

**Submission
No 62**

INQUIRY INTO WATER AUGMENTATION

Organisation: IPWEA
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NSW LEGISLATIVE COUNCIL
Inquiry into the augmentation of water supply for rural and regional
New South Wales

Submission by

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA
(NSW DIVISION)
and

the NSW Water Directorate

12 August 2016

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EXECUTIVE SUMMARY

IPWEA (NSW) and the NSW Water Directorate would like to thank General Purpose Standing Committee No. 5 for the opportunity to participate in this review, and looks forward to the inquiry into the augmentation of water supply for rural and regional New South Wales.

IPWEA (NSW) has a stated mission to enhance the quality of life of NSW communities through excellence in public works and services. This is achieved through our professional association that effectively informs, connects, represents and leads public works professionals for NSW.

IPWEA (NSW) has a set of values that requires respect, integrity, passion, excellence, recognition and ownership in everything we do.

IPWEA (NSW) is therefore ideally placed to take a lead role in enhancing outcomes for communities across NSW, by assisting practitioners within Local Government, and providing input into the Inquiry into the augmentation of water supply for rural and regional New South Wales.

This submission has identified a number of areas where the Terms of Reference for the “Inquiry into the augmentation of water supply for rural and regional New South Wales” can be improved. Specifically, NSW Water Directorate recommends the terms of reference be amended as follows:

- b) examine the suitability of existing New South Wales water storages and any future schemes for augmentation of water supply for New South Wales, including the potential for aquifer recharge **and the use of alterative water sources**
- c) review the NSW Government’s response to, **and actions resulting from**, the recommendations of the June 2013 report by the Standing Committee on State Development on the adequacy of water storages in New South Wales, **and review the NSW Government’s reason for not supporting Recommendation 8**
- e) examine technologies available to mitigate flood damage, including diversion systems, and the scope of infrastructure **and water quality controls** needed to support water augmentation, by diversion, for rural and regional New South Wales
- g) the efficiency, sustainability **and impact on urban water security** of environmental water being managed by different State and Federal Government departments and agencies

The above recommendations will add value to the inquiry into the augmentation of water supply for rural and regional New South Wales and improve the outcomes for NSW Water Directorate members.

The submission also details the need for training and employing skilled and knowledgeable staff to ensure that the correct objectives are set and optimum outcomes are delivered. In tandem with examining technologies available to mitigate flood damage, which IPWEA (NSW) fully supports, the sustainability of skilled professionals, which are required to operate and make decisions based on these technologies and their outputs, should be paramount. In line with previous submissions to various Inquiries, IPWEA (NSW) submits that each state and local government agency responsible



for the management of or providing advice about public infrastructure, particularly with regard to flooding, should appoint a Chief Engineer. The Chief Engineer should have appropriate qualifications for the particular focus of that agency. IPWEA (NSW) also recommends the NSW Government support industry calls for a registration scheme for Engineers to practice, as is the case in Queensland and currently being considered in several other states, and that any senior engineering roles within agencies including the Chief Engineer be required to obtain and hold this registration.



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1. Background

On 22nd March 2016 the NSW Legislative Council General Purpose Standing Committee No. 5 called for submissions to its Inquiry into the augmentation of water supply for rural and regional New South Wales.

The Inquiry's Terms of Reference are:

1. That General Purpose Standing Committee No. 5 inquire into and report on the performance or effectiveness of the NSW government agencies that are responsible for the augmentation of water supply for rural and regional New South Wales, and in particular:
 - a) investigate the requirement for a water equation (demand and supply out to the middle of this century) for rural and regional New South Wales
 - b) examine the suitability of existing New South Wales water storages and any future schemes for augmentation of water supply for New South Wales, including the potential for aquifer recharge
 - c) review the NSW Government's response to the recommendations of the June 2013 report by the Standing Committee on State Development on the adequacy of water storages in New South Wales
 - d) examine the 50 year flood history in New South Wales, particularly in northern coastal New South Wales, including the financial and human cost
 - e) examine technologies available to mitigate flood damage, including diversion systems, and the scope of infrastructure needed to support water augmentation, by diversion, for rural and regional New South Wales
 - f) examine social, economic and environmental aspects of water management practices in New South Wales and international jurisdictions, including the following case studies:
 - i. Broken Hill town water supply/Menindee Lakes system
 - ii. South Western NSW water management practices
 - iii. North Western NSW water management practices
 - g) the efficiency and sustainability of environmental water being managed by different State and Federal Government departments and agencies
 - h) the management, appropriateness, efficiency and reporting of:
 - i. inter-valley transfers
 - ii. conveyance and loss water
 - iii. carryover
 - iv. the management and reporting of the water market, and
 - i) any other related matter.

2. That the committee report by 27 October 2017

This submission is in response to the Terms of Reference, together with a number of more general observations which might assist the Committee in its deliberations.

2. Joint Submission

This submission has been prepared jointly by IPWEA (NSW) and the NSW Water Directorate. The backgrounds of these respective organisations are:

2.1 IPWEA (NSW)

The Institute of Public Works Engineering Australasia (IPWEA) is a not for profit, membership based, professional organisation representing engineers and others involved in the provision of public works and services predominantly in the local government sphere. The Institute conducts a National office and Divisions across all states and New Zealand.

IPWEA NSW is established to be a charity with the purpose of advancing the public works sector in Australia, particularly in NSW by:

- conducting and publishing research into improvements to the processes used in the industry
- working with government at all levels to ensure that the interests of the public works industry are represented in regard to the public decision-making process, and
- providing a forum for all people engaged in the public works to discuss best practice and enhancing the future of the industry

IPWEA NSW seeks through its mission to enhance the quality of life of NSW Communities through excellence in public works and services.

Infrastructure provided by all levels of Governments plays a critical and fundamental role in ensuring economic activity is supported and growth can occur. Delaying infrastructure improvements (or even basic maintenance) impacts on economic sustainability (often seen as confidence in a location), transport (movement of people and freight) public health and safety and impacts on the cost of living for our communities (electricity, water, sewerage, transport, etc).

Engineers, as part of a broader team, play key roles in infrastructure development, design, construction, operation and maintenance. These engineering roles underpin nearly every aspect of life nowadays (as the disciplines in engineering are broad and cover a very wide range of industries)

Engineers develop an understanding of systems, public risk, safety and performance requirements, and optimising delivery to meet service requirements. Without the safeguards inherent in an engineered solution, infrastructure performance would be haphazard, dangerous and much more costly.

To maintain the community's lifestyle and sustain our standard of living, sufficient engineering skills need to be brought to bear - sufficient engineering knowledge is required to be part of decision making processes, so at least, the results of decision-making are understood and the ramifications planned for.

2.2 NSW Water Directorate

The Water Directorate is a voluntary member based organisation that represents 95% of all NSW local water utilities. Its mission is to provide leadership and advice to local water utilities. Our members:

- provide 89% of reticulated water outside metropolitan New South Wales



- manage \$23 billion in assets
- have 3.2 times more customers than Hunter Water

The Water Directorate was initiated by local government water and sewerage practitioners in 1998. Our founding members recognised that the structure and legislative framework for water authorities in New South Wales was not ideal following the abolition of the Department of Public Works which had previously acted as the overall coordinating agency and mentor for regional New South Wales. An industry specific association was formed to address the lack of coordination between government departments and local authorities as well as the declining level of technical advice provided by the state agencies.

Since our establishment, NSW Water Directorate has provided consistent state-wide management tools at a low cost to our members. As a result, we have:

- invested more than \$3.5 million on developing relevant guidelines and technical documents to support industry best practice
- co-managed an \$8.73 million investment by the Federal Government and members in a water loss management program saving 5.5 billion litres of water annually
- advocated for local water utilities including responding to the Armstrong/Gellatly Review, and a whole series of other Government reviews undertaken by Infrastructure Australia, the National Water Commission, the Productivity Commission and Infrastructure NSW
- supported the industry with valuable information through on-line discussion groups, technical workshops and informal mentoring not provided by State Government departments.

2.3 Response to Terms of Reference

This submission addresses the Terms of Reference with a particular focus on sustainability from an asset management and technical capability point of view. Input into the submission has been provided from a number of sources including IPWEA (NSW) Board Members, IPWEA Staff NSW Water Directorate Members and published sources.

Local Government's task is to provide an agreed and adequate level of service to its local community, both in the short and long term. The ownership and management of infrastructure assets is exclusively to provide services to the community.

2.4 Acronyms

Acronym	Meaning
DPI	Department of Primary Industries
EPA	Environment Protection Authority
(IIMM)	International Infrastructure Management Manual
IPWEA (NSW)	Institute of Public Engineering Australasia (NSW Division)
NSW	New South Wales

3. Terms of Reference

1. That General Purpose Standing Committee No. 5 inquire into and report on the

performance or effectiveness of the NSW government agencies that are responsible for the augmentation of water supply for rural and regional New South Wales, and in particular:

- a) investigate the requirement for a water equation (demand and supply out to the middle of this century) for rural and regional New South Wales

NSW Water Directorate endorses the requirement for a long term (50 year) water balance to be calculated for rural and regional New South Wales.

The long term water balance is vital to ensuring adequate water is available for competing uses, and should take into account:

- Urban water needs
- Water quality
- Population and demographic changes
- Improvements in water use efficiency
- Changing water supply reliability caused by climate change
- Environmental water needs
- Cultural water needs
- Agricultural water needs
- Industry water needs
- Mining water needs

IPWEA (NSW) supports development of a water equation for rural and regional NSW. Water is vital for both the viability of regional and rural NSW and for its ongoing prosperity and economic productivity.

Given the long lead times at work in the delivery of water infrastructure (considering feasibility assessment, obtaining the requisite approvals, funding and construction), a planning horizon of at least 50 years should be considered for any water equation assessment. Further to this, as much of the infrastructure that provides for water storage, treatment, distribution etc., have design lives in excess of 50 years, and some up to 100 years, the ongoing impacts of climate change should be considered and planned for out to a commensurate period of time.

Any such water equation would need to be developed in a manner that allowed for its easy integration into Integrated Water Cycle Management plans, a plan all Local Water Utilities are required to prepare.

In parallel with assessment of the regional water equation and the associated infrastructure that may come from that, investigation into the management of current water related infrastructure assets and maturity of that asset management against the International Infrastructure Management Manual (IIMM) should also be made.

The IIMM is the international standard for the management of infrastructure assets. The 5th Edition of the globally acclaimed, International Infrastructure Management Manual (IIMM) has been driven largely by the introduction of the new ISO 55000 Asset Management Standards. Recognising that the ISO Standards are very much the “What to do”, the IIMM provides the “How to do it” in terms of

applying the standards for infrastructure asset management. Over 30% of the previous edition has been update including numerous new case studies.

The IIMM 5th Edition sees a significant enhancement in the following key areas:

- Developing a business case for asset management and key success factors
- The Strategic Asset Management Plan (SAMP) and Policy
- Setting of asset management objectives
- Risk management
- Asset management leadership and communication
- Operational strategies and planning
- Establishing and maintaining the Asset Management System
- Information management
- Asset Management Maturity
- Asset management performance measurement and auditing
- Assessing and managing infrastructure resilience

The new IIMM also includes a review and update of the glossary of definitions to ensure better alignment with those in ISO 55000 and an index to assist with locating subject-relevant material.

- b) examine the suitability of existing New South Wales water storages and any future schemes for augmentation of water supply for New South Wales, including the potential for aquifer recharge

NSW Water Directorate endorses the examination of the suitability of existing New South Wales water storages and any future schemes for augmentation of water supply for New South Wales, including the potential for managed aquifer recharge.

In addition, NSW Water Directorate requests the General Purpose Standing Committee No. 5 examines the suitability (quantity and quality) of alternative and climate independent water sources for the augmentation of water supplies in rural and regional New South Wales. The natural, social and economic systems of rural and regional New South Wales will all be affected by climate change, requiring adaptation. Potential alternative and climate independent water sources for rural and regional New South Wales include:

- Recycling urban stormwater
- Indirect potable reuse
- Further utilisation of ground water resources
- Desalination

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- c) review the NSW Government's response to the recommendations of the June 2013 report by the Standing Committee on State Development on the adequacy of water storages in New South Wales

NSW Water Directorate endorses the review of the NSW Government's response to the recommendations of the June 2013 report by the Standing Committee on State Development on the adequacy of water storages in New South Wales.

The NSW Government released its response to the report in January 2014, supporting ten recommendations, in principle supporting four recommendations and one partial recommendation, noting of three recommendations and one partial recommendation, and did not support one recommendation (Recommendation 8). The NSW Water Directorate requests the General Purpose Standing Committee No. 5 review what action NSW Government has implemented since January 2014.

In addition, the NSW Water Directorate requests the General Purpose Standing Committee No. 5 review why the NSW Government did not support Recommendation 8:

*8. That the NSW Government amend the principles of the Water Management Act 2000 to ensure that the commercial water supply for **towns and utilities** and high security needs in regulated rivers are prioritised above environmental needs.*

- d) examine the 50-year flood history in New South Wales, particularly in northern coastal New South Wales, including the financial and human cost

NSW Water Directorate endorses the examination of the 50-year flood history in New South Wales.

IPWEA (NSW) supports a new approach to emergency management and recovery operations to better mitigate the effects of regular flooding of communities across NSW, but particularly on the north coast. This examination should identify instances where, if appropriate infrastructure upgrades had been made as opposed to simply replacing like with like, whether there would have been a net benefit to the communities and governments alike.

Not only should there be an examination of the 50 year flood history, but the study should also include an estimation of the likely effects of climate change both in terms of increased potential flood peaks and longer isolation of vulnerable communities. A long term plan aimed at mitigating these likely outcomes would be a valuable outcome from this Inquiry.

- e) examine technologies available to mitigate flood damage, including diversion systems, and the scope of infrastructure needed to support water augmentation, by diversion, for rural and regional New South Wales

NSW Water Directorate endorses the examination of technologies available to mitigate flood damage, including diversion systems, and the scope of infrastructure needed to support water augmentation, by diversion, for rural and regional New South Wales.

In addition, NSW Water Directorate requests the General Purpose Standing Committee No. 5 investigates flood water quality to ensure the sustainability of augmenting water supplies with diverted flood water.

It should be made clear that technologies are complimentary too, not a replacement for skilled engineers and that without the appropriately qualified and experienced staff in the right seats in the right agencies and councils, all the technology in the world will achieve little, if anything at all.

In tandem with examining technologies available to mitigate flood damage, for which IPWEA (NSW) is supportive, the sustainability of skilled professionals, which are required to operate and make decisions based on these technologies and their outputs, should be paramount. In line with IPWEA NSW's previous submissions to various Inquiries, IPWEA (NSW) submits that each state agency responsible for the management of or providing advice about public infrastructure, particularly with regard to flooding, should appoint a Chief Engineer. The Chief Engineer should have appropriate qualifications for the particular focus of that agency. IPWEA (NSW) also recommends the NSW Government support industry calls for a registration scheme for Engineers to practice, as is the case in Queensland and currently being considered in several other states, and that any senior engineering roles within agencies including the Chief Engineer be required to obtain and hold this registration.

An element of registration that is present in all schemes IPWEA (NSW) is familiar with, is continuing professional development. This element places a requirement on registered engineers to continue to develop their professional knowledge and skills through attendance at conferences, reading of technical papers and industry publications, etc. By virtue of this requirement, there is within it a natural prompt to keep up to date with new technologies, their potential benefits or innovative uses and applications.

Further, to make every effort to ensuring the sustainability of skilled professionals and corporate knowledge, IPWEA (NSW) recommends that each state agency with responsibilities or roles in the management of or providing of advice about public infrastructure, particularly related to flooding, be required to develop a suitably structured engineering cadetship or internship program to provide for the future engineering needs of that agency.

- f) examine social, economic and environmental aspects of water management practices in New South Wales and international jurisdictions, including the following case studies:
 - i. Broken Hill town water supply/Menindee Lakes system
 - ii. South Western NSW water management practices
 - iii. North Western NSW water management practices

NSW Water Directorate endorses the examination of social, economic and environmental aspects of water management practices in New South Wales.

NSW Water Directorate and members offer their assistance with the preparation of case studies.

Regional and rural NSW presents itself as a none too easy problem to solve when it comes to ensuring that there are the appropriate numbers of skilled engineering professionals to design, advise upon and oversee development of water management practices, strategies and plans.

For a host of reasons these skilled engineering professionals are not always available or for economic reasons not always a feasible proposition if the private market of consultants and

consulting firms are to be relied upon.

To counter this, IPWEA NSW recommends that the State Government continues to resource a capable and skilled public works agency that is available to fill the void and provide expert advice to local water utilities and other agencies charged with the responsibility for the management of water in regional and rural NSW.

- g) the efficiency and sustainability of environmental water being managed by different State and Federal Government departments and agencies

NSW Water Directorate endorses the examination of the efficiency and sustainability of environmental water management.

In addition, NSW Water Directorate requests the General Purpose Standing Committee No. 5 examines the impact of environmental flows on the security of urban water supplies for communities in rural and regional New South Wales.

- h) the management, appropriateness, efficiency and reporting of:
- i. inter-valley transfers
 - ii. conveyance and loss water
 - iii. carryover
 - iv. the management and reporting of the water market, and

NSW Water Directorate endorses the examination of the management, appropriateness, efficiency and reporting of inter-valley transfers, conveyance and loss water, carryover, and the management and reporting of the water market.

- i) any other related matter.

NSW Water Directorate endorses the examination of any other matter related to the performance or effectiveness of the NSW Government agencies that are responsible for the augmentation of water supply for rural and regional New South Wales, including:

- Water quality (physical, chemical and microbiological)
- Climate change impacts on water supplies
- Essential water infrastructure that may be impacted by climate change
- Climate change adaptation measures
- Future technologies to improve:
 - water quality
 - water use efficiency
 - pumping and energy efficiency
- Customer service provided by NSW Government agencies
- Sharing of information between NSW Government agencies and between the three levels of government (Federal, State and Local)

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- Whole of government approach to water resource management, including DPI Water, DPI Fisheries, NSW Health, EPA, Dams Safety Committee, WaterNSW, and Public Works.
 - Benefits of public ownership and control of water industry infrastructure
 - Benefits of continued local government ownership of local water utilities
 - Impact of forced council mergers on the safe, effective and efficient delivery of urban water services

Furthermore, NSW Water Directorate requests General Purpose Standing Committee No. 5 inquire into the effectiveness of the NSW Government agencies in achieving the United Nations Sustainable Development Goal 6: Ensure access to water and sanitation for all, with particular regard to the following targets:

- Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, and substantially increasing recycling and safe reuse
- Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
- Implement integrated water resources management at all levels, including through transboundary cooperation as appropriate
- Protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes
- Support and strengthen the participation of local communities in improving water management

4. Conclusion

IPWEA (NSW) and the NSW Water Directorate would like to thank General Purpose Standing Committee No. 5 for the opportunity to participate in this review, and looks forward to the inquiry into the augmentation of water supply for rural and regional New South Wales.

This submission has identified a number of areas where the Terms of Reference for the “Inquiry into the augmentation of water supply for rural and regional New South Wales” can be improved. Specifically, NSW Water Directorate recommends the terms of reference be amended as follows:

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5. Contact Details

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