



KO

Ko te wai o te rangi e tū iho nei
Ko te wai o te papa e takoto ake nei

WAI

TĀTAU

WE

I am the water of the sky parent
I am the water of the earth parent

ARE

WATER



1.0

2.0

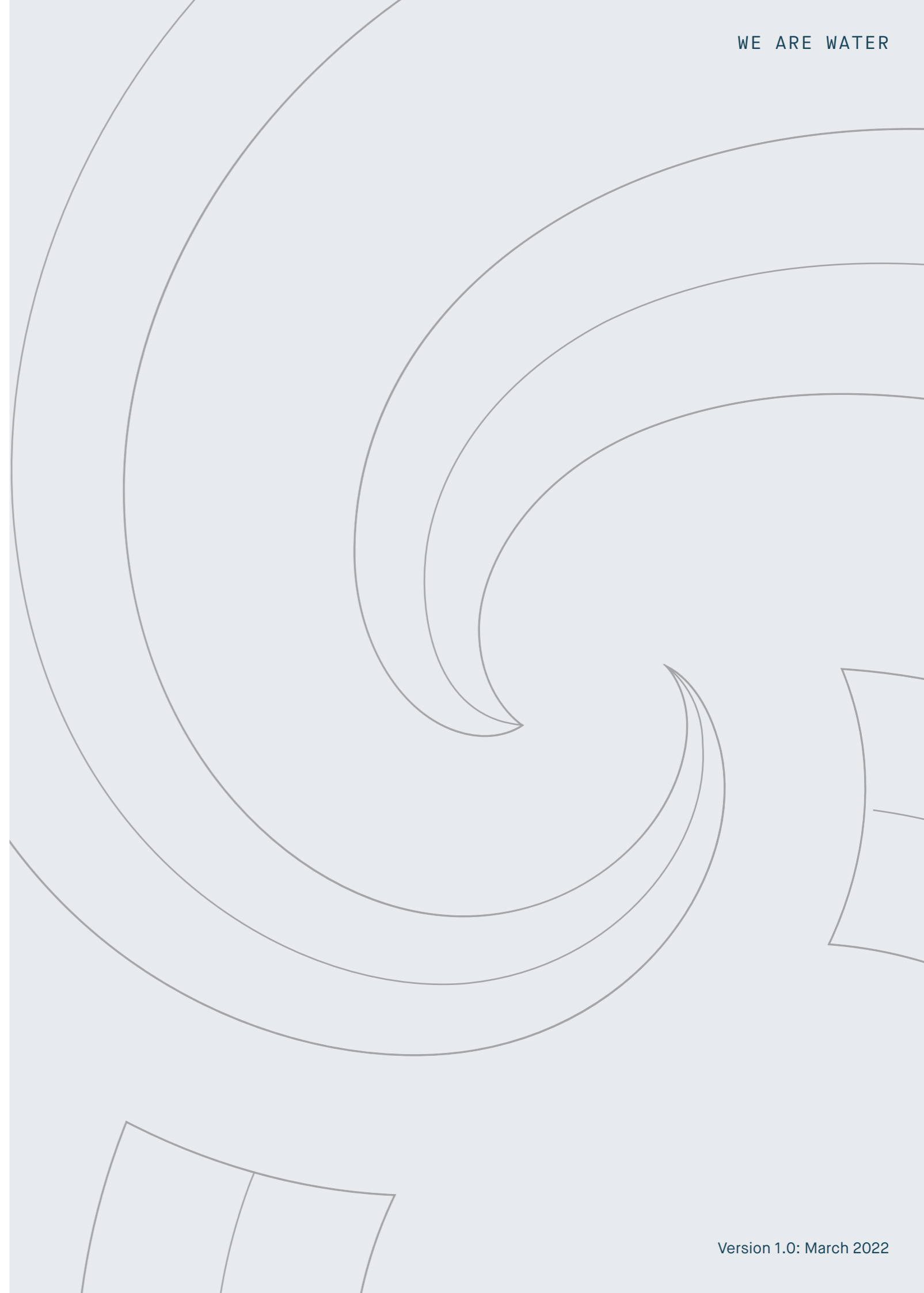
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Click to
navigate



Executive Summary	5
1.1 — Insights	7
1.2 — Strategic goals and recommendations	8
Introduction	10
2.1 — Elevating Three Waters as a leading career option	11
2.2 — How we produced this report	14
Insights	15
3.1 — Three Waters perception	16
3.2 — Industry voice	19
3.3 — Pathways to water careers	30
3.4 — Building competency	36
3.5 — Planning for success	42
Strategic goals and recommendations	45
4.1 — Respect Māori interests and knowledge	46
4.2 — Create intuitive career pathways	47
4.3 — Design for career progression	48
4.4 — Design for success	49
Contributors and collaborators	52





EXECUTIVE SUMMARY

1.0



Citycare Water, Auckland

Executive Summary

The water services sector is failing to meet expected environmental and health outcomes in many parts of New Zealand, and will soon be required to give effect to Te Mana o te Wai¹. Regardless of governmental reform, the sector will be required to address these challenges through substantial investment over the next 10 years and beyond.

As a result, the sector will see significantly increased workloads and new skill requirements. Investment is needed now to attract, train and retain a workforce with the capacity to deliver transformational change.



This report comprises a workforce development strategy for the water services sector, encompassing the Three Waters – drinking water supply, wastewater and stormwater. It presents outcomes from phase two of a larger three-phase initiative, which sets out to align industry stakeholders by achieving five- and ten-year plans to strengthen workforce and skills development.

A combination of qualitative interviews and quantitative analysis was conducted to form the base research for this report. Participants from both within and outside the industry were interviewed to provide unfiltered views of the water services sector and its perceived workforce challenges. The resulting data and insights were shared and workshopped in collaboration with representatives from the industry and associated entities towards establishing a set of 14 recommendations.

¹Te Mana o te Wai refers to the vital importance of water. When managing freshwater, it ensures the health and well-being of the water is protected and human health needs are provided for before enabling other uses of water. (MftE, 2020)

Summary of findings

This report identified five insight categories and outlined four strategic goals with fourteen recommendations.

1.1

Industry insights

Te Tira Hou

1. Three Waters perception

From the outside-in, a diversity of perspectives on water and water services exists, with views varying according to age and cultural background. The sector and the roles within it are largely invisible to outsiders.

2. Industry voice

The industry exhibits a rare capacity for collaboration, but faces a complex challenge to build a workforce that is able to meet requirements for industry transformation and giving effect to Te Mana o te Wai (the health and wellbeing of water).

3. Pathways to water careers

Pathways into and across water services are often hidden or challenging to access.

4. Building competency

Skills and competency frameworks are fragmented across the industry, with a need for clearly communicated pathways that allow for flexible and unbounded careers.

5. Planning for success

In the face of considerable infrastructure deficit, massive workforce competition, and an eventual need to onboard an estimated 75,000 small suppliers, there is a significant need for growth and strong leadership at all levels.

Strategic Goal 1

Respect Māori interests and knowledge.**Whakautengia ngā whaipānga me te mātauranga Māori.**

New Zealand's water sector is entering a new stage of management that incorporates regionalised (and localised) Māori knowledge and oversight. Commissioning Māori-led research on this topic is needed in order to progress in a way that upholds the articles of Te Tiriti o Waitangi (The Treaty of Waitangi).

Ko te rāngai wai o Aotearoa e kuhu ana i tētahi huringa hou o te whakahaere e whai wāhi ai ā-rohe te mātauranga Māori me tōna tiakanga. Me mātua whai kia āratakina te rangahau mō tēnei kaupapa e te Māori e taea ai te kauneke whakamua me te whakamānawa i ngā atikara o Te Tiriti o Waitangi.

Recommendations:

1. Build understanding of Te Mana o te Wai
2. Understand new opportunities for iwi and hapū roles and pathways
3. Provide a bridge for rangatahi Māori into existing water roles
4. Support iwi-led leadership initiatives

Tūtohunga:

1. Whakatupuria te māramatanga ki Te Mana o te Wai
2. Kia mārama ki ngā whai wāhitanga hou mō ngā kawenga me ngā ara Māori
3. Whakatūngia he ara e kuhu atu ai te rangatahi Māori ki ngā kawenga wai o te wā
4. Tautokona ngā hinonga hautūtanga e kōkiritia ana e te iwi

Strategic Goal 2

Create intuitive career pathways.**Whakatūngia he ara umanga rongō ā-manawa.**

Enacting the reform requires a step-change not previously experienced in the industry's ability to attract and recruit a diversity of talent in New Zealand.

Hei whakamana i te whakahouanga me whakaatu he panonitanga hira kāore anō kia kitea i roto i te āheinga o te ahumahi ki te kukume mai me te kimi tangata pūmanawa kanorau i Aotearoa.

Recommendations:

5. Create clear entry points from other sectors
6. Establish focused outreach to schools
7. Tell real stories of life in the industry
8. Find a united industry voice

Tūtohunga:

5. Whakaritea he tomokanga mārama i ētahi atu rāngai
6. Whakatūngia he toronga arotahinga ki ngā kura
7. Kia pūrākau tūturu ngā kōrero o te mataora i te ahumahi
8. Rapua tētahi reo ahumahi whakakotahi



Strategic Goal 3

Design for career progression.

Kia hoahoa mō te kauneke umanga.

There is a positive perception inside industry that a new level of collaboration is required for successful workforce growth.

He tirohanga huatau nō roto o te ahumahi kia tūria he taumata mahi tahi hou e angitu ai te whanaketanga o te hunga kaimahi.

Recommendations

9. Create flexible, consistent pathways
10. Develop leadership and mentorship programmes

Tūtohunga

9. Hāngaia he ara tāwariwari, taurite hoki
10. Whakawhanaketia he hōtaka hautūtanga me te ārahitanga



Strategic Goal 4

Design for success.

Kia hoahoa mō te angitu.

There is a need for a long-term, values-aligned strategy to strengthen recruitment, skills and training throughout the sector, and across all regions of New Zealand.

Me mātua whai ko tētahi rautaki uara pae tawhiti hei whakapakari i te kimi tangata, ngā pūkenga me te whakangungu huri noa i te rāngai, puta atu ki ngā takiwā katoa o Aotearoa.

Recommendations:

11. Invest in talent and communities
12. Build trust with small water suppliers
13. Build and leverage data
14. Create a values-driven sector

Tūtohunga:

11. Me tautoko ā-putea, ā-rawa i te pūmanawatanga me ngā hapori
12. Whakatupuria te pono ki ngā umanga iti whakarato wai
13. Waihangatia he raraunga taketake
14. Whakatūria tētahi rāngai he uara tōna tūāpapa





INTRODUCTION

2.0



Elevating Three Waters as a leading career option

New Zealand's water industry is poised for generational change. To improve and secure the future of water services, the sector must work together to elevate the perception of the industry, and activate strategies to attract, train and retain the workforce required to enable sector transformation.



The water services sector is seeing increased societal and regulatory pressure to improve the quality of water services and provide better environmental outcomes. Following decades of underinvestment, however, the water sector as a whole is falling short of service delivery and environmental expectations. Many water services in New Zealand are already overextended and lack the capacity to meet the needs of tomorrow.

An absence of universally adopted definitions of best practice is a contributor to inconsistent service delivery: the sector is fragmented, with most water services planned, managed and delivered by 67 different councils.

The quality of water services is related to scale, with smaller regional providers often lacking the specialist skills needed to achieve high-quality results.

“
Underinvestment, including deferred maintenance and renewals expenditure, has left a legacy of impending costs and poor services for future generations.
”

Hon. Nanaia Mahuta, Minister of Local Government

Easy access to clean drinking water is a fundamental human right. This right is not adequately met for one in five New Zealanders.

Data source: Transforming the system for delivering three waters services, DIA, 2021



The Three Waters reform programme aims to create a foundation for dynamic transformation that will build consistent outcomes across the sector, and is triggering conversation, debate and opinion. Irrespective of reform, the sector will be required to upskill and scale its workforce significantly to meet anticipated growth and deliver a renewed investment pipeline. In the coming decade, water service shortfalls will begin to be addressed by major capital projects that adopt the latest technologies; however, the sector workforce is inadequately prepared to build and operate this new infrastructure. The sector is facing pressure to find additional workforce capability and to push employees to work beyond their existing competency skill sets.

Sector transformation will also require a more informed management structure and workforce that understands the relevance of, and gives effect to, Te Tiriti o Waitangi and Te Mana o te Wai. For Māori, wai² and awa³ have their own mana⁴, and have spiritual qualities (mauri⁵ and wairua⁶) that can be badly affected by misuse. Water is seen as a taonga⁷ that is a vitally important keystone to the health and wellbeing of the whenua⁸ and tangata⁹. By giving effect to Te Mana o te Wai, the sector must acknowledge and protect the mauri of wai, and employ iwi and hapū¹⁰ to implement practices that assess, restore and protect it as an essential resource.

Sector transformation will also require a more informed management structure and workforce that understands the relevance of, and gives effect to, Te Tiriti o Waitangi and Te Mana o te Wai.



Citycare Water, Auckland

²Water. ³Rivers. ⁴Integrity. ⁵Life force. ⁶Spirit. ⁷A taonga is a treasure, anything prized - applied to anything considered to be of value including socially or culturally valuable objects, resources, phenomenon, ideas and techniques (Te Aka Māori dictionary). ⁸Land. ⁹People. ¹⁰People of the land.

The water services sector is complex and diverse. Research triggered by the proposed reform has highlighted in excess of 75,000 small water providers that will need to be onboarded over time following implementation of the Water Services Act 2021, which establishes drinking water standards and regulates all water suppliers. Over the next decade, this uncoordinated and under-resourced 'long tail' of suppliers will require resources, training and monitoring to support them in meeting transformation requirements.

The need to build the water services workforce is urgent, but significant recruitment challenges first have to be faced. Transformation will require thousands of new workers to design and complete capital projects, and to operate the reformed industry.

The need to build the water services workforce is urgent, but significant recruitment challenges first have to be faced. Transformation will require thousands of new workers to design and complete capital projects, and to operate the reformed industry; however, at present the sector and the roles within it are all but invisible to those outside of it. With record low unemployment, ongoing immigration restrictions, and competition with construction and other infrastructure sectors, the water services sector must invest in its workforce now.

This report focuses on the water services industry workforce development strategy. It balances a tension between a transforming industry intent on creating a new legacy of sustainable environmental assets and an emergent workforce bombarded by choice, content and global pressure. Based on qualitative interviews and quantitative research and analysis, insights and strategic recommendations are presented as a foundation for a workforce development strategy. They highlight the potential to leap beyond perceived challenges to attract and upskill the next-generation workforce.

1377

Taumata Arowai will require all 1377 registered suppliers to reach compliance in the four years following reform, followed by an estimated 75,000 as yet unregistered suppliers.

Data source: Taumata Arowai

75k

How we produced this report

This report comprises a workforce development strategy for the water services sector, encompassing the Three Waters – drinking water supply, wastewater and stormwater. It forms the outcome of phase two of a larger initiative that sets out to align industry stakeholders with opportunities to strengthen workforce and skills development. Following on from this report, the third phase will work toward design and implementation of specific workforce development solutions.

2.2

Research Methodology

The research has been formed through a quantitative industry scan of over 48 diverse documents and qualitative collective insights through 44 in-depth interviews with industry experts, 'Gen Z' students, academics, training providers, employees, employers, small regional water suppliers, representatives from the Three Waters Māori Working Group, kaupapa Māori environmental consultants, Crown-iwi advisors, runanga representatives, iwi engagement advisors, tagata Pasifika policy and workforce advisors, and representatives from global industry exemplars.

These insights and recommendations were collectively refined in collaboration with a steering group and project team consisting of representatives from various organisations including local councils, water entities, water services experts, Water New Zealand, Taumata Arowai, Taituarā, Connexis, Engineering New Zealand, Waihanga Ara Rau Construction and Infrastructure Workforce Development Council, the Department of Internal Affairs (DIA), Deloitte and research partner Assurity Consulting.

48

A quantitative industry scan of over 48 diverse documents.

44

Qualitative insights through 44 interviews.

- 07 Small suppliers
- 09 Industry experts
- 03 Academics and training providers
- 07 Iwi and hapu and tagata Pasifika consultation
- 16 Workforce empathy research
- 02 Global exemplars

INSIGHTS

3.0



Citycare Water, Auckland

Insight 1

Three Waters perception

Views on water and the water sector vary according to age and cultural background. In Te Ao Māori, water and rivers have their own mana, and are living entities that also have spiritual qualities that can be badly affected by misuse. Water is seen as a vitally important keystone to the health and wellbeing of the whenua and tangata. In general, people spoke of the need to preserve the integrity of water and the environment; however, knowledge of the water sector's processes, organisations and roles is extremely limited. Pathways are needed to nurture a young generation's varied perception of water, and bridge their potential to early-stage careers and opportunities in the water services industry.



3.1



In Te Ao Māori, the wellbeing of wai is one and the same as the wellbeing of people and culture. Wai is significant in that it has its own mauri and wairua.

Insight 1: Three Waters perception

Giving effect to Te Mana o te Wai

Te Ao Māori includes a sophisticated understanding of the holistic and cyclical nature of water. In essence, Te Mana o te Wai acknowledges and protects the mauri of wai and, through mātauranga¹¹ practices, strives to assess the condition of awa and affect the change necessary to enhance their mauri. Taking a whole system approach to protecting wai, as an essential resource, from the mountains to the sea, is paramount.

In Te Ao Māori, the wellbeing of wai is one and the same as the wellbeing of people and culture. Wai is significant in that it has its own mauri and wairua. Wai is linked to identity, and gives tangata whenua life and food. There is an inherent awareness about natural resources and a belief in a sacred duty to maintain their spiritual relationship with wai so it may be preserved for future generations. We understand that the spiritual connection to water stems back to the separation of Ranginui¹² and Papatūānuku¹³ and how these same evolutionary stages are told in stories throughout the indigenous populations in the Pacific.



¹¹Traditional Māori knowledge.

¹²Sky parent. ¹³Earth parent.

“
Māori children taught in Māori schools are achieving more than in mainstream schools. Three generations of Māori full-immersion education is coming through in confident, knowledgeable Māori.
”

Kaupapa Māori Environmental Consultant*



Insight 1: Three Waters perception

A new generation

There is a new generation of bilingual and bicultural rangatahi¹⁴ who have been educated in Kohanga Reo¹⁵, Kura Kaupapa Māori¹⁶, Kura ā iwi¹⁷ and Wānanga¹⁸. We heard how rangatahi Māori in full immersion education develop deep cultural and spiritual awareness within Te Ao Māori, and gain an understanding about the complex interrelation of everything, as well as relationships to whakapapa¹⁹, and the wellbeing of the land, sea and people. The industry would significantly benefit from attracting these people to water careers.

Iwi- and hapū-led research is needed to discover how to bridge a young Māori generation’s nuanced understanding of water and its potential towards early-stage water services careers and opportunities.



“
There’s a real pathway there for these guys and identifying the roles within the water industry. It is crucial to understand what are the Māori roles in the Three Waters industry and what are the Māori-specific roles.
”

Iwi engagement industry participant

*The Education Review Office/Ministry of Education 2021 report – Mahi Ngātahi, Kupu Ngātahi – Evaluation report for Kura Kaupapa Māori affirms this statement.

¹⁴Young people. ¹⁵Kōhanga reo run a total immersion te reo Māori whānau (family) programme for mokopuna (young children) from birth to six years of age to be raised within its whānau Māori, where the language of communication will be Māori. (source: MoE website). ¹⁶Kura kaupapa Maori are state schools in which children are taught primarily in the Māori language, with a particular focus on traditional and contemporary Māori values. (B. Donnelly, 1988). ¹⁷Te Rāngai Kāhui Ako ā-Iwi is a framework

to support sustainable Māori medium education, recognising the diversity region by region, iwi by iwi. (MoE website). ¹⁸Wānanga are tertiary institutions that implement teaching and research that maintains, advances, and disseminates knowledge and develops intellectual independence, and assists the application of knowledge regarding āhuatanga Māori (Māori tradition) according to tikanga Māori. (Education and Training Act, 2020). ¹⁹Genealogy.

Insight 2

Industry voice

Collectively the water industry exhibits a rare capacity for collaboration, with all stakeholders expressing a desire to work together to realise the potential of reform and effect a generational step-change. This desire isn't without complexity and challenge, however. At present the water services sector is all but invisible to outsiders, with many people drawn in through family connections within local communities.

Developing an expanded workforce will require a different approach that provides opportunities to upskill and grow the workforce across the country. The inclusion of Te Mana o Te Wai as a fundamental concept across the water regulatory environment offers inspiration for the creation of novel pathways between rangitahi and industry.



Citycare Water

Insight 2: Industry voice**Investing in communities and fair procurement**

The wider water services sector in New Zealand faces a significant water infrastructure deficit, with much of the country's existing water infrastructure built over 30 years ago by the former Ministry of Works. We found that the quality of water services is related to scale, with smaller providers often lacking the specialist skills needed to generate high-quality results. Small industry suppliers and councils spoke of a sector history of 'lowest cost wins' contracts awarded for the operation and maintenance of water infrastructure. The view is that this approach has created atrophy in both the network and workforce, with thin operating margins restricting the ability of small industry suppliers to carry and train apprentices.

“

The ratio of the number of qualified people doing the jobs versus labourers that have been pulled in to help has deteriorated over time.

”

Policy leader

25%

The sector is underperforming due to a skills shortage and lack of investment: Almost a quarter of wastewater plants are not consented, and more than half wastewater plants will need to be re-consented in the next ten years.

Data source: Transforming the system for delivering Three Waters services, DIA 2021

75–85%

Capital expenditure projects was only 75-80% of the budgeted spend in 2019 and 2020.

Data source: National Performance Review 2019-2020, Water NZ

\$185b

Water transformation will not be achievable without significant additional workforce: Minimum of \$120b to \$185b capex investment needed over the next 30 years. That's around \$14M capex every day of the year.

Data source: Water Services Industry Development Study & Economic Impact Assessment, DIA 2021

This shortfall in local knowledge and skilled workers was identified as a contributing factor to the regions being over-represented in terms of poor service outcomes. Industry insiders described an additional possible cause as the tendency for infrastructure contracts to be awarded to a handful of large dominant organisations, with much of the work then sub contracted back to small local community businesses at a lower rate – effectively eliminating margin and profitability. We heard how this trend often results in a drain on resources from provincial communities, and hinders the ability to grow local apprentices and build pathways into the sector.

“

What generally happens is that the bigger businesses sweep up all the work because they've got the capacity to deliver. But then they sub out all the work – so they're taking massive amounts of margin out of the jobs, removing the opportunity to develop apprentices. Success will be more localised employment, more localised apprenticeships, more procurement going local. We need these jobs coming into schools with rangitahi working in their local areas to grow their communities. We need to invest into these pathways now if we're serious about scaling this industry.

”

Iwi engagement industry participant

Others we spoke with cautioned that margins are slim everywhere, even when work is delivered directly. They spoke in favour of promoting local procurement, but communicated the need to go further and find centralised funding to design and deliver training support to local businesses.

“

The conundrum is the investment challenge. The industry works with very low margins and in a competitive environment. We can't rely on employers to self-fund this.

”

Industry association executive

We heard about existing 'on the ground' remedies, where the cost of training is distributed and managed through coordination of complex local ecosystems of councils, training providers and small businesses. These initiatives are often the result of a few passionate individuals, and there was an expressed desire from them to share these models with other providers nationally to create sustainable scale and fixed industry pathways.

People served by smaller suppliers are less likely to have access to safe drinking water. 1 in 4 water supplies to between 501 and 5,000 people did not achieve bacteriological standards in 2020.

Data source: Annual Report on Drinking Water Quality 2019-2020, Ministry of Health

Insight 2: Industry voice

Shared governance

Te Mana o te Wai has recently come into public policy in New Zealand. There is a growing awareness of the concept and how to give effect to it with regard to sustainable water management, and governance arrangements are being considered for how new water entities will manage drinking water, wastewater and stormwater. This includes consideration of Tiriti o Waitangi, Te Mana o te Wai and Crown-iwi partnership.

The Three Waters reform will support the development of iwi and hapū representation, accountability and co-governance. New iwi roles will be needed to facilitate representation of approximately 72 iwi and their associated hapū and whānau, and at a local level there will be a substantial need for new technical roles, mātauranga specialists and trainers.

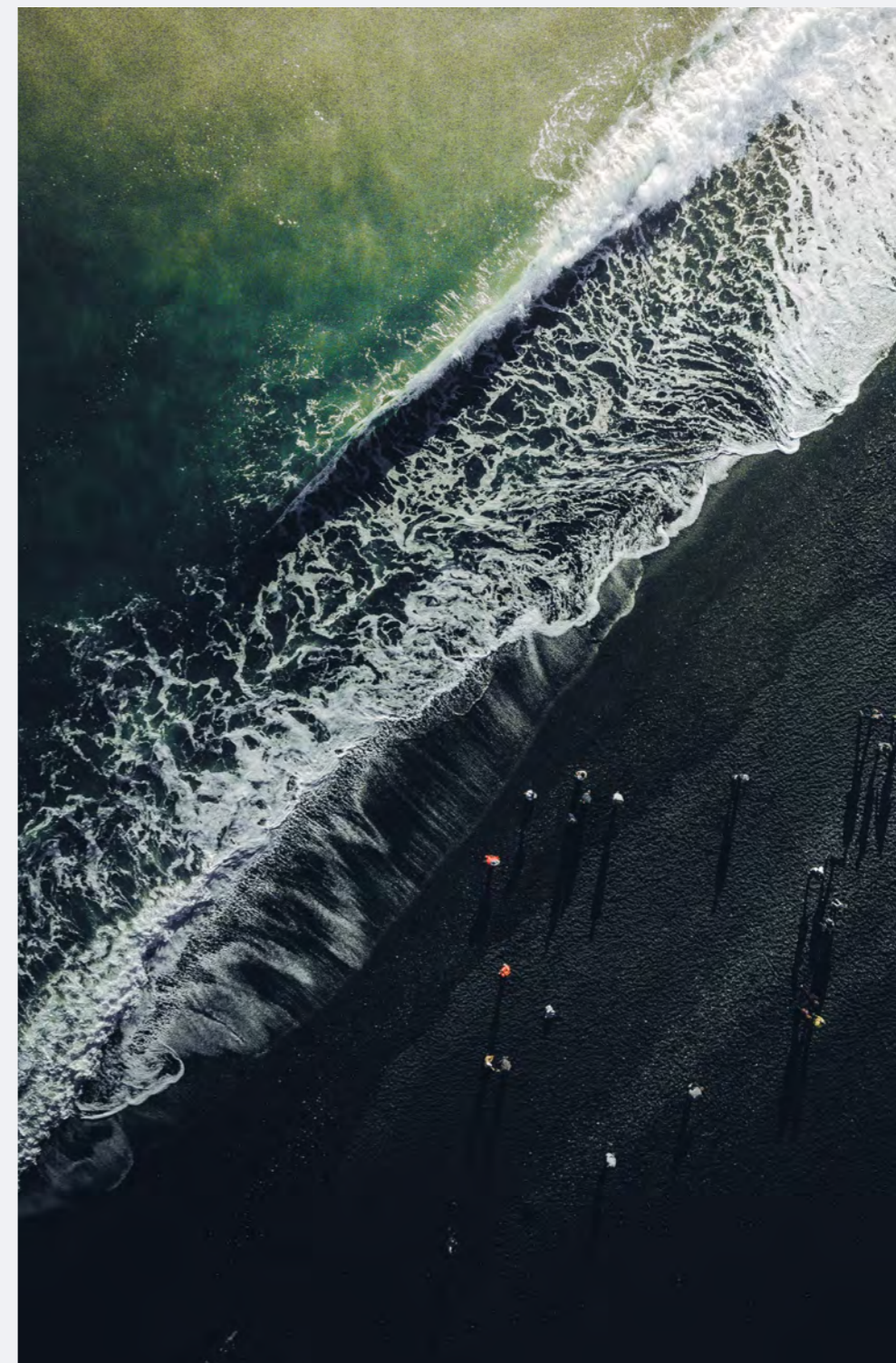
“

Te Mana o Te Wai provides a pathway for Crown agencies and other people with statutory functions, powers and duties to recognise and respect the kaitiakitanga²⁰ obligations of mana whenua, in a manner that aligns with mātauranga-a-iwi.

”

Taumata Arowai water services regulator

²⁰ Guardianship





Citycare Water, Auckland

“

The reform is about introducing a new way of working in a new model of co-governance with Māori. Industry will be led and operated in a fundamentally different way, a way that is good for the workforce and good for the environment. Kaitiakitanga means each iwi will restore their own land – it’s sacred to them.

”

Iwi engagement industry participant

In our research we heard a desire to design a governorship system that values both western and Māori approaches to knowledge towards a combined approach to water management. Such a system is without a true precedent and would require engagement with water beyond current western scientific understanding, which is considered by many Māori to be inadequate on its own to address the delicate, infinitely complex and cyclic relationship between things. We heard that while western science has great value, it must be used to supplement traditional practices, rather than dictate them.

New tangata whenua roles will be needed to facilitate representation of approximately 72 iwi and their associated hapū and whānau.

72

We heard from industry experts who are Māori about how giving effect to Te Mana o te Wai will vary across iwi and hapū. As a result, decision-making on water management will need to happen at a local, community level, with an agreed structure in place. Under this model, a workforce will be required who can 'go out and walk the waterways with iwi' to assess the mauri of ecosystems. Reform was seen as a positive step towards establishing a governance model that values mātauranga Māori – specifically by allowing the sector to fully engage with traditional knowledge around identifying the current state of waterways, and enacting the changes needed to fully restore their mauri.

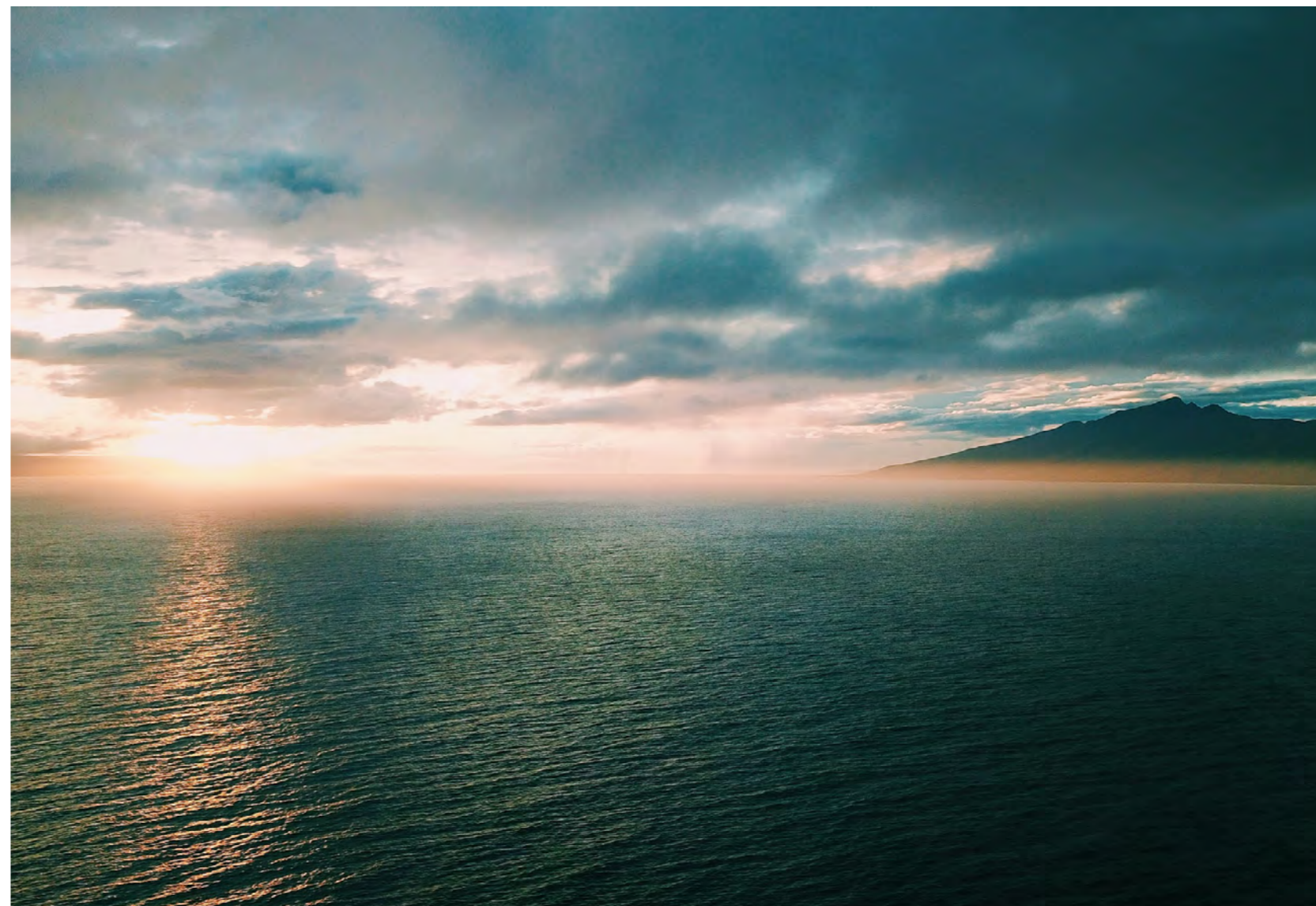
“

We do it all together 'on the mat'. This means that people with living relationships with the water are meeting with people that have an international and technical lens.

”

Indigenous environmental consultant

We received strong messages about the need to meet te Tiriti obligations by directly funding iwi- and hapū-led research programmes. Self-determination by Māori on the role of mātauranga and kaitiakitanga (and how to build the workforce to enact them) was seen as essential. A key reason for this is that these practices are only able to be exercised by iwi and hapū who have whakapapa connections to that whenua.



“

Water goes beyond the western scientific dimension. We have dimensions beyond what you can discuss and measure. We need to work to build an understanding of this in New Zealand.

”

Indigenous environmental consultant

Insight 2: Industry voice

Championing gender diversity

Gender was the main diversity challenge identified through our discussions with people in the water industry: many recent entrants to the sector shared that men tended to work in the operational space, while women predominantly filled office-based roles. For any industry that is facing significant workforce shortages, creating inclusive and welcoming environments is crucial to expanding the available talent pool. We heard anecdotal evidence about how making changes to workplaces, for example providing female toilets on site, increases uptake of women into operator roles.

“

Gender diversity is a challenge. Particularly in the treatment plants, it's definitely more male orientated. My boss is a guy – everyone in our team are guys.

”

New-entrant wastewater services engineer



Citycare Water

6%

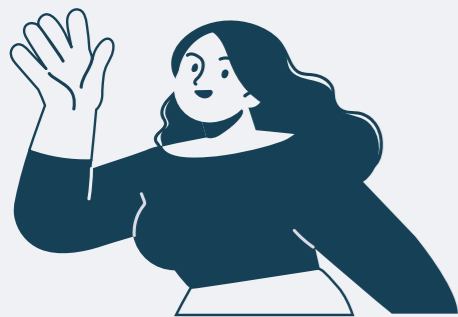
6% of water operators in New Zealand are female.

Data source: Elevating the Need for Diversity, Water NZ, 2019

27%

27% of water supply workers in New Zealand are female.

Data source: Connexis Review of Water Treatment and Water Assessment Qualifications, Infometrics, 2019

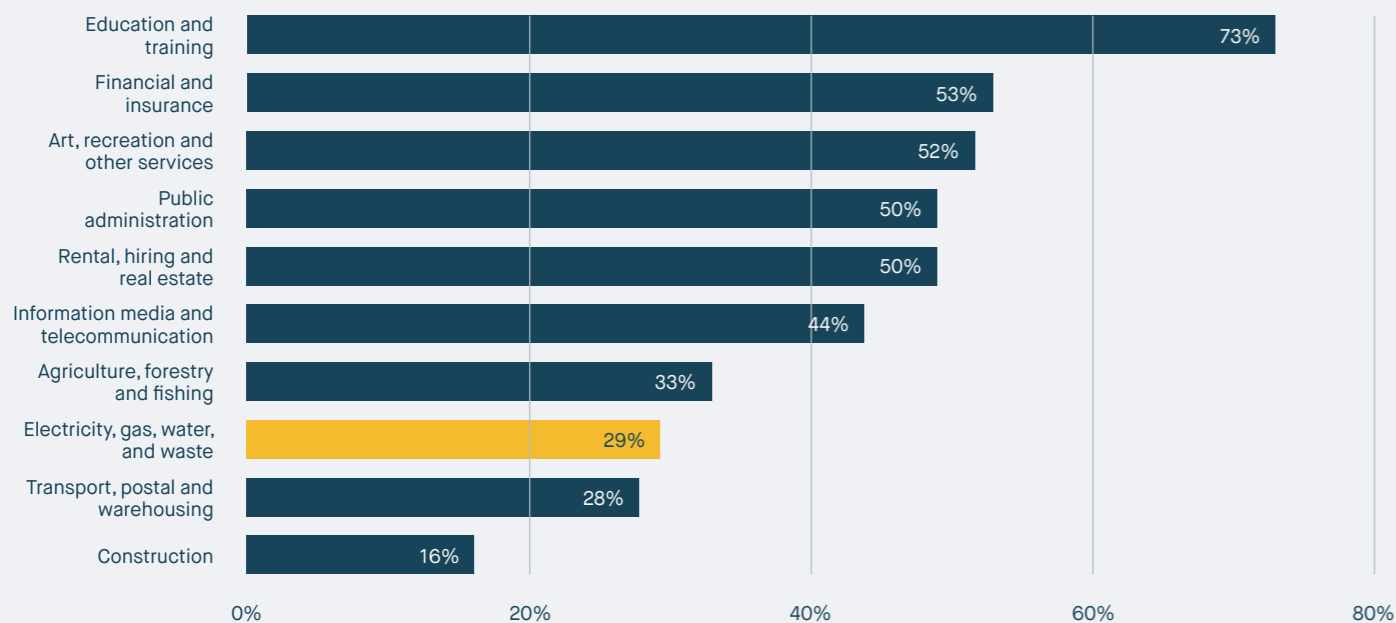


1/7

1 in 7 apprentices are female.

Data source: educationcounts.co.nz across all industries. Data supplied by the Tertiary Education Commission in 2020

Female Participation by New Zealand Industries (2021)



Source: Rounded figures from Diversity & Inclusion Impact Report, Champions for Change 2021

As was also seen in a 2021 workforce study into New Zealand's electricity sector, male operators who we spoke with saw no reason why more women shouldn't be able to fill operator roles; however, there was a sense that women are fully accepted once they become "one of the boys". This raises questions about how to reshape the culture of operational roles to be intrinsically more welcoming to women. Building diverse and inclusive workplaces has been shown to improve the experience of all workers, making them more likely to recommend careers in their industry to others.

“

I know that some women at [municipal water organisation], particularly the ones that work with operators, have had problems – so yeah, I feel like that could be a roadblock for some women in the industry.

”

Municipal water services graduate engineer

65%

On a positive note, gender diversity in water services is improving: 65% of graduate Water NZ members are female and 60% of females in water consultancies are under 35 years of age (compared with 42% of design, engineering, science and transport professionals).

Data source: Elevating the Need for Diversity, Water NZ, 2019

Insight 2: Industry voice

Limited data leads to limited decision-making

At present there is no reliable and up-to-date single source of water services data, leading to a lack of visibility and presenting a challenge to informed decision-making. In terms of workforce, we found scarce data about gender and gender equity, age, ethnicity, locations, roles and competencies of people across the sector. The lack of visibility within the sector is in part caused by fragmentation (due to the high number of entities that manage it), but also because it is serviced by a wide range of industries and personnel that also service other sectors. Improved visibility across the sector will be essential to understand how to meet ongoing technical and workforce requirements, and how to execute coordinated responses to mitigating the effects of climate change.

Best practices are changing, however, with regulation requiring providers to build knowledge of the latest technologies. Incorporation of internet of things (IoT) systems into every aspect of water management will bring exciting new opportunities: sector-wide adoption of advanced monitoring, coupled with integrated information systems will provide a high degree of visibility about physical assets (catchments, outflows, facilities, equipment etc.) and, crucially, granular detail on the experience and certifications of the people who run them. A content collection and management system (at an entity or national level) will be essential to collate data, build insights, and inform strategic decision-making on capex, operating expenditure (opex), recruitment and training.

“

If someone went to a regional council with \$100M they would struggle to know how to spend it in a way that gets the best outcomes for people and the environment. There’s not a lot of tech development in the infrastructure sector in NZ. We need a way to predict the future based on the changes in the network.

”

Three Waters industry
research programme leader

The sector has a limited knowledge on the make-up of its workforce: in 2019 only 3 out of 10 water consultancies collected data on staff ethnicity, and none collected data on disability.

Councils (or post-reform entities) across New Zealand will need to bridge gaps in knowledge on the number and nature of private drinking water supplies in their districts also. To understand the medium-to-long-term workforce requirements for aligning small private supplies with sector transformation, it will be important to expand on current efforts to design a way to gather data that paints a clear picture of the number and types of small community suppliers.

Insight 2: Industry voice

Leading change

There is anxiety about the step-change growth required in the workforce to enact sector reform. Delivery of works requires a plethora of skills and trades, and there is a desire to articulate a clear industry voice and vision that embodies a new regulatory model with a promise to the land and people. The next-generation workforce is waiting to hear this vision and understand how they might play a unique role in the Three Waters transformation.

“

The first thing is to try to educate whoever is leading investment. We want to improve the ability of decision-makers – procurement, designers, politicians and asset owners.

”

Industry resources and policy expert

The Three Waters reform is politically charged, and there is an industry perception that current dialogue is marring the true opportunity at hand. Throughout our research, industry stakeholders stressed the importance of focusing and articulating the opportunity the reform presents: to restore our natural ecology, our people’s health, and the mauri of our waterways. This message resonates with industry outsiders and is an attractive proposition for pursuing vocational training in water services.



Citycare Water

50%

For industry transformation, talent is everything: labour and related direct costs – in their various forms – is the largest cost input into water transformation capital works by a substantial margin, representing an estimated 50% of total costs.

Data source: Water Services Industry Development Study & Economic Impact Assessment, DIA, 2021

“
Purpose is one of the most important things for any water company in the world. Then you can tap talent or raise opportunities with the younger generation.
”

Scottish Water executive



Watercare

Delivering a long-term, adaptive capacity for change requires initiatives to ensure people at all levels are engaged and invested, have opportunities to make meaningful contributions towards the future of the sector, and are able to shape the direction of their careers. In our research, we heard that water trainees and operators are rarely involved in industry events, and as a result may feel emotionally disconnected from the sector as a whole. The sector will benefit from initiatives that encourage interaction and give people a voice to feel involved within the industry.

“
If you go to a conference, it's 70% consultants – councils don't send their water operators and it's rare to see apprentices.
”

Water services optimisation specialist

Current policies have amplified the competitiveness of recruitment activities across all industries, and there is a perception that some form of industry-wide collaboration is needed between water entities to enable them to collectively meet anticipated talent demands. Historically this has been difficult to achieve with tight competition for people, which has led to 'horse-trading' of employees between sector organisations. New collaborative models should be explored and leveraged to reduce the cost-to-train for each entity and provide simplified and transparent pathways into the water industry.

Pathways to water careers

Career pathways in the water services industry are hidden and challenging to access. Experiential engagement is critical to building awareness and motivating practically minded youth who are weary of traditional vocational marketing activity. Sector incentives for school leavers need re-imagining and the value of work-based learning and trades re-established.



Insight 3: Pathways to water careers

Career selection in schools

During our research, we heard from school students that they are being pressured to make career decisions early – by Year 10 many are narrowing subject selection towards a specific career path. Building knowledge about water and available water careers early should be a cornerstone of long-term industry workforce planning; however, water sector opportunities are not currently registering with youth:

“

We’ve never heard about this [Three Waters]. We’re looking for jobs that we know exist, but we don’t know what we don’t know. You should tell us about this early in life – we’re making career decisions early at high school.

”

School leaver

Student interviewees expressed a general anxiety towards their careers and training. They described the financial pressure of tertiary education, and the need to offset study with long-term financial reward. Despite the financial promise of trade industries, students overlook these pathway opportunities fearing a loss of lifestyle flexibility and a perceived inability to change careers.

“

I can’t be bothered with repetition in a job with trades. You will be a builder until the day you retire. It’s an early way out of college, but I’m fearful of being locked into the same thing for 20 years. I want to keep my options open and be flexible.

”

School leaver

While often seeing the benefits of trades paths, many students are being persuaded by careers advisors to take a university career path regardless of personal interest:

“

When you tried to discuss other (than trades) options, you were told you should do this way more high paying thing rather than what you actually enjoy.”

”

School leavers

Students are wary of industry promotion when seeking out career information. A general scepticism of industry case studies and careers evenings was routinely described. Students instead prefer hearing first-hand 'warts and all' anecdotal experiences from those new to the sector.

“

I'd rather have a builder come in and say, 'it sucks but you're out in the sun getting paid'. If someone talks, they are selling. We want to see the hard facts. Our generation is very much on to people lying a lot.

”

School leaver



Water careers do not pay as well as many other sectors, and workers often work long hours:

\$42-70k

Pay range for water/wastewater treatment operators with up to two years' experience

\$70-130k

Pay range for water/wastewater treatment operators who work as team leaders or managers

40-49hrs

Most respondents work 40 to 49 hours per week.

Data source: Infometrics, 2018

“

Gateway is looked down upon. It's for drop-kicks. I went there once and thought it was actually good. And then I got told 'No'. The perception is Gateway equals work at Macca's and get 10 credits. What's the point?

”

School leaver

“

These students would be lost until they turn 18. It's about picking them up early and giving them alternatives. A lot of these kids actually need practical's.

”

Iwi engagement industry participant

22,000

22,000 learners participated in Gateway and trades academies in 2020.

Data source: www.educationcounts.govt.nz/ Data supplied by the Tertiary Education Commission in 2020

Insight 3: Pathways to water careers

Experiential learning in schools

There is a perception that practical kinaesthetic learners are well suited to hands-on water services roles. Younger people joining the industry had their curiosity piqued early either through first-hand exposure to water operations or through work experiences (for example, one participant worked with swimming pool filtration systems as a youth). Those with some form of childhood industry exposure are more likely to develop a passion for careers in water.

“

I need to learn by doing – not end up on a list from a tradeshow.

”

School leaver

Secondary school Gateway programmes and trades academies are provided to give senior students access to integrated school and workplace learning. While supporting the premise of Gateway programmes, most interviewed spoke unfavourably about its impact. In reality Gateway struggles to match student aptitude to career opportunities. In certain situations Gateway is perceived as a tool for schools to manipulate academic results by removing lower achievers from participating in NCEA exams. This sentiment was echoed by Māori interviewees who spoke of disenfranchised Māori being 'kicked out of school by about the first term' before impacting the school's results.

Insight 3: Pathways to water careers**Competing with tertiary pathways**

In 2018 the New Zealand Government introduced a fees-free policy allowing students to claim up to one year’s full tuition costs when entering tertiary education. Zero-fees create a ‘why not?’ default pathway into universities for many students who might previously have explored trades vocations. For those who do enter university, consideration of the water industry is again only likely to occur through direct anecdotal experiences from influential figures.

“

You can’t do the things you want to do – if you’re working and doing a sport, don’t go to uni at the same time. Like you basically just have no time for anything at all. Find me a job that fits within my schedule and is meaningful. I want to be part of a team and committed, not just that person who does a shift on a Friday night.

”

Second-year university student

Attracting youth requires the water sector to offer a degree of flexibility; for example, incentivising flexible and purposeful work-based learning in tandem with study programmes. School leavers are seeking to support their learning with meaningful work opportunities in their preferred industries over perceived ‘dead-end jobs such as retail and hospitality’.

“

I was doing an internship with Dunedin City Council as a part of my engineering degree. My manager got me interested in how complex water systems are, and so in my third year of uni I took more water classes, which were my favourite and confirmed I wanted to do this!

”

New entrant water process engineer

41,000



1,995

41,000 provider-based students began fees-free study in New Zealand in 2020, but only 1,995 took up fees-free offers within vocational training.

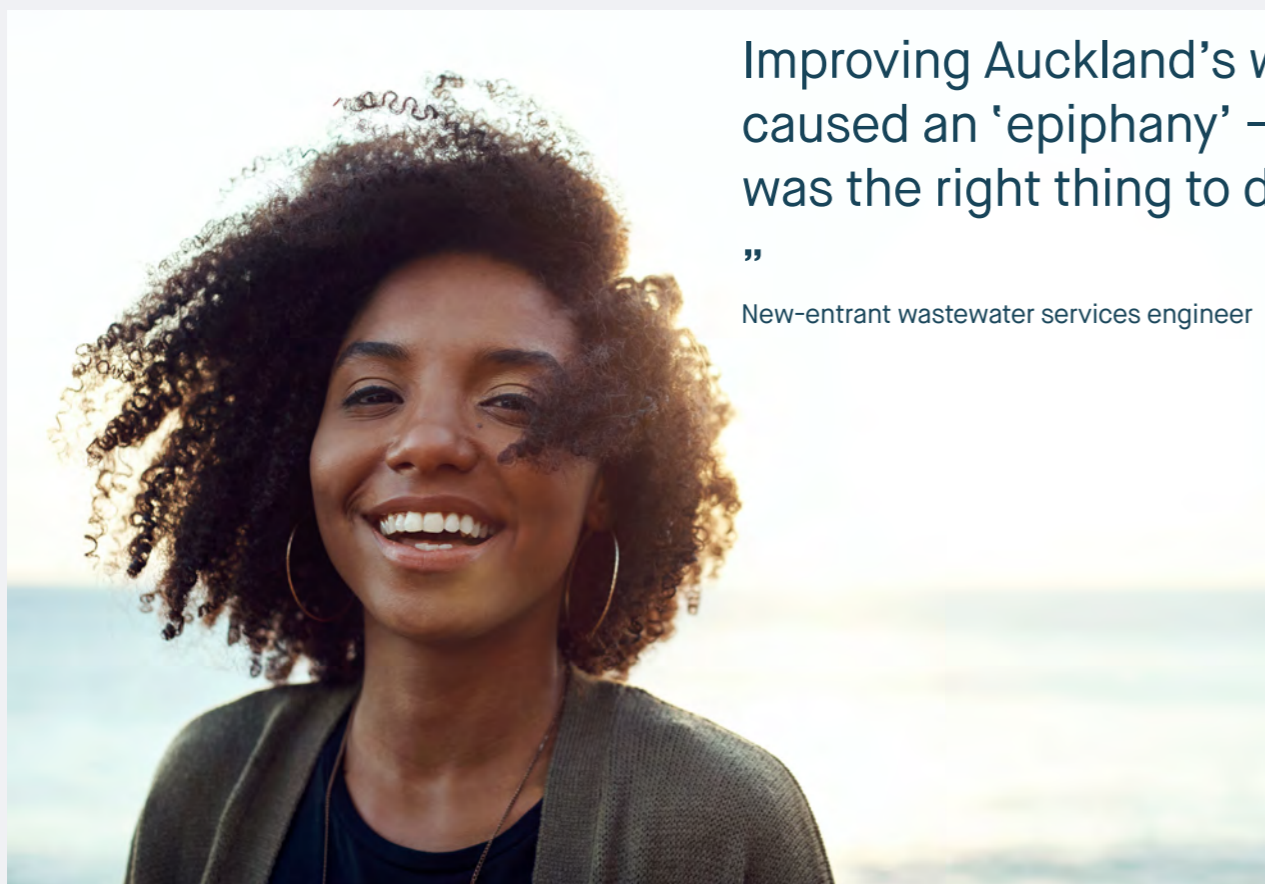
Data source: educationcounts.govt.nz. Data supplied by the Tertiary Education Commission in 2021

Average water engineer graduate’s starting salary: \$64,700
 Average salary after 5 years: \$91,500
 Average salary after 10 years: \$102,000 for independent and \$122,500 to \$180,000 if in management/general management.

Data source: 2020 remuneration survey, Engineering NZ

“
 Water wasn’t a consideration when I first studied. When I experienced it though, it changed my perceptions. I always thought I would be a structural engineer. Then I did a compulsory course called hydraulics. Without it, I would never have gotten into waste water management, because before this you think wastewater means ‘I’m going to be dealing with toilets’. I needed to see how I could transfer my skills into a role in the water industry.
 ”

Wastewater services engineer new entrant



“
 Improving Auckland’s water caused an ‘epiphany’ – that was the right thing to do.
 ”

New-entrant wastewater services engineer

Insight 3: Pathways to water careers

Attracting mature ‘fresh-start’ workers

‘Fresh-starters’ are people seeking to change industry from an existing career outside of the water sector. Fresh-start interviewees looked to the water industry for its perceived stability, job security (of particular importance for new families), cause-drive and environmental promise. In contrast to youth audiences, this group delights at the promise of a stable and fixed career pathway:

“
 I’m 30-something now and I found myself jumping between different roles and different jobs. I needed to find a career that was stable and something that I’m interested in as well.
 ”

New-entrant municipal water operator

Fresh-starters are seeking to cross-transfer their acquired skills and previous life experiences into roles available in the water industry. They offer a diversity of skills opportunity for the water sector and will happily re-skill themselves for water specific roles if offered a sound career path. There is the potential to focus water industry recruitment towards fresh-starters from diminishing sectors and industries with common proficiencies.

Building competency

It takes water operators two to three years of on-site training before they are able to work independently, and an additional two or more years of on-the-job experience to reach 'true competency'. Subsequent progression is often stifled by a lack of standardised specialist training and, in smaller organisations, a lack of capacity for more senior roles. Sector-wide consolidation is needed to streamline skills pathways, and to build transparent competencies at all levels and all roles.

“
There is no talent pipeline. It costs us \$30,000 to put operators through a drinking water diploma, with two years on the job to be competent, and a process engineer needs a degree and three years with a senior engineer before they are competent. It can't scale at the speed the reform will require.
”

Planning and infrastructure group manager at district council



Citycare Water, Auckland

Insight 4: Building competency

Hands-on experience

Enabling new recruits to immerse themselves in real-life work scenarios before heading out into the field was seen as essential to improving retention rates and safely reducing time to competency; the sector is therefore beginning to invest in bespoke training facilities. New Zealand's largest water and wastewater company, Watercare Services Ltd, is designing and building a skills-based, single-site training facility for people working in the operation, maintenance or construction of water and wastewater utilities. Crucially, this includes practical stimulated work environments at all scales, and the ability to set up water maintenance scenarios identical to those encountered in the field. Affiliations have not yet been confirmed, but the intention is for qualifications (up to diploma level) to be transferable.

“
The project vision is to create a state-of-the-art experiential facility for water learning with a hands-on approach, with the core objective of developing skills-based training in operations, construction and support services.
”

Programme Manager, Watercare Training Campus

“
We are building an end-to-end holistic experience for the learner: theory, practical, or whatever they need, with practical simulated work environments.
”

Training programme manager, Watercare



Citycare Water

45%

45% of trainees (across all industries) do not achieve their intended qualification within five years of commencement.

Data source: educationcounts.co.nz
Data supplied by the Tertiary Education Commission in 2020



Citycare Water, Auckland

Insight 4: Building competency

Changing trades

Once people are on water training courses the sector struggles to retain them. We heard that water employees and trainees, looking for careers with better pay and clearer pathways, often transfer to other trades before they become qualified. There is an allure to independent and professional trades, which are perceived as being more desirable: having a higher status, better pay and clear career prospects.

“

We are hearing a lot about trainees transferring to construction because that's where the decent pay is.

”

Industry training lead

“

Water operators are not considered a professional trade, like a plumber or an electrician, and have less perceived mana as a result.

”

Industry executive

“

We need pre-employment training. Otherwise, everything is on-the-job and it's very risky. It's a crash course in wheels, tracks and rollers with health and safety tickets. This sets them up to jump into other trades that pay better.

”

Planning and infrastructure group manager at district council

Insight 4: Building competency

Apprenticeships

Apprentices are industry-situated learners who do substantial training programmes at NZQA Levels 4 or above. NZQA-registered apprenticeship programmes are available in water and wastewater treatment, and pipeline construction and maintenance. The apprentices we spoke with were happy to be working in the field, and saw a benefit of having adequate time and resources to enable them to complete their qualifications. There was disappointment, however, that apprentices who complete early are still required to remain on low apprenticeship rates for the duration of their contract.

“

My apprenticeship was 24 months but I completed it in 8 months. I'm only on the apprentice role because of my contract for 24 months.

”

Water treatment apprentice

Perceptions among school leavers about apprenticeships in general were mixed, with many hesitant to consider them. Some viewed apprenticeships as a way of being paid to learn and avoiding university costs, but most saw them as an entry into dull, repetitive jobs. All had the view that apprenticeships are for trade careers in plumbing, building or electrical.

From an industry perspective, apprenticeships were criticised by some insiders as being 'the only real pathway to getting a water credential', and not adequately situated within larger organisational career paths. Connexis apprenticeships were viewed by some as monopolistic, with no competitive drive to improve and are at risk of 'breeding mediocrity'. The lack of apprenticeships for other roles was also criticised.

“

When we talk about apprenticeships we are only talking about operators. There are a whole lot of other roles, asset managers etc, and there is nothing for them around Three Waters.

”

Water services optimisation specialist

“

We put trainees through Connexis courses. If they are fresh, it's a minimum of 18 months; if not, it's two years before they can do things independently. In the two-year period they are still doing work, but after that they are independent. Real competence takes four to five years.

”

District council water asset manager

Insight 4: Building competency

No progression (hidden and non-standard pathways)

Water is currently managed by 67 councils (or council controlled organisations) with different visions on water priorities, and different ways to define what is important. During our research, we heard that pathways towards and within the sector are stifled due to inconsistent definitions of best practice, and a lack of training standards for specialised roles.

From operator and engineer perspectives, we were told how once competency is gained there are few options for career progression within the water services industry. Also, a lack of ongoing specialist training and poor career continuity often forces employees to shift roles, organisations or sectors.

“

I don't see the role being more than a two-year thing. And that's what my manager said to me as well. At this stage, I don't imagine there's another role to step into.

”

Municipal water services graduate engineer

While there are standard NZQA (Levels 4 and 5) courses available for drinking and wastewater treatment, these do not cover all roles within the industry. The 'in-house' training that is currently provided for specialist roles is not easily transferable, is variable in nature and is potentially a contributor to the quality variation we see in the sector today. From water engineers, we heard there is a need for the industry to facilitate more training options to enhance their understanding of the required body of knowledge to achieve, maintain and further their professional standing in the field.

“

There is a lack of formalised specialist development training in the operations space.

”

Industry association executive

Reform is seen by many as a means to build a more focused industry that can show clear examples of flexible career paths – from new recruits through to specialist, management or executive roles. There is optimism that bringing new regulatory oversight to industry operators (with the appointment of the regulator Taumata Arowai) will trigger progress on the nationwide frameworks that training and industry organisations need to enable them to build tomorrow's water services workforce.

67

Pathways through water careers are inconsistent: water is managed by 67 councils.

“

There is no career path. There is an apprenticeship for operators, but in terms of organisational path there is nothing. Reform is an opportunity to create workforce pathways – without it, we’re buggered.

”

Water services optimisation specialist

“

A lack of clear journeys to competence makes pathways into and across sectors riskier, more nebulous and less attractive to potential employees.

”

Electricity Supply Industry (ESI) Workforce Strategy Report

“

People are leaving councils to make more money as consultants – a good manager in a local authority with an engineering degree will get poached by an engineering firm.

”

Industry executive

Insight 4: Building competency

Employee retention

Despite the sector’s need to enhance career development options, once people establish their careers in water services they are likely to stay; both in New Zealand and abroad, water sees strong sector retention. Many employees stay in the sector for life, and are often driven by an individual purpose that is aligned with sector and community values, and a desire to improve people and the environment. The ability to work anywhere is seen as a retention factor as well, with relocating employees often being able to stay in water careers. There is an opportunity to leverage this positive aspect of the sector towards future workforce initiatives. Conversely, it is also important that prospective employees feel they will have options long term by developing transferable skill sets that can be applied to other industries too.

“

Maintaining a workforce is about aligning organisational and individual purpose, and making it a place where people enjoy working. We have good retention and long service. People tend to stay in the industry.

”

Scottish Water executive

Planning for success

In the face of the need to address a considerable infrastructure deficit, massive workforce competition and ongoing immigration restrictions, there is a significant need for growth in the sector. With many of the most skilled workers retiring in the next decade, succession planning is seen as one of the water industry's biggest challenges. Promoting strong leadership and activating role models at all levels will set a key foundation to long-term workforce engagement and retention.



Citycare Water

Insight 5: Planning for success**Training leaders**

We heard during our research that securing the future of water services depends on building a capacity for positive change. This can be achieved by strengthening representational leadership across the board: from nurturing young recruits with technical leadership potential, to educating politicians, professional board members and business leaders on how to proactively engage with a rapidly changing sector.

With universal values-driven leadership at all levels, the sector will be better placed to make the transition to delivering consistent outcomes. Establishing a new generation of capable, future-focused leaders requires recruits to be influenced by example, with active mentorship key to ensuring new entrants find their sense of belonging and purpose and their own leadership voice.

“

At ages 20–30 I think who is going to be the next team leader? The new operations manager? We need pathways from operations to management roles.

”

Industry association executive

Age profile of water supply workers in 2018

Data source: Water Supply Report, Infometrics/Connexis, 2021

The Three Waters industry is highly deficient compared to the New Zealand workforce’s average within the 15 to 35 age group, and over-represented in the 45+ age group.

Insight 5: Planning for success

Supporting small suppliers

There are an estimated 70,000+ water suppliers in New Zealand, the vast majority of which are small and unregistered. Many such suppliers have reached a point in time where their directors and committee members are ageing and lack a succession plan. Against a backdrop of uncertainty around future compliance and liability (for what is in many cases voluntary work), many are struggling to engage contractors or councils to support with running the day-to-day operations of their water schemes.

During our research, we spoke with many small suppliers who felt “on their own”, with councils failing to provide the technical, educational and in-person monitoring required to update and secure water supply operations for future generations. Supply managers are looking for an easy-to-follow ‘tick box’ action plan to understand how compliance looks, what equipment might be needed, and which skills and competencies they will need to hire in or develop internally.

“

We don’t need money, just the help to do it. Give me a manual and tell me what to do. And a bit in the corner that I can tick when I’ve done it. We miss having ground people to come and check out what we are doing. We’re looking for someone to take us on the journey – there’s plenty of people who will fix pipes, pumps etc., but no compliance and admin people.

”

Water supplier in Central Otago

Insight 5: Planning for success

Ageing industry

The sector’s workforce is ageing with limited succession planning and is struggling to retain sufficient experienced and skilled staff (Water NZ). Many of the water sector’s most skilled staff will retire in the coming decade. Against a tight labour market; a low proportion of highly skilled workers and ever-increasing public expectations on quality of delivery, many facilities do not have adequate succession planning to allow operations to continue at their current state.

“

We do not have any succession plan as most of the directors are in our 60s. We’re struggling with our operations and our scheme has a lot of pending upgrades. We’ve failed to get our operations outsourced to other contractors.

”

Coromandel-based small water supply director

56

Wastewater plants in particular are facing succession challenges: the average age of wastewater workers registered with the Water Industry Operations Group (WIOG) is 56.

Data source: WIOG

STRATEGIC GOALS AND RECOMMENDATIONS

4.0



Strategic Goal 1

Respect Māori interests and knowledge.

Whakautengia ngā whaipānga me te mātauranga Māori.



With a shared governance model that is underpinned by the articles of Te Tiriti o Waitangi, New Zealand’s water sector is entering a new stage of management that incorporates regionalised (and localised) Māori knowledge and oversight. In the spirit of genuine partnership between iwi and hapū and tangata tiriti, it will be necessary to (a) commission iwi- and hapū-led initiatives to oversee all aspects of Te Mana o Te Wai, including strategies for iwi and hapū participation in the workforce, and (b) build wider awareness of the principles of Te Ao Māori and Te Mana o te Wai, particularly among tangata tiriti.

Ko te rāngai wai o Aotearoa e kuhu ana i tētahi huringa hou o te whakahaere e whai wāhi ai ā-rohe te mātauranga Māori me tōna tiakanga. Me mātua whai kia āratakina te rangahau mō tēnei kaupapa e te Māori e taea ai te kauneke whakamua me te whakamānawa i ngā atikara o Te Tiriti o Waitangi.

Recommendations.
Tūtohunga.

- 1. Build understanding of Te Mana o te Wai.**
Whakatupuria te māramatanga ki Te Mana o te Wai.

Raise awareness among tangata tiriti (both within and outside of the sector) to foster a shared understanding of the significance of Te Ao Māori and how it relates to water service management, and what it means to give effect to Te Mana o te Wai.

- 2. Understand new opportunities for iwi and hapū roles and pathways.**
Kia mārama ki ngā whai wāhitanga hou mō ngā kawenga me ngā ara Māori.

Commission iwi- and hapū-led research to understand and shine a light on the types and scale of industry roles needed to give effect to Te Mana o te Wai and how to design sustainable and enduring talent pipelines to train and fill these roles.

- 3. Provide a bridge for rangatahi Māori into existing water roles.**
Whakatūngia he ara e kuhu atu ai te rangatahi Māori ki ngā kawenga wai o te wā.

Commission iwi- and hapū-led research about how to bridge pathways for young Māori into existing water sector roles by designing alternatives to traditional school pathways and making the sector more attractive to Māori.

- 4. Support iwi-led leadership initiatives.**
Tautokona ngā hinonga hautūtanga e kōkiritia ana e te iwi.

Commission iwi- and hapū-led research about how to create pathways and foster workplace cultures that recruit, sustain and retain Māori, and that nurture and advance leadership for Maori at all levels of the water sector and its supporting industries.

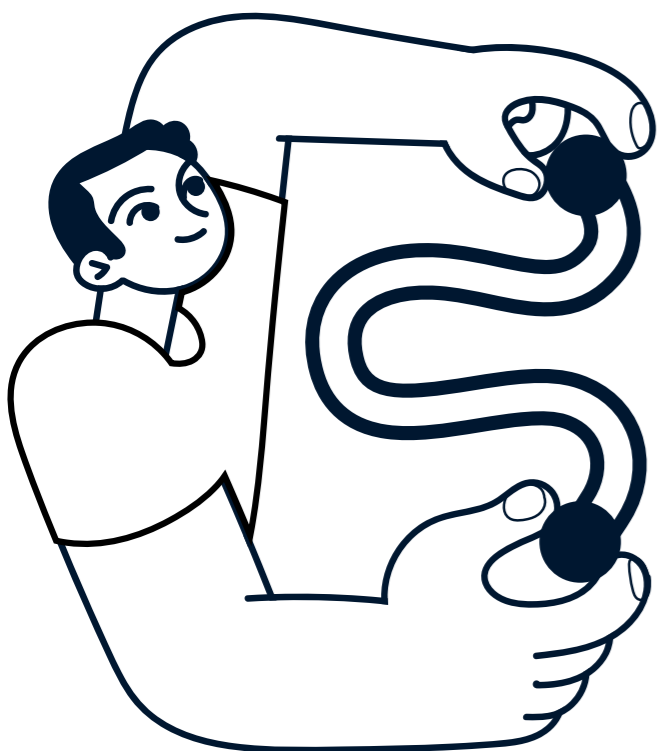
Strategic Goal 2

Create intuitive career pathways.

Whakatūngia he ara umanga rongo ā-manawa.

Industry stakeholders consistently spoke of a need to increase visibility of the water services sector. Like other core infrastructure sectors, many pathways are created through local family connections leading to predictable organic workforce growth over time. Enacting the reform requires a significant step-change in the industry's ability to attract and recruit a diversity of talent in New Zealand.

Hei whakamana i te whakahouanga me whakaatu he panonitanga hira kāore anō kia kitea i roto i te āheinga o te ahumahi ki te kukume mai me te kimi tangata pūmanawa kanorau i Aotearoa.



Recommendations.

Tūtohunga.

5. **Create clear entry points from other sectors.**
Whakaritea he tomokanga mārama i ētahi atu rāngai.

While 'fresh-starters' offer the potential for immediate workforce growth, they are discerning: this audience requires visibility of all roles and career trajectories available within the industry, including a forward view of the workforce's needs of tomorrow. Water roles are changing with technology adoption. Therefore, make entry more flexible by embracing wider skill sets and focusing more on values; fresh-starters that excel in water are seeking careers with security, stability and community stewardship.

6. **Establish focused outreach to schools**
Whakatūngia he toronga arotahinga ki ngā kura

Both youth and 'freedom-seeking' school leavers described their career selection as starting increasingly early in their school careers, with a perception that subject selection has a bearing on their ability to participate in any given industry. They spoke of a desire to participate within the industry from school, where they might gain real job experience while making a meaningful contribution to the industry itself. Focused outreach into schools offers significant potential to encourage the next-generation workforce into the water industry. After schooling, vocational options become far 'noisier' with greater competition for attention and participation.

7. **Tell real stories of life in the industry.**
Kia pūrākau tūturu ngā kōrero o te mataora i te ahumahi.

There is an opportunity to attract long-term employees by matching interest with aptitude through genuine communications that align prospective employees' personal values and interests with those of the sector. Potential industry entrants are seeking to know first-hand about the kinds of activities that happen within water roles. They want to imagine themselves in roles by communicating with real employees and hearing real-life stories.

8. **Find a united industry voice.**
Rapua tētahi reo ahumahi whakakotahi.

People outside of the industry presented mixed perceptions of the water services sector, often only able to describe a limited scope of what is truly on offer. There is an opportunity to build sector awareness and cultivate a positive message of technological, social, cultural and environmental change designed to specifically address fundamental issues faced today. The water industry needs to create a united industry voice that clearly articulates its promise to people outside of it. At its core there is unprecedented potential to be part of history in one of the most significant transformations of our time. The next-generation workforce is waiting to hear this message.

Strategic Goal 3**Design for career progression.****Kia hoahoa mō te kauneke umanga.**

Once inside the industry, career progression and pathways appear to be masked to employees, with recent starters unable to see beyond two years within their chosen career. There seem to be mixed interpretations of the competency frameworks and the diversity of roles and opportunities available inside the industry. There is a positive perception inside the industry that a new level of collaboration is required for successful workforce growth.

He tirohanga huatau nō roto o te ahumahi kia tūria he taumata mahi tahi hou e angitu ai te whanaketanga o te hunga kaimahi.

**Recommendations.****Tūtohunga.****9. Create flexible, consistent pathways.**

Hāngaia he ara tāwariwari, taurite hoki.

Heighten workforce attraction by creating consistent competency journeys that make employees feel valued and that their career is on a purposeful and unbounded trajectory. Make information about existing pathways accessible to everyone by designing concise, industry-wide communication on the breadth of existing sector roles and competency frameworks, then refine and extend competencies across all roles – from trainee to specialist, management and executive roles – in a way that delivers on the authorisations that will be required under the Water Services Act. Encompass technical and non-technical skills, as well as knowledge of Te Mana o Te Wai, and provide targeted career progression for engineers through industry-sponsored initiatives that allow them to further develop their body of knowledge.

10. Develop leadership and mentorship programmes.

Whakawhanaketia he hōtaka hautūtanga me te ārahitanga.

Mentorship activities that link leading water professionals with students and trainees could benefit from further refinement and expansion across the sector. Youth outside of industry are looking for hands-on mentorships that circumvent the current trends in digital training and communication which are seen in other industries and education models. As new roles and employees emerge across the industry, there will be a need to grow the leadership potential of those already involved within the sector. Existing employees will need to be able to share their tacit knowledge and ultimately help lead others to competency. Industry trainers speak of the need to identify leadership prospects early and provide them with pathways and support to develop this potential.

Strategic Goal 4

Design for success.**Kia hoahoa mō te angitu.**

The sector must invest now to secure a workforce of tomorrow that has the skills to roll out transformational change at a national and regional level. Through equitable procurement practices and by investing in local talent pipelines, communities and smaller employers will gain the resources needed to build local, highly skilled workforces. Achieving access to a granular level of visibility on facility and workforce data will help activate a long-term, values-aligned strategy to strengthen recruitment, skills and training throughout the sector and across New Zealand.

Me mātua whai ko tētahi rautaki uara pae tawhiti hei whakapakari i te kimi tangata, ngā pūkenga me te whakangungu huri noa i te rāngai, puta atu ki ngā takiwā katoa o Aotearoa.

**Recommendations.****Tūtohunga.****11. Invest in talent and communities.**

Me tautoko ā-putea, ā-rawa i te pūmanawatanga me ngā hapori.

The water services sector comprises a multitude of relatively small industry providers, each presenting local opportunities for new talent pathways. Supporting employers to commit to workforce growth by allocating funds (regardless of reform) to the talent supply chain and establishing community-level, localised, sustainable workforce development will be a cornerstone for industry prosperity. Increase industry reach by connecting and partnering with influential organisations, such as the Ministry for Pacific Peoples, who are seeking ways to upskill and activate meaningful careers for a young generation of tagata Pasifika.

12. Build trust with small water suppliers.

Whakatupuria te pono ki ngā umanga iti whakarato wai.

There is a growing need to mitigate reform anxiety by providing concise, easy-to-follow support material that helps small water suppliers to understand their part in the journey and how they might meet compliance requirements. These organisations are seeking inclusion and a two-way platform that clearly communicates requirements and builds nationwide visibility on their barriers to compliance. Look to overseas examples to bolster and improve current efforts to build a single, centralised database of all water suppliers, personnel and skills to enable effective management of qualifications, regulations and compliance.

13. Build and leverage data.

Waihangatia he raraunga taketake.

Industry interviews highlighted a desire to enable better visibility and planning by populating a purpose-built, accessible database containing up-to-date information about all water sector employees and their skills. Exemplar frameworks, for example British Columbia's Environmental Operators Certification Program (EOCP), benefit from matching the technical complexity of facilities with levels of operator proficiency through a content management system. Extending such a system to include all sector roles will provide the backbone for the support, training and tools that will further professionalise water careers, will enable activation of the Water Services Act authorisation framework and improve decision-making around successful people management.

14. Create a values driven sector.

Whakatūria tētahi rāngai he uara tōna tūāpapa.

Globally, our research shows that successful water sectors are driven by workforces whose values align with those of the sector as a whole. Sector alignment on shared values is a foundation to building long-term trust, promoting consistent and purposeful communication within the sector, and to selling the experience to those outside it. Positive emotional contracts can be established by promoting (and enacting) values around Te Mana o te Wai, community and environmental stewardship, inclusivity and enjoyable workplaces. Regardless of whether or not employees stay in the industry long term, lifelong ambassadors are created.

Recognising limitations of scope and notes for future considerations

We have endeavoured to gather and accurately represent many and varied perspectives from Māori within the scope and timeframe available; however, we acknowledge there is further Māori-led research needed to realise a deeper and appropriately representative view. This concern is reflected in recommendations two to four.

Emerging technology and future requirements for supporting roles hasn't been a targeted focus area up to this point. Future research should explore ways in which the rollout of specific technological developments will shape the workforce requirements and how digital learning can provide new opportunities for pathways into the sector.

A parallel workstream - Water Workforce Analysis and Modelling - is being commissioned by the Department of Internal Affairs (DIA) to undertake preliminary analysis that identifies the nature and scale of changes that will be required in the Water Sector workforce. This workstream is still in progress at the time of publishing this workforce development strategy. We recommend Phase 3 optimises opportunities to leverage insights and findings between the two projects.

Next Steps

This report completes the second phase of this workforce development initiative. Phase three will see integration with a previously completed workforce development strategy report undertaken for the Electricity Supply Industry (ESI) in 2021. This phase is currently being scoped but will likely involve discovery workshops, empathy interviews, design exploration and prototyping sprints with stakeholders from both industries. The goal is to design and implement specific workforce development solutions that act on selected recommendations from the two reports. The solutions will be shared between the ESI and Three Waters where possible, or otherwise contextualised to each specific industry.

Be a part of the conversation.

We encourage you to read, share and challenge these findings, so together we can help the next generation workforce to succeed.

Funding and leadership

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Representing industries where construction and infrastructure are at the heart of what they do, Waihanga Ara Rau is part of a system-wide change that is tackling the long-term challenge of skills shortages and the mismatch between training provided and the needs of employers.

Contact us to learn more and share your thoughts

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