



Australian Government



National
Water Grid
Authority

Connecting the National Water Grid

March 2022



The National Water
Grid is connecting
farmers to the
water needed for
agricultural growth

3 PROJECTS
NT | More than \$300 million

10 PROJECTS
WA | More than \$59 million

13 PROJECTS
SA | More than \$68 million

18 PROJECTS
VIC | More than \$200 million

12 PROJECTS
QLD | More than \$7 billion

8 PROJECTS
NSW | More than \$1 billion

70+ BUSINESS CASES AND
FEASIBILITY STUDIES
More than \$205 million

30+ SCIENCE PROJECTS
More than \$44 million

12 PROJECTS
TAS | More than \$160 million



Contents

Connecting the National Water Grid	2
Boosting regional prosperity	4
Construction well underway	6
Delivering for the future	8
Building a sound evidence base	10
Glossary of terms	14



Connecting the National Water Grid

Given the large expanse of our country and variable water availability, developing water infrastructure to support agriculture and primary industries is a long-held priority for Australia.

In a global context, we are performing well against other developed nations with similar primary industry output levels but we can't rest on history. So while Australia has a strong record of water management and investment, a national approach to water infrastructure planning and investment is vital to secure Australia's ongoing water future. This is why the Australian Government continues to invest in water infrastructure.

More than two years on from the establishment of the National Water Grid Authority, this vision of delivering national water infrastructure to support a prosperous and resilient regional Australia is coming to fruition. We are investing in the National Water Grid network of dams, weirs, pipelines and natural water systems and in the scientific research and planning that will secure predictable supplies of water now and into the future.

Despite the onset of the global pandemic, and the impact of fires, floods and other natural disasters, the planning, building and delivery of the National Water Grid across Australia continues to gain momentum.

The Australian Government has now committed to more than 150 water infrastructure projects and business cases across Australia. These projects are already delivering benefits for regional communities, including increased water security and resilience to drought, as well as improved regional economic growth and jobs creation.

Through the 2022–23 Budget, an additional \$6.9 billion over 12-years is being invested under the National Water Grid Fund, taking the total investment to \$8.9 billion.

This investment in the National Water Grid Fund, plus water infrastructure investments the Australian Government is making through the Energy Security and Regional Development Plan, means more than \$9 billion is being invested in water infrastructure, which will help build a more resilient and secure regional Australia.



Did you know?

More than two-thirds of our major dams and storage capacity were built in the 30 years from 1960 to 1990¹.

¹ Australian National Committee on large dams (ANCOLD 2010) available at <https://www.ancold.org.au>



The new and augmented projects being funded include:

- 💧 \$5.4 billion set aside to support the construction of Hells Gates Dam in Queensland, subject to the completion of the final stage of the business case and regulatory approvals.
- 💧 \$600 million to restore the Paradise Dam in Queensland to its full capacity.
- 💧 \$483 million locked away to fund Urannah Dam, pending demonstration of value for money and sufficient public benefit for investment. This is in addition to \$22.65 million towards the business case that is underway and expected to be completed later this year.
- 💧 \$126.5 million in additional funding for Emu Swamp Dam and Pipeline, bringing the total funding committed to \$168.5 million.
- 💧 \$80 million has been set aside towards the future construction of the Bowen Pipeline, subject to completion of the detailed business case, confirmation of total delivery costs and co-funding, and demonstration of value for money and public benefit
- 💧 \$8 million in additional funding towards Big Rocks Weir to see that project delivered, bringing the total funding committed from the Australian Government to \$38 million.
- 💧 \$12.5 million towards a package of groundwater improvements in the Lower Burdekin that will be delivered by the Queensland Government, with the aim of realising water savings that could be made available for agriculture and primary industries.

- 💧 \$11.5 million towards strategic planning work with the Queensland Government that will help determine the optimal mix of investments to further sustainably develop our water resources. This includes a Burdekin water infrastructure study and water plan review as well as a Central Queensland Water Grid Assessment.
- 💧 \$300.6 million towards the first stage of the Darwin Region Water Supply Infrastructure Program. This investment includes:
 - Manton Dam Return to Service.
 - Pre-construction for Adelaide River Off Stream Water Storage (AROWS). In addition, \$7.1 million is also being invested to support evidence-based allocation decisions through the Adelaide River Catchment Water Allocation Plan.
- 💧 Additional funding of up to \$433 million towards the Dungowan Dam and Pipeline project in New South Wales, subject to the finalisation of the business case and approvals processes. This brings the total funding committed by the Australian Government to up to \$675 million.
- 💧 An additional \$13.7 million towards the Don Irrigation Scheme in Tasmania – bringing the total commitment to \$26.28 million.

Another three projects across Australia will receive \$6.27 million to go towards the development of business cases: \$5 million for the Northern Water Supply Business Case in South Australia, \$800,000 for the Collie to Coast Business Case in Western Australia and \$470,000 for the McLaren Vale Irrigation Water Security Business Case in South Australia.

Boosting regional prosperity

The National Water Grid Authority is working in partnership with Australia's state and territory governments to identify, plan and deliver a program of national water infrastructure investments that will improve the reliability and security of water for Australia's regions, agriculture and primary industry sectors.

With more than 150 water infrastructure projects and business cases committed under the National Water Grid Fund, the aim of connecting Australia through the National Water Grid is well underway.

Of the 70 construction projects, nine are now complete and already boosting prosperity across regional Australia, including supporting irrigation opportunities across 200,000 hectares of land and providing more than 53,000 megalitres of ongoing annual water allocation. Together these projects have also supported more than 610 jobs during construction and continue to support around 740 ongoing jobs.

In 2021, the Australian Government invested \$108 million in the National Water Grid Connections funding pathway for seven packages comprising 40 projects for new water infrastructure projects across Australia, significantly boosting water security in rural and regional communities. Construction has commenced for five packages, comprising a total of 10 individual projects now under construction. Construction is expected to have commenced on another 20 projects by mid-2022.

A series of specific and measureable targets are used for water infrastructure investments from the National Water Grid Fund. National Water Grid projects have delivered strong performance against these targets and the projects delivered to date are already reaping positive benefits for our regions.

Completed National Water Grid projects

The completed construction projects include:

- ✓ Sunraysia Modernisation Project, Victoria
- ✓ Coolanie Water Scheme Project, South Australia
- ✓ South West Loddon Rural Water Supply Project, Victoria
- ✓ McLaren Vale Treated Water Storage Project, South Australia
- ✓ Scottsdale Irrigation Scheme Project, Tasmania
- ✓ Macalister Irrigation District 2030 Phase 1B Project, Victoria
- ✓ Warwick Recycled Water for Agriculture Project, Queensland
- ✓ Mitiamo and District Reticulated Water Supply Project, Victoria
- ✓ Mareeba-Dimbulah Water Storage Efficiency Improvement Project, Queensland



More than
740 jobs
ongoing direct and
indirect supported



Nearly
200,000 ha
increase in irrigable land
and new areas serviced



More than
610 jobs
supported during
construction



More than
53,000ML
increase in ongoing
annual water allocation



Construction well underway

A combination of large, nationally significant developments and smaller scale projects, providing targeted local benefits, is vital to the long term strength of the National Water Grid. Construction on the dams and weirs, modernisation and efficiency works, recycled water projects, and water storage and distribution solutions are well underway. With projects already delivering secure and predictable supplies of water.

There are nine projects that are operationally complete and 16 are under construction. More than 20 construction projects include a large scale water storage component, i.e. with a capacity of more than 100 megalitres.

Construction on **Rookwood Weir** in Queensland, the largest water infrastructure project underway in Australia, continued with the first of many concrete pours.

This project involves construction of a 350 metre long weir on the Fitzroy River near Rockhampton. This landmark project supports hundreds of jobs in central Queensland and once complete, is expected to yield up to 86,000 megalitres for water users. This additional water will allow local farmers to expand their operations and transition to farming high value crops, such as macadamias.

In December 2021, construction for the **Mareeba-Dimbulah Efficiency Improvement project** in far north Queensland was completed. By upgrading 14 kilometres of pipeline – with sections either replaced or new sections built, this project has resulted in approximately 8,300 megalitres

of extra water to increase irrigation across a 17,000 hectare region. As a result, it's anticipated that agricultural production in the Mareeba-Dimbulah region will grow by around \$20 million per year with larger yields in sugar cane, bananas, mangoes, avocados, coffee, tea trees and vegetables.

The first sod on the new **Dungowan pipeline** was turned in February 2022, marking the start of a once in a generation project to improve water security for the communities of Tamworth and Peel Valley in New South Wales. The project will update the 70 year old pipeline with 55 kilometres of new pipeline and construct the new Dungowan Dam to connect to the Tamworth's Calala water treatment plant. The Dungowan Dam and Pipeline project is expected to help build greater drought resilience and improve water reliability for agricultural production in the region.

Significant progress has been made in delivering the 40 projects funded through the **National Water Grid Connections funding pathway**. A quarter of these projects have commenced construction across several states already, including Victoria, Western Australia, South Australia, Tasmania and the Northern Territory.



These smaller scale infrastructure projects include:

- Northern Territory – the **Emerging Agribusiness Precinct project** at Gunn Point Peninsula involves the construction of tanks, pipes and bores to support a trial of different crops across three 100 hectare agricultural sites. The pilot will explore the commercial viability of growing the different produce, including a range of native species in northern Australia.
- Victoria – the **Horsham Agriculture SmartWater for Grains project** is already under construction and once built will convert wastewater into high quality irrigation water.
- Western Australia – construction is underway for the **Cave Springs Road Tail Water Return System** which is expected to produce 2,400 megalitres of water savings in the Ord River Irrigation Area.

These are just three examples of the smaller scale infrastructure projects already under construction through the Connections funding pathway. All these projects individually will make localised improvements to water outcomes and collectively will make nationally significant contributions to the National Water Grid.

Delivering for the future

Securing a reliable supply of water is important for all Australians. By building the right infrastructure in the right place, we can improve water access and support new and expanding agriculture.

As part of the NWGA's Investment Framework, every project being considered for investment must demonstrate how it will build resilience to future drought, support primary industries and promote regional prosperity, including through the creation of jobs.

Building the right infrastructure in the right place is crucial, which is why the NWGA is taking a long term, evidence-based approach to planning and investment decisions. The focus is on investing in a suite of measures to not only address current needs, but also for the future.

This goes beyond simply funding new infrastructure – to also include investing in scientific research, and planning – that will drive long term benefits for local communities.

The NWGA is the Australian Government's lead agency responsible for investing in Australia's next generation of water infrastructure, but it is only one part of the broader water agenda. Strong partnerships are also critical in the planning process to identify where the opportunities lie.

The NWGA works closely with state and territory governments, as well as Australia's leading science agencies to collaboratively identify and plan where and how existing or new water resources can be used so the collective goal of a strong regional Australia can be realised.



The projects committed in the 2022–23 Budget will deliver more water, more jobs and more irrigable land for agricultural growth in regional Australia.

Queensland Water Infrastructure Investment Package

The Australian Government is committing to deliver a package of water infrastructure investments across Queensland to support the future growth of agriculture and primary industries.

Future Australian Government investment will be informed by effective planning work and \$11.5 million is being invested towards strategic planning work that will help determine the optimal mix of investments to sustainably develop water resources in Queensland. Proposals for major water infrastructure projects across the region will be considered in the context of the completion of the Burdekin Water Infrastructure Study and Water Plan Review.

- \$5.4 billion has been set aside to support the construction of Hells Gates Dam in Queensland, subject to completion of the final stage of the business case and regulatory approvals.
- \$483 million locked away to fund Urannah Dam, pending demonstration of value for money and sufficient public benefit for investment. This is in addition to \$22.65 million towards the business case that is underway and expected to be completed later this year.
- \$600 million to restore the Paradise Dam in Queensland to its full capacity.

- \$126.5 million in additional funding for Emu Swamp Dam and Pipeline, bringing the total funding committed to \$168.5 million.
- \$80 million has been set aside towards the future construction of the Bowen Pipeline, subject to completion of the detailed business case, confirmation of total delivery costs and co-funding, and demonstration of value for money and public benefit.
- \$8 million in additional funding towards Big Rocks Weir to see that project delivered, bringing the total funding committed from the Australian Government to \$38 million.
- \$12.5 million towards a package of groundwater improvements in the Lower Burdekin to be delivered by the Queensland Government, with the aim of realising water savings to be made available for agriculture and primary industries.

Darwin Region Water Supply Infrastructure Program

The Australian Government is committing \$300.6 million towards Stage 1 of the Darwin Region Water Supply Infrastructure Program to ensure a safer, more reliable and more sustainable water supply in the Darwin region of the Northern Territory. This involves construction works

to return the Manton Dam to service and preconstruction activities to get the Adelaide River Off Stream Water Storage (AROWS) to a final investment decision. The Darwin Region Water Supply Infrastructure Program Stage 1 is expected to deliver 7,300 megalitres of water per year to support economic development of the Darwin region.

Through the National Water Grid Science program \$7.1 million is also being invested to inform the development of the Adelaide River Catchment Water Allocation Plan. This work will ultimately support allocations for the AROWS project.

The \$2 million Australian Government funded detailed business case, released in February 2022, assessed the water storage options for the Darwin region, and found the AROWS and the return to service (RTS) of the Manton Dam are the two recommended infrastructure solutions for a safe and reliable water supply.

- The Manton Dam RTS would upgrade the existing Manton Dam and construct supporting infrastructure, including the Strauss Water Treatment Plant, to address short term water supply for the region.
- The AROWS project would address long term needs through the construction of a reservoir west of the Adelaide River to be filled during the wet season for storage and use throughout the year.

The NWGA collaborated with Queensland and the Northern Territory to identify many of these projects that will help transform economic potential and support regional growth. Good planning is fundamental for delivering nation-building water infrastructure projects in the right places.

Building a sound evidence base

The National Water Grid Science Program ensures that high quality scientific information and data is available to inform water infrastructure investment decisions.

Projects are funded across three science strategy themes—water resource analysis; alternative and emerging options; and information resources.

Through the Science Program, the Australian Government is now investing in more than 30 science projects, delivering high quality scientific information and data to inform future water infrastructure investment decisions.

Completed projects include:

- a rapid appraisal of managed aquifer recharge opportunities across Australia
- a review of low-cost desalination opportunities that could support agriculture
- a rapid appraisal of new groundwater-based irrigation opportunities, and
- a salinity risk assessment to inform groundwater use in the Northern Territory.



The science program is informed by Australia's leading science and research institutions, such as CSIRO, the Bureau of Meteorology and Geoscience Australia.





Managed Aquifer Recharge

One emerging technology with potential to increase Australia's water security or provide new water supplies is Managed Aquifer Recharge (MAR).

The National Water Grid Authority Science Program engaged CSIRO to research MAR opportunities for agriculture in Australia. CSIRO assessed the MAR potential of 17 irrigation areas, and found that 15 of the areas had significant aquifer storage. Six of these areas showed potential storage opportunities of 50 gigalitres or more, including:

- the Lachlan, Macquarie and Namoi rivers in New South Wales
- Gingin in Western Australia
- Bundaberg, Queensland, and
- South east South Australia.

Other areas, such as Myalup in Western Australia, were identified as having less than 50 gigalitres of potential storage but still offering potential for localised benefits, such as providing critical irrigation support for high value horticulture plantings throughout one or more consecutive dry seasons.



Did you know?

MAR is an emerging technology for storing additional water underground, by intentionally refilling or 'recharging' underground aquifers. Storing water underground reduces evaporation, creating an efficient storage that can act as a drought reserve.

Through partnerships with state and territory governments 18 science projects are underway or planned to commence by mid-2023. Each will support investigations tailored to local or regional needs and knowledge gaps.



Northern Territory

- Western Davenport hydrostratigraphy – specialised interpretation of data relating to underground storage aquifers, undertaken in partnership with the National Centre for Groundwater Research and Training, Flinders University and Charles Darwin University.
- LiDAR survey and Digital Elevation Model (DEM) to inform water planning and decision making.
- Support for evidence based water allocation decisions for the potential Adelaide River Off Stream Water Storage.
- Recalibration of Models in High Demand Water Systems – to refine existing groundwater and surface water models from the Flora, Roper, Ooloo/Lower Daly Rivers and the Western Davenport Central Plains Aquifer to better identify water availability, and increase the certainty around the amount of water that can be provided for agricultural developments.
- Upper King River Managed Aquifer Recharge Investigations, establishing a viable site that sources water from the King River to recharge the Katherine Tindall Limestone Aquifer.

Western Australia

- Managing water quality to enable future irrigation development in the Kimberley region – a review to understand crop management options to reduce the risk from agricultural chemicals.

- MAR pilot project in Myalup, to obtain information required for approvals and inform design and cost of a full scale MAR scheme.

South Australia

- Further sustainable expansion of irrigated agriculture along the Northern Adelaide Corridor – a three year research trial to assess the region's use for crop growing.
- Optimising the agricultural uses of different water qualities in the Barossa region, aimed at addressing challenges of matching water demand with volume and quality.
- Adaptation of the South-Eastern Drainage System under a changing climate.

Tasmania

- Catchment yield science update – incorporating contemporary predictions of the impact of climate change to update catchment water yields and inform planning for allocations, water use and water infrastructure across Tasmania.
- Water accountability, metering and reporting framework review for Tasmania.
- Groundwater assessment project – this project aims to address knowledge gaps in Tasmania's groundwater properties and sustainable yields, related to core water resource assessment, which may impact future infrastructure and water security investment decisions.

New South Wales

- Managed Aquifer Recharge (MAR) opportunities for agriculture – a desktop study to advance possible MAR opportunities in irrigation areas of New South Wales, as identified in CSIRO's rapid appraisal.
- Improving understanding of groundwater sustainability and renewability using isotope hydrochemistry – using samples already collected from aquifers across the state to determine groundwater age and provide information about how groundwater replenishes and moves across aquifers.
- Improving groundwater supply security for agriculture and primary industries through better understanding of groundwater flow and completing existing work across government in the Great Artesian Basin.

Queensland

- Strategic assessment of sustainable agricultural development potential for Mitchell, Flinders and Gilbert catchments, focused on prospective agricultural areas identified by previous catchment-scale studies.
- Feasibility assessment of opportunities for underground technologies in Queensland to support future agricultural development, with the aim to move to trials or pilots if viable opportunities are identified.

Glossary of terms

Detailed descriptions of some water related terms used within this publication.

Aquifer: An underground rock formation that holds groundwater.

Dam: A barrier or structure across a stream, river or waterway to confine and control the flow of water.

Digital elevation model (DEM):
A way of representing the ground surface of the Earth excluding vegetation, buildings or any other surface objects. DEMs are created from a variety of sources including from topographic maps, and more recently are constructed using high resolution data such as LiDAR information.

Gigalitre: 1,000 megalitres, which is also 1,000,000,000 litres.

Groundwater connectivity:
The level of interaction between groundwater systems (or “aquifers”), between different parts of the same aquifer, and between groundwater and surface water systems. High interconnectivity is where water bodies are connected in such a way that there is a high rate of transfer or exchange of water between them. The degree of interconnectedness between water bodies depends largely on the physical character of the rock (lithology), including the permeability (or “leakiness”) and uniformity of the substrate material, the presence of fractures, faults and any natural or man-made boreholes, as well as the hydraulic pressure which creates a driving force for water to flow.

High-surety: High likelihood with which a water allocation is expected to be available, having regard to the natural variability of the supply of water.

Hydrostratigraphy:
The classification of geological structures based on how water moves through it.

Irrigation: The artificial application of water to land for the purpose of agricultural production.

Isotope hydrochemistry: The study of the various forms (or isotopes) of the chemical composition of water. This study is particularly important in understanding the characteristics of groundwater (which may be high in salts, other minerals, dissolved oxygen or have particular properties) as the chemistry of the particular water source will affect its potential uses.

LiDAR survey: A Light Detection and Ranging (LiDAR) survey is a remote sensing method used to capture information about the Earth’s surface, and has been used to assess how water is likely to move across the surface.

Managed aquifer recharge:

The intentional recharge of water to aquifers for subsequent use or environmental benefit.

Megalitre: 1,000,000 litres.

Return to service (RTS): Taking a structure from a non-operational or non-functional state to a working state so it can be used effectively again for water supply management.

Waste water: The combination of both greywater (water from baths, showers and washing machines) and blackwater (water from toilets).

Weir: A large wall that holds back water in a waterway (e.g. river) so it can be diverted for other use, such as agriculture.



Since the establishment of the National Water Grid Authority, \$8.9 billion has been committed towards more than 150 projects in our investment pipeline, including more than 70 construction projects.

This collection of dams, weirs, pipelines, recycled water systems, business cases and scientific studies is delivering reliable and secure water supplies to help build regional water security.

Collectively, by connecting the National Water Grid and recognising the importance of water as a critical enabler, we are continuing to deliver greater drought resilience, increased economic and jobs growth, as well as opening up new agricultural opportunities across Australia, now and into the future.

You can find out more on our website: www.nationalwatergrid.gov.au





© Commonwealth of Australia 2022
ISBN: 978-1-922521-64-4
March 2022
INFRASTRUCTURE 5104

Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia (referred to below as the Commonwealth).

Disclaimer

The material contained in this publication is made available on the understanding that the Commonwealth is not providing professional advice, and that users exercise their own skill and care with respect to its use, and seek independent advice if necessary.

The Commonwealth makes no representations or warranties as to the contents or accuracy of the information contained in this publication. To the extent permitted by law, the Commonwealth disclaims liability to any person or organisation in respect of anything done, or omitted to be done, in reliance upon information contained in this publication.

Creative Commons licence

With the exception of (a) the Coat of Arms and (b) the Department of Infrastructure, Transport, Regional Development and Communication's photos and graphics, copyright in this publication is licensed under a Creative Commons Attribution 4.0 Australia Licence.

Creative Commons Attribution 4.0 Australia Licence is a standard form licence agreement that allows you to copy, communicate and adapt this publication provided that you attribute the work to the Commonwealth and abide by the other licence terms.

Image credits

Northern Territory Government – cover page, pages 2, 12 and 16.
Southern Rural Water – cover page
CSIRO – pages 1, 8, 9, 10, 11, 15 and 16
Sunwater – pages 5, 7 and 8
Department of Infrastructure, Transport, Regional Development and Communications – page 16

Further information on the licence terms is available from <https://creativecommons.org/licenses/by/4.0/>.

This publication should be attributed in the following way:
© Commonwealth of Australia 2022.

Use of the Coat of Arms

The Department of the Prime Minister and Cabinet sets the terms under which the Coat of Arms is used. Please refer to the Commonwealth Coat of Arms – Information and Guidelines publication available at <http://www.pmc.gov.au>.

Contact us

This publication is available in hard copy or PDF format. All other rights are reserved, including in relation to any Departmental logos or trade marks which may exist. For enquiries regarding the licence and any use of this publication, please contact:

Director – Creative Services
Communication Branch
Department of Infrastructure,
Transport, Regional Development and
Communications
GPO Box 594
Canberra ACT 2601
Australia

Email:
creative.design@infrastructure.gov.au
Website: www.infrastructure.gov.au

www.nationalwatergrid.gov.au