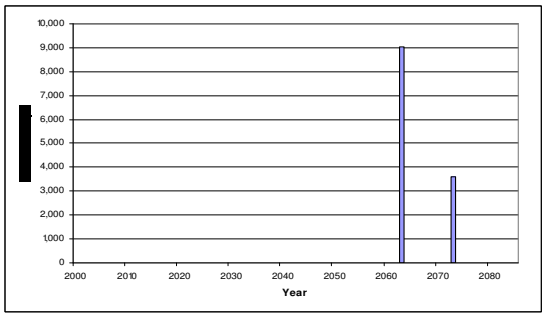
1.0 Tai Tapu Sewage Scheme

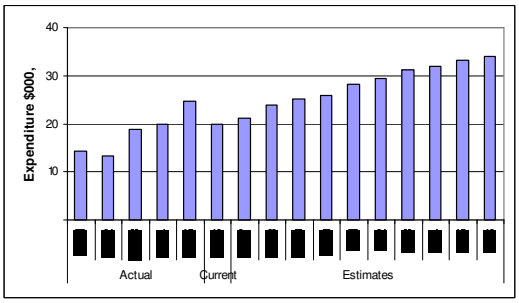
1.1 Executive Summary

Description		Quantity
Population Served		330 (estimate)
Deprivation Index		Unknown
Physical Statistics	Reticulation Length (km)	12.62
	Manholes	42
	Pump Stations	1
Value ($)	Replacement	$2,225,191
	Depreciated Replacement	$1,905,218
Flows	Annual average over last 6 years	17,908 m^3/day
	Average daily	49 m^3/day
	Peak daily	79.7 m^3/day
	Minimum daily	- m^3/day
Treatment & Disposal	To Christchurch City	
Infiltration		Unknown
Properties	Connected	107
	Not connected	23

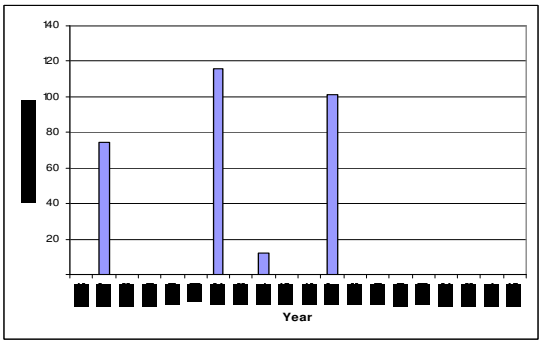
Pipework Replacement Dates



Operating and Maintenance Financial Requirements



Renewals Financial Requirements



New Capital Financial Requirements

There are no capital requirements

The key issue relating to the management of the Tai Tapu sewerage scheme are:

- Ensuring infiltration is monitored and minimised

1.2 Introduction

1.2.1 Overview and History

An agreement between Selwyn District Council and Christchurch City Council was signed in November 1997 allowing the pumping of raw sewage to Christchurch City reticulation. A sewer reticulation was installed into Tai Tapu Township in 1998.

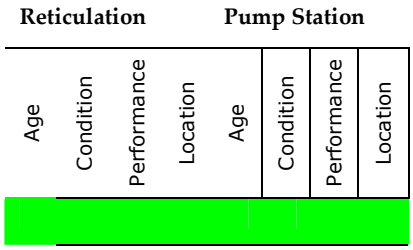
Prior to this, wastewater from each property was disposed of by individual septic tanks. Due to the high ground water levels in Tai Tapu during winter periods septic tanks had a high percentage of failure in certain areas and unacceptable health hazards were considered to occur.

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



1.2.3 Criticality

The following is a preliminary assessment of the criticality of the scheme components.

Table 1-2: Critical Assets

Facility or Main	Location	Reason
Main Pump Station	School Rd	No standby generator and services the Tai Tapu community
Rising main to Christchurch	Springs and Shands Roads	Single main over 8.6 Km long serving the Tai Tapu community

1.2.4 Design

Because of poor ground conditions (clays and high ground water), the gravity sewer within Tai Tapu was laid at shallow depth with flushing grades in accordance with CCC specifications. These shallow grades reduce the capacity of the pipes and therefore decrease the number the number of households that can be serviced by the reticulation.

The critical sewer mains are the two gravity mains on School Rd that flow to the pump station that can serve up to 320 households.

The scheme has the following design:

- Peak loading factor of 1,000 Litres/p/day
- Number of people per household is 2.8
- Maximum volume of discharge is 250 Litres/day
- Number of properties able to be served is 231

1.3 Treatment and Disposal

1.3.1 Overview

No treatment is carried out with all wastewater being pumped to Christchurch City.

1.3.2 Issues

The issues for Springston Treatment and Disposal are:

- High cost of disposal requires monitoring of infiltration levels and corrective action as required on a ongoing basis

1.4 Pump Station

1.4.1 Overview

Wastewater from the individual properties gravitates to a single pump station on School Road. Wastewater is then pumped from the pump station to Christchurch.

Existing pump capacity can be reset to operate at a higher flow rate of 7.8 Litres/sec (which is the upper limit of the flow rate of the existing pumps).

The system is designed to provide storage for 4 hours for 232 households.

1.4.2 Pump Station Details

The following table is an overview of the pump station.

Table 1-3: Schedule of Pump Stations

Pump Station	Description	Year installed	Capacity (L/sec)	Condition	Performance	Criticality
School Rd	Two surface mounted mono pumps with munches (mechanical screens before pumping).	1998	7.5	1	1	High

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

1.4.3 Pump Station Issues

The pump station contains a high degree of sophistication with munches and high head pumps. These units require special attention due to their inability to take "large and hard" items and the high cost of associated repairs.

1.5 Supply Reticulation

1.5.1 Overview

Due to the very flat grades within the township there is a need for flushing on a regular basis of the reticulation. This is carried out by the use of three flush tanks.

A schedule of the pipe asset statistics is shown in Table 1-4 below.

Table 1-4: Schedule of Pipework Length (m)

Diameter mm	MPVC	PE80	UPVC	Total
50	0	0	42	42
80	0	0	457	457
100	8,568	0	43	8,610
110	0	0	48	48
150	0	76	3,062	3,138
225	0	0	199	199
250	0	0	121	121
Total	**8,568**	**76**	**3,971**	**12,615**

1.5.2 Condition

The condition of the reticulation installed in 1998 and later will be very good.

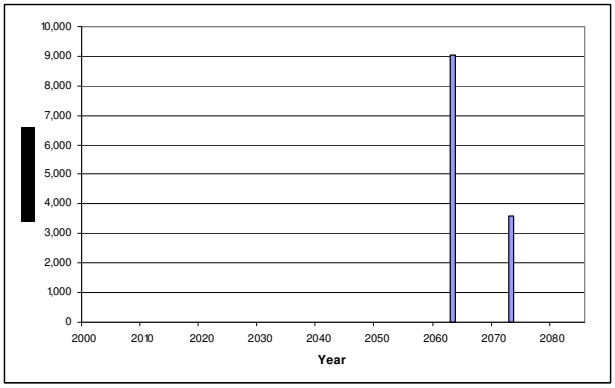
1.5.3 Performance

The performance of the reticulation is considered by Council engineers to be very good. Hydraulic modelling of the reticulation is programmed for 2006/07 and 2007/08 to ensure future development can be facilitated.

1.5.4 Pipe Network Replacement Date

Table 1-5 details the expected year of mains replacement.

Table 1-5 Pipework Replacement Dates



1.5.5 Infiltration

The infiltration rate is unknown.

1.5.6 Property Inspections

Property inspections were to be carried out in 2003/04 but due to constraints in resources this inspection has now been programmed for 2006/07 and subsequently in 2010/11.

1.5.7 CCTV

No CCTV is required in the foreseeable future.

1.6 Environmental Management and Agreements

1.6.1 Agreements

The current agreement with CCC is a maximum flow of 7.5 Litres/sec with a maximum volume of discharge of 90,000m^3 in each financial year, permitted hours of pumping are 24 hours/day and nature of discharge is raw sewage.

1.6.2 Consenting Issues

There are no requirements for resource consents.

1.7 Maintenance and Operating

1.7.1 Maintenance Contract

Maintenance of the reticulation and the pump station is carried out by SICON Ltd under Maintenance Contract 849. The Tai Tapu wastewater scheme Operation Manual has been assessed as moderate. Enhancement of the existing manual is programmed for 2006/07.

1.7.2 Maintenance Issues

The issues for the maintenance of the Tai Tapu Wastewater Services are

- Possible trade waste disposal causing degradation of the Candys Road (Christchurch City/Selwyn boundary) manhole

1.7.3 SCADA

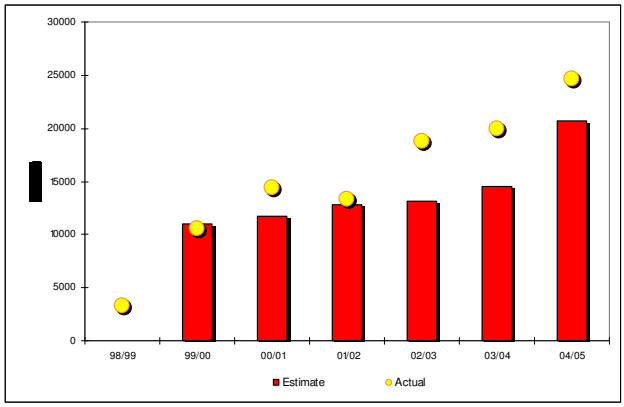
The pump station is monitored by Council's SCADA system and has the following alarm and monitoring capacity:

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

1.7.4 Actual Operating versus Estimated Costs

Table 1-6 details the comparison between annual estimates and actual annual costs.

Table 1-6: Actual Costs versus Estimates 1997/98 – 2004/05



1.7.5 Future Maintenance Financial Programme

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

1.8 Renewals Capital Expenditure

Table 1-7 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	3620	5491	5693	5746	6231	6515	6977	7153	7392	7577
Consultants Fees	1719	1830	1941	2004	2178	2289	2400	2463	2574	2637
Consultants Fees - other	333	354	376	388	422	443	464	477	498	510
Insurance and Rates	521	521	521	521	521	521	521	521	521	521
Electricity	2441	2598	2755	2845	3092	3249	3406	3496	3653	3743
Maint. - Pump Station	3328	3542	3757	3879	4216	4430	4644	4767	4981	5103
Maint. - Reticulation	1970	2097	2224	2296	2496	2623	2750	2822	2949	3021
Routine Checks	998	1063	1127	1164	1265	1329	1393	1430	1494	1531
CCC Disposal Fees	6101	6494	6887	7112	7729	8122	8515	8739	9132	9356
Total Expenses	21032	23990	25280	25954	28148	29520	31070	31867	33194	34000

Scheme Improvements

IP I1 CCTV	5,300									
Operations Manuals & Procedures	2,500									
Property Inspections					2,000					2,000
Improvement Plan items	2,800									
Ground water level monitoring	3,000									
Total Scheme Improvements	13,600	0	0	0	2,000	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
PUMP UNIT 1		32										32								
PUMP MOTOR 1							12													
PUMP UNIT 2		32										32								
PUMP MOTOR 2							12													
MUNCHER 1							36													
MUNCHER 2							36													
ELECTRICAL SWITCHBOARD												27								
VARIABLE SPEED DRIVE		11										11								
FLOW METER							5													
SCADA SYSTEM							10													
SCADA RT							1													
BACK FLOW PREVENTER							1													
PRESSURE RELIEF VALVE							3													
PUMP 3 COMPLETE									12											
TOTAL		75					116		12			102								

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

Excluding: Depreciation

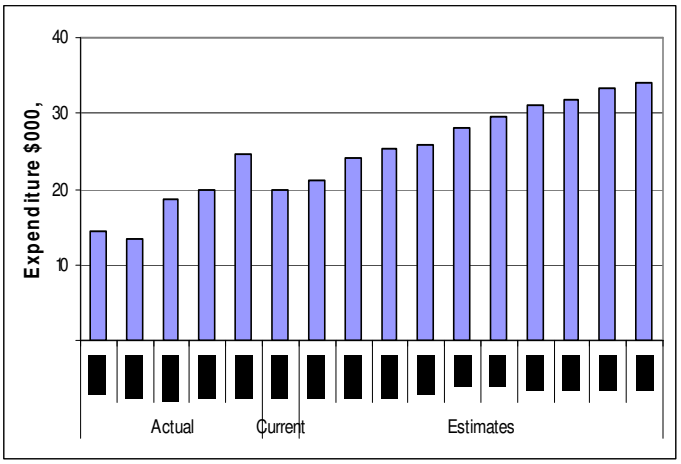
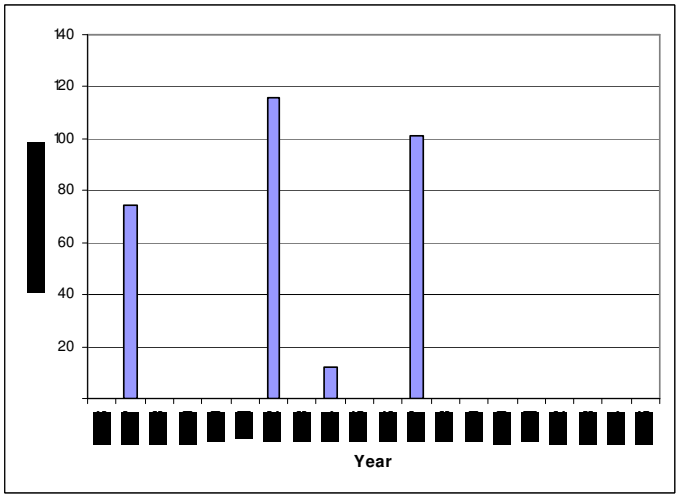


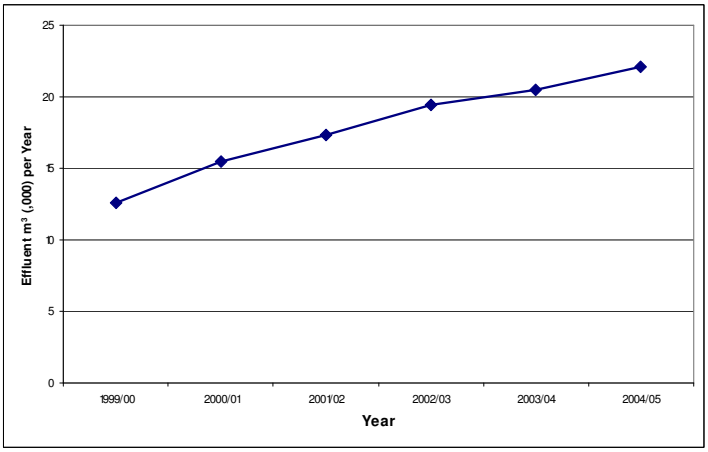
Table 1-10: Projected Renewals Expenditure



1.9 Annual Wastewater Quantities

The following table details the annual wastewater quantities for Tai Tapu sewerage scheme.

Table 1-11: Annual Wastewater Quantities

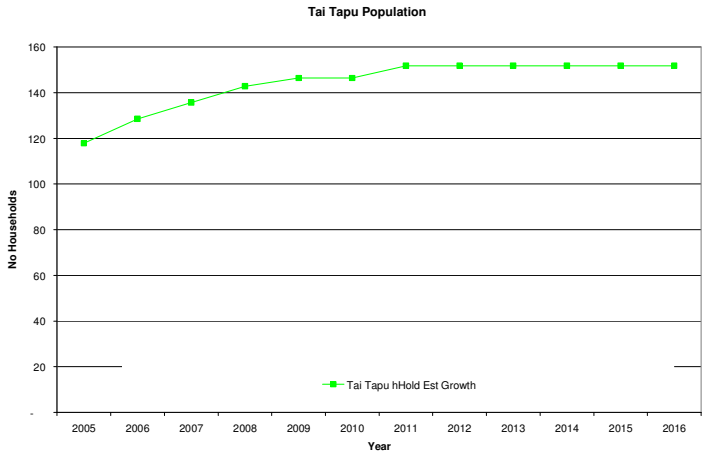


1.10 Future Demand and New Capital Expenditure

1.10.1 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 Tai Tapu.

Population Projections 2005/2016



1.10.2 Capacity/Future Asset Development Requirements

1.10.3 Future Demand

Table 1-12 indicates that there is an overall spare capacity for 127 connections. The hydraulic modelling to be undertaken will ensure that the reticulation design is not compromised.

Table 1-12: Predicted Demand and Spare Capacity

Design Connections		Predicted Population 2015/16	Predicted connections 2015/16	Spare Capacity connections
Year	Connections			
2005	279	410	152	127

1.11 Disposal Programme

No disposal of assets are considered necessary over the next 10 years