General and technical information

Our Long Term Council Community Plan 2009–2019
Christchurch Ōtautahi

The following pages contain assessments of certain services and information about Council controlled organisations, as required by the Local Government Act. They are also potentially of interest to stakeholders seeking specific technical information.

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Assessments of various services

Cemeteries and crematoria

This assessment considers the adequacy of the provision of cemeteries and crematoria in Christchurch City to meet future demands for disposal of the dead in a controlled, hygienic and dignified manner for the period 2009 to 2019. The following report is a compilation of information provided by the former Banks Peninsula District Council and Christchurch City Council in a Sanitary Services Assessment in 2005 and updated to 2008.

Key findings are:

- Following the last sanitary services assessment it was decided to prepare a Cemeteries Master Plan to be completed in 2009. This plan will consider use and burial practices for all the cemeteries.
- There is sufficient capacity within existing urban district cemeteries to meet predicted demand for the next 8 years with further existing land to be developed through the capital programme to meet a 20 year period. Location of urban cemeteries is an issue though that needs to be addressed and more land acquired.
- Rural district and small settlement cemeteries on the peninsula have capacity from 25 years with further existing land to be developed through the capital programme to meet a 46 years period.
- Current crematoria estimated capacity is adequate to meet predicted demand well beyond a 20 year period.
- Because of community preference for locally accessible cemeteries, there is a requirement for a new cemetery site to service the northern urban part of the city and additional capacity is required to further extend Avonhead Cemetery. (One site has been acquired at Ouruhia but establishment as a cemetery is subject to resource consent and planning processes).
- A partnership with Selwyn District Council for the joint use of Shands Road Cemetery could be further explored, but currently the southern part of the city is well met by Yaldhurst Cemetery which does have a long term capacity.
- Limitations on the pre–purchase of cemetery plots is required to extend cemetery life spans and optimise cemetery use as there is a significant number of pre–sold plots using up land that will take many years to be utilised.
- Returned Services needs will continue to be met, and a wider range of cultural preferences to meet differing people's needs.
- Marketing to improve the use of less known cemeteries and ashes interment areas is required.
- Current capacity at both cemeteries and crematoria is sufficient to deal with death rates from a civil emergency or pandemic. However, during the next 10 years, it would be prudent to investigate an area that could be used for both mass burial and as a future cemetery.
- No public health issues were identified by the Medical Officer of Health. The issues of groundwater contamination from cemeteries and air discharges from crematoria which were raised by other agencies are considered in the assessment.

Asset description

There are 24 cemeteries located within the Christchurch district with 12 on the peninsular and 12 in the urban area which are managed by the Christchurch City Council (Council). Three cemeteries on the peninsula are owned by the Council but are managed by others. Eight of the 24 Council cemeteries are either closed or have reached capacity with the only burials being a second burial in an existing plot or burial in a reserved plot. In addition to the Council cemeteries, a number of churches (14) have their own burial grounds and there are 3 privately owned burial grounds on the peninsula.

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Cemeteries and crematoria are provided for the community and the provision of this activity does not significantly alter, based on the geography or demographic profile of different parts of a community. However, the Christchurch district differs from most others around New Zealand in that most districts have only two or three larger operational cemeteries whereas in Christchurch there are six operational in the urban area and 12 typically smaller rural cemeteries on the peninsula. The effect is that there tends to be a localised community need around each cemetery.

The Christchurch City Council does not own or operate any crematoria. Cremation services within the Christchurch district are provided by two private companies. The Cremation Society of Canterbury has two facilities, one located at Linwood and the other at Harewood. The Garden City Crematory also has a cremator, and it is located at Sockburn. No defined catchment could be determined for each of the crematoria; therefore, the assessment considers the entire district of Christchurch as a single community for cremation services.

Public health issues

Public health issues in cemeteries relate to work around graves, potential environmental effects such as contamination of ground water, and The ability of cemeteries and crematoria to cope with large numbers of dead following a natural disaster or pandemic. The few public health issues relating to cremation relate to air discharges, radiotherapy effects and devices, such as pacemakers.

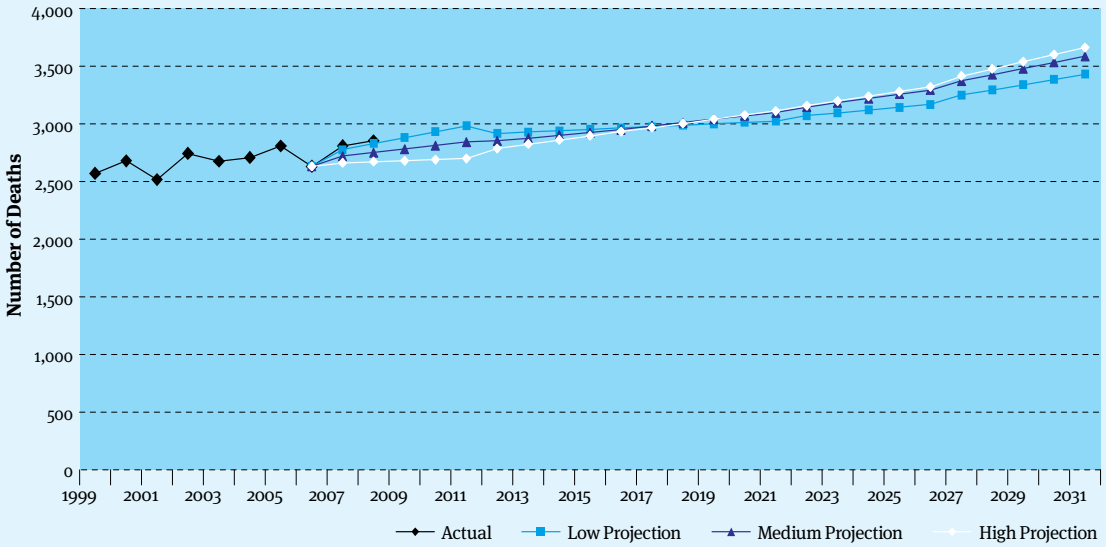
Appropriate operating procedures are in place and documented for public health issues relating to both cemetery operations and cremations. The application of the procedures is audited as part of the ISO certification process.

Forecast of deaths

The figure below shows that there will be a substantial increase in predicted deaths for the resident population over the next 20 years owing to a combination of an aging population and the large increase in population in the district.

Actual urban district cemetery numbers of grave plots interments for the last four years are shown in the figure below.

Urban cemeteries	Total number burials
2005	845
2006	835
2007	851
2008	835



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Current capacity

The current capacity of cemeteries is calculated by considering both the current number of available plots both for burials and ashes and the future demand projections.

Christchurch City records information on the number of burial plots available. This excludes plots that have been pre–sold.

Cemetery	Full burial plots developed *1	Ashes plots developed *1	Extra capacity undeveloped *3
Avonhead	1104	361	450
Akaroa	120	0	0
Diamond Harbour	41	36	260
Duvauchelle	160	0	150
Kaituna valley	20	20	0
Little Akaloa	5	0	50
Little River	100	45	452
Lyttelton Public and RSA	No new plots		0
Lyttelton Anglican	12	0	0
Le Bons Bay		0	300
Memorial Park	1122	114	5800
Okains Bay	48	0	0
Pigeon Bay	100	0	150
Ruru Lawn	486	40	0
Sydenham	253	456	0
Wainui	25	0	110
Yaldurst	602	81	2900
Addington	Closed		
Barbadoes Street	Closed		
Belfast	0	65	0
Bromley	No new plots	0	85*2
Linwood	13	50	250
Waimairi	0	152	0
Woolston	Closed		
Total	**4211**	**1420**	**10872**

[1] Land is prepared but does not include all beams for headstones which are constructed on an annual basis ahead of need, or paths and landscaping.
[2] Subject to removal of former sextons house.
[3] Vacant land will need to be developed with landscaping.

Note: The projection of burial requirements and capacity includes all special burial plots (RSA, ethnic and religious) in the overall calculation.

There is a significant number of pre–purchased burial plots in the Christchurch cemeteries, representing about 3 to 5 years of total burial capacity for the City. At present there is no restriction on the pre–purchase of plots, accelerating the need for additional burial plots. The impact is highlighted by the 457 plots sold but unoccupied at Belfast Cemetery. It now has only a few burial plots remaining and a new cemetery site for the northern part of the city is being sought.

Future demand

Future demand projections from the previous sanitary services assessment were based on a growing number of new full burials and ashes plots use. As at 2008 the new plots full burial use in the urban district cemeteries was low prediction 465 and high prediction 499. The actual average for the last four years is estimated at 400 based on all double and triple debth plots sold and 50% of new single debth plots sold. As there is no faster method of checking all the single debth figures, an average of 400 may be conservative.

Therefore based on the 450 new full burial plots demand forecast, by adding a 2% growth factor (based on the increase in numbers of deaths predicted) urban district cemetery capacity will be reached in 2017 for prepared land, and with all land yet to be developed by 2029 (all available plots used). In the rural district all developed plots will be used in 2034 and all land yet to be developed by 2055.

No new plots are available at Bromley and Linwood cemeteries but land is available for development if the former sextons house is removed at Bromley and there are a number of pre–sold plots still remaining at these cemeteries. Linwood Cemetery similarly has a area occupied formerly by the sextons house which could be developed into an estimated 250 lots.

The first operational cemetery to reach capacity is Belfast which has only six new plots available. This creates a significant gap in the cemetery distribution, there being no operational cemetery in the northern part of the district.

Estimated number of new full plots predicted to be used in Urban District	
2008	400
2009	408
2010	416
2011	424
2012	432
2013	440
2014	448
2015	456
2016	464
2017	**472**
2018	480

Burial numbers have remained fairly static reflecting a greater preference for cremation, which is outside the scope of the Christchurch City Council's responsibility. Urban cemeteries have areas of land available but with new beams to be installed as part of the capital programme for the next eight years.

There is overall extra capacity for the next 20 years. However this does not show a true picture as the Yaldhurst Cemetery which does have the capacity is considered too far out in the country and there are no bus routes to take visitors to the cemetery. The whole north and west area of the city is not well serviced with cemeteries and the current small extension to Avonhead Cemetery will soon fill. Land adjoining Belfast Cemetery was investigated for possible purchase but purchase could not be completed.

In the mainly rural area of Banks Peninsula there is capacity based on a growing average of 25 burials per year for 25 years, with overall undeveloped capacity for 46 years at this current rate. However Lyttelton Public Cemetery is full and the Lyttelton Anglican Cemetery in a similar situation which is an issue that needs to be addressed. Diamond Harbour Cemetery will need to take over for the burials in the Lyttelton Basin area.

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Another trend that needs to be addressed is that as people become larger, so do full burial caskets and plot sizes will need to be increased which will again use more land.

Ash Plots
Ash plots are easily accommodated as they take up minimal area. At present there are 1420 plots available in Council cemeteries. It is possible that additional ash plots could be created if required.

Based on the continuation of the high demand forecast for new ash plots, which is averaging 280 per year in the urban district, capacity will be reached in 2014 (all available plots used). It should be noted that Christchurch City Council provides for only a small proportion of ash burials in the district. The majority are held or scattered by friends and relatives, interred in an ash plot or columbarium at one of the churches, or in the memorial gardens at one of the crematoria.

Pre–purchased ash plots represent a small proportion of total ash plot capacity for the City, in the order of one to two years. Although allowing pre–purchase has no major effect on the long term net capacity of the city's cemeteries, except where they remain unused, they accelerate the need for new areas and additional infrastructure. New ashes beams are required at Akaroa Cemetery as all existing have been pre–sold. Any new ash plots at Akaroa and at Diamond Harbour, where there are plans for more ashes beams, should not be pre–sold

Special designated areas
Special burial plots available in Council cemeteries include White Russian, (Belfast), Indian , (Sydenham), Muslim (Rum Lawn; Memorial Park), non–local Maori (268 plots, Memorial Park) and Jewish, (Linwood). In addition, a request has been received through the 2005 consultation process for an area to be set aside at Memorial Park Cemetery for Russian Orthodox burials. It is recommended that this request receive further consideration as required under Burial and Cremations Act 1964.

Representatives of Pacific Island people have asked that a more culturally–sensitive approach be applied to their burial needs which could involve the designation of special areas to meet these requirements. It is recommended that this request is further investigated in consultation with Pacific Island representatives. The proposed Cemeteries Master Plan will consider community and other needs for denominational areas in cemeteries as the newer ones no longer have different religions in segregated areas.

Returned Services Association plots
Returned Services Association (RSA) plots are provided in the Ruru Lawn cemetery. Analysis of the actual burial records and plot availability indicates that the RSA ash plots section will have room for further headstones beams extension. RSA burial plots can be extended as well as there is room in the current location for more headstone beams to be laid.

The expected use of the RSA section is expected to taper off in the next 10 years as the WWII veterans pass away. It is therefore recommended that RSA areas be monitored regularly and if another area is required that a dedicated site be provided across the road at Memorial Park Cemetery which will be included in the proposed Cemeteries Master Plan.

Crematoria
There was a lack of detailed information provided by the crematorium operators for the 2005 assessment perhaps relating to commercial sensitivities. It was therefore difficult to accurately assess the provision for cremation. However, from the cremation information available and the Christchurch City burial records, assumptions could be made about the expected average annual resident and out–of district cremations. Analysis showed that the total capacity of the operating crematoria in the district was well in excess of forecast demand. Time has not allowed for renewed discussions with the cremation owners but will be followed up.

Options to meet demand
The assessment of cemeteries and crematoria has shown that the overall provision of land for cemeteries and total number of cremators is adequate to meet overall demand within the district for the 10 year planning period and beyond. However there are localised issues that need to be addressed with Lyttelton cemeteries full and a similar situation in the north of the urban district with more land needed in that locality.

The assessment highlights a community preference for the provision of local cemeteries. In order to continue to meet this need the following actions are recommended:

- A new cemetery is provided in the northern part of the city as a replacement for Belfast Cemetery which may still include extending this cemetery or obtaining resource consent for Ouruhia.
- Develop additional capacity with additional adjoining land purchase at Avonhead Cemetery.
- A denominational area for Russian Orthodox burials is developed at Memorial Park Cemetery.
- Investigate provision of designated burial areas to meet the needs of Pacific Island people.
- A new area is developed at Memorial Park Cemetery for RSA burials if needed within the next 10 years.
- A limit on the pre–purchase of plots is established.

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- Further explore the shared use of Shands Road Cemetery with Selwyn District Council and continue to use Yaldhurst in the meantime.
- Options for improved use of plots are investigated, particularly ash plots.
- A public promotion plan for less known cemetery sites is developed and implemented.
- Investigate future provision of an area that could be used for mass burial purposes and as a future cemetery site.
- Restrict all first burials to double debth to use land in a more sustainable manner and to cater for future family internments.
- Lyttelton basin area burials will need to be located in Diamond Harbour Cemetery.
- Akaroa requires additional ashes beams that are not to be pre–sold but held for use as needed.
- Larger casket sizes being used will require larger plot sizes and the uptake of available full burial space at a faster rate than currently.

Role of the Council

The Council owns and operates all but three of the operational cemeteries in the city, excluding the church cemeteries, and has purchased land for one new cemetery (Ouruhia) and extensions to several of the existing cemeteries. Funding for further provision in the north of the urban area is provided for in the draft capital programme for 2013. It provides a service for interment by burial and of ashes. The management, design, development and maintenance of both operational and closed cemeteries are also provided by Christchurch City Council.

In order to meet future demand, the Council will plan for increased need and develop new areas for cemeteries. It will provide funding for cemetery infrastructure, such as landscape treatment, roads, footpaths, water supply and drainage. Appropriate funding provision for cemetery infrastructure will be made in The Christchurch City Council Long Term Council Community Plan.

Identification of issues

Discussions were held with The following persons/ organisations in 2005 in order to identify any issues relating to the provision of cemeteries and crematoria and/ or any public health issues. It was considered important to ensure that any issues were identified and addressed through the assessment. There has been no further discussions since that date.

- The Medical Officer of Health did not identify any current public health concerns relating to cemeteries and crematoria in the Christchurch district.
- Environment Canterbury raised potential issues as being air discharges from crematoria and contamination of groundwater from cemeteries.
- Christchurch City Council Environmental Health raised a number of issues including high water tables in some cemeteries, potential hazards from unstable headstones and ensuring that burials are performed at correct debths. Measures have been taken to eliminate or manage all of these concerns to mitigate any public health risks.
- The Selwyn District Council raised the possibility of joint development with Christchurch City Council of the Sha nds Road cemetery, located close to the Christchurch City boundary. Further investigation into this option was proposed.

Adequacy of assessment

The assessment of 2005 was considered to fully meet the requirements for a sanitary services assessment as set out in Part 7 Sub–part 1 of the Local Government Act 2002. The information has been updated to 2008 figures.

The information used in the assessment is considered to be adequate to provide an informed view about the adequacy of cemetery services and facilities in the Christchurch district. In preparing the assessment, a number of assumptions have been made relating to death rates, the ratio of burials to cremations, and the number of out–of–district burials. The information used in calculating future demand is based on statistical information provided by the Department of Statistics and burial and cremation records held by the Christchurch City Council. This information has been extrapolated to provide a comprehensive view of capacity and future demand.

There was a lack of detailed information provided by the crematorium operators, perhaps relating to commercial sensitivities that made it difficult to accurately assess the provision for cremation. However, enough information was gathered to determine that neither operator is operating at anywhere near capacity. Therefore, this is unlikely to become an issue within the assessment period. If capacity were to become an issue, it is likely that one of the operators would install an additional cremator or one of the larger funeral directors would consider purchase of a cremator.

The assessment has not been compromised by a lack of information or by cost of obtaining information and is considered to be a full and balanced assessment of cemeteries and crematoria.

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Public conveniences

Public conveniences summary

Under the Local Government Act 2002 (LGA) councils are required to periodically assess the provision of sanitary services – including public toilets.

This assessment focuses on non–residential toilets as a sanitary service provided in the City, mainly in public parks. This report is a compilation of information provided by a 2008 survey of all buildings in parks in relation to building maintenance and updates the Sanitary Services Assessment in 2005. No update information was available for non parks toilets and the cleanliness survey has not been repeated.

In delivering this assessment the report:

- identifies the current and forecast metropolitan situation relative to the total supply and demand for public conveniences, as distinct from those provided in residential dwellings, in order to ensure that appropriate and adequate provision is made
- identifies Councils current response, both regulatory and through direct provision of services, to the demand and to the maintenance of appropriate health outcomes for the community
- identities and presents options for ongoing and future provision — including options to reduce, maintain, change or enhance levels of service provided directly or indirectly to the public
- recommends Council preferred options to meet ongoing demand and maintain appropriate health outcomes for the community.

This assessment considers the public access to non–residential toilets in terms of the:

- contribution to achieving public health outcomes through ensuring the public have adequate access to clean and safe toilet facilities, while away from home
- capacity to meet reasonable expectations of Christchurch residents visiting public places
- capacity to meet reasonable expectations of tourists visiting public places.

Identification of public health and other issues

The flowing perspectives and issues have been identified through consultation with stakeholders and interested parties, and also through complaints received by the Council about public toilets.

Public toilets need to be:

- located in convenient places
- open at convenient times
- occur in sufficient quantities to reflect demand (e.g. at events)
- hygienic, safe and secure (e.g. are clean at all times, have sufficient hand washing facilities, have sufficient lighting, have safe disposal for other wastes left by the public including sanitary items, condoms and syringes etc)
- fully functioning and regularly maintained (e.g. all fixtures are fully operational, and septic tanks or composting toilets are emptied and cleaned appropriately).

Council's role and other service providers

Public access to toilets, other than those in residential homes, is currently provided by a wide range of businesses activities, educations, institutions and other organisations – with toilets located either within or associated with their facilities. These businesses and organisations have an obligation to provide toilet facilities for their staff and in most cases for their customers (for the purposes of this report these toilets are referred to as in the Public Domain").

The provision of public toilets is not the primary driver for most organisations, consequently the extent and quality of the toilets is driven by staff and/or customer expectations and regulatory compliance. However, some businesses do view the provision of toilets as part of a complementary service (e.g. service stations generically provide toilet facilities, in much the same way as they provide free air for tyres). In general the presence of staff at these businesses and the requirements of customers result in reasonable levels of monitoring toilets in terms of cleanliness, supplies and condition.

The Council is also engaged in a number of activities such as libraries, community centres, parking buildings and services centres, providing toilets for staff and visitors at these locations (for the purposes of this report these toilets are referred to as "Secondary Council Sites"). Separate to these are "public toilets" provided by the City Council and hire companies. The latter generically provide portable toilets for specific events or worksites (in this report these toilets will be referred to as "Primary Pubic Toilets").

Within the Christchurch district there are over 214 Council–owned public toilets:

- 175 are toilets located in or associated with parks;
- 26 toilets are also located in pavilions
- 13 are located in predominantly retail areas (including Cathedral Square).

Assessment of the level of service

In this assessment of the sanitary services, a city–wide audit was made on the levels of service provided by Primary Council sites and a sample survey of both Secondary Council and Public Domain sites. In addition, a building condition assessment was completed on Primary Council sites to determine current maintenance issues and long term maintenance and renewal requirements.

The results of the condition assessment showed that on the whole the buildings were in relatively good condition with some notable exceptions. Future maintenance and renewal requirements for surfaces, fixtures and fittings are planned based on the passing of time, industry standards and/or a decline in condition. It can also be triggered by other enhancement programmes associated with the facility.

The table below shows a comparative assessment of toilets available to the public throughout the city, on the basis of a levels of service audit of current provision. The audit graded sites on the basis of availability, location, cleanliness, and general amenity values. The level of service evident within the Primary Public Toilets varied considerably.

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	Primary public toilets		Secondary Council sites	Public domain toilet sites			Comments
	All	BAP		Shopping Centres	Fast Food Outlets	Petrol Stations	
Availability	9.7	9.9	9.5+	9.5	9.6	9.0	
Location	8.7	9.2	9.5	9.9	9.9	9.9	
Cleanliness	7.0	8.4	8.0	9.0+	8.9	8.4	McDonalds cleaning exemplary
Amenities	9.0	9.3	9.0	9.5	9.5	9.0	

Shopping centres and major fast food outlets perform well in terms of the provision of public conveniences due to their location at high usage points, availability during all normal shopping hours, high standard of amenity, and in particular, frequency and standard of cleaning. Petrol stations also performed well but with less consistency in terms of access for non–patrons, the standard of amenity and the level and frequency of cleaning.

As a large, diverse portfolio of properties, Council's secondary sites scored better than petrol stations in terms of availability but inferior to other providers with some facilities providing staff–only access. The general level of amenity was also inferior to shopping centres and fast food outlets as was the standard and frequency of cleaning. Location factors were however high. Within the secondary Council sites are several sub–groupings and their performance varied markedly. In general terms, for example, libraries performed very well on all criteria, whereas other community facilities such as parking buildings did not Mostly this related to availability and cleanliness.

It is clear that the overall assessed performance of Private Domain toilets is at a consistently high level against the criteria used in the audit and that in general Council–owned facilities are inferior, in particular with regard to cleanliness.

While most of the Primary Council sites scored well, the cleanliness criterion was the poorest performing category by a significant factor and highlights the difficulty of keeping these sites clean with a lack of on–site monitoring by staff, and the open nature of the facilities.

The following details criteria used in the evaluation with the average scores for the 2005, then 171 Primary site toilets.

Toilets are clean and hygienic with no build up of excessive litter	80%
Litter bins are installed internally and available adjacent externally to the site	57%
The site is free of unpleasant odour	84%
Sanitary bins are supplied and clean	46%
Automatic flush unit is operational and sufficient to dispose of waste	97%
Soap dispensers and automatic hand driers are fully functional	35%
Overall avenge 2005	**66%**

Particular issues that impact on the performance of cleaning at Primary and Secondary Council sites are;

- Only one public toilet staffed (Cathedral Square);
- Cleaning regimes only as good as the last person using the facility, therefore, frequency of cleaning is a crucial factor in maintaining standards and public perceptions;
- Some surfaces more difficult to clean and maintain hygiene standards than others;
- Toilet facilities managed and cleaned by a range of different parties! contractors with a lack of consistent standards;
- Audits of cleaning standards required;
- Accountability for public toilets as a service is managed by different parts of the Council.

New auditing

An auditing system developed by the city contractor who is the primary cleaning provider for the majority of public parks toilets in the city has been developed and covers areas such as, cleanliness and hygiene, refreshed with toilet paper, pipes and sumps are working satisfactorily, and the internal and external walls are clean after each service. Auditing shows that the demerit points system for not meeting the standards taken across all factors is that 3% of these factors relate to not meeting the toilet cleaning standards. For Banks Peninsula there is a different cleaning contractor and the contracts manager reports the toilets generally on the peninsula were not well cleaned and this has recently been addressed. Some of the toilets in the domains and camping grounds are maintained by the reserves committees that manage the reserves. No recent detailed assessment has been undertaken for the peninsula toilets for the condition of the building asset or cleanliness.

Current and future demand

Demand for public conveniences is influenced and modified by compliance and customer expectations, however in total capacity terms it is driven by population. This needs to account not only for the resident population, but also tourist numbers and those outside the immediate geographic area who frequent the city for work, leisure or other reasons.

In the context of a total city wide provision of toilets in public places by Primary, Secondary and Public Domain providers, the current supply is considered adequate. The standard of some facilities, however, is less than adequate and presents a modest degree of public health concerns. More detailed demand analysis is required to inform site specific requirements with options to expand, maintain or contract (over time) the number and nature of facilities provided at individual sites. A recent condition assessment of 103 toilets and changing rooms on parks has found that operational maintenance of $125,000 per year is required over the next six years to address needed maintenance repairs. As the survey shows reactive maintenance needs to be replaced with a proper Facilities Management (FM)contract which will introduce a regular maintenance programme. There is sufficient funding for operational maintenance in the current programme, however many of the facilities require

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a capital upgrade to ensure there are better surfaces to aid cleaning and replacement of fixtures and fittings.

Many of the toilet facilities on the peninsula which cater for visitors sometimes in larger numbers and the buildings are not adequate for this purpose due to age and size. Water supply can also be a problem with untreated water or slow supply.

Again there needs to be a complete appraisal of the peninsula toilets to ascertain the capital upgrades that are needed to bring the facilities to a required standard. In some cases total replacement is required. Many of these toilets are the old concrete block type with inadequate access, light, and air movement or are from converted buildings that were not designed to be toilets.

While site specific provision falls outside the statutory requirements of this assessment, the Special Consultative Procedure provided a legitimate vehicle for individuals, groups and the wider community to express their desires for additional or different facilities at specific locations. No specific funding is available for such sites and initiatives, however, these are now being considered within the context of the 2006 to 2016 Long Term Council Community Plan.

Options to meet demand

Public Domain and Secondary Council toilets are subject to the Building Act and Building Code in terms of toilet design and capacity. Most of these sites take responsibility for the toilets on behalf of their staff and customers, based on user expectations and compliance. This also applies to parks and locations where Council encourages large numbers of residents and tourists to aggregate, such as in Cathedral Square or at Council–run events.

However, the Building Code falls to require retailers to provide facilities for their customers in the same way that a Shopping Centre must. While true for all retailers, this inconsistent approach is most noticeable with the larger retail outlets, such as supermarkets, large format warehouse– styled retailers and bulk retailers. Similar issues exist with the provision of toilet facilities within nightclubs and other late night venues. Anecdotal evidence suggests inadequate toilet facilities are provided, which in turn contributes to anti–social behaviour in adjacent public areas.

In light of these factors, the following options are available:

1. Status Quo. Provision by a mix of Council and non–Council providers is adequate to meet the overall demand. This does not address differences in the quality of the toilets provided.
2. Improve level of service at existing Council–owned toilets. Options to achieve this include:

- Increase the frequency of cleaning;
- Rationalise cleaning contracts and develop consistent cleaning standards for Council facilities;
- Improve signage to encourage the reporting of damage or cleanliness problems to the Council;
- A quick response cleaning service when notification of problems is received by the Council;
- Upgrading buildings including surfaces, fixtures and fittings to those more resistant to vandalism and easier to clean;
- Place the building maintenance on a facilities maintenance contract.

3. Increase provision of Council–owned toilets in retail locations. Council could choose to provide toilet facilities in retail areas to address the lack of services provided by the retailers linked to the limitations of the Building Code.
4. Reduce provision of Council–owned toilets in retail locations. Council could rely more fully on businesses to provide services for their customers.
5. Lobby for changes to the Building Code. Council could lobby central government for amendments to the Building Code that would require the retail sector, including nightclubs to provide (or enhance) sanitary facilities.
6. Complete site specific monitoring of demand. Commission monitoring to develop demand profile for specific groups of sites identifying current demand on a seasonal basis and at peak demand periods, etc. This would enable services to be customised better to demand.
7. Improve community awareness of availability and standards. Explore opportunities to improve awareness of the availability of public conveniences for residents and tourists, the standards they should expect and the options available for them to raise concerns.
8. Charge for access to public toilets. Some cities in other parts of the world charge for access to public toilets as a means to fund the service. The same could be implemented here.
9. Options for sanitary waste disposal from vehicles. Some provision for sanitary waste disposal from trailer homes and motor homes exists with camping ground facilities and truck stop facilities (ostensibly for livestock). However, the adequacy and appropriateness of these needs to be researched and alternate options considered

Council's preferred options

The recommendation of the assessment is for adoption by Council of a combination of options included within 1, 2, 5, 6, 7 and 9 outlined above. Where there is no existing funding within Council's budgets, the initiatives should be considered within the context of the LTCCP.

Once detailed site specific demand profiles have been identified and the private sectors provision of toilet facilities for public access is better understood, Council needs to indicate clearly and consistently its provision of service relating to options three, four and eight.

With regard to 24–hour, central city public conveniences, additional facilities are most likely to be safe and effective if staffed and delivered as part of a wider strategy for addressing behavioural problems within the Central City. This wider strategy is outside the scope of this assessment and the role that public conveniences may or may not have in this strategy is yet to be determined.

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Stormwater

Stormwater summary

Purpose and scope
The objective of the stormwater assessment is to identify risks and show how these services will be managed by the Christchurch City Council to achieve community outcomes in a sustainable manner.

Stormwater services in Christchurch city
The roles of Council with respect to stormwater drainage services in the city are to coordinate the setting of Community Outcomes and as a service provider. The key service functions of storm water drainage infrastructure are the:

- protection of property, public safety and access
- protection of ecosystems
- creation of productive land

Adequacy of stormwater services
Christchurch city has invested heavily in flood relief works over the past 40 years in response to a series of destructive floods through the 1 960s, 1 970s and 1980s. A combination of historical investment in physical upgrading works and planning measures has effectively mitigated risks associated with the inundation of dwellings and buildings, and there are few urban development constraints in the city that are not mitigated by planning rules, proper subdivision design and building design.

Investment in urban stormwater services on Banks Peninsula has been more modest, and service improvements are warranted in some Peninsula communities.

In rural areas, stormwater is generally disposed of by ground soakage or to watercourses. There are unlikely to be any significant constraints on additional rural–type development related to drainage or disposal of stormwater.

Public health risks

Risks associated with stormwater services
Potential health impacts associated with the stormwater drainage network are:

- Illness caused by contact with micro–biological or chemical contaminants in natural water resources, through the use of streams, rivers, estuaries and beaches for recreational purposes, or drinking potable water drawn from polluted water sources.
- Injury or death caused by falls from stormwater structures or drowning.
- Illness from mosquito bites.

The range of contaminants in stormwater and the extent of environmental impacts on the city's watercourses are:

- Microbiological concentrations, including bacteria, viruses and protozoa, generally exceeding contact recreation guidelines. The main source of contamination in dry weather is believed to be waterfowl. The impact of wet weather pollution is lessened by rain water dilution and the low level of recreational activity at these times.
- Chemical contaminates, including organic compounds, such as hydrocarbons, pesticides and organic wastes, and inorganic compounds, such as metals and metalloids.
- The concentration of heavy metals in stormwater and river sediments exceeding the relevant water quality guidelines for the protection of aquatic organisms.
- Nutrients, including nitrogen and phosphorus, can cause algal blooms and prolific growth of aquatic plants when at elevated levels. There is extensive growth of algae, especially in the Avon River and Lake Forsyth, likely to be linked to nutrient enrichment in the streams.

Although microbiological concentrations, at times, exceed contact recreation guidelines, neither the Council nor the Medical Officer of Health has any record of injury or illness that is attributable to deficiencies in the design, operation or maintenance of the stormwater network, and health risks are assessed as low.

Risks associated with the lack of a reticulated stormwater drainage system
There are less likely to be stormwater systems in rural areas. Because of the much larger allotments in rural areas and the higher proportion of permeable, vegetated areas, there are few problems when reticulated stormwater disposal is unavailable.

Risks to stormwater communities
Assessments of stormwater services were carried out at a "community" level to identify risks to particular communities. (see table opposite)

Environmental risks
Water–quality monitoring indicates that several of the environmental parameters monitored exceed minimum guideline levels. Ecosystems in the majority of streams are in a degraded condition, however the impact on waterway habitats appears to be accepted by the majority of The community and a rigorous debate on the community costs and benefits of markedly improving environmental outcomes is required.

Environment Canterbury has issued for comment a draft Natural Resources Plan which will, when adopted, set the rules and water–quality standards with which Council must comply for all existing point source discharges. It is likely that the standards will require additional planning, investigations and investment in land and treatment facilities.

Options to address risks
Options to address water–quality degradation.

- Prepare and implement integrated catchment management plans (ICMPs) as required by the Proposed Natural Resources Regional Plan (NRRP). This option will require the Council to be aware of land use activities in the catchment and to control harmful discharges;
- Prepare and implement ICMPs; investigate operational measures such as street sweeping and sump cleaning that will improve discharge quality, and implement selected measures;
- As above, but improve stormwater treatment by construction of in–line treatment devices;
- Undertake a study of stormwater discharge quality in selected catchments and assess the impact of stormwater quality on the receiving waterways.

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Risks to stormwater communities		
Types of communities	**Community**	**Risk assessment**
Communities served by public drainage systems	Urban area to receiving waters– drained by street channels, street, sumps, pipes, open water courses and streams	• Quality of water in urban rivers and streams continues to degrade due to urban discharges • Increasing risk of land flooding due to inner urban intensification • Risk of flooding due climate change • Risk of insect borne diseases if an exotic vector establishes in Christchurch
	Banks Peninsula Settlements	• Risk of flooding and access difficulties from under–capacity stormwater infrastructure • Water quality from time to time not compliant with ECan rules
	Rural areas serviced by Council maintained streams and drains	Low levels of risk
	Brooklands – discharge to a controlled groundwater storage zone	Low levels of risk
Communities served by private drainage systems	Rural areas discharging storm–water run–off by either direct soakage to ground or to open drains funded privately	Low levels of risk
	Industrial areas discharging to ground via soakage basins	Risks of ground water contamination through leakage or spills onto ground or contaminants entering soak pits

Options to address the risk of land flooding due to urban intensification:

- Continuous improvement of stormwater infrastructure, as proposed in the storm water drainage assetmanagement plan;
- An increase in stormwater capacity early in the development cycle.

Options to address the risk of insect–borne diseases:

- Minimise the potential habitat for insects by minimising the number of open water bodies in the city (i.e. eliminate ornamental and environmental water bodies);
- Limit the number of likely habitats while monitoring for insect nuisances and maintaining an awareness of potential problems. The Council currently implements this option;
- Control insect populations only if an exotic insect establishes in Canterbury.

Climate change and associated effects is a risk which should be dealt with through planning measures until the timing of effects is better understood.

The risk of groundwater contamination in industrial areas through private stormwater soakage is primarily controlled by Environment Canterbury which authorises these discharges via resource consents. Options available to the Christchurch City Council are:

- Advocate for appropriate levels of environmental protection;
- Construct additional stormwater infrastructure to provide services to at–risk areas.

Council's role

The proposed role of Council is to continue as:

- Facilitator of community consultation to establish community outcomes and service standards for stormwater services;
- Owner of infrastructure delivering public stormwater services to the community;
- Partner to Environment Canterbury and the Ministry of Health in the achievement of regulatory outcomes, and advocate for the community in the setting of environmental standards;
- Monitoring city growth, water quality and the health of habitats, and the development of policies, infrastructure management and development plans, District Plan measures and public education programmes to ensure environmental and public health standards are achieved.

Christchurch City Council

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Wastewater collection and treatment

Wastewater summary
This is a compilation of two assessments; the 2005 Council assessment and the 2005 Banks Peninsula District Council assessment. It has also been adjusted to take into account known changes that have occurred since the assessments were prepared.

Methods used to dispose of wastewater
For the purpose of making the assessment, the city has been broken up into a number of separate community classifications. These are Christchurch City urban community, the Banks Peninsula wastewater reticulated communities, the Banks Peninsula non reticulated settlements. In addition there are a significant number of individual premises located away from others on the city fringe and throughout the peninsula with their own individual treatment and disposal systems.

The city urban community is defined by all those properties that are connected to the Council's sewer network that delivers wastewater to the treatment plant at Bromley.

Banks Peninsula Reticulated communities include Lyttelton, Diamond harbour, Governors Bay, Akaroa, Duvauchelle, Robinsons Bay Tikao bay and part of Wainui. In addition two non Council schemes (Wainui YMCA and Living Springs) are known to be operating.

The Banks Peninsula non –reticulated settlements number approx 14 and include Purau, Charteris Bay, Little River, Birdlings Flat, parts of Wainui, Takamatua, Pigeon Bay, Le Bons Bay.

Wastewater from Christchurch treated at the wastewater treatment plant at Bromley and the treated effluent is discharged into the Avon–Heathcote Estuary. The Christchurch City Council has works underway to replace the estuary discharge with an ocean outfall in 2009.

Individual stand alone properties use stand–alone schemes for wastewater treatment and disposal. These schemes consist mostly of single–chamber septic tanks with gravity disposal trenches.

Risk assessment
The discharge of effluent from the Christchurch Wastewater Treatment Plant contributes to the health risk for users of the estuary. The risk zone is assessed as being small and centred on the point of discharge. Commissioning of the Ocean Outfall in 2009 will eliminate this risk.

Wet weather overflows from the sewer reticulation into the Avon and Heathcote Rivers contribute to the increase the levels of contaminants in these rivers during this time and for a period afterwards, presenting a public health risk to users of the rivers. A significant mitigating factor is the prevalence of low–contact water related activities being discouraged by the poor weather or high river flow conditions that coincide with the sewer overflows.

Risks with the Peninsula reticulated schemes are degradation of receiving sea water quality due to discharge of treated effluent, and the Maori cultural concerns in respect to human waste being discharged into water rather than to land or via a land element prior to discharge.

The main risks associated with septic tanks (particularly when several are in close proximity) are summarised below:

- Treatment plant or disposal field poorly designed leading to a low level of treatment;
- Treatment plant or disposal field poorly maintained leading to uneven distribution of effluent;
- Shallow groundwater leading to contamination of groundwater;
- Poor quality or hydraulically limited soils leading to surface ponding or shallow groundwater contamination.
- Free draining spoils that allow wastewater to drain directly into groundwater or surface water.

The higher risk areas identified are:

- Marshlands owing to its shallow groundwater and peaty soils.
- Wainui due to the difficulties expected in renewing the existing consent and problems with overloading of the private YMCA scheme.
- Birdlings Flat due to the impact on groundwater quality.
- Little River due to high water table and water quality problems due to its proximity to Lake Forsythe.
- Purau and Charteris Bay due to the increasing numbers of holiday homes with poor septic tanks being used as permanent residences.
- Takamatua due to the number of individual schemes and some poor maintenance practices.
- Aging pipe work particularly Lyttelton, Akaroa and Christchurch allowing increasing volumes of infiltration into the systems and thus overloading treatment plants and causing overflows into water bodies.

There is a potential health risk for properties on night soil collection because of the untreated wastewater being held on–site for up to a week.

Quality and quantity of discharged wastewater
The Christchurch City wastewater system collects about 55 million cubic metres of wastewater each year, transporting it through a series of sewers and pump stations to the treatment plant at Bromley. The advanced secondary treatment process produces a high–quality effluent which is discharged into The Avon–Heathcote Estuary. There are also 12 consented locations , and 13 recently identified unconsented locations where diluted untreated effluent is discharged, during periods of high rainfall, into the Avon and Heathcote Rivers.

There are a considerable number of domestic septic tank systems in operation on the of Christchurch area. These systems consist mainly of single chamber septic tanks with gravity disposal trenches. The estimated volume of effluent associated with this number of tanks is 500–800 cubic metres a day. The effluent quality of these systems is highly variable and dependent on design, construction and maintenance standards adopted by the owners.

There are currently 11 properties in the northeast fringe area served by a night soil collection. Untreated effluent is kept in a holding tank, emptied out and taken to the Christchurch Wastewater Treatment Plant. Four of these properties are being connected to the city reticulation, five collected on a weekly basis and two only occasionally.

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While the Council controlled wastewater collection and treatment systems are operated by appropriately trained and qualified staff, it is assumed the private schemes and domestic tank systems are operated by property owners with varying and limited knowledge of wastewater treatment systems.

The peninsula schemes generally meet their present resource consent conditions. However there has been a trend over recent years of increasing standards for wastewater treatment, driven by higher environmental expectations and made possible through technical advancements. Consent condition standards could increase further in the future as resource consents come up for renewal. There is also an increasing public desire to stop discharging into the harbour waters altogether. Many of the Banks Peninsula discharge consents expire in the near future, or contain conditions that require wholesale review of the discharge methods. This, together with many of the plants having ageing or poorly maintained assets create a significant challenge for the city.

Current and estimated future demands

Future demand for the Council–operated supplies are assessed in detail in the Wastewater Asset Management Plan, Wastewater flows are projected to increase as a result of:

- increased population (about 7% in the next 10 years)
- intensification of development in urban fringe areas and settlements meaning septic tank effluent disposal fields are less acceptable from a public health perspective
- increases in inflow and infiltration into the existing systems. This has been estimated to increase by 10% over the next 40 years as the collection network ages.

Upgrades to the Christchurch wastewater treatment plant and reticulation system have been designed to provide sufficient system capacity for future planned demands within the Urban Development Strategy time horizon of 2041.

However increasing environmental and cultural requirements are likely to have an impact on future treatment and disposal processes and methods.

There is also demand to get properties served by night soil collection on to alternative methods of wastewater collection, treatment and disposal.

Options to meet the demands

Options to meet demand resulting from population growth;

- construction of additional pumping stations and pipelines to increase capacity to help meet peak demands
- inflow and infiltration reduction programmes (ongoing maintenance programme)
- increase capacity of treatment plants and pipe networks.
- construction of new wastewater systems
- wastewater system modelling to identify operational changes to increase system efficiencies, monitor effectiveness of capital works and rehabilitation programmes, assist with pipe sizing and capacities required
- investigate alternative systems such as storage or decentralised treatment systems, to help cater for peak flows and cater for growth above the current capacities.

Options to meet demand related to environmental issues:

- inflow and infiltration reduction programmes
- capital works to reduce wet weather overflows
- construction of ocean outfall to replace the current estuary discharge
- construct new wastewater systems
- attempt to limit growth etc to avoid issues
- renewals programmes to retain assets in acceptable condition.

Options to meet demand related to night soil collection:

- investigate options to get properties off night cart collection
- investigate reticulated septic tank options (STEP/STEG systems)
- extend city reticulation to service the properties.

Christchurch City Council's role

The Council considers the collection and disposal of wastewater an essential activity and will continue to own and manage the many wastewater schemes it presently owns. For these existing schemes it will continue to monitor scheme performance and maintain them to the level of service identified. It will aim to identify gaps and improve the service where required. Council will monitor discharges to ensure acceptable risk to public health as well monitoring changes in legislation that may impact upon standards required for wastewater.

The Christchurch City Council will play the role of facilitator in meeting the demands for wastewater services. It is expected that any new infrastructure for growth will ultimately be funded by developers. The Council may also consider assistance with providing or funding of the service where there are significant public health and /or environmental issues. This would be assessed on a case by case basis.

Proposals for meeting the demands

The Christchurch City Council has several initiatives underway to meet the future demands. These include:

- Upgrade of Christchurch wastewater treatment plant to increase capacity and effluent quality.
- A major sewer upgrade programme of new sewers to cater for projected growth; some of these works are also aimed at reducing the wet weather overflows to the rivers;
- Construction of an ocean outfall to divert all treated wastewater from the estuary and discharge offshore through a three kilometre pipeline;
- Inflow and Infiltration reduction programmes;
- Capital works to reduce wet weather overflows;
- Expansion of the Wainui reticulation (with a new land based disposal system) to include most of the settlement and with the capacity for the YMCA camp effluent.
- Akaroa harbour basin investigation on future options for wastewater including options for disposal.
- Lyttelton harbour basin investigation on future options for wastewater including options for disposal.
- Extensive pipe and pumping, and treatment asset renewal programme.

The Council also proposes to investigate options to get the remaining properties off night cart collection.

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Waste management strategy

Waste Management Plan 2006
Waste minimisation and the efficient use of our natural resources is fundamental to a sustainable way of life and to the future wellbeing of our city and its residents.

The Council's Waste Management Plan 2006 is focussed on solid waste and establishes a vision, goals and targets for waste in the city. The Plan will be updated during the next three year period.

Vision
A prosperous city, where each person and business takes responsibility for waste minimisation and actively works towards zero waste.

Goals

- Individuals and businesses take greater responsibility for waste minimisation
- Council provides much enhanced reuse and recycling services at the kerbside
- Council supports and incentivises waste reduction, reuse and recycling
- Council ensures that environmentally sound waste disposal services are provided

The Plan also contains specific targets for the different components of the waste stream and can be viewed at www.ccc.govt.nz/waste/strategiesplans/managementplan

In 2007–08 Christchurch disposed of 250,000 tonnes to landfill. This means that every person produced an average of 682 kg of waste per year that ended up in the landfill (domestic and commercial waste combined). Actions taken to date to reduce solid waste to landfill include, but are not limited to:

- The introduction in early 2009 of a new kerbside collection service for a large part of the city with separate wheelie–bins for recyclables, kitchen and garden waste, and residual waste;
- The commissioning in early 2009 of a new enclosed composting plant and a new mechanised sorting plant for recyclables;
- Offering assistance to businesses to become more resource efficient through the Target Sustainability programme;
- Providing free drop–off facilities for domestic quantities of recyclable materials at Council owned transfer stations;
- Offering free drop–off facilities for domestic quantities of paints and hazardous wastes at Council owned transfer stations;
- The completion of a collection service of unwanted and banned agricultural chemicals from farms in Christchurch;
- Working with the construction and demolition industry to identify methods to reduce waste from their activities;
- Facilitating recycling at public events; and
- Implementing opportunities within the Council to become more resource efficient and sustainable in its operations.

Total waste to landfill has started declining in the recent past however more needs to be done to achieve the targets contained in the Plan.

Each person in Christchurch can affect how successful we are in meeting our vision, goals and waste reduction targets. How each person and business responds to this challenge will determine our success in making Christchurch a more sustainable place to live.

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Water supply

This is a compilation of two assessments; the 2005 Council assessment and the 2005 Banks Peninsula District Council assessment. It has also been adjusted to take into account known changes that have occurred since the assessments were prepared

How drinking water is obtained

For the purpose of making this assessment, the city has been divided into a number of separate communities: the Christchurch City urban community, the Banks Peninsula water reticulated communities, private community schemes, and the Banks Peninsula non–reticulated settlements. In addition there are a significant number of individual premises located away from others on the city fringe and throughout the peninsula, with their own individual systems.

The Christchurch City urban community includes Lyttelton, Diamond Harbour and Governors Bay, and several hospitals and schools which have independent supplies within the urban area. The Peninsula has seven reticulated public schemes: Akaroa, Takamatua, Duvauchelle, Wainui, Pigeon Bay, Birdlings Flat, and Little River.

Private schemes number about 12, plus a number of schools, hospitals and Christchurch Airport. The Banks Peninsula non–reticulated settlements number approx nine and include Purau, Charteris Bay, parts of Le Bons Bay, and Port Levy. The urban fringe community includes supplies on the outskirts of the city.

Christchurch City and the surrounding areas on the plains source their water from wells into the aquifers, extending under the city and the Canterbury Plains. However water sources for Bank Peninsula supplies are from a variety of sources including wells, springs and streams.

Risk assessment

Contamination can occur at any point in the water supply system, being at the source, during treatment, storage or reticulation, The various public supplies provide different levels of treatment or mitigation of these risks resulting in differing probabilities of a contamination event occurring.

The potential risks to each of the supplies with a groundwater source (well) are similar. The main risks identified are summarised below:

- Ill fitting well heads or access hatches leading to contamination of the source or stored water;
- No residual treatment provided, except for Paparua Prison, leading to risk of contamination of water during storage or reticulation;
- Contamination (protozoa – cryptosporidium and giardia, and faecal) in shallow wells (known as non secure wells)
- Salt water intrusion into aquifers that discharge into the sea;
- Loss of service due to lack of storage or backup electricity;
- Insufficient backflow protection leading to backflow of contaminants into the reticulation from industrial, commercial or domestic premises.

For schemes with surface water sources (streams, springs etc) the potential risks are similar to each other:

- Unsecured access hatches etc on reservoirs leading to contamination of the stored water;
- No residual treatment provided, leading to increased risk of contamination of water during storage or reticulation (all stream/spring fed public schemes do have treatment);
- Contamination (Protozoa – Cryptosporidium and Giardia,) in water source.
- Contamination (faecal) from animals in vicinity of water sources as well as from poorly performing septic tanks etc.
- Insufficient backflow protection leading to backflow of contaminants into the reticulation.

All these risks can be treated in order to reduce the probability of a contamination event occurring. Christchurch City Council has Public Health Risk Management Plans in place. Operators of other supplies have some preventative measures in place.

Additional water quality testing may be necessary to guard against any public health risks resulting from some of these risks.

Quality and adequacy of drinking water

Most of the water supplies have sufficient water to meet their current demand. Akaroa is the immediate exception, but growth in some other smaller communities may be limited due the water scheme. The North West supply zone of the City has a very good history for water quality but the relatively shallow groundwater (wells) does not meet the technical requirements to be classified as low risk.

Dirty water overloading treatment processes during storm events is an issue with a number of peninsula supplies. Also treatment processes for most of the peninsula schemes do not meet Ministry of Health standards. Rudimentary controls and the lack of remote (electronic) monitoring limit the performance of these schemes.

The Council currently abstracts over 50 million cubic metres of water a year for its reticulated supply. This represents about half of the water taken annually within the city boundaries.

The policies and rules set out in Chapter 4 and 5 of Environment Canterbury's proposed National Resources Regional Plan have been developed to ensure no significant long–term decline in groundwater levels as a result of abstraction; no significant long–term–decline in water quality as a result of land–use activities, particularly the Christchurch aquifers source water and no contamination of groundwater as a result of abstraction. These rules will ensure that the long–term sustainability of the aquifers as a water source is protected.

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However the geology of the peninsula is predominantly fractured volcanic basalt and much of it is steep and rocky. Groundwater is generally only located in fractured rock near streams and the water quality is highly variable. There are no major rivers on the peninsula and so most water supplies are sourced from small streams on farmed land. In general, this area is poor for water quantity and quality and droughts severely aggravate the problem. Water restrictions can be severe.

Christchurch City groundwater is well known for its high quality. As a result, this water has not needed to be treated to date to meet drinking water standards. Paparua Prison, in the Urban Fringe community, is the only supply which treats its water with a chlorine solution to provide residual treatment. There is no infection incidence data suggesting that any of the sources of drinking water in either the Urban or Urban Fringe Communities have been a cause of water–borne diseases.

The Council– owned water supply schemes are operated by adequately trained staff to ensure compliance with the New Zealand Drinking Water Standards. The training and qualifications of the operators of non–council–operated supplies have not been established. Supplies to schools are generally operated by school caretakers with only a rudimentary understanding of their supply systems. It is believed that preventative maintenance is generally not practised on school supplies. The hospital, airport and prison supplies appear to be operated by personnel knowledgeable in the operation and maintenance of water–supply systems. They have preventative maintenance systems in place.

Current and estimated future demands

The current total annual consumption from the Christchurch City Water Supply is about 50 million cubic metres per year. The Council has consented approvals with Environment Canterbury to draw in about 75 million cubic metres per annum from the aquifers serving the city. The peak demand for the whole city is about 21,000 cubic metres an hour. Accurate consumption figures are not available for the non–Council–operated supplies.

Future demand for the Council–operated supplies is assessed in detail in the Water Supply Asset Management Plan. The population served by the Christchurch City Water Supply is expected to increase by about 7% in the next 10 years. A large proportion of the peak water demand in Christchurch is for domestic irrigation. For new greenfield developments the peak demand will increase proportionally to the number of households. Infill housing decreases the irrigable land area and therefore does not increase peak demand. Only a small increase in the total annual consumption is expected because of the demand management methods already in place. The Water Supply Activity Management Plan includes an aim to reduce consumption from 369 Cubic Metres/property/annum 2007/08 to 321 Cubic Metres/property /annum in 2019/20.)

Future demands are not expected to increase for non–council urban suppliers. Of the known private schemes, only the Christchurch Airport and Paparua Prison are predicting an increase in demand. The increase is expected to be in the order of 10% to 15%.

The Health (Drinking Water) Amendment Act (2007) requires greater responsibilities with regard to the quality of water supplied. This may become too onerous for many non–council suppliers and therefore increased demand for the council provided supply may result.

Options to meet the demand

Demand resulting from population growth can be met in the following ways:

- construction of additional pumping stations, wells and other infrastructure to increase capacity to help meet peak demands up to the agreed maximum take levels as stipulated in Environment Canterbury consents
- implementation of demand management programmes, including public education to encourage efficient water use, water loss reduction programmes, implementation of water restrictions
- water system modelling to identify operational changes to increase system efficiencies, monitor effectiveness of capital works and rehabilitation programmes, assist with pipe sizing and capacities required

Options to meet demand related to non–secure groundwater sources can be met by:

- additional water quality testing
- addition or upgrading of water treatment
- connection to Council reticulated supply, for non–council supplies
- drilling new wells into secure (deeper) sources.

Options to meet demand related to supplies in areas with septic tanks and insufficient drainage:

- further investigation to establish if there is a public health risk
- ensure supplies are operated correctly
- addition to or upgrading of water treatment
- abandon existing supply and connect to Council reticulated supply.

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Options to meet demand related to the Health (Drinking Water) Amendment Bill and the greater responsibilities with regard to the quality of water supplied:

- continue to manage own supply ensuring staff are adequately trained and risk management procedures are in place
- employing external qualified staff to operate and maintain supply and manage risks
- addition or upgrading of water treatment, or the drilling of new deeper wells
- renewals programmes to retain assets in acceptable condition
- backflow protection programme to reduce the risk of backflow of contaminants into the reticulation
- abandon existing supply and connect to Council reticulated supply.

Council's role in meeting the demand

Most of the responsibility for ensuring water supplies are appropriate rests with the local Medical Officer of Health (Community Public Health Unit of Christchurch District Health Board) who is charged with this responsibility through the Health Act and via administration arrangements with the Ministry of Health.

The Council's role will be to ensure its own public water supply system is managed in an appropriate manner to meet compliance and community needs.

It is expected that any new infrastructure for growth will be funded by developers. The Council may consider assistance with funding of the service where there are significant public health issues. This would be assessed on a case–by–case basis. The Council may also have a future role to liaise with water scheme owners and other agencies, such as Environment Canterbury and Community Public Health, to ensure appropriate water supply arrangements are in place to meet the total community's reasonable needs. This would be assessed on a case–by–case basis.

Proposals for meeting the demand

The Health (Drinking Water) Amendment Act (2007) requires water–supply owners to construct, manage and monitor the supplies in a manner that will ensure acceptable levels of risk are achieved.

The Christchurch City Council, for its own supply, is already implementing plans to meet future demand. This includes:

- capital works programmes to provide additional infrastructure for growth
- demand management programmes to reduce per capita consumption
- implementation of Public Health Risk Management Plans
- a projected increase in the operating budget to cover likely additional water–testing and compliance requirements
- upgrading of water treatment at most Banks Peninsula schemes
- consideration of options for Akaroa and Takamatua schemes to overcome demand and water quality issues
- water system modelling to identify operational changes to increase system efficiencies, monitor effectiveness of capital works and rehabilitation programmes, assist with pipe sizing and capacities required
- renewals programmes to retain assets in acceptable condition
- backflow protection programme to reduce the risk of backflow of contaminants into the reticulation
- consideration of provision of water treatment and/or deeper wells for the Christchurch North West zone.

The Council will consider applications to connect to the supply from non–council–operated supplies within the reticulated area, although there may be restrictions on the size of connection that can be made. Non–council supplies outside the city's reticulated area may also apply but permission to connect will be made on a case–by–case basis. Extension of reticulation beyond appropriate land use zonings will not generally be allowed. Assistance with funding to connect, where there are public health issues, will also be assessed on a case–by–case basis.