esri Australia

National Water Reform 2026 inquiry
Productivity Commission
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SUBMISSION TO THE PRODUCTIVITY COMMISSION

National Water Reform 2026 Inquiry

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About Esri Australia

Esri Australia is Australia's leading provider of geographic information system (GIS) technology and spatial analytics, and has been the exclusive distributor of Esri Inc. products in Australia since 1977. Esri Australia works across federal, state, and local government, infrastructure, utilities, and the private sector to help organisations understand and act on the geographic dimensions of complex problems.

Within the water sector, Esri Australia works with utilities across every state and territory, from major metropolitan authorities including Water Corporation, SA Water, Urban Utilities, Unity Water, Icon Water, Melbourne Water, and SA Water, through to regional and rural providers including Goulburn Valley Water, Wannon Water, Central Highlands Water, Barwon Water, and Power and Water Corporation in the Northern Territory. Across the globe, more than 9,000 water utility organisations use Esri's geographic information system to connect network management, field operations, planning, compliance, and customer engagement.

This submission is made in Esri Australia's capacity as a long-term technical partner to the Australian water sector. It does not advocate for specific products or procurement outcomes. Its purpose is to offer an evidence-grounded perspective on how place-based spatial intelligence can address structural

productivity, governance, and equity challenges identified by the Commission across successive national water reform inquiries.

Overarching Position

Water systems are inherently spatial systems. Every asset, catchment, demand centre, climate risk, environmental obligation, and service boundary exists at a location. Australia's water policy frameworks have made substantial progress over two decades of National Water Initiative (NWI) reform, yet reform continues to stall **where data is weak.**

The Commission's own published findings from the 2024 NWI assessment identify failures in metering compliance, infrastructure investment governance, environmental outcome reporting, and remote service quality. In each case, the failure is not primarily a governance design failure: it is a data visibility failure. Decisions are made without adequate spatial context. Assets are managed without a current authoritative record of what exists and where. Regulatory submissions are built on siloed datasets that cannot be integrated or independently verified.

This submission advances a single, coherent argument:

Authoritative spatial data should be recognised as enabling infrastructure for the water sector, as foundational as the physical networks it describes. Embedding this recognition in the National Water Agreement (NWA) and associated reform settings will improve investment governance, regulatory accountability, environmental outcomes, and service equity across urban, regional, and remote Australia.

This is a policy argument, not a technology argument. Spatial frameworks are framed here as a neutral decision-support layer, linking engineering data, environmental data, operational data, and regulatory data. The Commission's recommendations need not specify any platform, vendor, or implementation approach. What matters is the recognition, the standard, and the funding signal.

PART A — NWI ASSESSMENT RESPONSE

How Spatial Data Gaps Map to Reform Gaps

The Commission's 2024 findings reveal a consistent structural pattern. Each of the major reform failures maps directly to an underlying spatial data gap:

PC 2024 Finding	Stated Problem	Underlying Spatial Gap
Finding 5.1 — Water trade registers	Registers lack real-time data; not freely searchable	No spatially-referenced, interoperable entitlement layer
Finding 6.2 — Infrastructure investment	Decisions lack transparent cost-benefit analysis	No authoritative spatial network model to baseline against
Finding 7.1–7.3 — Environmental outcomes	Outcomes inconsistently specified; reporting inadequate	Environmental data not integrated with spatial planning frameworks
Finding 8.1 — Metering	Jurisdictions not on track for AS4747 compliance	No spatial asset register to identify, track, and prioritise upgrades
Finding 9.1–9.2 — Remote water quality	Quality failures persist; reporting inconsistent	Remote utilities lack digital asset and monitoring capability

These failures share a common structural cause: the absence of a recognised, adequately resourced, and consistently maintained spatial foundation for water sector decision-making. Addressing this foundation is the most direct lever available to the Commission for improving NWI outcomes across multiple reform areas simultaneously, without requiring governance restructure or changes to pricing regulation.

PART B —SPATIAL SPECIFIC THEMES SUBMISSION

Theme 1: Pricing and Economic Regulation

1.1 Transparent, Defensible Investment Decision-Making

The Commission's terms of reference require examination of pricing and economic regulation settings that ensure *"efficient resource allocation and the long-term financial sustainability of the water services industry."*

The Commission's 2024 inquiry found that a significant proportion of major infrastructure developments funded by governments have not been subjected to transparent cost-benefit analysis,

and that a number of funded projects, including those under the National Water Grid, were funded where assessed costs outweighed estimated benefits (PC Finding 6.2). Comments received to the 2026 call for submissions reinforce this concern, with submitters calling for "*all infrastructure proposals to be subject to rigorous, transparent cost-benefit assessment that considers all feasible options*" and for "*business cases to undergo independent scrutiny prior to funding decisions.*"

Academic economists submitting to this inquiry have also identified political interference in economic regulation as a persistent structural problem: "*There is no clear link between the initial poor choice and the 'tab' picked up by customers*", *partly* because the evidence base for investment decisions is not transparent or independently verifiable.

1.2 Need and Argument

A core reason investment decisions lack rigour is that **utilities cannot easily demonstrate what they have, what condition it is in, and what the realistic cost and risk of alternatives looks like. This is because they do not** maintain a current, authoritative, spatially-referenced record of their networks.

Where such a record exists (an accurate, connected spatial model of the full water and sewer network, with asset condition, maintenance history, and performance data integrated) utilities can construct defensible investment cases. They can demonstrate, spatially, where risk is concentrated, what the consequence of failure would be, which assets are approaching end of life, and how capital renewal options compare in cost and impact.

Without this foundation, regulators scrutinising business cases are working from incomplete information. Independent economic regulators cannot meaningfully assess whether a capital program is prudent if they cannot see a spatial model of what the utility is actually managing and why. The result is the pattern the Commission has observed: investment decisions that proceed without rigorous independent assessment.

Place-based planning, using a shared spatial framework to overlay engineering condition, environmental obligation, demand growth, and climate risk, makes trade-offs visible before capital is committed. This reduces duplication and rework across agencies, supports smarter capital sequencing, and produces the kind of transparent evidence base that independent economic regulation requires.

Established water utility GIS maturity frameworks describe a pathway from foundational network visibility through to integrated planning and resilience. This pathway mirrors how utilities actually improve: progressively, in compounding steps, each of which produces both operational benefit and improved investment defensibility.

1.3 Recommendation

Recommendation 1: The Commission should recommend that the NWA implementation framework require water service providers seeking Commonwealth infrastructure funding (including through the

National Water Grid program) to demonstrate that capital investment proposals are supported by a spatially-referenced, multi-criteria analysis that integrates asset condition, demand growth, climate risk, and service equity considerations, and that this analysis be made publicly available as part of transparent cost-benefit reporting.

Recommendation 2: The Commission should recommend that economic regulators be empowered and resourced to require utilities to provide spatially-referenced asset and network data as part of regulatory submissions, enabling independent scrutiny of the spatial distribution of risk, investment, and service performance across each utility's network.

Theme 2: Governance, Accountability, and Coordination

2.1 Authoritative Spatial Data as Enabling Infrastructure — Closing the Governance Data Gap

The Commission's terms of reference examine whether governance arrangements support "*clear accountability and integrated system outcomes*", *including* effective coordination between water supply, wastewater, stormwater, land-use planning, economic regulators, environmental regulators, and health regulators.

ATSE's submission to this inquiry identifies data fragmentation as a structural barrier to reform, and recommends that "*modelling assumptions, methodologies and datasets used in regulatory and planning decisions be made publicly available.*" Academic economists have similarly identified that the absence of integrated data creates conditions for political interference to go undetected: when there is no common, publicly accessible evidence base, the link between a poor investment decision and its cost to customers remains invisible.

Queensland's own WaterQ 30-year strategy, which underpins the state's current reform trajectory, explicitly calls for "*smart systems*" and "*innovative technology*" as a strategic priority, and identifies the water sector's fragmentation as a governance challenge: "*the sector is ill-defined and fragmented as service providers organise and deliver services in many different ways.*"

2.3 Need and Argument

Siloed datasets across governments, utilities, regulators, and planners are not just an information management problem: they are a governance problem. When economic data, engineering data, environmental data, and operational data exist in separate systems with no common reference, cross-agency coordination requires expensive, time-consuming reconciliation effort. The quality of joint decisions (between a utility and its regulator, between state planning agencies and water authorities,

between Commonwealth funders and local providers) depends on the ability to see the same picture from a shared reference point.

A **common spatial framework** (not a mandated platform, but a common data schema and exchange standard) provides this shared reference. It allows datasets from different agencies and systems to be integrated and cross-referenced without requiring governance restructure. Engineering data, environmental monitoring, financial performance, and customer outcomes can be overlaid and compared. This is the same principle that underlies the national metering standard (AS4747): a common schema that enables data from different meters, collected by different utilities, to be aggregated and compared nationally. The same logic applies to network and asset data.

The Australian water sector could develop a common network data model aligned with the Water Services Association of Australia (WSAA) industry framework. This model could be implemented across multiple Australian utilities, creating a consistent spatial schema that enables cross-utility comparison of network structure, asset condition, and service performance. A

national spatial data standard for the water sector is practically achievable, not aspirational.

Where this common reference model exists, coordination improves. Utilities can compare performance against peers. Regulators can scrutinise asset condition spatially. Environmental agencies can overlay catchment obligations against operational records. Community members can access transparent, location-specific service performance data.

2.4 Recommendation

Recommendation 3: The Commission should recommend that the NWA implementation framework include the development of a national minimum standard for water network and asset data, specifying schema, spatial reference requirements, exchange formats, and public reporting obligations, enabling cross-utility benchmarking, independent regulatory scrutiny, and informed community engagement.

Recommendation 4: The Commission should recommend that authoritative, spatially-referenced water network data be formally recognised in the NWA as a category of enabling infrastructure, equivalent in governance importance to the physical assets it describes, and that investment in maintaining this data to a defined minimum standard be treated as a prudent and recoverable operating expenditure in regulatory determinations.

Theme 3: Regional, Remote, and Equity Considerations

3.1 Digital Capability as a Precondition for Equity — Addressing the Service Gap in Regional and Remote Utilities

The Commission's 2024 inquiry found persistent drinking water quality failures in remote areas (Finding 9.1) and a continued lack of consistency and transparency in drinking water quality reporting (Finding 9.2). These failures disproportionately affect Aboriginal and Torres Strait Islander communities, a point reinforced by both the ILSC submission and the ATSE submission to this inquiry.

Queensland's WaterQ strategy highlights the structural challenge: 173 registered water service providers across the state range from major SEQ utilities serving over one million connections to remote councils serving a few hundred people. The PC's terms of reference ask specifically how "*current funding and governance arrangements reflect higher per-customer costs in regional or remote settings*" and what "*alternative service provision models are likely to improve performance.*"

The water efficiency specialists' submission to this inquiry makes an important structural observation: water efficiency programs, like foundational digital capability, are annual operational expenditure, not

capital expenditure. Yet the regulatory and funding frameworks strongly incentivise capital investment and provide weak support for operational capability investment. The result is that utilities may receive funding for physical infrastructure but lack the digital capability to operate it efficiently.

3.2 Need and Argument

A utility that lacks a current, accurate record of its own network cannot manage what it has, regardless of how much capital is invested in physical assets. The pattern of service failures in remote and regional utilities is not solely a funding problem. It is also a **capability problem**: many smaller utilities do not have the foundational digital infrastructure to identify leaks, track asset condition, manage compliance obligations, or report service performance consistently.

Established GIS maturity models for the water sector describe how utilities improve decision-making through progressive capability investment:

- **Level 1 — Visibility and awareness:** A current, operational view of the network; real-time event and outage awareness
- **Level 2 — Performance and coordination:** Repeatable performance reporting; coordinated field operations
- **Level 3 — Risk and optimisation:** Risk-based asset prioritisation; water quality and environmental reporting
- **Level 4 — Integrated planning and resilience:** Scenario modelling; climate adaptation; integrated asset lifecycle management

Utilities at Level 1, those without even a current, reliable view of their own network, cannot prudently plan capital programs, respond efficiently to service failures, or demonstrate compliance with regulatory obligations. This maturity gap is disproportionately concentrated in regional and remote utilities: the same utilities the Commission has identified as facing the greatest structural challenges.

The result is a reinforcing cycle: small utilities receive less per-customer revenue, face higher per-customer costs, and have less digital capability to manage what they have efficiently. Funding physical infrastructure into this environment without addressing foundational digital capability produces poor outcomes: the physical assets are under-managed and their productive life is shortened.

Experience across the sector has demonstrated that scalable, cloud-hosted spatial capability, accessible at low cost without requiring specialist GIS staff on-site, is achievable for utilities of all sizes. A small council can maintain a current spatial record of its water network using mobile field data collection, accessible through a web browser, at a fraction of the cost of traditional enterprise GIS implementations. Power and Water Corporation in the Northern Territory increased the rate and efficiency of meter replacement by up to 70 per cent through the use of spatial mobile solutions, directly demonstrating the operational productivity gains available to remote utilities from foundational digital investment.

3.3 Recommendation

Recommendation 5: The Commission should recommend that Commonwealth programs targeting water security in regional and remote communities include a baseline digital capability assessment as a condition of funding, and that digital infrastructure, including spatially-referenced network records, field data collection tools, and performance dashboards, be treated as an eligible and prioritised component of regional water investment programs, alongside physical infrastructure.

Recommendation 6: The Commission should recommend that the NWA support the development of shared digital infrastructure models for regional utility clusters, enabling small utilities to access cloud-hosted spatial capability at scale, reducing per-utility cost while building the foundational data quality needed to manage physical assets efficiently and demonstrate regulatory compliance.

Theme 4: National Consistency and Intergovernmental Coordination

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4.1 Spatial Frameworks as a Cross-Jurisdiction Coordination Mechanism

The Commission's terms of reference ask whether differences between jurisdictions create compliance costs or inefficiencies, and where national consistency would deliver net benefits. The 2024 inquiry identified that water trade registers across jurisdictions lack real-time data and consistent public accessibility (Finding 5.1), and that environmental outcome reporting is inconsistently specified and reported across jurisdictions (Findings 7.1–7.3).

ATSE's submission explicitly recommends that "*modelling assumptions, methodologies and datasets used in regulatory and planning decisions be made publicly available*", *and connects* this directly to the failures of the Murray-Darling Basin governance experience, where restricted access to modelling data undermined independent assessment and public trust.

The Commission's terms of reference specifically identify that national consistency in areas like data standards must be balanced against jurisdictional flexibility. The question is not whether to standardise everything: it is where the benefits of consistency clearly outweigh the costs of jurisdictional flexibility.

4.2 Need and Argument

Spatial data standards are an area where the benefits of national consistency clearly and substantially outweigh the costs of jurisdictional flexibility. The physical properties of a water network (pipe location, asset condition, connectivity, pressure zone boundaries) are universal. There is no legitimate reason for

a water main in Queensland to be described in a different spatial schema than one in Victoria. Jurisdictional variation in data schemas is not a feature of regulatory diversity; it is an accident of procurement history that creates real costs for benchmarking, oversight, and reform.

A national spatial data standard for water networks, specifying what data must be maintained, in what schema, at what level of accuracy, and in what exchange format, would:

- Enable **cross-utility benchmarking** of asset condition, service performance, and investment patterns, giving regulators and the public a consistent basis for comparison
- Support **intergovernmental coordination** by allowing state planning agencies, environmental regulators, and Commonwealth funders to work from a common spatial reference without requiring bilateral data reconciliation agreements
- Reduce **duplication and rework** in data collection and reporting across agencies, a real productivity gain for utilities and regulators alike
- Improve **community trust** through consistent, publicly accessible spatial reporting of service performance and environmental outcomes

This is analogous to the role the AS4747 metering standard plays in enabling consistent water use measurement across jurisdictions. The Commission has recommended metering compliance as a priority. The same logic applies to the data standard for the networks that meters sit within.

A national data standard does not require a national platform, a national agency, or governance restructure. It requires agreement on schema, exchange format, and minimum reporting obligations: the kind of technical standard that the water sector's own body (WSAA) has already developed in prototype form.

4.3 Recommendation

Recommendation 7: The Commission should recommend that the NWA include, as a national consistency measure, the development and adoption of a minimum national spatial data standard for water and wastewater network assets, specifying schema, exchange format, accuracy requirements, and public reporting obligations, to be developed through the National Water Reform Committee in consultation with WSAA, state and territory governments, and the water sector, within two years of NWA commencement.

Recommendation 8: The Commission should recommend that water trade registers be spatially enabled as a minimum standard, providing publicly accessible, map-based interfaces to current entitlement, allocation, and trade data, to directly address the accessibility and currency failures identified in PC Finding 5.1.

PART B — INTEGRATION WITH DESIGN AND ENGINEERING TOOLS

The following section addresses the integration of spatial data systems with design and engineering tools across the water infrastructure lifecycle.

Capability overview:

	Geospatial Technologies	Design and Engineering Tools
Primary role	Authoritative spatial data; place-based analytics; cross-agency coordination; spatial systems of record and insight	Engineering design; asset delivery; hydraulic simulation; lifecycle information management
Core question	Where is it, what is it, and what does it mean spatially?	How do we design, build, and model it through its full lifecycle?
Lifecycle stage	Plan → Operate (continuous)	Plan → Design → Build → Handover

Spatial data and engineering design tools contribute to the full water infrastructure lifecycle, from long-term spatial planning through engineering design, construction, and operational management. Their value to water reform is greatest when considered as a connected lifecycle, not as separate point-in-time interventions.

Theme 5: Pricing and Economic Regulation

5.1 Integrated Digital Delivery — Closing the Data Gap Between Infrastructure Design and Operational Management

The Commission has found that major infrastructure investment decisions often lack rigorous cost-benefit analysis (PC Finding 6.2) and that investment proceeds without transparent, independent scrutiny of business cases. A structural cause of this, one that has not been explicitly addressed in previous reform cycles, is the **data gap** that exists between the design and construction of infrastructure and its operational management.

In current practice across the Australian water sector, infrastructure is designed using engineering tools (CAD, BIM, hydraulic modelling), built using construction management platforms, and then handed over to utilities whose geographic information systems (their authoritative operational record of the network) are updated manually, partially, and often months or years after construction completion. The as-built record in the GIS frequently does not match the as-designed or as-constructed record in the engineering system. This gap means:

- **Regulatory business cases** for future investment are built on asset records that do not accurately reflect what was actually built or what condition it is actually in
- **Operational decisions** (maintenance scheduling, pressure zone management, emergency response) are made on the basis of an incomplete or inaccurate network picture
- **Cost-benefit analysis** for renewal programs cannot be meaningfully conducted when the condition and performance history of the assets being renewed is not reliably recorded

This is a documented structural problem encountered across the Australian water sector at the point of handover from capital delivery to operational management.

5.2 Need and Argument

Digital delivery, the integration of spatial planning with engineering design, construction, and operational handover, is a **lifecycle concept, not a technology initiative**. Its value to the Commission's reform agenda is the elimination of the data gap that currently undermines investment governance.

Geospatial technologies enable integrated workflows that connect engineering design environments with the authoritative spatial operational record across the full project lifecycle:

- **Planning phase:** Spatial analysis informs site selection, route optimisation, and environmental impact assessment. Engineering design is anchored in the geographic reality of the existing network: its pressure zones, asset condition, and connectivity
- **Design phase:** Engineering design data (CAD, BIM) is validated against the spatial network record, ensuring that as-designed infrastructure integrates correctly with existing assets and complies with operational rules. Stakeholders can review and comment on spatially-positioned designs without requiring engineering expertise
- **Construction phase:** As-built data is captured in the field using mobile tools, with spatial accuracy, and linked directly to the engineering model, reducing the manual reconciliation that currently produces the handover data gap
- **Handover phase:** The completed project's spatial and engineering data flows directly into the utility's operational asset register, eliminating the gap and ensuring that the network record used for future investment planning accurately reflects what was built

This lifecycle approach directly addresses PC Finding 6.2. A utility that can demonstrate, spatially and with engineering traceability, the actual condition and performance history of its assets, and model the

spatial impact of investment alternatives, produces a more defensible business case than one relying on written engineering reports alone.

The Thames Tideway Tunnel project in the United Kingdom is a globally recognised example of integrated spatial-engineering delivery at scale, where GIS-connected engineering design and construction management reduced rework, improved regulatory reporting, and produced a more complete operational asset record at handover. This approach is directly applicable to Australian water infrastructure programs of comparable complexity.

5.3 Recommendation

Recommendation 9: The Commission should recommend that major water infrastructure projects receiving Commonwealth funding be required to deliver a connected design-to-operations data handover, ensuring that engineering and as-built data flows through to the utility's operational asset register at project completion, and that the cost of achieving this integration be treated as an eligible and required project expenditure, not an afterthought.

Recommendation 10: The Commission should recommend that Commonwealth funding criteria for the National Water Grid program require proponents to demonstrate an integrated digital delivery plan, specifying how engineering design data will be connected to the utility's operational spatial network record throughout the project lifecycle and at handover.

Theme 6: Governance, Accountability, and Coordination

6.1 Digital Twins as a Planning and Resilience Tool — Enabling the Forward-Looking Governance the Sector Needs

The Commission's terms of reference ask how current arrangements support "*utilities' long-term planning, including investment in circularity and moving operations towards net zero*", and how governance settings should respond to emerging challenges including climate change, population growth, and new water-intensive industries such as data centres.

ATSE's submission explicitly recommends lifecycle water analysis for data centres and new industries, noting that "*failing to plan for water consumption for data centres could result in this industry being a net economic and environmental loss.*" Multiple submissions identify the need for better forward planning tools to address climate variability and population growth, and the inadequacy of current arrangements for doing so.

Queensland's WaterQ strategy envisions water utilities evolving to use "*interactive meters and sensors integrated into water and energy systems, providing real-time, accurate information about water consumption*" and "*smart systems that prevent run-off pollution in rivers and lakes.*" This vision remains largely unrealised across most of the sector, not because the technology does not exist, but because utilities lack the foundational data infrastructure to connect operational sensing to planning-grade analysis.

6.2 Need and Argument

A connected digital twin, combining the authoritative spatial network record with hydraulic simulation and engineering lifecycle data, is the practical tool that enables the kind of forward-looking planning the Commission is seeking to promote.

This capability has two complementary components:

- **Geospatial technologies provide** the authoritative spatial network record: the connected, rules-based model of the water network that defines pressure zones, asset connectivity, isolation logic, and service boundaries. This is the operational context within which any simulation is meaningful: the "what exists and where" that grounds forward planning in geographic reality. It also provides real-time integration of IoT sensor data (flow, pressure, water quality) into the living operational picture.
- **Hydraulic simulation tools** enable utilities to simulate water distribution performance, model flood behaviour, test pressure zone response under demand scenarios, and assess the impact of new infrastructure on the existing network, before capital is committed.

Combined, these capabilities enable utilities and planners to test the impact of new industrial water demand (data centres, housing estates, agricultural expansion), climate-driven supply reduction, or infrastructure failures against a spatially grounded, hydraulically validated model of the network, and to make that analysis available to regulators, planning agencies, and communities in a transparent, spatially accessible form.

This is the forward-looking, evidence-based planning the Commission has found absent in much of the sector. It converts investment decisions from backward-looking engineering reports into forward-looking, spatially grounded scenario analysis, improving both the quality of decisions and their transparency to independent scrutiny.

This approach scales. The same integrated spatial-hydraulic capability that enables a major metropolitan utility to model the impact of a new data centre on its pressure zones can, at appropriate scale, enable a regional utility to model the impact of population growth on its existing storage and treatment capacity, without requiring a major capital program to find out.

6.3 Recommendation

Recommendation 11: The Commission should recommend that the Commonwealth, through the National Water Reform Committee, fund a national Digital Twin demonstration program for water utilities of varying scale (metropolitan, regional, and remote) to produce publicly available findings on the productivity, resilience, and planning benefits of integrated spatial-hydraulic modelling. Outcomes should directly inform NWA implementation guidance on minimum digital infrastructure standards for water service providers.

Recommendation 12: The Commission should recommend that state and territory water planning frameworks require major urban water utilities to demonstrate a forward-looking, spatially grounded demand and climate scenario analysis as part of their regulatory period planning submissions, and that Commonwealth funding for new water infrastructure be conditional on the proponent demonstrating that the proposal has been assessed against a credible digital network model of the existing system.

Theme 7: Regional, Remote, and Equity Considerations

7.1 Digital Workforce Capability as a Reform Precondition — Building the Sector's Capacity to Deliver on NWA Commitments

The Commission's terms of reference examine structural challenges faced by regional and remote utilities, including workforce constraints as an explicit factor affecting provider viability. Queensland's WaterQ strategy identifies workforce capability as a strategic priority for the water sector: "*clearly defined skill requirements, along with training and career development pathways, will ensure service providers have the right skills and resources*", *noting* that the future workforce will need "*a wide range of skills and knowledge beyond its traditional base, including information management, data analysis, economics, community engagement and general business skills.*"

The water efficiency specialists' submission to this inquiry identifies a related structural problem: that demand management programs, like digital capability investments, "*take years to set up and implement*" and require sustained investment to be effective. A sector that invests only in physical infrastructure and regulatory frameworks, without building the human capability to operate and manage them digitally, will continue to underperform against its own reform commitments.

7.2 Need and Argument

The water sector's ability to deliver on NWA commitments, whether on metering compliance, environmental reporting, service equity, or net zero transition, depends on having digitally capable

workforces at utilities of all sizes. This is not a commercial training argument; it is a **sector resilience argument**.

Experience across the sector confirms that the most common barrier to realising the productivity benefits of digital investment is not technology availability: it is workforce capability. Utilities that invest in spatial and engineering digital tools without investing in the people to use them effectively achieve limited outcomes. But utilities with even modest digital capability (staff who can update network records in the field, run basic spatial analysis, and produce transparent performance dashboards) consistently make better operational and investment decisions.

Leading water utility capability programs embed capability development as a core component of technology investment, recognising that "*experienced and knowledgeable teams, capability and strengths, structure and governance*" are as important as the technology itself. This is a principle that should be reflected in national reform settings.

For regional and remote utilities, particularly those serving Aboriginal and Torres Strait Islander communities, the workforce capability gap is acute. These utilities often cannot attract or retain staff with specialist digital skills. A national approach to shared digital infrastructure and subsidised capability pathways would allow these utilities to access the same quality of decision-support as major metropolitan authorities, at a cost proportionate to their scale.

7.4 Recommendation

Recommendation 13: The Commission should recommend that the NWA include a national digital water skills framework, covering spatial data management, hydraulic modelling, and integrated asset lifecycle management, as a component of the water sector workforce strategy, with subsidised capability pathways for regional and remote utilities developed in partnership with industry, state governments, and vocational education providers.

Recommendation 14: The Commission should recommend that Commonwealth water sector workforce programs, including those with a specific focus on Aboriginal and Torres Strait Islander communities, include digital capability components: specifically, the skills to capture, manage, and use spatially-referenced water network data for operational management and regulatory compliance, enabling communities to exercise genuine self-determination over the monitoring and management of their water resources.

SUMMARY OF RECOMMENDATIONS

Geospatial Technologies

#	Recommendation	PC Theme
E1	Require spatially-referenced, multi-criteria analysis for National Water Grid funding applications, made publicly available	Pricing & investment governance
E2	Empower economic regulators to require spatially-referenced asset and network data in regulatory submissions	Pricing & economic regulation
E3	Develop a national minimum spatial data standard for water networks under NWA: schema, exchange format, public reporting	Governance & national consistency
E4	Recognise authoritative spatial data as enabling infrastructure in the NWA, recoverable as prudent operating expenditure	Governance & accountability
E5	Require baseline digital capability assessment for regional/remote Commonwealth water funding; fund digital alongside physical	Regional & remote equity
E6	Support shared digital infrastructure models for regional utility clusters	Regional & remote equity
E7	Develop and adopt a national spatial data standard for water networks within two years of NWA commencement	National consistency
E8	Require water trade registers to be spatially enabled with map-based public interfaces	Governance & transparency

Integration with Design and Engineering Tools

#	Recommendation	PC Theme
J1	Require connected design-to-operations data handover for Commonwealth-funded projects; treat integration cost as eligible expenditure	Pricing & investment governance
J2	Require an integrated digital delivery plan as a condition of National Water Grid funding	Pricing & investment governance
J3	Fund a national Digital Twin demonstration program for utilities of varying scale, with publicly available findings	Governance & long-term planning
J4	Require major utilities to demonstrate spatially grounded demand and climate scenario analysis in regulatory period planning	Governance & climate resilience
J5	Develop a national digital water skills framework with subsidised pathways for regional utilities	Regional equity & workforce
J6	Include digital capability components in First Nations water workforce programs	Regional equity & Closing the Gap