townsville enterprise

Hells Gates Dam
Opportunity Overview

July 2017

The Strategic Opportunity

By 2050, three billion people across Asia will have living standards similar to those in Australia today. These people increasingly demand quality food, reliable energy and minerals supply, premium travel experiences, world's best health services and education opportunities.

The north of Australia is seen as the future of the nation. It covers over 40 per cent of Australia's land mass and contains up to 17 million hectares of arable soil, around 60 per cent of the nation's water and 90 per cent of Australia's gas reserves. With a population of less than 1 million people, northern Australia accounts for more than half of our sea exports[1]. Based on proximity and capacity, it is best able to meet the demands of a growing Asian middle class.

In 2015, the Federal Government released the White Paper on Developing Northern Australia, setting out an investment and policy agenda to unlock the economic potential of Northern Australia. With a timeframe of 20 years, the Northern Australia White Paper is focused on unlocking latent capacity by addressing challenges to development including:

- Making it easier to use natural assets, in close consultation with, and the support of, Indigenous communities;
- Providing a more welcoming investment environment;
- Investing in infrastructure to lower business and household costs;
- Reducing barriers to employing people; and,
- Improving governance.

In February 2016, Infrastructure Australia released the *Australian Infrastructure Plan*, which projects that by 2031, Townsville will be the most prosperous regional economy in northern Australia after the Pilbara and among the top five in Australia.

The *Infrastructure Plan* follows the federal Government's *Northern Australia Infrastructure Audit*, which identified infrastructure gaps that are critical to meeting Townsville North Queensland's population and economic growth opportunities.

Significantly, under every scenario considered in the Audit, not only will Townsville remain the largest urban centre over the next 15 years, but it grows at a faster rate than other northern cities. This development is predicted to be driven by three key growth areas – the Burdekin (irrigated agriculture), the Galilee and Bowen Basins (coal) and the North West Minerals Province (base metals and other minerals) – all of which flow into the Townsville North Queensland economy.

The White Paper on Developing Northern Australia includes an undertaking to fund detailed water resource assessment to provide a comprehensive and integrated evaluation of the feasibility, economic viability and sustainability of water resource development in northern Australia.

The $500 million Water Infrastructure Development Fund has been established to facilitate greater investment in water infrastructure nationally. The Fund includes a dedicated northern component of $170 million.

[1] Ports Australia 2014.

The Burdekin River

The Burdekin River Basin covers an area of 136,000 km^2. This equates to approximately 2/3^{rds} of the size of the state of Victoria. This area can be categorised into four major hydrological sub-catchments, as outlined in Table 1.

The Burdekin River is Australia's largest river by (peak) discharge volume. Located approximately 200 km south of Townsville, the Burdekin Falls Dam was completed in 1987. With a capacity four times that of Sydney Harbour, the Burdekin Falls Dam is Queensland largest dam. The dam filled within its first wet season in 1988.

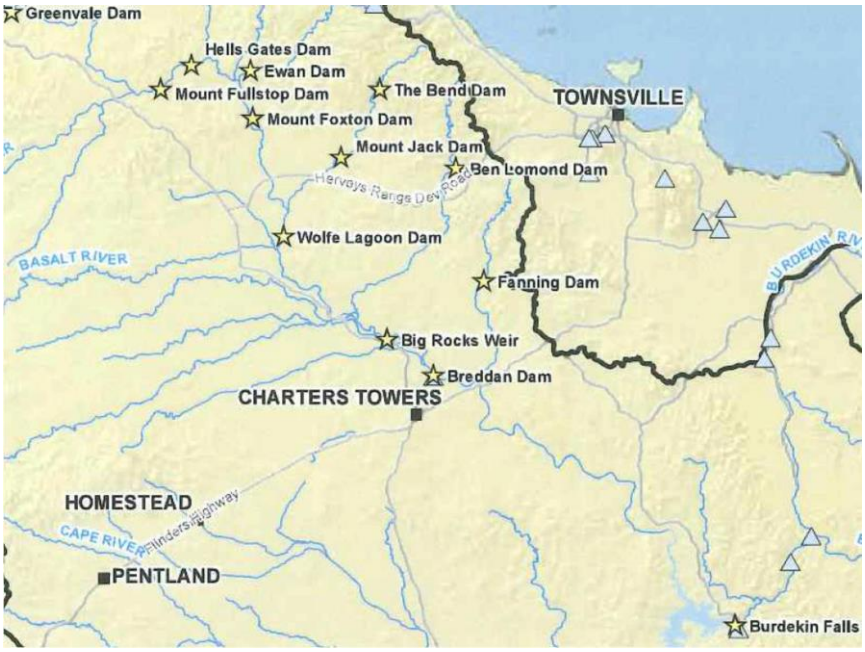
Below the dam wall, is northern Australia's largest irrigation area with approximately 70,000 hectares under irrigation, predominantly for growing sugar cane.

Table 1: Burdekin Basin by Sub-catchment.

Subcatchment	Area (km^2)	Major tributaries and streams
Upper Burdekin	36,181	Clarke River Basalt River Star River Fanning River Running River Broughton River Upper Burdekin River
Belyando/Suttor	73,828	Belyando River Cape River Suttor River Rollston River Mistake Creek Diamond Creek Logan Creek
Bowen/Broken	9,413	Bowen River Broken River Pelican Creek
Lower Burdekin and coastal plains	16,600	Bogie River Burdekin River Haughton River Don River Elliot River Majors Creek

Hells Gates

Hells Gates is located approximately 120 kilometres north west of Townsville. The proposal to build a dam at Hells Gates was first considered as part of the Bradfield Scheme in 1938.



Reconnaissance and preliminary investigations were completed by the Snowy Mountains Engineering Corporation (SMEC) in 1973 and 1975 respectively. These studies were followed up in 1999 by the State Water Projects – Engineering Services (SWP-ES) *Scoping Study of Water Infrastructure Options and Related Issues in the Burdekin River Catchment.*

In April 2014, Townsville Enterprise released the North and Northwest Queensland Sustainable Resource Feasibility Studies (NNWQSRFS). The NNWQSRFS assessed the potential economic outcomes derived from large scale irrigated agriculture and electricity generation in the region west of Townsville. For water and agriculture, these studies found, inter alia: -

- A major dam in the Upper Burdekin is required to underpin an irrigated agriculture project. Hells Gates is the optimal location for this dam.
- There is confidence in the area providing 49,000ha of contiguous suitable land in proximity to the dam. This would support 4 million tonnes per annum (MTPA) of sugarcane production and a sugar mill with an output of 400,000 TPA of sugar and 130MLpa of ethanol.
- The possibility of extending the agricultural development to 10 MTPA of sugarcane was considered, but more detailed investigation of the land suitability is required.
- Total capex varies from $2.7b (2014 terms) for the 4 MTPA to $4.9b for 10 MTPA scale.
- A 4 MTPA scheme is only viable in circumstances of high sugar and ethanol prices. The social cost benefit analysis does not provide a positive forecast for the 4 MTPA case (-$227m).
- The 10 MTPA project can deliver sufficient returns, except where sugar and ethanol prices are low and the project bears the entire $4.9b capital cost ($2.5b for water infrastructure). Increasing scale to 10 MTPA increases the net social economic benefit to $273m.

The study found that two key elements are required to advance knowledge within the project feasibility: -

1 Greater certainty regarding the availability and accessibility of suitable soils; and,

2 Confirmation of the water supply (both requirements and availability) within the wider Burdekin water system to support an up to 10 MTPA scheme.

Hells Gates Dam Q & A

With estimated resident population exceeding 193,000, Townsville is the largest urban centre in Northern Australia. Queensland Treasury medium projections has Townsville's population exceeding 300,000 in 2031. With growth comes additional demand for water and pressure on water security.

Townsville has the following sources of water supply:

- To the north is Paluma Dam with a catchment of 9.8 km^2 and a storage capacity of 11,400 ML. Water from Paluma is transported through the Mount Spec pipeline and treated at the Northern Water Treatment Plant (WTP). The Northern WTP has a maximum capacity of 40 ML per day.

- To the south, Ross River Dam stores water before releasing it to the Douglas WTP. With a catchment of 750 km^2 and a capacity of 233,187 ML, Ross River Dam is Townsville's primary water source.

- If the water levels in Ross River Dam fall below 15 per cent, supplementary water is sourced from the Burdekin Haughton Water Supply Scheme (BHWSS) via the Haughton pipeline. The pipeline, which has a capacity of 130 ML/day, discharges into the Dam catchment at Toonpan Creek. Council purchases an entitlement to 10,000 ML/annum of high priority water allocation from the BHWSS and has an agreement to access a further 110,000 ML/annum of medium priority allocation.

The Paluma and Ross River Dam systems provide Townsville with approximately two years guaranteed water supply. After three failed wet seasons, water levels within Ross Dam are below 15 percent.

The Haughton Pipeline has a capacity of 130 ML/Day. With the pipeline discharging upstream of the Dam at Toonpan Creek, it is estimated that average losses of ~20 percent occur. This reduces the effective supply to ~104 ML/Day.