Townsville Water Security Taskforce

FINAL REPORT
I remain confident that the solutions developed and proposed by the Taskforce will ultimately give Townsville the water security, business confidence and community benefits it needs and deserves for many years to come.

- Brad Webb, Independent Chair
Independent Chair’s Foreword

On behalf of the Townsville Water Security Taskforce (Taskforce), I am pleased to discharge my duties as Chair by presenting this Final Report to the Prime Minister and the Premier of Queensland. This Final Report confirms and builds on the Recommendations and Options detailed in the Taskforce’s Interim Report published in June 2017.

I particularly want to again thank all those who continued to support me over the past 18 months including my fellow Taskforce members, its expert advisors and consultants, the Water for Townsville Action Group and the local Townsville community as a whole. I remain confident that the solutions developed and proposed by the Taskforce will ultimately give Townsville the water security, business confidence and community benefits it needs and deserves for many years to come.

I commend this Final Report to the Prime Minister, the Premier of Queensland, the Mayor of Townsville as well as to the residents of Townsville.

Mr Brad Webb
Independent Chair
1. Executive Summary

The Taskforce has completed its investigations in line with its Terms of Reference. This Final Report outlines progress on implementing the short-term recommendations, updated information from recent studies into long term options, identifies residual risks and emerging opportunities, and makes the following final conclusions and recommendations.

The Taskforce concludes that:

- Its package of short to medium term recommendations – both infrastructure and non-infrastructure strategies – for immediate action (as proposed in its June 2017 Interim Report) remain valid.
- Significant progress is being made by Townsville City Council in implementing the short-term recommendations with funding support from the Queensland Government.
- Bringing forward Stage 2 of the pipeline would save $55 million in capital costs if Stage 2 were to be delivered concurrently with Stage 1.
- Progressing either the Hells Gate Dam or the Burdekin Falls Dam Raising projects in the longer term, subject to the outcomes of the business case processes and environmental approvals, are consistent with the Taskforce’s strategy for underpinning Townsville’s long-term bulk water supply and water security prospects by tapping into the water resources of the Burdekin catchment.

Based on those conclusions, the Taskforce has recommended that:

- The short to medium-term recommendations as proposed in the Interim Report continue to be implemented by Townsville City Council.
- Townsville City Council continue to implement the short-term recommendations from the Interim Report in the following priority order:
  - Recommendation A1 (see p.9)
  - Recommendation A3
  - Recommendation B1
  - Recommendation A2
  - And all others identified in the most appropriate order as decided by Townsville City Council.
- Should funding be available, then Stage 2 of the pipeline (Interim Report Recommendation A4) should be delivered concurrently with Stage 1, whilst appropriately managing contractual matters and scheduling its planning and construction. The Australian Government representative did not support this recommendation as the detailed investigations suggested in Recommendation A4 of the Interim Report have not been undertaken.
- The suite of long-term options (as proposed in its June 2017 Interim Report) should continue to be progressed as a prudent approach to ensuring the long-term water security of Townsville City as well as the region as a whole.
Independent Chair’s Commentary on the Final Report

As Independent Chair of the Taskforce, on behalf of the people of Townsville I applaud the three levels of Government and their taskforce representatives for their efforts in contributing to this report and honouring the principles of our city’s historical City Deal.

Since the Taskforce came together just over a year ago, some major inroads are already occurring. Thanks to a significant capital contribution by the Palaszczuk Government, works have already commenced on Stage 1 Haughton to Ross River Dam duplicated (and augmented) pipeline. This 1800mm Glass Reinforced Polymer pipeline is currently being designed and constructed by local engineering and civil contractors and is an effective water transportation solution (with significant cost savings against the steel option we initially recommended).

In recent years Townsville has been working harder than ever to build its confidence and I personally believe our residents and businesses need medium to long term water certainty now - not in 10 or 15 years. Millions of dollars in public and private floral and irrigation assets have been written off as a result of recent water restrictions (not to mention the economic constraint costs to the City) and we cannot afford a repeat of this situation. I am strongly advocating for a once and for all fix for our water supply, both for the City’s benefit and for the $55 million saving (excluding savings on escalation costs) in public funds that can be realised by delivering Stage 1 and 2 concurrently. The time for further studies and political debate has passed - we need to commit to this long term solution now.

I urge Council to continue to deliver its three-point plan as a matter of urgency in order to provide a water security solution which can guarantee the community has enough water to cater for future growth and ensure that there is an end to Brownsville. I note that Council shares my view that water security is a key economic enabler for Townsville, both in terms of jobs, increased investment and business opportunities, enhancing amenity and attracting new people to live, work and invest in Townsville.

Given it has been over 30 years since any significant investment has been made in major water supply infrastructure for Townsville, I am adamant about the need to restore confidence in the region, particularly given access to water is such a critical component of urban development.

I believe the northern Australia initiatives of Federal Government will take a major step forward if our medium to long term water solution is committed now, as a means to stimulating much needed long-term investment confidence.

Furthermore, as demonstrated throughout the feedback and engagement process the Taskforce ran in preparing the Interim Report, community sentiment is heavily weighted in favour of a “once and for all” fix. There is great expectation from a large and active group of residents and business owners who are waiting anxiously for inspiration from our elected leaders. Investment in water is a cornerstone for our region’s prosperity.

The Taskforce has tackled the easy part of Townsville’s water issues, now the hard work starts. Staying true to the course the Taskforce has outlined will be challenging at times, but it is a course that will most certainly reap rewards.
2. Introduction

2.1 Purpose of the Taskforce

A commitment was included in the Townsville City Deal\(^1\) to establish a taskforce involving all three levels of government to develop a strategic approach to Townsville’s urban water security, review water service standards and pricing, and develop water efficiency programs. Accordingly, the Australian and Queensland Governments, along with Townsville City Council, appointed an intergovernmental Taskforce on 10 March 2017 to investigate short, medium and long-term solutions to water security for Townsville including considering investment in water supply infrastructure and management of demand. The Taskforce was tasked with identifying a series of preferred options to improve Townsville’s water security and providing an interim report to the Prime Minister and Premier of Queensland by 30 June 2017 and this Final Report by 30 September 2018.

The Taskforce members are:

- Mr Brad Webb, Independent Chair;
- Mr Adam Sincock, Director, Australian Government Department of Agriculture and Water Resources;
- Mr James Purtill\(^2\), Director-General, Queensland Department of Natural Resources Mines and Energy; and
- Ms Adele Young, Chief Executive Officer, Townsville City Council.

The Taskforce has been supported by an Expert Advisory Panel comprised of water expert Mr Tom Vanderbyl and community engagement expert Mr Lewis Ramsay. A Technical Reference Group (TRG), comprised of representatives of the Taskforce members, has also provided technical information and advice to the Taskforce throughout its term of engagement.

The Terms of Reference for the Taskforce are available at [www.watersecuritytownsville.org.au].\(^3\)

---

1 The Townsville City Deal is a 15-year commitment between the Australian Government, Queensland Government and Townsville City Council to work together to plan and deliver transformative outcomes for Townsville and its residents. It is the key mechanism for developing collective plans for economic growth and committing to the actions, investment, reforms and governance needed to implement them.

2 Mr Purtill replaced Mr Paul Simshauser from December 2017.

3 For the avoidance of doubt, the Terms of Reference makes it clear that the Taskforce is not a decision-making body and does not represent the City Deal parties.
2.2 Summary of the Interim Report

In its Interim Report, the Taskforce concluded there are a number of dimensions defining Townsville’s water security problem including:

- Need for a clear plan to meet future growth in water demand
- Constraints to investment and regional economic growth due to the uncertainty of water supply, and the associated stress of that uncertainty
- Current frequency, duration and severity of restrictions (that is the level of service experienced by Townsville water users) leading to adverse economic and social impacts
- Sufficient bulk water transport capacity and reliability
- Water affordability and suitable pricing to accommodate the dry tropics
- Greater consumer choice through a user pays system
- High energy cost of pumping
- Cost of water storage and transport infrastructure
- Concerns about efficient and wise water use
- Optimal use of alternative local water sources and
- Long term regional water source reliability.

The Taskforce considered information obtained from previous and existing studies, the TRG and from community engagement processes. The Taskforce also commissioned consultants GHD to identify and review potential water supply and water management options and referenced studies undertaken by the Department of Environment and Science (DES) in liaison with the Department of Natural Resources, Mines and Energy (DNRME) and TCC, that explored the factors affecting the level of service associated with Townsville’s water supplies.

The process that led to the 2017 Interim Report and this final report is illustrated below.
The Taskforce examined the critical infrastructure and non-infrastructural elements contributing to Townsville’s bulk water supply. Key considerations included the following:

- There is a need for cost effective augmentation of the Ross River Dam supply; to be sourced from the Burdekin Falls Dam. Townsville’s bulk water supply is effectively changing from one where water has been primarily sourced from Ross River Dam via the Burdekin Haughton pipeline to Ross River Dam (and supplemented during supply emergencies from the Burdekin catchment), to one where water will now be primarily sourced from the Burdekin catchment (and supplemented whenever available from Ross River Dam).4

- There are sufficient bulk water supplies and high priority water allocations available from the Burdekin catchment to supply Townsville’s demands over the medium term. Further, there are two alternative future major dam proposals (Hells Gate Dam as discussed in Section 4.2.1 and the raising of the Burdekin Falls Dam wall as discussed in Section 4.2.2) that, if and when constructed, will create more than enough additional bulk water supplies and water allocations in the Burdekin catchment to supply Townsville’s demands in the long term.

- The existing Haughton pipeline that supplies water from the Burdekin catchment to Ross River Dam was designed as an emergency measure only. A possible failure of the existing emergency pipeline and pumps represents a significant present risk to Townsville’s water supply security in significant extended dry periods.

- Bulk water infrastructure enhancements and non-infrastructure initiatives to encourage and facilitate Townsville residents and business to adopt wise water use practices, use recycled water, fix leaks and improve system performance are equally important in achieving an appropriate level of service in the short, medium and long-term.

- Ross River Dam has multiple objectives that are important to the city of Townsville, namely flood mitigation and water supply. For example, Ross River Dam’s gated structure is specifically designed to handle flood flows from major flooding rainfall events. It also means that spare capacity in the dam at the commencement of a wet season would provide further flood mitigation benefit in the event of extreme weather events.

- The high level of anxiety and frustration evident within the residential and business community around lack of certainty and availability of water. While public perceptions around appropriate solutions and responsibilities varied, there was a general feeling that Townsville’s water predicament was the result of short-term thinking and a lack of leadership. The Water for Townsville Action Group enlisted some 12,000 members in their first 12 months of existence which was testament to the emotion surrounding this issue.

In its Interim Report, the Taskforce made several short to medium-term recommendations for immediate action and suggested a number of long-term options. These recommendations and options are presented on the next page.

These recommendations and options covered both infrastructure and non-infrastructure strategies for improving Townsville’s water security. Recent progress in implementing short-term actions are summarised in Section 3 of this report, and the status and findings of investigations into the longer-term options are summarised in Section 4 of this Report.

---

4 Supplementation whenever available from Ross River Dam means that water will continue to be taken from Ross River Dam before being taken from the Burdekin catchment whenever Ross River Dam is above a defined trigger level.
2.2.1 Taskforce recommendations from its June 2017 Interim Report

<table>
<thead>
<tr>
<th>RECOMMENDATIONS TO COMMENCE IN THE SHORT TERM (0 - 3 YEARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. INFRASTRUCTURE</strong></td>
</tr>
<tr>
<td>A1. This recommendation requires the following works to</td>
</tr>
<tr>
<td>commence immediately:</td>
</tr>
<tr>
<td>• Build an additional 1,800mm diameter</td>
</tr>
<tr>
<td>steel pipeline and install additional pumps</td>
</tr>
<tr>
<td>(of 234 ML/day capacity) from Haughton Pump</td>
</tr>
<tr>
<td>Station to Ross River Dam;</td>
</tr>
<tr>
<td>• Increase the capacity by 234ML/day of the existing</td>
</tr>
<tr>
<td>SunWater pump station and gravity channel</td>
</tr>
<tr>
<td>from Clare to Haughton Pump Station; and</td>
</tr>
<tr>
<td>• All levels of government to work towards more</td>
</tr>
<tr>
<td>appropriate energy solutions including:</td>
</tr>
<tr>
<td>▶ Sourcing cheaper energy by connecting new</td>
</tr>
<tr>
<td>and existing pumps at the Haughton Pump Station to</td>
</tr>
<tr>
<td>nearby high voltage lines; and</td>
</tr>
<tr>
<td>▶ Embracing green energy via the installation of</td>
</tr>
<tr>
<td>battery-ready 6.8MW solar energy array</td>
</tr>
<tr>
<td>to offset energy costs and sell excess</td>
</tr>
<tr>
<td>into the National Energy Market.</td>
</tr>
<tr>
<td>A2. Invest in bulk water meters within Townsville’s</td>
</tr>
<tr>
<td>reticulation system to allow detection and reduction</td>
</tr>
<tr>
<td>of water losses within that system. Council to</td>
</tr>
<tr>
<td>continue to undertake distribution system leakage</td>
</tr>
<tr>
<td>reduction as part of its existing asset renewal</td>
</tr>
<tr>
<td>program.</td>
</tr>
<tr>
<td>A3. Commence a non-potable water reuse program to supply</td>
</tr>
<tr>
<td>industrial users, irrigate Townsville’s parks and</td>
</tr>
<tr>
<td>gardens, and examine possible changes required in the</td>
</tr>
<tr>
<td>regulatory framework.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RECOMMENDATIONS TO COMMENCE IN THE MEDIUM TERM (3 - 15 YEARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A4. This recommendation requires the following works to</td>
</tr>
<tr>
<td>take place in 15 years subject to water demand,</td>
</tr>
<tr>
<td>water savings, population growth and additional water-</td>
</tr>
<tr>
<td>using industries coming on line and further detailed</td>
</tr>
<tr>
<td>investigation by Townsville City Council prior to</td>
</tr>
<tr>
<td>implementation:</td>
</tr>
<tr>
<td>• Continue the works outlined in Recommendation</td>
</tr>
<tr>
<td>A1 by building a new 1,800mm diameter</td>
</tr>
<tr>
<td>steel pipeline from the Haughton Pipeline to</td>
</tr>
<tr>
<td>Clare plus building a dedicated 364ML/day</td>
</tr>
<tr>
<td>pump station at Clare;</td>
</tr>
<tr>
<td>• Install battery-ready 6.8MW solar energy array</td>
</tr>
<tr>
<td>for the new pump station at Clare; and</td>
</tr>
<tr>
<td>• Transfer the TCC’s 364ML/day share of the SunWater</td>
</tr>
<tr>
<td>Clare pump capacity</td>
</tr>
<tr>
<td>and channel system to Irrigation.</td>
</tr>
<tr>
<td>A5. Install batteries and additional solar energy arrays at</td>
</tr>
<tr>
<td>Clare and Haughton to allow an increase to 24/7 solar</td>
</tr>
<tr>
<td>powered pump operation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LONG TERM OPTIONS (15 - 50+ YEARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A6. Long term water supply options to be considered,</td>
</tr>
<tr>
<td>with timing subject to water demand, water savings,</td>
</tr>
<tr>
<td>population growth and additional water-using industries</td>
</tr>
<tr>
<td>coming on line.</td>
</tr>
<tr>
<td>These options include raising Burdekin Falls Dam and</td>
</tr>
<tr>
<td>construction of Hell’s Gate Dam. Townsville City Council</td>
</tr>
<tr>
<td>will continue to provide input on future water demands</td>
</tr>
<tr>
<td>into investigations on these regional bulk water supply</td>
</tr>
<tr>
<td>projects.</td>
</tr>
</tbody>
</table>

1 Note that batteries and additional solar energy arrays may |
   be installed at Haughton to allow increase to 24/7 pump     |
   operation timing would be between 15 years subject to      |
   water demand, water savings, population growth and         |
   additional water-using industries coming on line.          |

2 Note that large-scale battery technology is considered likely |
   to become a cost-effective option within the 15 year time |
   horizon.
3. Progress on Short-Term Recommendations (as at 1st August 2018)

Since the delivery of the Interim Report in June 2017, Townsville City Council has been progressing a number of recommendations from the Townsville Water Security Taskforce. At the time of the release of the Interim Report, the Queensland Government committed $225 million for Townsville City Council to implement water security measures consistent with the findings of the Taskforce. Townsville City Council decided to use this funding to build the duplicate pipeline ($215 million) and deliver a Community Water Transition Support Package ($10 million).

The Interim Report has formed the direction of Council's Three Point Water Security Solution which includes:

- The new 1.8 metre diameter Haughton Pipeline
- A recycled water system for community spaces and industrial use
- The Community Water Transition Support Package.

A major focus for Council in 2018-19 is to deliver this three-point solution which can guarantee the community has enough water to cater for future growth.

In addition, Townsville took steps toward becoming a water sensitive city in the 2017/18 financial year in partnership with the Cooperative Research Centre (CRC) for Water Sensitive Cities. The approach allows development of a shared vision and strategic framework for accelerating Townsville’s transition towards a water sensitive city. It seeks to optimise the management of all water streams (potable water, wastewater, stormwater and waterways, wetlands and marine areas) through improved strategic planning (infrastructure and land use), development assessment processes, enforcement/compliance, construction and maintenance, asset operations, and enhanced community and stakeholder engagement. Outcomes include reductions in water use, improved water quality, improved livability and enhanced community engagement and consensus.
3.1 Infrastructure Initiatives

3.1.1 New Haughton Pipeline  
(Interim Report Recommendation A1)

A significant amount of engineering and design work has been completed on a new pipeline from Haughton Pump Station to Ross River Dam since the delivery of the Interim Report. The construction of the new pipeline from the Haughton Pump Station to Ross River Dam is supported by a $215 million grant from the Queensland Government. Council has established a project team and let a number of major work packages as part of the pipeline construction. This includes sourcing the pipe itself as well as looking for opportunities to maximise local content and economic development opportunities for local businesses.

Early construction works commenced in July 2018 on the new 36.5km pipeline. This will be capable of boosting the current emergency pipeline capacity (of 130 ML/day) with an additional capacity of 234 ML per day in line with the Taskforce’s short-term recommendation for ensuring water security for Townsville. The installation of the 36.5km pipeline is being divided into four delivery packages to tap into local capability and foster local industry and capacity development. The pipeline installation packages are being tendered from July through August 2018 and will be awarded in September through October 2018. As part of the project, alternative energy options are also being considered consistent with the recommendation in the Interim Report.

In addition, the new pump station at the Haughton irrigation channel will be tendered and awarded in late 2018. The majority of the pipeline installation is expected to be completed at the end of 2018/19 financial year, with the pump station and power supply well underway.

Construction of the pipeline is scheduled to be completed by December 2019.

3.1.2 Bulk Water Meters  
(Interim Report Recommendation A2)

The Taskforce recommended investment in bulk water meters within Townsville’s reticulation system to allow detection and reduction of water losses within that system. Council is planning to install bulk water meters and other technologies over the coming twelve months which will enhance its ability to undertake leak detection across the network.

3.1.3 Cleveland Bay Recycled Water System  
(Interim Report Recommendation A3)

This project will recycle treated water from the Cleveland Bay Purification Plant to produce economically viable non-potable water to irrigate parks, golf courses, James Cook University, the new North Queensland Stadium and large industrial users. Construction of the plant at Cleveland Bay Purification Plant is expected to commence in January 2019. The project is also forecast to be able to provide water to the new North Queensland Stadium by the time it is completed in early 2020.
3.2 Non-Infrastructure Initiatives

3.2.1 Wise Water Use Program
(Interim Report Recommendation B1)

The Townsville Water Security Taskforce recommended the implementation of a wise water use program in Townsville, as part of an overall solution to address Townsville’s water security issues. This is discussed below.

3.2.1.1 Community Water Transition Support Package

The Community Water Transition Package is supported by a $10 million grant from the Queensland Government. This package assists the community in transitioning to more efficient outdoor water use practices that are compatible with Townsville’s dry tropics environment. Council has been developing the policy framework to deliver the package to ensure it delivers on the community need, can maximise water savings and reach a broad range of the community.

It will achieve this by:

- Maximising the awareness and fostering the adoption of water efficient behaviours and practices appropriate for Townsville’s dry tropical environment across the community
- Providing direct or indirect financial support to the community to increase the uptake of water saving methods and devices
- Providing economic opportunities for local business by entering into commercial supply arrangements to deliver products and/or services.

The program will be rolled out to the community from the second half of the 2018/19 financial year.

3.2.1.2 Water Education Programs

For many years, Townsville Water has been providing community and school education programs, including offering school groups the opportunity to participate in Eco-catchment Education Tours. These tours enable students to follow the water cycle from catchment to reef and integrate essential infrastructure with the local natural environment. School groups also participate in guided tours of “Learnscapes” such as the Mount Saint John Wastewater Treatment Plant and the Ross River Dam Spillway, where connections are made between the built environment and surrounding natural habitats.

Community members can learn about how to keep their lawns and gardens healthy while using less water and learn about Council’s sewerage treatment processes and the many items that, if flushed, can cause blockages and overflows, or are a danger to workers or impact the sewerage treatment process.

3.2.1.3 Water Demand Management Strategy

Since July 2015 Council has adopted a Water Demand Management Strategy 2015 – 2025 (WDMS). The WDMS provides the vision and a framework for water demand management into the future. Drivers for effective water demand management in Townsville include opportunities for deferral of significant water infrastructure capital investments, which could lead to savings for the Townsville community, improved water security and the ability to cope with drought.

The delivery of the WDMS coupled with the water education programs will continue during 2018/19 and beyond and be aligned with the delivery of the Community Water Transition Support Package outlined earlier.

3.2.1.4 Digital Utilities of the Future

Pilot projects and trials like the Smart Water Metering and Sensor Q-Smart Water Quality Monitoring are currently underway and will continue during the 2018/19 financial year. These trials will help inform the pathway to becoming a more customer focused, safe and efficient digital utility of the future which will transform the way Townsville Water delivers services to the community.

3.2.2 Water Tariff Scheme
(Interim Report Recommendation B2)

Council offers a choice between the Standard Plan and the Water Watchers Plan for residential properties. During the Opt-in Period, customers can decide which water plan works best for their household. Council sets a Water Opt-In period each year (usually during the month of August) when customers can notify their intention to change water plans. The default for all residential customers is the Standard Plan with an allocated 772kL of water/year.

As recommended, Townsville City Council will continue to review and adjust as appropriate, the existing water tariff scheme.

3.2.3 Townsville’s Water Allocation from the Burdekin (Interim Report Recommendation B3)

Townsville City Council has commenced discussions with SuiWater in relation to its allocation from the Burdekin. These discussions are ongoing at time of publication.
4. Updated Information from Recent Studies into Long-Term Options

4.1 GHD’s detailed review of options

The Taskforce commissioned GHD to conduct a review of all options relevant to Townsville’s long-term water security.

GHD systematically looked at the full suite of bulk water infrastructure and non-infrastructure options relevant to Townsville’s water security that:

- had been identified in previous technical studies
- were put forward as ideas or suggestions by members of the community (through the Taskforce’s community engagement processes in May and June 2017)
- formed part of the Taskforce’s recommendations and options contained in its Interim Report.

In undertaking their review, GHD relied on readily available, existing information relating to previous studies and reports about Townsville’s bulk water source and delivery. In addition, GHD considered the information contained within public submissions that were made to the Taskforce, as well as within the transcripts of comments made in public meetings held by the Taskforce in mid 2017.

The review examined Townsville’s current and future water demands, Townsville’s water security as well as a suite of potential stand-alone and combination options. This included estimating costs as well as identifying and comparing other implications for some 50 discreet supply, demand and operational related options relevant to Townsville’s bulk water supply security.

GHD’s study suggests that the short to medium term actions are technically feasible and appropriate for addressing Townsville’s water security issues. The study updated the cost-estimates of the infrastructure options recommended in the Interim Report to take account of additional studies or new information since mid 2017. These changes were relatively minor in scale compared to the cost-estimates that were considered by the Taskforce when formulating its recommendations in mid 2017.

4.2 National Water Infrastructure Development Fund (NWIDF) Studies

A range of studies, funded by the Australian Government under the National Water Infrastructure Development Fund (NWIDF), have been have progressed since June 2017 that are relevant to the Taskforce’s medium to long-term options. The Taskforce received a briefing on these studies in June 2018 for which a summary is provided in the sections below.
4.2.1 Hells Gate Dam Feasibility Study

The proponents for this study, Townsville Enterprise Limited (TEL), engaged a consortium of Townsville businesses, led by national engineering and development consultants, SMEC, to undertake a detailed feasibility study for the proposed Hells Gates Dam. The "Hells Gates Dam Feasibility Study" aimed to assess the viability of large-scale irrigated agriculture within the upper Burdekin River along with the requirements and viability for providing urban water supply and security for Townsville. TEL contend that the Hells Gates Dam project on the Upper Burdekin River would provide opportunities to significantly increase the agricultural production of the North, establishing up to 100,000 hectares of irrigated agricultural land.

The Hells Gate Dam proposal aims to introduce a significant new bulk water source in the region primarily to support growth in irrigated agricultural production. However, the Taskforce concluded that the proposed dam is unlikely to be needed to address short-falls in Townsville's urban water supply until the long-term.

Townsville Enterprise Limited has lodged their Final Report with the Queensland Department of Natural Resources, Mines and Energy.

Figure 1 – Geographical Overview of Townsville’s Major Existing or Proposed Water Storage Infrastructure

Figure 2 – General Location of the Proposed Pump/Pipeline/Solar Station Works from the Burdekin
4.2.2 Burdekin Falls Dam Raising Feasibility Study

The Burdekin Falls Dam Raising Feasibility Study involved undertaking a high-level analysis of key factors affecting the economic viability of a 2-metre raising of the Burdekin Falls Dam. The study has focussed on meeting water demands for existing and future economic development opportunities, potential uses of the additional water, as well as mitigating key potential environmental impacts and issues associated directly with the raising.

The study has now been completed by the Queensland Department of State Development, Manufacturing and Infrastructure Planning (DSDMIP) and provided to the Australian Government. The study indicates that there is sufficient water available within the existing Burdekin Falls Dam to meet identified short term demands in the area. The study has also involved the high-level identification of possible environmental offsets to mitigate the potential consequential impacts from using an additional 150,000 ML of water associated with the potential raising of the dam. Since this assessment was finalised SunWater has continued to discuss water needs with potential customers including Townsville City Council.

SunWater, as the asset owner of the dam, is now undertaking a staged strategic and preliminary business case process to further investigate long-term water supply requirements and options for raising the dam wall. This assessment will consolidate the results of the DSDMIP assessment, further negotiations with potential water customers and will include assessment of the viability of 2m, 6m and 14.6m raising heights which were allowed for in the original design of the dam.

SunWater indicate that development of the strategic and preliminary business cases is aimed at ensuring the appropriate strategy to meet the long-term water requirement of the region is in place. Dependent on the outcome of the preliminary business case, SunWater proposes to then work with Building Queensland on a detailed business case under the Queensland Government’s Project Assurance Framework, and the preparation of an environmental impact statement. The work on the Preliminary Business Case (PBC) is planned for completion late in 2018. Following this, a detailed business case will be conducted to determine whether to proceed with the project.

The Taskforce notes that progressing either the Hells Gate Dam or the Burdekin Falls Dam Raising projects in the longer term could be important in order to underpin Townsville’s long-term bulk water supply and water security prospects, subject to the outcomes of the business case and environmental approvals.

4.2.3 Burdekin-Haughton Channel Capacity Upgrade Feasibility Study

The Burdekin Haughton Channel Capacity Upgrade Feasibility Study analysed the key factors potentially impacting the SunWater-owned Burdekin Haughton water supply scheme over a 20-year horizon. This scheme is a large, complex system of channels and pipelines delivering water to a wide region of irrigation, industrial and urban customers. SunWater has been undertaking a feasibility study to address key issues facing the scheme, consider the long-term environmental and economic sustainability of the region, as well as ensure there is sufficient capacity to continue servicing customer requirements into the future.

A range of potential options to improve supply outcomes and remove flow capacity bottlenecks within the channel system have been assessed. These include an upgrade of the Haughton main channel, additional pipelines and balancing storages, targeted channel lining to prevent seepage, and groundwater dewatering and re-use.

Townsville City Council’s urban water demand and the work undertaken by the Taskforce have been considered as part of the existing and future demand scenarios that have been analysed. SunWater’s study is nearing completion and will shortly be provided to the Queensland Department of Natural Resources, Mines and Energy and the Australian Government.

In the meantime, SunWater have also indicated that detailed design is well advanced to expedite an upgrade to the channel system’s capacity to be able to deliver the increased flow rates associated with the duplication and augmentation of Townsville’s Haughton Pipeline.
4.3 Level of Service Modelling

The Queensland Department of Natural Resources Mines and Energy and the Queensland Department of Environment and Science undertook detailed hydrologic modelling to provide information about the levels of service for Townsville’s bulk water supply. These analyses were outlined and presented in detail in the Taskforce’s Interim Report.

The Taskforce found that:

- At the current level of demand, the level of service with no change to the water supply system had a very low probability of running out of water. However, the probability of experiencing level three restrictions at least once in a four (4) year period was very high (40%), and of experiencing level four restrictions in a ten (10) year period was possible (5.8%).
- Substantial improvements in the levels of service could be achieved as follows:
  - by raising the trigger level in Ross River Dam at which pumping from the Burdekin River commences,
  - changing the levels in Ross River Dam at which water restrictions are triggered, altering the mix of high and medium priority water allocation from the Burdekin River held by Townsville City Council, and
  - supplementing the existing 130 ML/day pipeline from the Burdekin with an additional new 234 ML/day from the Burdekin River.
- The change in restriction triggers, increasing high priority allocations and duplicating the pipeline were found to reduce the probability of experiencing level three restrictions at least once in a four (4) year period to low levels (0.7%), and of level four restrictions in a ten (10) year period to very low levels (0.1%).
- As Townsville’s future water demands increase, the probability of experiencing restrictions also increases. However, these would still be significantly better than current levels of service if improvements are made to operations, restriction levels and pipeline capacity from the Burdekin.

This modelling will continue to be refined and updated to reflect the infrastructural upgrades and operational changes that are being implemented by Council as outlined in Section 3.

5. Residual Risks and Emerging opportunities

The Taskforce noted that Townsville’s water supply would, in the short term, continue to be reliant on delivery to the new pipeline via SunWater’s Haughton Main Channel. The Taskforce considered the risks and opportunities related to the infrastructure recommendation for supplying bulk water to the city of Townsville as follows:

- Levels of Service benefit expected from its suite of recommended short-term measures are dependent on the existing 130 ML/day emergency pipeline remaining functional. Should this not be the case, Stage 1 would only be able to divert up to 234 ML/day from the Haughton Main Channel to Ross River Dam and the extent of Level of Service benefits outlined in Section 4.3 would be reduced. However, Stage 2 would not be reliant on the emergency pipeline and would be capable of diverting up to 364 ML/day and deliver a higher level of service.
- Council’s ability to maintain its access to a share of the channel capacity given the current investigations into potentially transferring the ownership and/or management of SunWater’s channel system to an irrigation cooperative or company. However, the Taskforce was satisfied that this risk would be low as it is anticipated that any existing distribution arrangements relating to Townsville City-owned entitlements to water allocations and/or share of the channel delivery capacity would be preserved should the irrigation scheme be transferred.
- Planned and unplanned closures of SunWater’s channel for 2-3 weeks yearly for operational requirements. The Taskforce was satisfied that there would be sufficient capacity in the Townsville’s water storages for Council to manage (through appropriate planning) the supply to Townsville during and after any planned or unplanned shutdowns of the Haughton Main Channel.

10 This includes shutdowns for chemical weed control and maintenance of mechanical and other assets
In the context of these considerations, the Taskforce considered the implications of bringing forward the timeframe by which the new 1800mm pipeline (from Ross River Dam to Haughton) might be extended all the way through to Clare (Recommendation A4).

GHD examined the cost implications of constructing stage 1 and 2 separately and concurrently. Although the operational costs between these options were not compared in detail\(^1\), GHD’s review found that the estimated nominal capital cost of building a 1800mm pipeline (and associated pumps and solar arrays) concurrently in a single stage from Ross River Dam all the way to Clare would be $55M less than of building it in two stages (i.e. from Ross River to Haughton, and then from Haughton to Clare). This is because in the combined single stage option, the capital costs associated with upgrading SunWater channel and pump station, upgrading the existing pump station at Haughton, as well as installing a solar array at Haughton would be avoided as illustrated in the following table.

<table>
<thead>
<tr>
<th>Items</th>
<th>Estimated capital cost</th>
<th>If installed in 2 separate stages</th>
<th>If installed in a single stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>New 1800 pipeline (Haughton to Ross River Dam Section)</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Major upgrade of Townsville City-owned Haughton pump station</td>
<td>√</td>
<td>Not required</td>
<td></td>
</tr>
<tr>
<td>New Solar array for Haughton pump station</td>
<td>√</td>
<td>Not required</td>
<td></td>
</tr>
<tr>
<td>SunWater-owned Channel System Upgrade</td>
<td>√</td>
<td>Not required</td>
<td></td>
</tr>
<tr>
<td>SunWater-owned Clare Pump Station Upgrade to supply upgraded SunWater Channel System</td>
<td>√</td>
<td>Not required</td>
<td></td>
</tr>
<tr>
<td>Sub-total – Stage 1 (excluding contingencies)</td>
<td>$198.4M</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>New 1800 pipeline (Clare to Haughton Section)</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>New Townsville City-owned Low Lift and High Lift Pump Stations at Clare to supply new pipeline</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Solar array for new Low Lift and High Lift Pump Stations at Clare</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Sub-total - Stage 2</td>
<td>$190.9M</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>TOTAL (excluding contingencies)</td>
<td>$389.3M</td>
<td>$334.2M</td>
<td></td>
</tr>
</tbody>
</table>

However, the Taskforce noted that bringing forward the pipeline extension and ancillary work:

- Would require significant additional unfunded capital works of around $135.8M (excluding contingencies). The Taskforce recognised that funding matters related to implementation is a matter for separate consideration by governments.
- Would only result in savings if a timely decision was made to proceed with concurrent delivery so that contractual matters and scheduling of planning and construction could be appropriately managed.

\(^1\) The operating costs associated with running a pipeline from Clare to Ross River Dam would be different than that of an option whereby water is firstly pumped into the SunWater channel then re-pumped from Haughton to Ross River Dam. This is because bypassing the channel system with a pipeline might also avoid incurring costs associated with the open earth channel’s operation, management and periodic cleaning.
6. Taskforce Final Conclusions

Based on the above considerations, the Taskforce concludes that:

- Its package of short to medium term recommendations – both infrastructure and non-infrastructure strategies – for immediate action (as proposed in its June 2017 Interim Report) remain valid.
- Significant progress is being made by Townsville City Council in implementing the short-term recommendations with funding support from the Queensland Government.
- Bringing forward Stage 2 of the pipeline would save $55 million in capital costs if Stage 2 were to be delivered concurrently with Stage 1.
- Progressing either the Hells Gate Dam or the Burdekin Falls Dam Raising projects in the longer term, subject to the outcomes of the business case processes and environmental approvals, are consistent with the Taskforce’s strategy for underpinning Townsville’s long-term bulk water supply and water security prospects by tapping into the water resources of the Burdekin catchment.
7. Taskforce Final Recommendations

The Taskforce recommends that:

- The short to medium-term recommendations as proposed in the Interim Report continue to be implemented by Townsville City Council.

- Townsville City Council continue to implement the short-term recommendations from the Interim Report in the following priority order:
  - Recommendation A1 (see p.9)
  - Recommendation A3
  - Recommendation B1
  - Recommendation A2
  - And all others identified in the most appropriate order as decided by Townsville City Council.

- Should funding be available, then Stage 2 of the pipeline (Interim Report Recommendation A4) should be delivered concurrently with Stage 1, whilst appropriately managing contractual matters and scheduling its planning and construction. The Australian Government representative did not support this recommendation as the detailed investigations suggested in Recommendation A4 of the Interim Report have not been undertaken.

- The suite of long-term options (as proposed in its June 2017 Interim Report) should continue to be progressed as a prudent approach to ensuring the long-term water security of Townsville City as well as the region as a whole.