



WATER AND DROUGHT SECURITY REPORT

SUMMARY

1 Executive Summary

1.1 Purpose of Study

The aim of this Study is to investigate potential solutions to improve water supply security across the 12 member councils of the Lower Macquarie Water Utilities Alliance (LMWUA) region. The Study focuses on two levels of water security:

- Improving reliability of supply in the worst case scenarios of interruption to supply or extreme drought conditions in order to minimise transporting water and to avoid evacuation of urban centres
- Improving reliability of supply in order to reduce the frequency and severity of water restrictions.

The Study is based on the work and consultant studies undertaken by the individual and groups of councils as well as studies carried out by the Office of Water. This report brings together the recommendations of these various studies into a consolidated water security strategy.

This report has been prepared as far as possible in consultation with Council staff and the Office of Water.

The relevant water-sharing plans are considered within the broader context of the Murray-Darling Basin Plan.

The primary focus of this Study is water security and drought preparedness for the urban communities. The issues of water security for irrigation and other water users (such as mining companies) that access water outside the local water utility infrastructure is considered only in relation to where it directly impacts on urban water supplies. Likewise, infrastructure downstream of the water sources also has an impact on water security; however, this issue is not considered in detail and has been addressed separately in other documents prepared by the Alliance councils and is therefore not considered again in this report.

This Study was proposed by the Alliance to avoid the town-by-town approach on which the existing reports used to prepare this Study may have been based. By highlighting opportunities for cooperation on a regional scale, this Study has the potential to identify water supply options that may benefit numbers of towns, or provide mutually benefits for other sectors such as irrigation and mining for example. This could include the sharing of water sources or water entitlements, or provide economies of scale for works required to be undertaken in a number of member council areas where this is feasible and not affected by significant geographical distance.

1.2 Summary of Recommendations.

1.2.1 Regional Recommendations

1. Commence discussions with DPI Water regarding the implications of current water-sharing plans, with a view to improving security of supply to urban centres leading into severe droughts.
2. Prepare a report regarding the proposed pipeline from Burrendong Dam to Dubbo.
3. Prepare a report regarding the proposed pipeline from Warren to Nyngan.
4. Analyse where water conservation measures can be implemented economically without unduly affecting the lifestyles of communities and the appearance of urban centres.
5. Carry out analysis of unaccounted-for water losses, especially with regard to identifying leakage in reticulation systems with a view to lobbying for another round of funding to identify leakage in pipe networks.
6. Carry out a condition survey of bores.

1.2.2 Individual Council Recommendations

Council Recommendations

Bogan and Cobar

In order to improve emergency supplies

- a. Investigate Macquarie River and Great Artesian Basin (GAB) recharge zone aquifers in the Warren area to establish quantity and reliability of supply for a potential emergency supply for Nyngan and Cobar (for when the Albert Priest Channel is piped).
- b. Carry out preliminary design and environmental studies for the construction of a pipeline from Warren to Nyngan.
- c. Obtain funding to construct a pipeline from Warren to Nyngan.
- d. Investigate potential emergency supplies from several existing low yielding bores in the immediate Cobar area that can be transported to Cobar in an emergency.
- e. Investigate feasibility of additional raw water storage at Cobar for emergency supply for the township.
- f. Investigate and reduce unaccounted for water losses in the pipe networks in Nyngan and Cobar.

In order to improve reliability of supply in normal drought periods

- a. Investigate and construct water storage facilities at Nyngan adjacent to the existing weir pools using the \$10 000 000 in Water Security for Regions funding.
- b. Further investigate the feasibility and any environmental impacts of establishing a drought time operating water level in the weir pool at Nyngan in order to reduce evaporation and seepage losses.
- c. Seek an increase in water allocation for Cobar Council from 1850 ML/annum to 2850 ML/annum.
- d. Consider the feasibility of expanding Cobar's stormwater harvesting capability.

Bogan Villages

- a. Investigate feasibility of supplying raw water from Gunningbar Creek to Coolabah and Girilambone villages schemes
- b. Investigate feasibility of a permanent raw water supply from the Nyngan-Cobar Pipeline to the Hermidale village scheme.
- c. Works as required for Coolabah, Girilambone, Miandetta and Hermidale.

Cobar Villages

- a. Works as required for Canbelego, Nymagee, Mount Hope, Euabalong and Euabalong West.

Bourke

In order to improve emergency supplies

- a. Complete the development of the Walkden's no. 2 bore, treatment facilities at the bore site, the pipeline to Bourke water treatment plant (WTP), power line to bore site and improvements at Bourke WTP.
- b. Test the Walkden's bores (no. 1 and no. 2) over an extended period of time to monitor drawdown, interference effects and safe yield capacity.
- c. Complete a hydrogeological evaluation of the available groundwater supply from the connected bores. Seek approval to vary licence conditions to temporarily increase GAB groundwater usage during drought times, while resting the bores during normal times—provided some mitigation of interference effects can be demonstrated.
- d. Apply for funding to install an additional bore along the proposed pipeline between Walkden's no. 2 bore and Bourke.

In order to improve reliability of supply in normal dry periods

- a. Investigate and ameliorate the sources of unaccounted-for water losses, and in particular, water loss through leaking pipework.
- b. Undertake weir pool investigations including a structural assessment of the ageing weir wall.
- c. Develop a protocol for management of weir pool extraction for all users during cease-to-flow periods.
- d. Further investigate various demand management approaches regarding the use of both potable and non-potable water.

Bourke Villages

- a. Works as required for Enngonia, Wanaaring, Byrock, Fords Bridge and Louth including the following:
 - Apply for funding to install a backup bore at Enngonia.
 - Apply for funding to install a backup bore at Wanaaring.
 - Apply for funding to carry out test drilling at Byrock.

Brewarrina

In order to improve emergency supplies

- a. Carry out test drilling and bore development in the GAB north-west of Brewarrina using funding provided under the Water Security for Regions Program.
- b. Following successful development of the bore in the GAB, apply for funding for a pipeline to Brewarrina.
- c. Carry out reservoir drop tests in order to check the level of leakage in the pipe networks and rectify any significant leakage.

In order to improve reliability of supply in normal dry periods

- a. Carry out a safe yield analysis of the weir based on historical usage and cease-to-flow events in order to better understand the reliability of supply from the weir and when to implement appropriate levels of restrictions.
- b. Monitor salinity levels and establish the implications of higher salinity levels on the community and infrastructure (such as evaporative air conditioners).
- c. Investigate suitable treatment options to deal with algal blooms in the weir pool.
- d. Carry out a structural assessment of the weir wall in order to provide assurance regarding its adequacy.
- e. Monitor bore yields and check their physical condition
- f. Consider implementing demand management measures, and in particular user pays for non-potable water, in order to extend the drawdown life on the weir pool.

Brewarrina Villages

Works are required for Goodooga, Gongolgon, Weilmoringle and Angledool including the following.

- Carry out test drilling and develop an artesian bore at Angledool using the funding provided under the Water Security for Regions Program.
- Carry out test drilling at Gongolgon and, if successful, apply for funding to develop the supply.
- Apply for funding to install a backup bore in Goodooga

Coonamble

In order to improve emergency supplies

- a. Establish the yield of the existing bores in Coonamble and apply for funding to install one or two extra bores in order to meet the emergency supply requirements in the event of two bores failing.
- b. Carry out a reservoir drop test in order to check the level of leakage in the pipe networks.

In order to improve reliability of supply in normal dry periods

- a. Establish and monitor bore yields and check their physical condition.
- b. Consider further demand management measures.

Coonamble Villages

Works are required for Gulargambone and Quambone including the following.

- Apply for funding for one extra bore at Gulargambone.
- Apply for funding for one extra bore at Quambone.

Dubbo (Now part of Western Plains Regional Council)

In order to improve emergency supplies

- a. Apply for funding to purchase properties and groundwater licence allocations and to develop proposed bore field A.
- b. Pursue funding for the development of bore fields B and C as detailed in the GHD Groundwater Model Report.
- c. Lobby for additional groundwater allocations to meet future drought demand and transfer some existing groundwater allocations to new bores.
- d. Lobby to have the Water Sharing Plan adjusted to preserve more water in Burrendong Dam for downstream town water supplies under drought conditions.
- e. Carry out reservoir drop tests in order to check the level of leakage in the pipe network and rectify any significant leakage.
- f. Carry out a feasibility study into a pipeline from Burrendong Dam to Dubbo.

In order to improve reliability of supply in normal dry periods

- a. Lobby for additional surface water and groundwater allocations to meet future demand.
- b. Continue to purchase high security surface water licences as the opportunities arise.
- c. Research the possibility of buying high security surface water allocations leading into periods of drought.
- d. Monitor groundwater levels, yield and physical condition of existing bores.
- e. Consider implementing further demand management measures.
- f. Consider further stormwater reuse projects as funding opportunities arise.
- g. Consider feasibility studies into indirect potable reuse and desalination of saline groundwater.
- h. Encourage water conservation measures, including grey water reuse.

Dubbo Villages

- a. Works as required for Eumungerie including connection of Eumungerie to Dubbo town water supply.

Gilgandra

In order to improve emergency supplies:

- a. Install a new sub-artesian bore in Gilgandra utilising the \$1100 000 in Water Security for Regions funding.
- b. Carry out reservoir drop tests in order to check the level of leakage in the pipe network and rectify any significant leakage.

In order to improve reliability of supply in normal dry periods

- a. Monitor groundwater levels, yield and physical condition of existing bores.
- b. Carry out reservoir drop tests in order to assess the actual level of leakage in the pipe network and rectify any significant leakage.
- c. Analyse unaccounted-for water losses.

Gilgandra Villages

- a. Works as required for Tooraweenah including the following.
 - Apply for funding to install a bore in the Tooraweenah Creek aquifer.

In order to improve emergency supplies

- a. Provide one extra deeper bore at Narromine utilising the \$690 000 in Water Security for Regions funding.
- b. Consider purchasing a bore licence for Narromine.
- c. Lobby for Narromine's town water supply to be given preference when the Water Sharing Plan is reviewed in 2017.
- d. When the new riser mains are completed in Narromine and Trangie, carry out reservoir drop tests in order to check the level of leakage in the pipe network and rectify any significant leakage.

In order to improve reliability of supply in normal dry periods

- a. Install additional bores at Narromine and Trangie utilising funds from the Water Security for Regions funding.
- b. Monitor drawdown of bores in periods of drought in order to better understand the reliability of supply from the bores and implement water restrictions in a timely manner.
- c. Monitor water table levels, yields and physical condition of all bores.
- d. Consider implementing further demand management measures.

Narromine Villages

- a. Works as required for Trangie and Tomingley including:
 - Provide two deep bores at Trangie utilising the \$1290 000 in Water Security for Regions funding.

Walgett

In order to improve emergency supplies

- a. Install an extra artesian bore near the new WTP in Walgett utilising grant funding. (Note: Work now completed utilising \$2200 000 funding.)
- b. Install pipelines from the two existing artesian bores (Swimming Pool or Bicentennial bore and extra artesian bore) in Walgett to the new WTP. (Note: Work now completed utilising \$2200 000 funding.)
- c. Install aeration/cooling and process equipment to connect two bores to the WTP.
- d. Carry out reservoir drop tests in order to check the level of leakage in the pipe network and rectify any significant leakage.

In order to improve reliability of supply in normal dry periods

- a. Carry out the project to lift the wall of the Walgett Weir 11A using the \$3587 000 in Water Security for Regions funding.
- b. Survey the weir pool on the Barwon River in order to establish the current capacity of the weir following siltation from recent floods.
- c. Assess reliability of supply from the weir at Collarenebri.
- d. Monitor yield and physical condition of all bores.

Walgett Villages

- a. Works as required for Lightning Ridge, Collarenebri Rowena, Burren Junction Come by Chance, Carinda, Cumborah, Pokataroo, Grawin Opal Fields including the following.
 - Apply for funding to carry out test drilling and bore development in the GAB near Lightning Ridge in order to have one or two backup bore supplies.
 - Apply for funding to carry out test drilling and bore development in the GAB near Collarenebri in order to have one bore supply.

Warren

In order to improve emergency supplies

- a. Install two new artesian bores in Warren utilising the \$370 000 in funding received under the 2013/14 Water Security for Regions program.
- b. Carry out reservoir drop tests in order to check the level of leakage in the pipe networks and rectify any significant leakage.

In order to improve reliability of supply in normal dry periods

- a. Monitor the physical condition of all bores and as well as consider deepening where necessary.
- b. Monitor the groundwater levels and yield characteristics of the bores in order to better understand the reliability of supply and when to consider restrictions.
- c. Consider implementing further demand management measures.

Warren Villages

- a. Works as required for Nevertire and Collie including the following.
 - Install one new bore in Nevertire utilising the \$165 000 in funding received under the 2013/14 Water Security for Regions program.
 - Install one new bore in Collie utilising the \$165 000 in funding received under the 2013/14 Water Security for Regions program.

Warrumbungle

In order to improve emergency supplies

- a. Apply for funding to install a further four bores in Coonabarabran in the Castlereagh River alluvial aquifer.
- b. Renew infrastructure in order to access dead water storage in Timor Dam.
- c. Carry out reservoir drop tests in order to check the level of leakage in the pipe networks and rectify any significant leakage.

In order to improve reliability of supply

- a. Investigate the feasibility of raising the Timor Dam Wall using the \$512 000 in Water Security for Regions funding.
- b. Monitor groundwater levels, yield and physical condition of all bores.
- c. Consider implementing further demand management measures.

Warrumbungle Townships and Villages

- a. Works as required for Dunedoo, Binnaway, Mendooran, Coolah, Baradine, Bugaldie, Kenebri and Merrygoen including the following.
 - Install a further one bore in Binnaway in the Castlereagh River alluvial aquifer using the \$395 000 in Water Security for Regions funding.
 - Install a further one bore in Mendooran in the Castlereagh River alluvial aquifer using the \$342 000 in Water Security for Regions funding.
 - Install a further one bore in Coolah in the Coolaburragundy Creek alluvial aquifer using the \$370 000 in Water Security for Regions funding.
 - Consider the feasibility of installing an extra river intake in Binnaway.
 - Consider the feasibility of installing an extra river intake in Mendooran.
 - Consider the need to install an additional bore in Dunedoo.

Wellington (Now part of Western Plains Regional Council)

In order to improve emergency supplies

- a. Apply for funding to rehabilitate the bore at Montefiores in Wellington.
- b. Carry out reservoir drop tests in order to check the level of leakage in the pipe networks and rectify any significant leakage.
- c. Carry out a feasibility study into a pipeline from Burrendong Dam to Dubbo in partnership with Dubbo Council.

In order to improve reliability of supply in normal dry periods

- a. Monitor groundwater levels, yield and physical condition of existing bores in Mumbil.
- b. Consider implementing further demand management measures.

Wellington Villages

- a. Works as required for Geurie, Mumbil, Stuart Town, Wellington Caves, North Yeoval (Cabonne Water Supply), Euchareena, Bodangora and Elong Elong including the following.
 - Apply for funding to rehabilitate the bore at Scabbing Flat Bridge on the Macquarie River to supply Geurie.
 - Consider applying for funding to install one additional bore for Mumbil.
 - Consider development of the bore field and standpipe at Stuart Town.



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