/16 Population	Spare Capacity (pe)
Leeston/Doyleston	2,200	1900	300
Southbridge	900	970	-70
Dunsandel	500	540	-40
Combined Totals	3,600	3410	190

1.10 Disposal Programme

No disposals of assets are considered necessary over the next 10 years.