

Ilfracombe

regional water supply security assessment



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Introduction

The town of Ilfracombe is located in central-western Queensland, approximately 30 km east of Longreach.

The main industries in the region of Ilfracombe are cattle and sheep production, and tourism. Based on projections provided by the Queensland Government Statistician's Office, it is estimated that Ilfracombe's population is around 160 people (as at June 2019), and the population is predicted to remain relatively stable. However when climate conditions are more favourable for agricultural productivity, Ilfracombe can experience an influx of additional workers and their families, which can significantly boost the town's population.

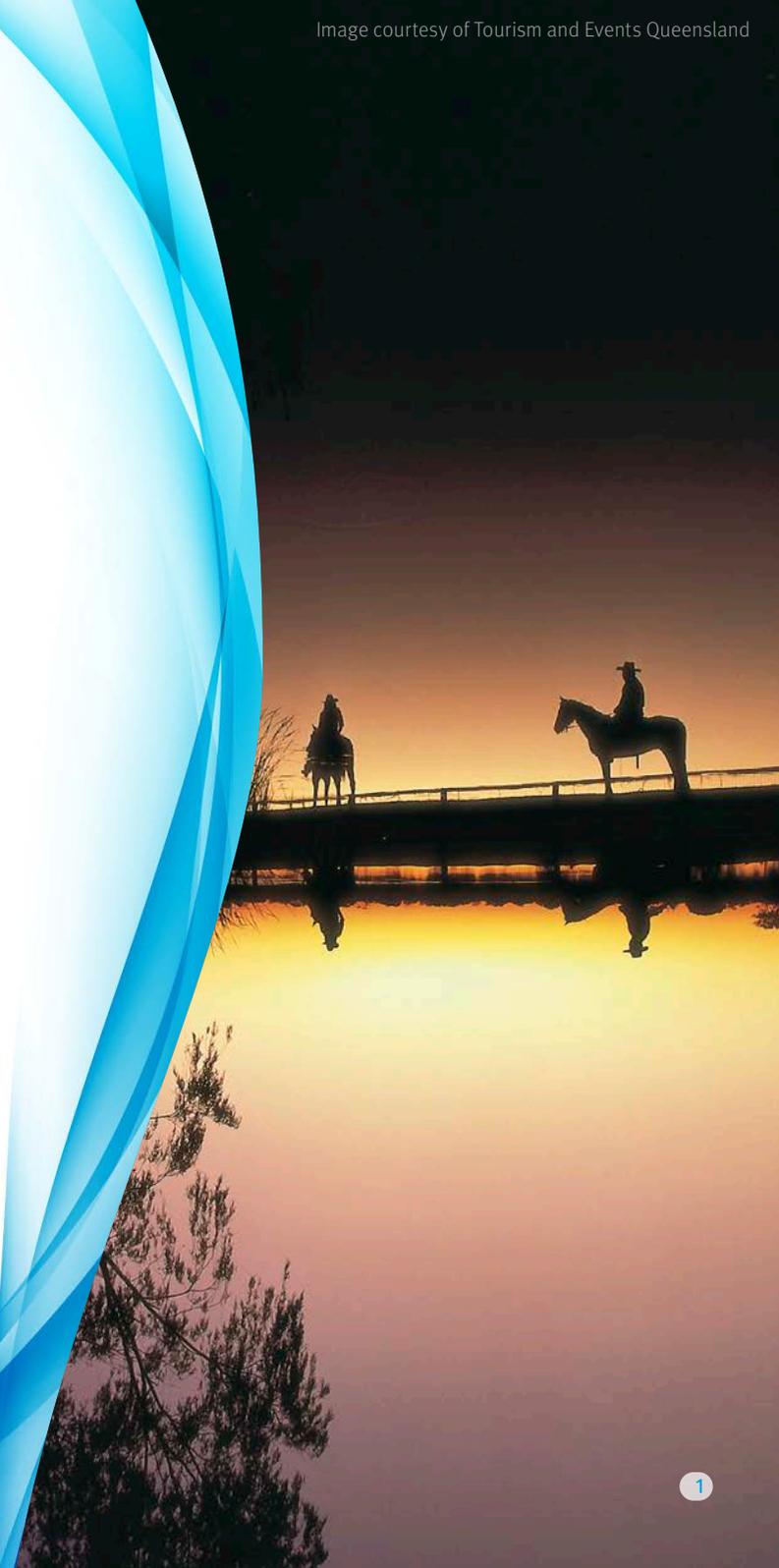
Safe, secure and reliable water is an essential resource for Ilfracombe, providing for the health and wellbeing of the community. Water also provides opportunities for economic and community development, and supports tourism. Longreach Regional Council (Council) is the registered water service provider for Ilfracombe's urban water supply system, providing both water and wastewater services to Ilfracombe.

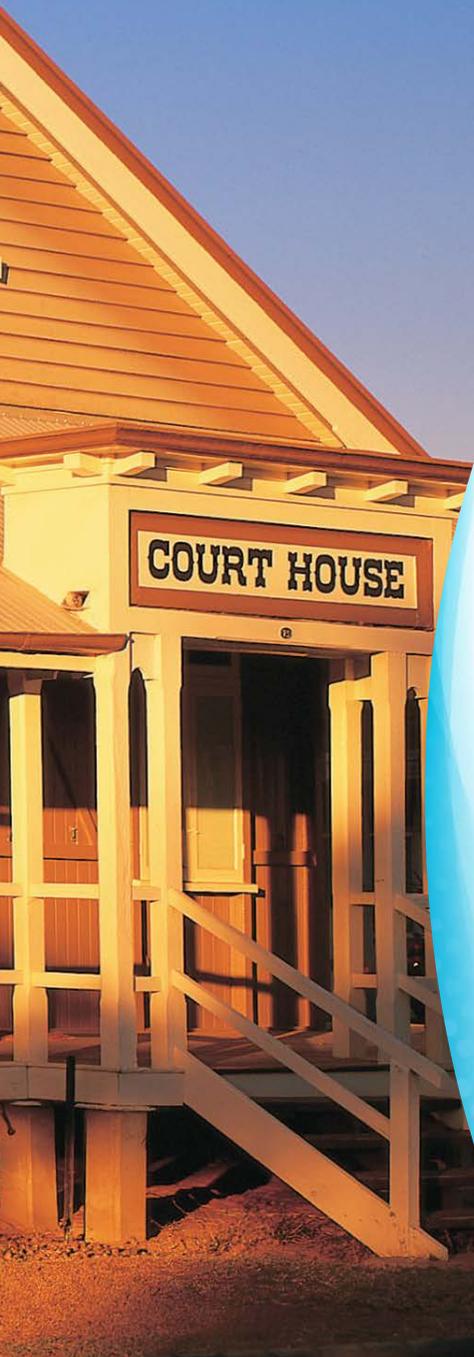
The Queensland Government, through the Department of Regional Development, Manufacturing and Water (DRDMW), and Council have worked together to investigate and establish a shared understanding of the existing security of Ilfracombe's urban water supply system and its capacity to support current demands and future growth. Arising from this partnership, this regional

water supply security assessment (RWSSA) provides valuable information to the community and water supply planners about Ilfracombe's urban water supply security, thereby providing a foundation for future water supply management by Council.

This assessment has considered a number of water demand scenarios for the population of Ilfracombe to identify the timing and magnitude of potential water supply risks. The assessment shows that Ilfracombe's water supply, drawn from both surface water and groundwater, is able to meet Ilfracombe's current and projected urban water requirements until at least 2041 with a moderate to high degree of reliability.

The information presented in this RWSSA is based on the capacity of the existing water supply system and associated infrastructure.





Water supply sources

Ilfracombe is primarily supplied with surface water, with a local bore to provide back-up supply.

Ilfracombe's primary water supply sources are Murray-MacMillan Dam on Collumpton Creek, and Shannon Dam—an off-stream storage. In addition to these surface water storages a single bore provides groundwater supply.

Council holds an entitlement for 770 megalitres per annum (ML/a) from Collumpton Creek, with a daily extraction volumetric limit of 120 ML and a maximum extraction rate of 1667 L/sec. Council also has a permit (to 31 December 2021) to extract up to 342 ML over three years from a groundwater bore, with the maximum extraction rate of 5.5 L/sec.

The 381 ML capacity Murray-MacMillan Dam on nearby Collumpton Creek is council-owned and lies within the Cooper Creek water plan area. Water from this dam is pumped to an additional holding storage—the 96 ML capacity Shannon Dam, prior to treatment at the Ilfracombe Water Treatment Plant (WTP).

Water is also able to be sourced from a bore located approximately 300 metres north of Ilfracombe. Bore drilling records indicate that this bore draws water from the Hooray Sandstone (part of the Great Artesian Basin) at a depth of 600 m and has a potential yield of

240 ML/a. This bore was constructed in 2018 to replace an older council bore that had a corroded casing. A reverse osmosis plant has been installed by Council to address the groundwater quality issues of high fluoride and salinity. The water is then mixed with water drawn from Shannon Dam during the treatment process.

In the event that neither the local surface water nor ground water can adequately meet the town's demands, water can be carted from Longreach 30 km away.

Council does not currently provide a recycled water service in Ilfracombe.

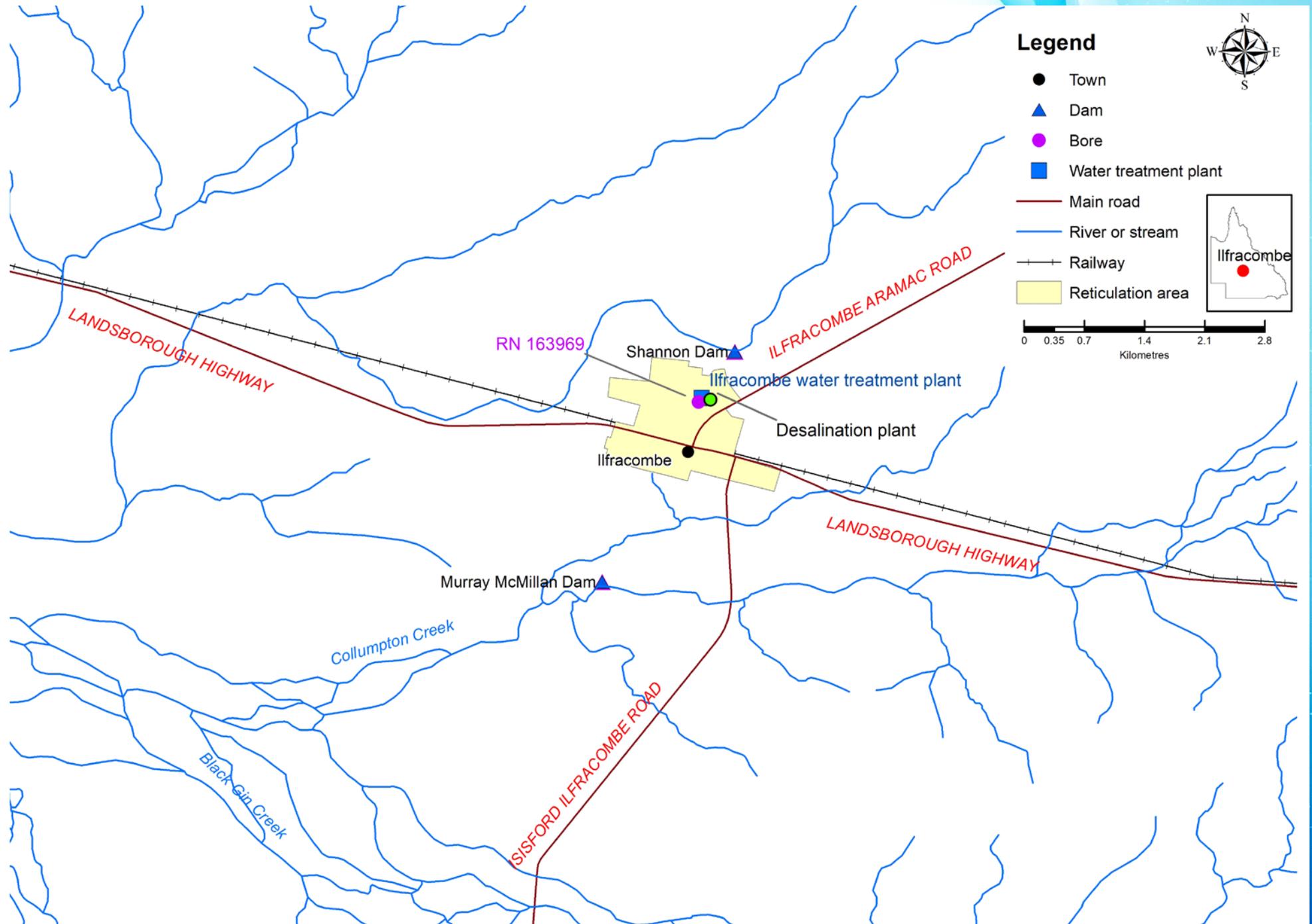


Figure 1: Location of Ilfracombe and Council's associated water sources



Water users and water demand

Ilfracombe’s reticulation network extends throughout the developed area of the town and supplies water for about 160 people (as at June 2019).

Ilfracombe's reticulation network

Information reported by Council in the Statewide Water Information Management database shows that the total volume of water sourced by Council for the potable water reticulation network over the period from 2014–2015 to 2017–2018 averaged 94 ML/a (ranging from 74 ML/a to 108 ML/a). Based on the total volume of water sourced and the serviced population for each year, the average total water demand during this period was approximately 1300 litres per capita per day (L/c/d). This figure accounts for residential, and non-residential (commercial, municipal and industrial) water supplied from the reticulation network, plus unmetered use and any system losses. It also includes water use by the transient population, such as tourists. Water use by the transient population is mostly accounted for under the category of commercial use; however, the transient population is not included in the serviced population figures.

Over 60% of the water sourced is used by the residential population. The average residential water use for this period was approximately 810 litres per person per day (L/p/d). Non-residential potable water use for this period averaged approximately 275 L/p/d, whilst non-revenue water averaged around 215 L/p/d (over 15% of the water sourced).

In an effort to reduce water consumption and extend the duration of the available water supply during extended dry periods, Council has established a water restriction

regime for Ilfracombe based on trigger levels in the dams. The water restrictions primarily target outdoor water uses including watering of gardens, washing cars, hosing or washing paved or concreted areas, and swimming pool use.

Table 1 shows the water levels in the dams at Ilfracombe that trigger the various water restrictions, and the corresponding targeted urban demand levels.

Table 1: Ilfracombe’s water restriction levels

Restriction Level	Dam gauge levels (m)	Percent of full demand	Targeted residential demand* (L/p/d)
Level 1	MMD gauge = 10.3 to 0 SD gauge = 14.0 to 11	100%	810
Level 2	MMD gauge = 0 to -1.7 SD gauge = 14 to 11	83.9%	680
Level 3	MMD gauge = -1.7 SD gauge = 11 to 5	71.0%	575
Level 4	MMD gauge = -1.7 SD gauge = 5 to 3	58.1%	470
Level 5	MMD gauge = -1.7 SD gauge = 3 to empty	41.9%	340

Note: MMD = Murray-MacMillan Dam, SD = Shannon Dam
Trigger levels and targeted reductions are subject to review and amendment as determined by Longreach Regional Council from time to time. Further details on water restriction rules are available on Council’s website.

* Based on the current average residential demand of 810 L/p/d.

Water demand affected by climate variations

Urban water demand varies between years and within each year, depending on various factors including climatic conditions such as rainfall, with higher demand usually occurring during hotter, drier periods. However, during extended dry periods water levels in the dams may become low and, as a result of water restrictions being applied, water use may be lower than it would otherwise have been.

The average annual rainfall for different periods is summarised in Table 2. Average annual rainfall for

nearby Longreach over the 70 year period from 1950 to 2018 was 437 mm. Also shown in Table 2 is the 2010–11 to 2017–18 period has been drier compared to the long term (average rainfall about 18% lower than the average over the longer term). The town’s water demand has generally been higher in years with lower rainfall (refer to Figure 2). Therefore it is probable that the water demand has been higher over the drier 2013/14 to 2017/18 period compared to the long term.

Table 2: Summary rainfall statistics for Ilfracombe

Rainfall Station No: 36031 Longreach Aero	Annual rainfall (mm)			
	Lowest	Average	Median	Highest
1950 to 2018	106.8	436.6	413.2	1026.5
1986 to 2005 (Climate change reference period)	106.8	423.4	384.5	797.0
2010–11 to 2017–18	142.4	359.0	390.7	667.0

Note: 1986-2005 denotes the climate change reference period and the value for 2050 is derived using a predicted reduction of 3.6% relative to this period.

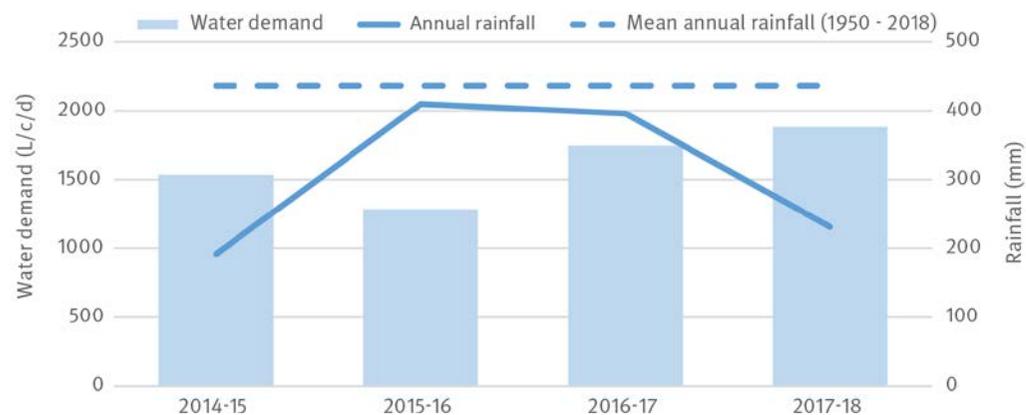


Figure 2: Annual rainfall and potable water demand



Other users of the bulk water supply sources

Agriculture

There are no surface water entitlements from Collumpton Creek either upstream or downstream of Council's point of take.

The key agricultural industries in the Ilfracombe region are the production of cattle and sheep, which largely depend on groundwater. Access to water from the aquifers is also limited due to the impacts that the cumulative effects of extraction would have on Great Artesian Basin springs further east.

Industry

There is no significant industrial water demand on Ilfracombe's water supply source from outside of Ilfracombe's urban area. The main industries within Ilfracombe's urban area are associated with agribusiness, construction, transport, and tourism. The water use by these businesses is accounted for within the total water demand figures for the network, generally under the category of 'non-residential' water use.

Future water demand

An understanding of likely and possible changes in water demand in the future is required for well-founded water supply planning.

Council and DRDMW agreed on key assumptions, such as rates of water use and population growth, in developing a projection of Ilfracombe's future water demand. The projections will remain subject to ongoing monitoring of actual population growth and variations in water use trends (e.g. changes in water use practices may increase or decrease consumption).

this also means an appropriate balance can be reached between the cost of water supply and the demand for available water. These demand projections are based on historical demands during a period of relatively dry climatic conditions, and therefore conservatively represent demands during the drier conditions projected for the future.

Ilfracombe's reticulation network

For the purpose of this assessment it is assumed that over the next 20 years (to around 2041) the population of Ilfracombe remains at around 160 people.

Based on Ilfracombe's average daily total water demand of approximately 1300 L/c/d over the period from 2014–15 to 2017–18, with a future population of around 160 people Ilfracombe's average future water demand would be around 94 ML/a. It is important to note that this projection represents average demand rather than high demand, and average demand levels may often be exceeded (e.g. during historical hotter dry years around 110 ML/a have been sought). However, the use of average demand figures provides a means of directly comparing future demand projections to determine when demand is likely to exceed available supply. For planning purposes,



Other users of the bulk water supply sources

Agriculture

Although agriculture is a key industry in the Ilfracombe region, the availability of surface water to support expansion of the agricultural industry is very limited (not only in terms of consistent supply, but also the number and volume of entitlements that could be permanently or seasonally traded). The volume of unallocated water reserves is 2200 ML in the Thomson-Barcoo subcatchment under the Water Plan (Cooper Creek) 2011. This upper limit of water reserves is made up of four components which include: Town Water Supply, State, General and Indigenous Reserves with the volumes for each being 500, 1300, 200 and 200 ML/a respectively. Future development in the Ilfracombe area is unlikely to result in any significant upstream storage that would impact flows into Murray-MacMillan Dam. Accordingly, for the purposes of this RWSSA it has been assumed that agriculture will continue to not impact the availability of surface water supplies.

Access to Great Artesian Basin (GAB) groundwater is limited in the region due to potential impacts on groundwater dependent ecosystems, with any new licence applications or transfers subject to assessment of impacts on these systems, which may restrict the granting of a new permit or licence for Council to take water. As a result, Council may in the future need to consider applying for a seasonal transfer of part of their GAB allocation from Longreach to maintain continuity of their groundwater supply at Ilfracombe.

Industry

Industry in Ilfracombe is primarily associated with the town's role as a support centre for the local area, as well as tourism. Future growth in Ilfracombe's industry, and associated industrial water demand, is therefore expected to be aligned with any expansion of the aforementioned services which are considered to be relatively stable at this stage.

Water supply system capability

Investigations have been undertaken to identify the capability of Ilfracombe's existing bulk water supply system to meet current and projected future water demands.

Assessment of Ilfracombe's water supply system

There have never been any gauging stations installed on Collumpton Creek. Consequently there is no available stream flow data for the assessment of the historical performance of this source. However water extraction data from Collumpton Creek has been gathered to enable some assessment of water security.

Frequency of water supply shortfalls

For this assessment, Ilfracombe is considered to have experienced a water supply shortfall when its water supply system (the storage of Murray-MacMillan Dam and Shannon Dam and available groundwater) is unable to meet the water demands placed on the system by Ilfracombe's community. This could, for example, occur as a result of the dams reaching minimum operating volume due to severe or extended drought, or as a result of reduced groundwater yield. Over the past seven years, restrictions have been continuous. This has included one instance of long duration of high level restrictions. Level 4 restrictions occurred for 15 months from March 2015 to June 2016 due to the long-running drought. This extended drought triggered the construction of the replacement bore and installation of a reverse osmosis plant to now provide a continuous feed into the town water supply. Prior to the construction of the new bore, carting water from Longreach was undertaken as a contingency supply.

Ilfracombe is now well placed having access to groundwater.

Climate change

The Queensland Government provides climate change projections for Queensland local government areas (LGAs), which are referenced against the historical period 1986–2005 for temperature, evaporation and rainfall (among other climatic variables). The climate change projections are reviewed and revised as new data and improved methodologies become available.

In general, Queensland's future climate is projected to be warmer and drier, with increased evaporation and a potential increase in the annual and inter-annual variability. These same trends are also projected for the Longreach LGA. Additionally, under an unchanged greenhouse gas emission scenario, the projected climatic changes for Ilfracombe indicate that by 2050 seasonal variations may include:

- slightly wetter summers, with drier winter, autumn, and spring (the median projection is for 3.6% reduction in annual rainfall)
- warmer temperatures for each season (average, minimum, and maximum), and
- higher evaporation rates for each season (the median projection is for 17% increased evaporation).



Importantly, one of the key elements of nearly all climate change projections is a change to extreme events—in terms of both frequency and magnitude. This suggests that major events, such as droughts and flooding, may become more extreme. The possibility of more extreme and longer-duration droughts than have previously been recorded for Queensland poses a unique challenge for water service providers, and highlights the need for long-term water supply planning processes to be adopted, implemented, and regularly reviewed.

As shown in Table 2, while the climate change reference period was only marginally drier than the historical long term rainfall, the period for which water use records are available was, on average, considerably drier. Ilfracombe's average water demands over the drier recent period may therefore be reflective of water demands during the drier conditions projected for the future. Potential impacts include limitations to water supply availability and increased water demand within the region. Further, an increase in the annual and inter-annual climatic variability may result in longer dry periods, consequently increasing the duration of higher demand periods.

Water supply system capability outcomes

Ilfracombe's future sourced water demand is anticipated to be on average 94 ML/a across the period to 2041.

The assessment showed that Murray-MacMillan Dam and Shannon Dam are usually able to meet Ilfracombe's urban water requirements. These storages, together with the bore and permit to extract groundwater until 31 December 2021, ensures an increased level of water security until then. Renewing the groundwater permit would be subject to the Department's review of cumulative impacts on the groundwater resource, and the potential associated impacts on Great Artesian Basin springs, and other water users. Should a permit to take water not be issued, obtaining continued access to groundwater of up to 200 ML over a three year period could potentially be obtained through a seasonal relocation of allocation from Council's Longreach bore.

Water supply security may also be marginally improved through reticulation leakage investigations and demand management measures.

Moving forward

This regional water supply security assessment represents a collaborative approach between the Queensland Government and Longreach Regional Council to establish a shared understanding of the existing security of Ilfracombe's water supply and its capacity to support future growth.

Longreach Regional Council recognises that a secure and reliable water supply is essential for supporting Ilfracombe's current and future population, as well as local businesses, industry and tourism. Council is committed to undertaking the steps required to achieve this outcome for the community, and is planning for the long-term water supply needs of the community.

Council has worked closely with the Queensland Government to collate data from historical records, to better ascertain the potential water supply security risks that council and the community currently face.

Council will continue to proactively investigate, develop and implement solutions to maintain water supply security for the Ilfracombe community. Some of the areas of ongoing investigation may include:

- Maintaining the dams and the groundwater supply
- Substituting some uses of potable water with alternate non-potable water supply sources
- Continuing and improving work to monitor, detect and reduce water losses within the town's supply network
- Demand management through optimisation of the reticulation system and community education on water saving measures

Council acknowledges that it has an important role to play in educating the community regarding water conservation and ensuring that the available water resources are effectively managed. Council will work with the community to identify an appropriate level of service for water supply security in Ilfracombe, which will involve balancing an acceptable level of water availability with the lifestyle and expectations of residents. The viability of any water supply option will, among other things, consider the economic, environmental, hydrologic and community outcomes, as well as statutory requirements.

By continuing to pursue an appropriate level of water supply security for Ilfracombe, Council is working to ensure that the right environment exists for the community, businesses, industry and tourism to continue to thrive in Ilfracombe.



For more information on the Regional Water
Supply Security Assessment program please visit

business.qld.gov.au