Aboriginal Communities Water Services Drinking Water Quality

Annual Report 2023-24

WATER CORPORATION

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About this report

Water Corporation's 2023-24 Aboriginal Communities Water Services Drinking Water Quality Annual Report is a review of our performance for the financial year ending 30 June 2024.

This report is designed to provide our customers and the wider Western Australian public with information on the water quality of these services.

Publication of this report allows us to meet the requirements of the Australian Drinking Water Guidelines, our Water Services Licence with the Economic Regulation Authority, our Memorandum of Understanding with the Department of Health and the National Performance Reporting requirements under the National Water Initiative.

This is our first Aboriginal Communities Water Services Water Quality Annual Report; we trust it provides our customers with the information they require about their water services.

Acknowledgement of Country

In the spirit of reconciliation, Water Corporation acknowledges the Traditional Custodians of Country throughout Western Australia and their enduring connections to land, sea and community. We pay our respects to Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

Further information and feedback

For further information about our Aboriginal Communities Water Services water quality or to provide feedback on this report:

- Call us on 13 13 85
- Visit watercorporation.com.au

Acronyms

Acronym	Description
ACWS	Aboriginal Communities Water Services
ADWG	Australian Drinking Water Guidelines
CFU/100ml	Colony forming units per 100 millilitres
DoC	Department of Communities
DoH	Department of Health
ERA	Economic Regulation Authority
KRSP	Kimberley Regional Service Providers
mg/L	Milligrams per litre
MoU	Memorandum of Understanding between Water Corporation and Department of Health on Drinking Water
mSv/year	Millisieverts per year
NgS	Ngaanyatjarra Services
NTU	Nephelometric Turbidity Units
PMM	Pilbara Meta Maya Regional Aboriginal Corporation
REMS	Remote Essential and Municipal Services
RO	Reverse Osmosis
TCU	True Colour Units
TDS	Total Dissolved Solids
UF	Ultra filtration
UV	Ultraviolet

Introduction

On 1 July 2023, responsibility for the management of water services for 137 Aboriginal communities, previously provided through the Department of Communities' Remote Essential and Municipal Services (REMS) program, was transferred to Water Corporation. The REMS service model, asset practices and regulation differed from standard Water Corporation practice. As a regulated water service provider, Water Corporation was appointed to facilitate improved oversight and use its expertise to uplift operations, management, and performance of the Aboriginal Communities Water Services (ACWS) schemes and bring them into alignment with equivalent water services in accordance with the principles of the *National Agreement on Closing the* Gap.

The ACWS program is split into three geographical regions - Kimberley, Pilbara and Mid-West, and Goldfields Central. On-the-ground operation and maintenance of water services is carried out by three contracted Aboriginal-owned regional service providers. Kimberley operations are undertaken by Kimberley Regional Service Providers (KRSP). Pilbara Meta Maya Regional Aboriginal Corporation (PMM) provides services to Pilbara and Mid-West, and Ngaanyatjarra Services (NgS) provides services to Goldfields Central.

At the time of transfer, 88 of the communities were managed to a potable water standard. However these standard services were not consistent with the Memorandum of Understanding between Water Corporation and Department of Health on Drinking Water (MoU) or the Australian Drinking Water Guidelines (ADWG) best management practices as required for existing Water Corporation schemes under its Water Services Licence.[1] Water Corporation has received funding to support routine maintenance, compliance monitoring and reporting for these communities against the ADWG to align operation of these schemes with its existing regulatory commitments.

Another 44 communities, defined as self-managed, have not participated in compliance monitoring or reporting against the ADWG, and we have limited information on assets and operating practices.[2] We aim to gain improved understanding of the risks in the 44 communities and implement a plan to improve public health outcomes.

The remaining 5 communities' water schemes have been incorporated into larger, adjacent schemes (refer to *Where does your water come from*, page 11).[3]

Water Corporation established the ACWS program to manage the provision of water services for these communities. Through this program, we are committed to working collaboratively with the communities, service providers, and government agencies to improve drinking water services using a risk-based approach, as advised by the Department of Health (DoH). Improvements will initially focus on microbiological and acute chemical health risks.

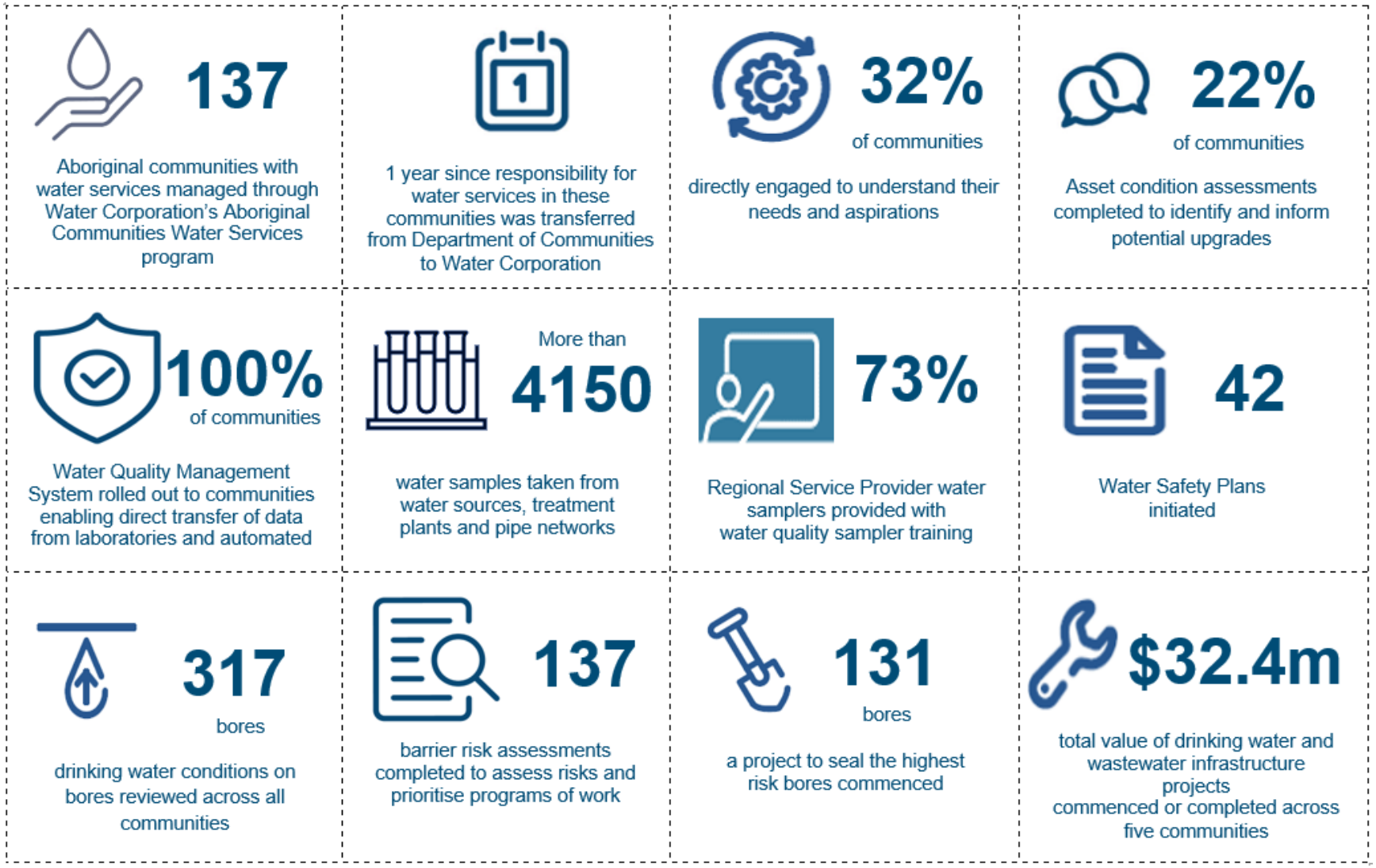
It is our intention over the initial 10 years of the program that the 88 communities, will be transitioned to Water Corporation standard drinking water services.

In the first twelve months since the transfer, Water Corporation has improved monitoring and response to water quality issues including better communications to communities, service providers and regulators. A focus on assessing current infrastructure and risks is informing future investment and planning, laying the foundation for improved water quality across communities.

While we include some information on all these communities, the focus of this report, as required by DoH, is the 88 communities, and their compliance with the ADWG.

[1] Hereafter referred to as the '88' communities.
[2] Hereafter referred to as the '44' communities.
[3] Hereafter referred to as the '5' communities.

Year at a glance



Drinking water quality risk management

The National Health and Medical Research Council define the requirements for safe drinking water in Australia through the ADWG. These guidelines include a 12-element framework for best practice management of drinking water supplies (the Framework) designed to integrate all facets of the drinking water quality management and assurance system (refer to figure 1).

Engagement with Department of Health

The DoH regulates drinking water quality in Western Australia. We have an MoU with the DoH which requires us to work towards continual improvement in implementing the ADWG and the Framework. More specifically, it requires us to comply with the microbiological, chemical health and radiological parameters as specified in the ADWG (refer to *Appendix B – list of sampling parameters*, pages 30-31). This forms part of our Water Services Licence as issued by the Economic Regulation Authority (ERA). Along with the DoH, we recognise the practices and processes used to maintain high levels of drinking water quality need to be transparent to the community.

As the Department of Communities was not required to be licensed by the ERA to provide water services, they were also not required to enter into an MoU with DoH. Consequently, the ACWS communities were not compliant with aspects of our MoU with DoH, Water Corporation asset standards and management practices, or the ADWG. Therefore, it was not considered appropriate for the 137 ACWS communities to be immediately regulated as standard drinking water services under the existing MoU on transfer. Water Corporation and the DoH will work collaboratively to improve the Aboriginal communities' water services to the standard required by the MoU, ADWG, and Water Corporation.

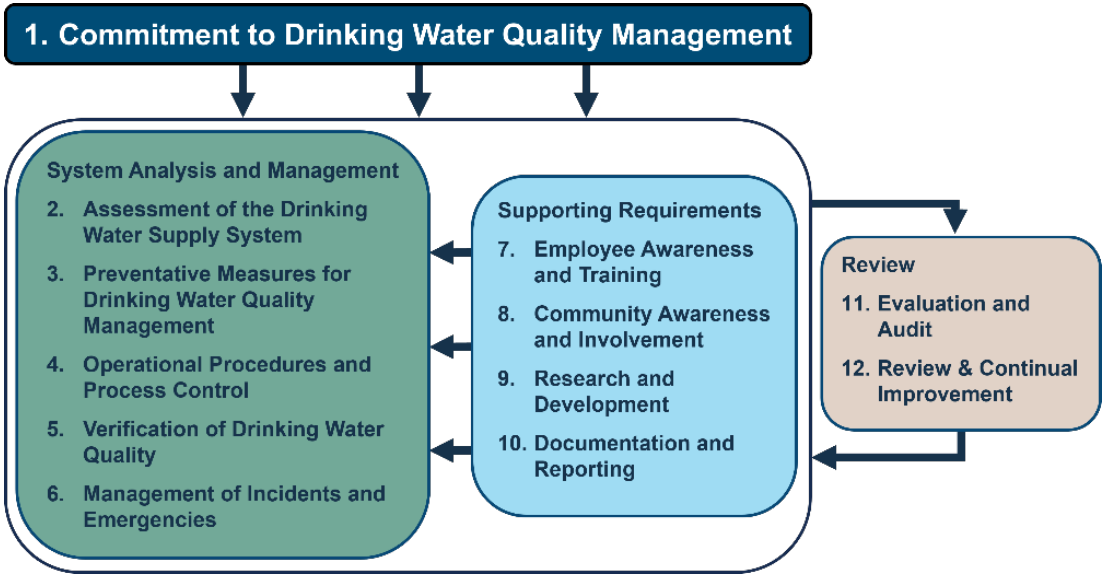


Figure 1: Framework for the management of drinking water quality (ADWG)

Our Commitment

Water Corporation is seeking to implement consistent processes to achieve similar outcomes between existing Water Corporation localities and the ACWS communities.

We are committed to providing our customers with safe, high-quality drinking water that consistently meets the requirements of the ADWG, our customers and other regulatory provisions.

To achieve this, we have partnered with relevant agencies to:

- Manage water quality from water source to water meter and promote confidence in the supply of safe drinking water.
- Incorporate the needs and expectations of our customers, stakeholders, regulators, and employees into our planning.
- Strongly advocate source protection and the primacy of drinking water quality over other land uses.
- Use a risk-based approach to identify and manage hazards and ensure appropriate barriers to protect water quality.
- Routinely monitor our systems and use effective reporting mechanisms to provide relevant and timely information on our performance.
- Use appropriate contingency planning and maintain incident response capability.
- Meet the health-related requirements of the *ADWG and work to progressively improve the aesthetic quality of water supplied.
- Contribute to setting industry regulations and guidelines, and other standards relevant to public health and the water cycle.
- Continually improve our practices by assessing performance against corporate objectives and stakeholder expectations.
- Constantly strive to be a leader in operational training through exploration of visual intelligence technologies to supplement existing face-to-face courses.
- Participate in research and development activities to ensure we continually improve understanding and management of our drinking water supply systems.

We will implement and maintain a drinking water quality management system consistent with the ADWG to effectively manage the risks to drinking water quality. All Water Corporation employees, partners and contractors are responsible for understanding their role in implementing and continuously improving the drinking water quality management and outcomes.

* Water Corporation has standards and scheme requirements that allow us to comply with ADWG. While the assets inherited under the REMS program may not align to a typical Water Corporation standard service, we are working towards consistently meeting the ADWG and fulfilling these commitments in the ACWS. We provide additional water to communities where ADWG health guideline limits are exceeded and provide a water quality advisory, in consultation with the DoH, after a detection of a parameter of health concern or the occurrence of an event that could cause an impact to public health, which is unable to be mitigated immediately.

For further information please refer to our Drinking Water Quality Policy and Drinking Water Source Protection Policy

Improving drinking water quality

Staged over an initial 10 years, Water Corporation will seek to progressively upgrade infrastructure in the 137 Aboriginal communities and improve the management and delivery of services.

Figure 2: The new Djarindjin borefield: Water Corporation General Manager Customer and Community Karen Willis, Djarindjin Heritage Monitor Andrew Sampi, Water Minister Simone McGurk, and Kimberley MLA Divina D'Anna

On transfer many of the existing frameworks and processes that are already in place for managing the existing 251 drinking water localities operated by Water Corporation were able to be applied and deliver higher levels of monitoring and reporting so we can better understand requirements and identify potential improvements.

Water Corporation has initially focused on community engagement as we seek to understand their individual water service needs, experiences, and infrastructure. Engagement has commenced with close to 50 communities.

Physical assessment of the condition of existing water infrastructure has been conducted in more than 30 communities.

Several programs of work have also commenced to address higher-risk water quality issues, and scope and plan more significant, longer-term solutions.

Figure 3: Water Corporation community information day, Ardyaloon

Where does your water come from

All communities, apart from Kalumburu, are supplied from local groundwater sources. Kalumburu is supplied by surface water from Kalumburu River. Due to the presence of elevated metals or inorganic chemicals in the reticulated water supply, some communities receive bottled water to all or part of the community, or drinking water to one kitchen tap. Tables 1 and 3 to 5 show these communities.

Table 1: Communities with an additional water supply

Region	Community	Drinking water
Kimberley	Kadjina [1]	Bottled water - whole community
Kimberley	Munthanmar[1]	Bottled water - whole community
Kimberley	Bow River[1]	Bottled water - children under 9 years
Pilbara - Mid West	Burringurrah[1]	Bottled water - whole community
Pilbara - Mid West	Pia Wadjari[1]	Bottled water - whole community
Pilbara - Mid West	Kiwirrkurra[1]	Bottled water - whole community
Goldfields Central	Tjukurla[1]	Bottled water - whole community
Goldfields Central	Mt Margaret	Kitchen tap only (non drinking water all other taps)
Goldfields Central	Patjarr	Kitchen tap only (non drinking water all other taps)
Goldfields Central	Tjuntjuntjara	Kitchen tap only (non drinking water all other taps)

The 5 schemes that have been incorporated into larger, adjacent schemes are shown in table 2. Although the maintenance of the water assets in these communities is managed individually through the ACWS program, the water delivery, and therefore, the compliance monitoring is managed and reported through the adjacent scheme. For water quality data on schemes incorporated into an existing Water Corporation scheme, refer to the Drinking Water Quality Annual Report and those incorporated into another ACWS community, refer to the data tables for that community in Appendix C.

Table 2: The '5' communities

Region	Community	Drinking water source
Kimberley	Guda Guda	Wyndham [2]
Kimberley	Karmulinunga	Derby[2]
Kimberley	Gilaroong	Bayulu
Kimberley	Girriyoowa	Yiyili
Goldfields Central	Kurrawang	Goldfields and Agricultural Water Supply Scheme[2]

[1] These communities receive ongoing water quality advisories (refer to *Water quality advisories – ongoing*, page 25).
[2] Water Corporation existing scheme.

Communities exceeding the infant health guideline level – nitrate

Seventeen communities are provided bottled water to parents and carers of infants under 3 months of age for preparation of formula, as the water supplied to the community has the potential to exceed the ADWG health guideline for nitrate of 50 mg/L for infants under 3 months of age. The water at all these communities is safe to drink for adults, pregnant women, and children over 3 months of age (refer to *Understanding water quality test results – nitrate*, page 18). This water is distributed by community health clinics, community stores or community leaders.

Table 3: Kimberley communities above ADWG infant health guideline value

Mulan	Pandanus Park	Wanarn

Table 4: Pilbara and Mid West communities above ADWG infant health guideline value

Jigalong	Kunawarritji	Kutkabubba
Wandanooka	Yulga Jinna	

Table 5: Goldfields Central communities above ADWG infant health guideline value

Blackstone	Cosmo Newberry	Jameson
Mt Margaret	Mulga Queen	Patjarr
Tjuntjuntjara	Warburton	Wingellina

A number of these communities have had treatment processes installed which reduce nitrate concentrations in the water supply scheme. To support infant health bottled water will continue to be provided while long-term treatment performance is assessed.

There are an additional four ACWS communities that have nitrate consistently above the ADWG infant guideline value, however they receive ongoing advisories for naturally occurring fluoride or uranium above the ADWG guideline value and receive bottled water for the whole community (refer to *Water quality advisories – ongoing*, page 25).

Multiple barrier approach to drinking water quality management

Preventing contamination and minimising risk is an essential part of providing safe drinking water. The ADWG's guiding principle two states:

> *"The drinking water system must have, and continuously maintain, robust multiple barriers appropriate to the level of potential contamination facing the raw water supply."*

This approach ensures that if one barrier fails, the effective operation of the other barriers will ensure safe drinking water is maintained throughout the water supply.

Barriers, applied from water source to water meter, are:

- Protected catchments and groundwater recharge areas
- Ensuring tanks and bores are sealed to prevent contamination.
- Water treatment.
- Disinfection of water.
- A sealed distribution system and maintenance of chlorine residuals throughout the system.

Water Safety Plans

A water safety plan is a comprehensive risk management document that lays out all scheme information pertinent to the safety of a drinking water scheme, including a detailed schematic of the system showing how it is operated, monitored, and controlled. We aim to complete a water safety plan for each community as we undertake detailed assessments on existing water assets.

Source protection

Source protection is the protection and management of our drinking water catchments as part of a multiple barrier approach to providing safe drinking water to the community. Protecting drinking water at the source minimises the risk of contamination, reducing the level of treatment required before supplying it to the community. Source water protection is a crucial step in ensuring safe, good quality drinking water.

Under the previous REMS program there were no formal areas of protection that were able to guide land management decisions to minimise or avoid potentially polluting land uses and activities close to the water supply. There was also an increased risk of contamination due to inadequate fencing around bores.

Figure 4: Inadequate fencing around bore

We are committed to work collaboratively with DWER to improve source protection within the ACWS communities and have commenced the development of a comprehensive source protection risk assessment. This assessment considers the risks nearby land uses and catchment activities pose to drinking water quality and will recommend measures to prevent drinking water contamination. These risk assessments have already been

useful for prioritising improvement in the physical barriers to a number of groundwater sources in the ACWS program and long-term planning of new water sources

Tanks and bores

On transition the condition of some water infrastructure was not maintained to a condition that provides adequate physical barriers against contamination, for example unsealed bores. Water Corporation has commenced a project to improve bore sealing in 131 bores in 58 communities over the next 2 years.

Under the REMS program, DoC had undertaken several capital works projects to install new tanks and chlorination systems in communities. Water Corporation are ensuring this new infrastructure is maintained to a standard that ensures adequate barriers against contamination are maintained, by working with the regional service providers to implement improved maintenance plans.

Figure 5: Kandiwal elevated tank and chlorination system

Figure 6: Varied bore conditions

Water treatment

The specific water quality of each source dictates the necessity of water treatment and the type of treatment required. Where water comes from groundwater supplied by fully protected catchment areas, very little treatment is required – often just disinfection. In other cases, more intensive treatment processes may be required to ensure the drinking water delivered to every house is safe. From a water safety perspective, water treatment is one of the possible barriers in a multiple barrier approach to the management of our water supplies.

Filtration / Ultrafiltration

Ultra-filtration (UF) treatment is where source water is forced through a membrane. It is designed to remove suspended solids, bacteria, viruses, and other pathogens to produce water with very high purity.

Reverse osmosis

In the Aboriginal communities reverse osmosis (RO) is generally used to remove minerals and impurities from groundwater sources rather than seawater. In general, groundwater is passed through pre-treatment filtration to remove the majority of large and small particles before the filtered groundwater is forced under pressure though semipermeable membranes, which reverses the osmosis process as it occurs in nature. The pores in the membranes are so small that salt, bacteria, viruses, and other impurities are separated from the source water, in essence they act like microscopic strainers. About half of the water that enters the plant becomes drinking water.

Ion Exchange

At Yandeyarra, uranium exists in the groundwater as dissolved, electrically charged particles (ions) above the ADWG health guideline value. Ion exchange is used to reduce the concentration of uranium to below the health guideline value by passing the groundwater through a resin containing non-toxic, electrically charged particles. The uranium ions exchange with the non-toxic resin ions and are removed from the drinking water.

Figure 7: Yandeyarra ion exchange

Disinfection

Disinfection is undertaken to inactivate pathogenic microorganisms, such as bacteria, viruses, or amoebae, that may be in the source water.

Chlorination is the preferred method of disinfection as, when sufficiently dosed, it will inactivate most microorganisms and leave a residual chlorine concentration in the distribution system which can provide ongoing protection.

Ultraviolet (UV) light is used for disinfection in some ACWS schemes. UV light will inactivate pathogenic microorganisms at the dose point; however, it does not have a residual effect, therefore provides no ongoing protection through the distribution system.

Table 6: Communities with advanced water treatment

Region	Community	Treatment	Reason
Kimberley	Kalumburu	UF	Remove larger particulates
Pilbara - Mid West	Kiwirrkurra	UF and RO	UF to remove larger particulates and RO to reduce fluoride and uranium
Pilbara - Mid West	Parnngurr	UF and RO	UF to remove larger particulates and RO to reduce fluoride and uranium
Goldfields Central	Warburton	UF and RO	UF to remove larger particulates and RO to reduce nitrates
Goldfields Central	Mt Margaret [1]	RO	Reduce nitrates in a secondary supply system going directly and only to a drinking water kitchen tap
Goldfields Central	Patjarr [1]	RO	Reduce nitrates in a secondary supply system going directly and only to a drinking water kitchen tap
Goldfields Central	Tjuntjuntjara [2]	RO	Treat brackish (saline) groundwater and reduce uranium in the primary supply system which connects to all taps apart from the drinking water kitchen tap
Goldfields Central	Cosmo Newberry	RO	Reduce nitrates
Goldfields Central	Jameson	RO	Reduce nitrates
Pilbara - Mid West	Jigalong	RO	Reduce nitrates
Pilbara - Mid West	Karalundi	RO	Reduce nitrates
Pilbara - Mid West	Barrel Well	RO	Treat brackish (saline) groundwater
Pilbara - Mid West	Yandeyarra	Ion exchange	Remove uranium ions

[1] Dual reticulation system supplies this community. RO (drinking) water is supplied to a tap in the kitchen. Water supplied to all other taps is not intended for drinking.
[2] Dual reticulation system supplies this community. RO (non-drinking) water is supplied to all taps apart from the drinking water kitchen tap. The RO water is not intended for drinking. A drinking water kitchen tap is supplied from a separate borefield that meets ADWG health requirements.

Understanding water quality test results

Water quality testing continues to be undertaken through the contracts in place at transfer.

The following summaries are intended to assist with interpreting the results presented in Appendix C of this report. Health-related parameters are presented first, followed by aesthetic parameters. Additional information can be obtained by referring to the Fact Sheets contained in the ADWG.

Appendix B contains a list of regularly sampled parameters within functional groups, and their respective health and/or aesthetic guideline values.[1] For the purposes of this report, all data are assessed in relation to the ADWG unless otherwise stated in Appendix B.

Escherichia coli (*E. coli*)

Most human pathogenic microorganisms are found in the gut and faeces of humans and other warm-blooded animals. The bacteria *E. coli* is found in abundance in the intestine of humans and other warm-blooded animals. While most *E. coli* species are not pathogenic to humans, they indicate possible recent contamination by human or animal faecal waste. As it is impractical to test for the presence of all pathogenic microorganisms in water, the ADWG recommends testing for the microbial indicator bacterium *E. coli* to indicate the presence of faecal contamination or pathogenic organisms.

We are working towards implementing a multiple barrier approach in ACWS water supplies (refer to *Multiple barrier approach to drinking water quality management*, page 13) to prevent microbial contamination of water supplies, however, if there is an *E. coli* detection it is immediately addressed to ensure the water supplied is safe.

Thermophilic *Naegleria*

Naegleria are free living amoebae which are almost ubiquitous, being found in fresh water, soils, and sediments. They are not associated with human waste. They grow more freely in waters between 27 and 46°C but may survive for long periods in cyst form in much colder waters and, under certain conditions, may proliferate in pipework and tanks. As they proliferate in warmer water they are referred to as thermophilic or *Naegleria* tolerant to 42°C. This organism is safe to drink but the species *Naegleria fowleri* can cause the disease primary amoebic meningoencephalitis if it enters the body, under pressure, through the nose. Adequate levels of chlorine can control *Naegleria* in water. Any detection of thermophilic *Naegleria* is responded to immediately to ensure the potential risk to public health is managed and to ensure the water supplied is safe.

Burkholderia pseudomallei

Burkholderia pseudomallei, a bacterium which can cause the disease melioidosis, is commonly found in soil and muddy water in tropical regions and can survive for prolonged periods. Melioidosis is endemic in northern Australia and, although generally a tropical illness, it has been detected in the southwest of Western Australia. Infection usually results from contact with soil or surface-accumulated water (muddy water). Most infection appears to be through skin cuts or abrasions; however, infection may also occur via other routes, particularly through inhalation or ingestion. Exposure to environmental *B. pseudomallei* after heavy rainfall presents the greatest risk, however there is also a risk of exposure through inadequately treated potable water. Maintaining an adequate chlorine residual and sealing the distribution system should eliminate the risk of *B. pseudomallei* in the water supply.

[1] ADWG defines these as the concentration or measure of a water quality characteristic that, based on present knowledge, either does not result in any significant risk to the health of the consumer (health guideline), or is associated with good quality water (aesthetic guideline value).

Fluoride

Fluorine is one of the most abundant elements in the Earth's crust and is typically found as the fluoride ion or as organic or inorganic fluoride compounds. It is found naturally in groundwater supplies and is present in most food and beverage products and toothpaste. Fluoride is added to the water supplies of many cities and towns across the world. In Western Australia, fluoridation of community water supplies is regulated by the Fluoridation of Public Water Supplies Act 1966, which is administered by DoH. The Fluoridation of Public Water Supplies Advisory Committee oversees fluoridation and makes recommendations to the Minister for Health who may issue or rescind directives as appropriate. No water supply in the ACWS currently has a directive to provide fluoridation. The ADWG health guideline value is 1.5 mg/L. There are three ACWS communities that have naturally occurring fluoride above the ADWG guidelines, these communities are provided bottled water, for the whole community or children under 9 years of age, for drinking and cooking purposes (refer to *Water quality advisories – ongoing*, page 25).

Nitrate

In Western Australia, elevated nitrate concentrations are usually due to the natural process of plant decay that has occurred underground over geological time. Some agricultural practices have also led to elevated nitrate concentrations of underlying groundwater. The ADWG specify a health guideline for nitrate of 50 mg/L (as nitrate) for formula-fed infants less than three months old and a guideline of 100 mg/L (as nitrate) for adults and children over three months old. Health effects due to elevated nitrate concentrations in drinking water are very rare and no issues have been recorded in Western Australia.

Four communities with elevated nitrates also have elevated fluoride or uranium. These communities have ongoing water quality advisories (refer to *Water quality advisories – ongoing*, page 25) and receive bottled water to the entire community for drinking and food preparation.

There are 17 other communities that have the potential to exceed the infant guideline value for nitrate (refer to *Communities exceeding the infant health guideline level – nitrate*, page 12) this water does not exceed the adult health guideline value and is safe to drink for adults, pregnant women, and children over 3 months of age. Water Corporation provides bottled water for preparation of formula for infants under 3 months of age. The bottled water is distributed by community health clinics, community stores, or community leaders.

Radium-226 and 228

Radium is a naturally occurring radioactive element that is present in varying amounts in rock and soils in the earth's crust. It is formed when uranium and thorium, both abundant in Australia, undergo radioactive decay producing isotopes, of which Radium-226 and 228 are the two most significant in terms of radiological health.

In drinking water supplies derived from groundwater sources, radium-226 and radium-228 concentrations vary considerably depending on the minerology of the aquifer and the chemical and physical processes occurring during its movement within the aquifer.

The radiological activities of these two isotopes are used to calculate the Annual Radiation Dose of the drinking water supply. The ADWG specifies that if the Annual Radiation Dose from drinking water exceeds the reference value of 1 mSv/year then water supply providers and the relevant regulatory authority should assess results and examine options to reduce the levels of exposure.

Australia has adopted an operational dose level of 0.3 mSv/year. If the Annual Radiation Dose from a drinking water exceeds the operational dose value, then routine monitoring may be increased.

Uranium

Uranium is a heavy metal which occurs in most rocks, soils, and water. It is almost always found combined with other elements and is as common

in the earth's crust as tin or about 40 times more abundant than silver. Australia has about 28 per cent of the world's recoverable uranium reserves.

Australian drinking water supply concentrations are generally less than 0.002 mg/L but have been recorded up to 0.12 mg/L in some remote areas (ADWG 2011). The ADWG health guideline value is 0.02 mg/L, based on its chemical toxicity, which is more limiting than its radiological toxicity.

There are two ACWS communities that have naturally occurring uranium above the ADWG guidelines, these communities are provided bottled water for drinking and cooking purposes (refer to *Water quality advisories – ongoing*, page 25).

Alkalinity (as calcium carbonate)

Alkalinity is a measure of the parameters in water that have acid-neutralising ability, typically expressed in mg/L of equivalent calcium carbonate. Alkalinity can be affected by naturally occurring minerals or water treatment chemicals. Sufficient alkalinity, in conjunction with other parameters, is important to managing the corrosivity of water. There are no aesthetic or health considerations for alkalinity, therefore the ADWG do not provide a guideline value.

Aluminium (acid-soluble)

Acid-soluble aluminium in water primarily originates from the addition of coagulants such as aluminium sulphate or poly-aluminium chloride in the water treatment process. These coagulants are added to aid the removal of constituents that impart colour and particulate matter that causes turbidity. Aluminium can accumulate in pipe sediments and be re-suspended during periods of rapid changes to flow patterns. The ADWG specify an aesthetic guideline of 0.2 mg/L. No health guideline is set.

Chloride

Chloride is present in natural waters from the dissolution of salt deposits. In surface water, the concentration of chloride is typically less than 100 mg/L while groundwater can have higher concentrations, particularly if there is saltwater intrusion. In Australian drinking water supplies, chloride levels range up to 650 mg/L depending on local water source characteristics.

Chloride is essential for humans and animals. It contributes to the osmotic activity of body fluids. Based on aesthetic considerations, the chloride concentration in drinking water should not exceed 250 mg/L (ADWG).

Hardness (as calcium carbonate)

Hardness is caused by the presence of dissolved calcium and magnesium in water. Hard water requires more soap to obtain lather and can also cause scale to form on hot water pipes and fittings. It can also be an important issue to consider when purchasing appliances, such as dishwashers. The ADWG specify an aesthetic hardness guideline of 200 mg/L.

Table 7: ADWG guidance – Degrees of hardness

Hardness (mg/L)	Properties
< 60	Soft and possibly corrosive (depends on pH, alkalinity, and dissolved oxygen concentration)
60 – 200	Good quality for all domestic uses
200 – 500	Will increase scale formation
> 500	Will cause a high-level scaling

Iron

Iron occurs naturally in water from contact with iron-containing soil or rock in the catchment. It can accumulate in pipe sediments and be re-suspended during periods of rapid changes to water flow patterns.

Elevated concentrations cause discoloured water and can stain laundry. The ADWG specify an aesthetic guideline of 0.3 mg/L, though we aim to manage below this guideline value due to customer impacts.

Manganese

Manganese in water can come from contact with manganese-containing soil or rock in the catchment. It can accumulate in pipe sediments and be re-suspended during periods of rapid changes to water flow patterns.

Elevated manganese can make water look black and stain laundry. The ADWG specify an aesthetic guideline of 0.1 mg/L, though we aim to manage below this guideline due to customer impacts. Manganese also has a health guideline value of 0.5mg/L. For further information regarding guideline levels for other metals relevant to drinking water, refer to *Appendix B – List of sampling parameters*, page 30.

pH

pH is a measure of water acidity (pH 7 is neutral). The ADWG specify a lower and upper aesthetic value of 6.5 and 8.5, respectively, based on the need to reduce corrosion and scale build-up within pipes and fittings. The guidelines allow for a pH of up to 9.2 for new concrete tanks and cement-lined pipes, which can significantly increase the pH for a short period of time. Elevated pH is often caused by calcium carbonate leaching from the protective cement lining of the pipes after long transit times. Where low pH is experienced, it is typically a consequence of the source characteristic rather than the influence of treatment; however, in four communities low pH is a result of RO treatment.

Silica

In Australia, dissolved silica (SiO_2) can range between 0.6 mg/L in some surface waters to 110 mg/L in ground waters. Dissolved silica can precipitate on some surfaces forming a white residue. In cases where customer complaints occur due to scale build-up, water hardness and silica concentrations are often identified as the primary cause. There are no adverse health considerations associated with silica in drinking water, but to minimise scale build-up on surfaces silica should not exceed 80 mg/L (ADWG).

Sodium

Sodium is widespread in water due to the high solubility of sodium salts and the abundance of mineral deposits. In major Australian reticulated supplies, sodium concentrations range from 3 mg/L to 300 mg/L. While sodium is essential to human life, there is no agreed minimum daily intake level. Based on aesthetic considerations, the concentration of sodium in drinking water should not exceed 180 mg/L (ADWG).

Sulfate

The presence of sulfate in groundwater is due to natural leaching from sulfate containing rocks. In major Australian reticulated supplies, sulfate concentrations range from 1 mg/L to 240 mg/L. The taste threshold for sulfate is 250-500 mg/L. Based on aesthetic considerations, the concentration of sulfate in drinking water should not exceed 250 mg/L (ADWG).

Total Dissolved Solids

Total dissolved solids (TDS) is the mass of all filterable substances in water and comprises of salts, such as calcium, magnesium, potassium, sodium bicarbonates, chlorides, and sulphates, as well as small amounts of organic matter that dissolve in water.

Water with low TDS can taste flat, while water with high TDS tastes salty and causes scaling in pipes, fittings, and household appliances. The ADWG provide guidance on the palatability of drinking water according to TDS concentration, as shown in Table 8.

Table 8: ADWG guidance – TDS concentration and drinking water palatability *(The ADWG guideline of 600 mg/L is based on taste).*

TDS (mg/L)	Palatability
0 – 600	Good quality
600 – 900	Fair quality
900 – 1200	Poor quality
> 1200	Unpalatable

True colour

Colour in water originates mainly from natural materials, such as organic matter and minerals, following water drainage through soil and vegetation in a catchment. Corroding metal pipes can also discolour the water, with iron producing a brownish colour and copper a faint blue colour. The ADWG specify an aesthetic guideline of 15 Hazen Units. Water Corporation measures true colour in True Colour Units (TCU) which are numerically identical to Hazen Units. As a guide, 15 TCU is just noticeable in a glass of water.

Turbidity

Turbidity is the cloudy appearance of water caused by the presence of suspended particulate matter. The ADWG specify an aesthetic guideline of 5 Nephelometric Turbidity Units (NTU) which is just noticeable in a glass of water. There are three ACWS communities that have elevated turbidity, due to iron and manganese in the source, that may interfere with the effectiveness of disinfection and therefore, receive ongoing water quality advisories (refer to *Water quality advisories – ongoing*, page 25).

Monitoring, incident management and drinking water quality performance

Compliance monitoring

Water quality test results for the 88 are summarised and compared to the ADWG health and aesthetic guideline values, in Appendix C. Communities with non-drinking water provisions are shown in separate tables.

Verification monitoring

Water Corporation run an extensive drinking water quality monitoring program to confirm the safety of the water provided. In 2023-24, more than 4150 water samples were taken from water sources, treatment plants, and pipe networks which supply our Aboriginal communities. Tests were performed by our contracted analytical laboratories. Compliance monitoring for the 88 are shown in the tables in Appendix C.

Water quality incidents

Water Corporation are working towards implementing a multiple barrier approach to managing risk (refer to *Multiple barrier approach to drinking water quality management*, page 13), which provides fail-safes to prevent potentially unsafe drinking water reaching our customers. If a barrier fails, it will initiate an incident, enabling rapid resolution of the failure and provision of learnings to aid in prevention of a recurrence across all schemes.

On transfer, many assets and operating practices did not meet our standards of barrier protection, including barriers not in place or not robust and prone to failure. Due to this, we may issue a public water quality advisory when a barrier fails.

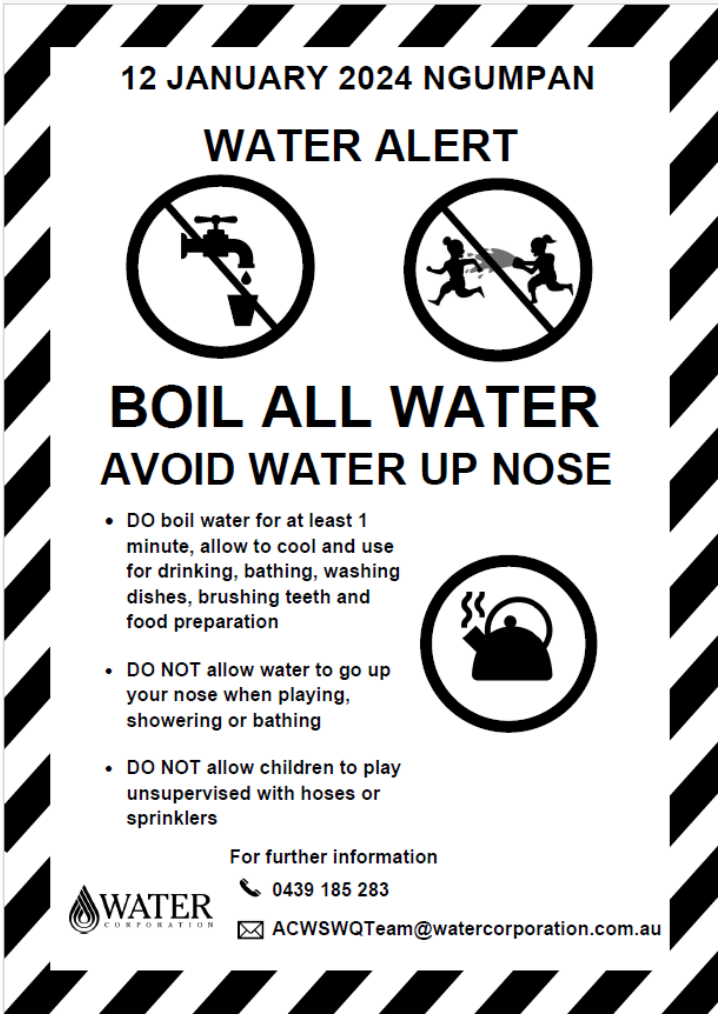
Water quality advisories

A public water quality advisory is an announcement advising customers that the drinking water supply may not be safe and recommended actions to take.

Water Corporation may issue a water quality advisory, in consultation with Department of Health, after a detection of a parameter of health concern or the occurrence of an event that could cause an impact to public health which Water Corporation and the regional service provider are unable to mitigate immediately. Water Corporation will issue the advisory when the problem has been identified. The advisory will be lifted, in consultation with Department of Health, once once all operational actions have been completed to repair any faults or institute additional mitigating barriers, any potentially contaminated water has been flushed from the water supply system and the water is proven to be safe.

Advisories are issued to key community contacts, Aboriginal Health Services, local councils, schools, and/or health clinics. The advisory will describe what actions community members are recommended to undertake to ensure they are safe. Actions can include, but are not limited to:

- Boil water prior to use.
- Avoid getting water up the nose.
- Cover open wounds when bathing.
- Not to use water for drinking or food preparation.
- Not to use water for preparation of formula for infants under 3 months of age.



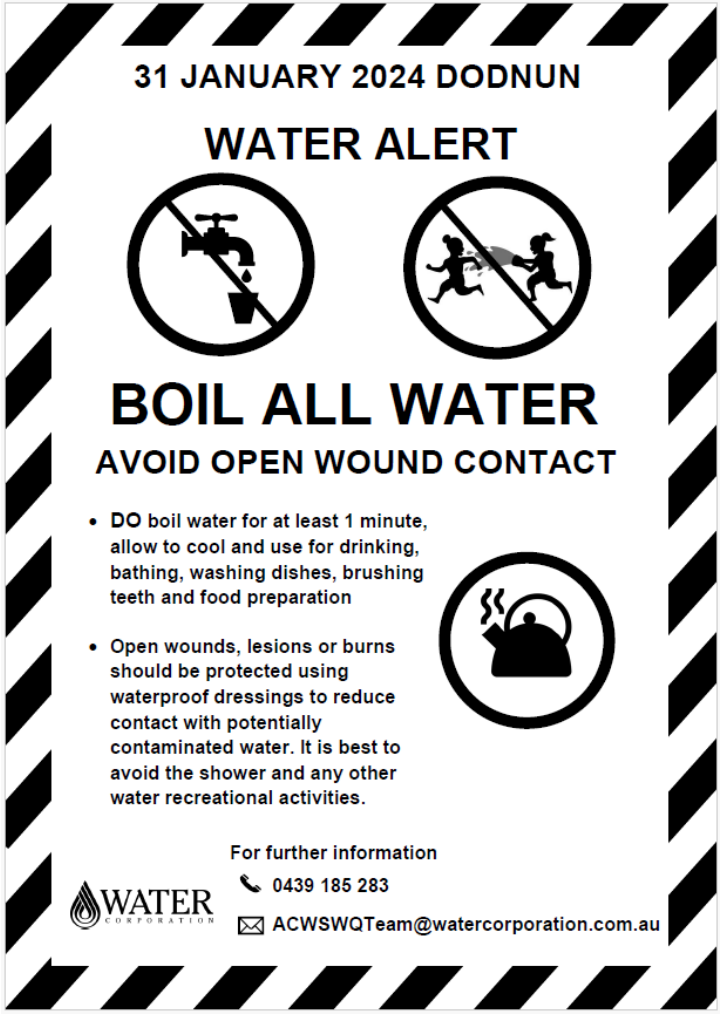


Figure 8: Examples of Water Quality Advisories

Water quality advisories – temporary

The following communities received temporary advisories due to detections of potentially pathogenic microorganisms:

Table 9: Temporary advisories due to detections of potentially pathogenic microorganisms

Region	Community	Advisory type	Date
Kimberley	Kundat Djaru	Thermophilic *Naegleria*	08/08/2023
Kimberley	Ngumpan	*E. coli* and Thermophilic *Naegleria*	12/01/2024
Kimberley	Dodnun	*Burkholderia Pseudomallei*	31/01/2024
Kimberley	Kalumburu	*E. coli*	27/02/2024
Kimberley	Jimbalakadunj	Thermophilic *Naegleria*	30/01/2024
Goldfields Central	Tjirrkarli	Thermophilic *Naegleria*	10/05/2024

Water Corporation and the regional service providers undertook corrective actions to ensure any potentially contaminated water was removed from the water supply systems and that sufficient barriers were in place to deactivate pathogenic microorganisms. These advisories were rescinded after response samples taken from the water supply systems were free from detections. Examples of these advisories are shown in Figure 5.

The following communities received temporary advisories due to treatment failures or other events that compromised the disinfection of the water supply systems:

Table 10: Temporary advisories due to events that may compromise disinfection

Region	Community	Advisory type	Date
Kimberley	Wangkatjungka	Water Supply System Security Breach	06/10/2023
Pilbara - Mid West	Punmu	Event of Public Health Significance – emergency water carting	21/09/2023
Pilbara - Mid West	Barrell Well	Event of Public Health Significance – planned power outage	11/02/2024
Kimberley	Kundat Djaru	Event of Public Health Significance – use of emergency bore	03/01/2024
Goldfields Central	Mulga Queen	Primary Chlorination Failure	07/03/2024
Kimberley	Kundat Djaru	Event of Public Health Significance – use of emergency bore	11/03/2024

Water Corporation and the regional service providers undertook corrective actions to ensure any potentially contaminated water was removed from the water supply systems and restore the barriers to deactivate pathogenic microorganisms. These advisories were rescinded after the corrective actions were completed and barriers confirmed to be operating as intended.

Water quality advisories – ongoing

The following communities receive ongoing advisories due to elevated concentrations of health-related parameters that occur naturally in the source water, or elevated turbidity from iron and manganese in the source water, which can interfere with disinfection of the water supply.

Table 11: Ongoing advisories due to elevated metals or inorganic chemicals

Region	Community	Parameter
Kimberley	Bow River	Fluoride
Pilbara - Mid West	Burringurrah	Uranium and nitrate
Pilbara - Mid West	Kiwirrkurra	Fluoride and nitrate
Pilbara - Mid West	Pia Wadjari	Uranium and nitrate
Goldfields Central	Tjukurla	Fluoride and nitrate

Water Corporation provides bottled water to all community members, except Bow River where it is supplied to children under 9 years of age, for drinking and food preparation until a new source can be identified or a treatment process is installed. Nitrate in these community water supplies, except Bow River, exceed infant health guideline value. Refer to *Understanding water quality test results*, page 18), for more information.

Table 12: Ongoing advisories due to elevated turbidity

Region	Community	Parameter
Kimberley	Dodnun	Turbidity
Kimberley	Kadjina	Turbidity
Kimberley	Munthanmar	Turbidity

Water Corporation advises community members to boil all water prior to drinking and food preparation and avoid getting water up the nose. Water Corporation also provides bottled water to all community members in Kadjina and Munthanmar for drinking and food preparation.

Planning is being undertaken for improvement initiatives to these communities and will be implemented across the 10-year program.

Appendix A - Maps of ACWS regions

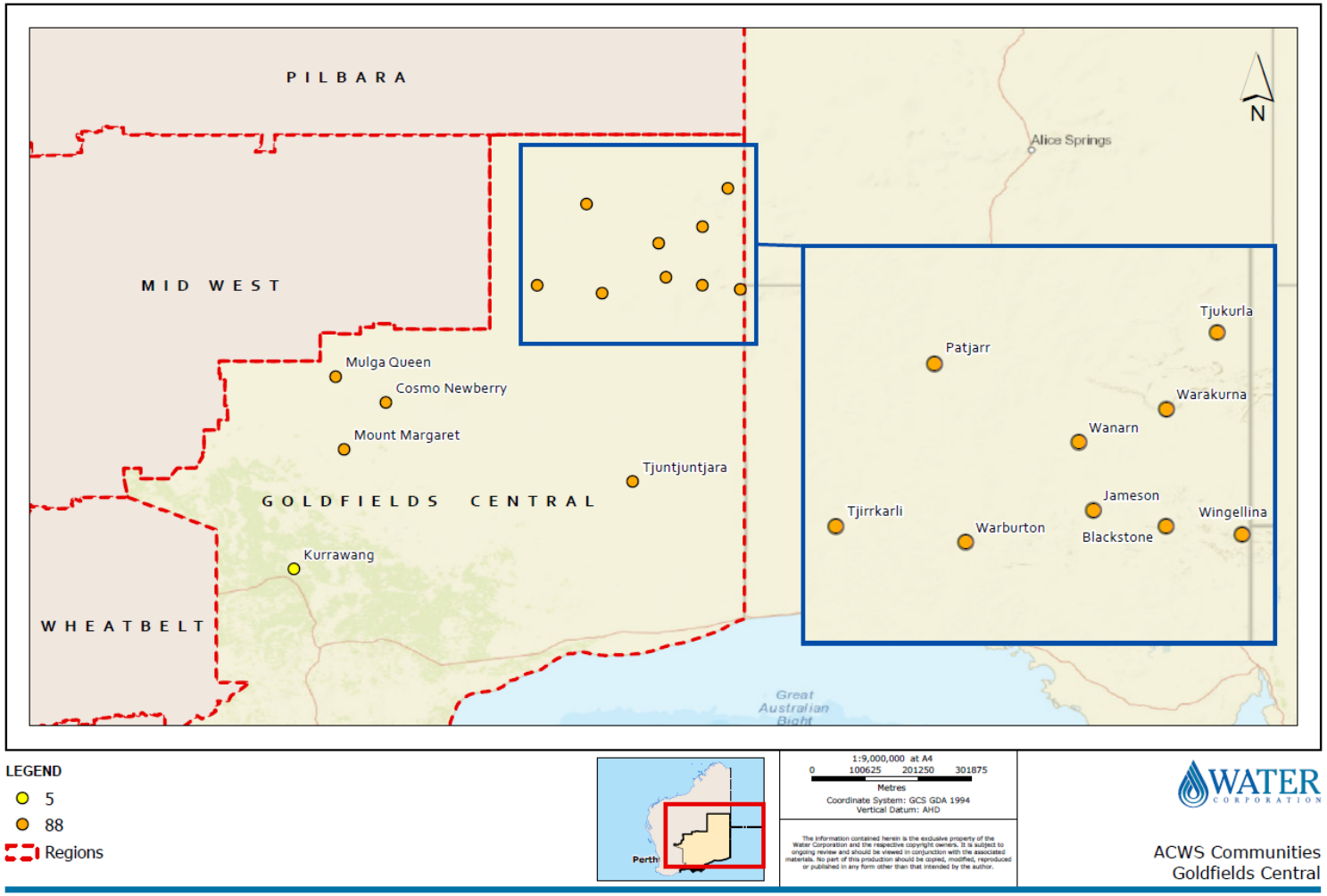


Figure 9: ACWS – Goldfields Central

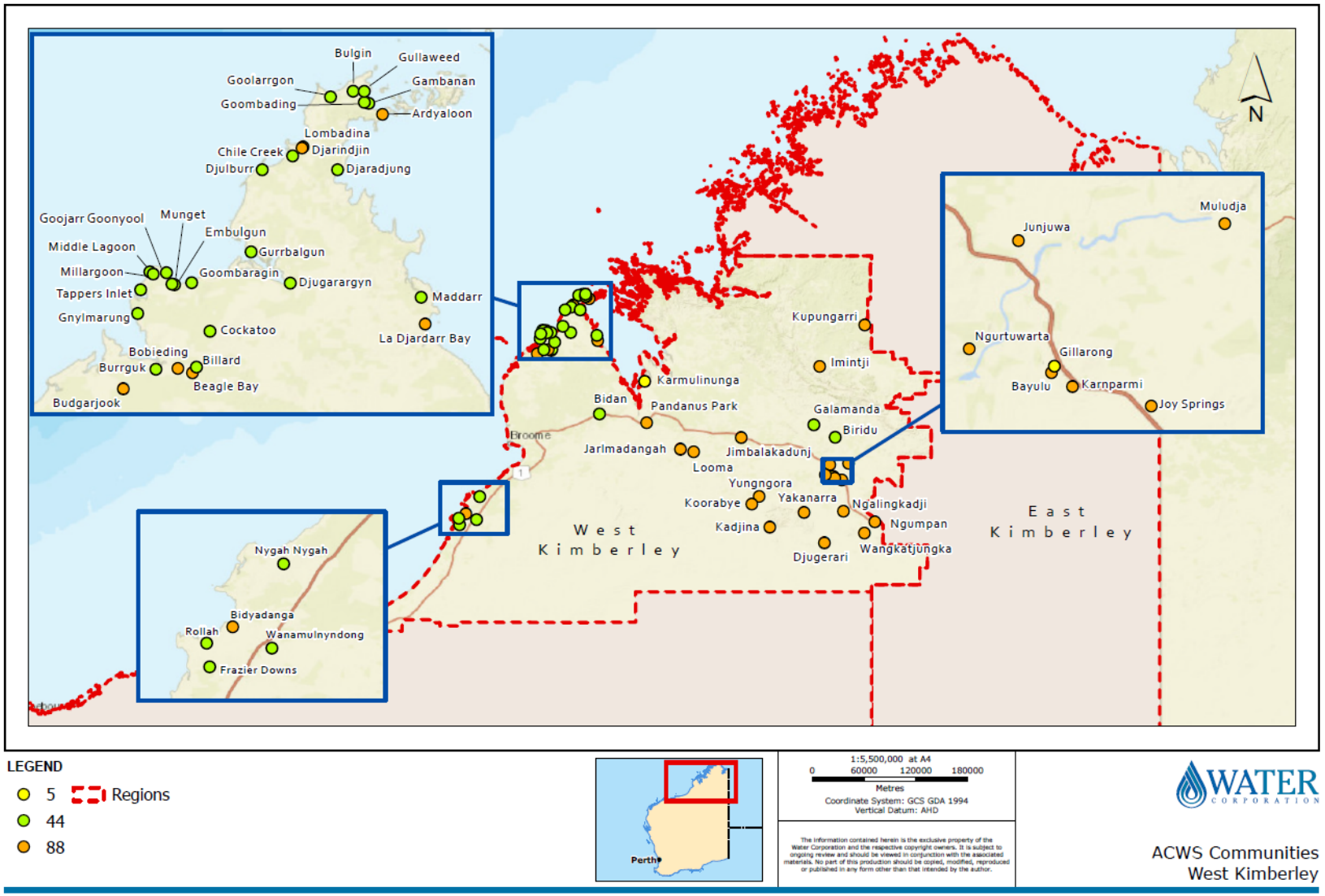


Figure 10: ACWS – Kimberley - West

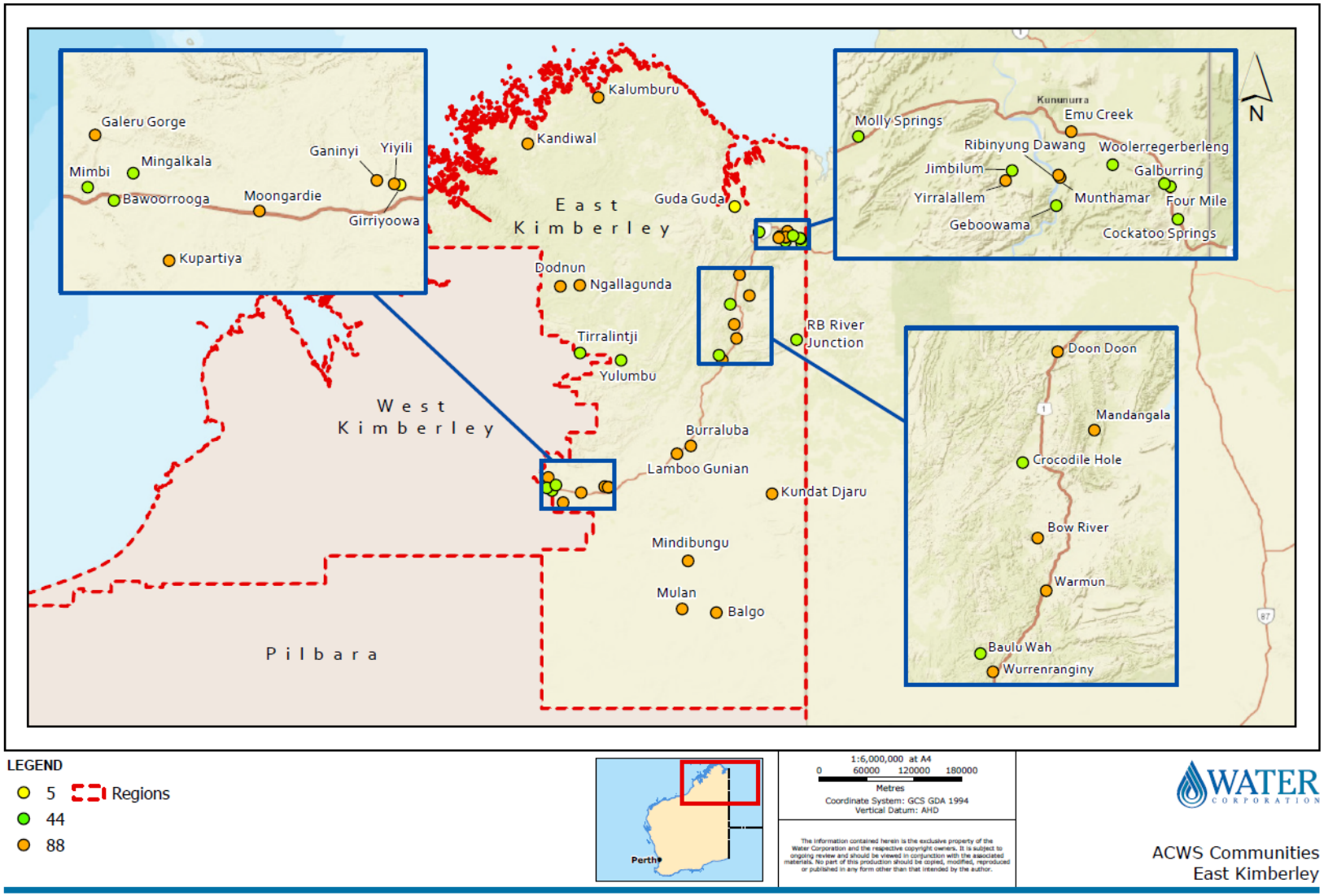


Figure 11: ACWS – Kimberley - East

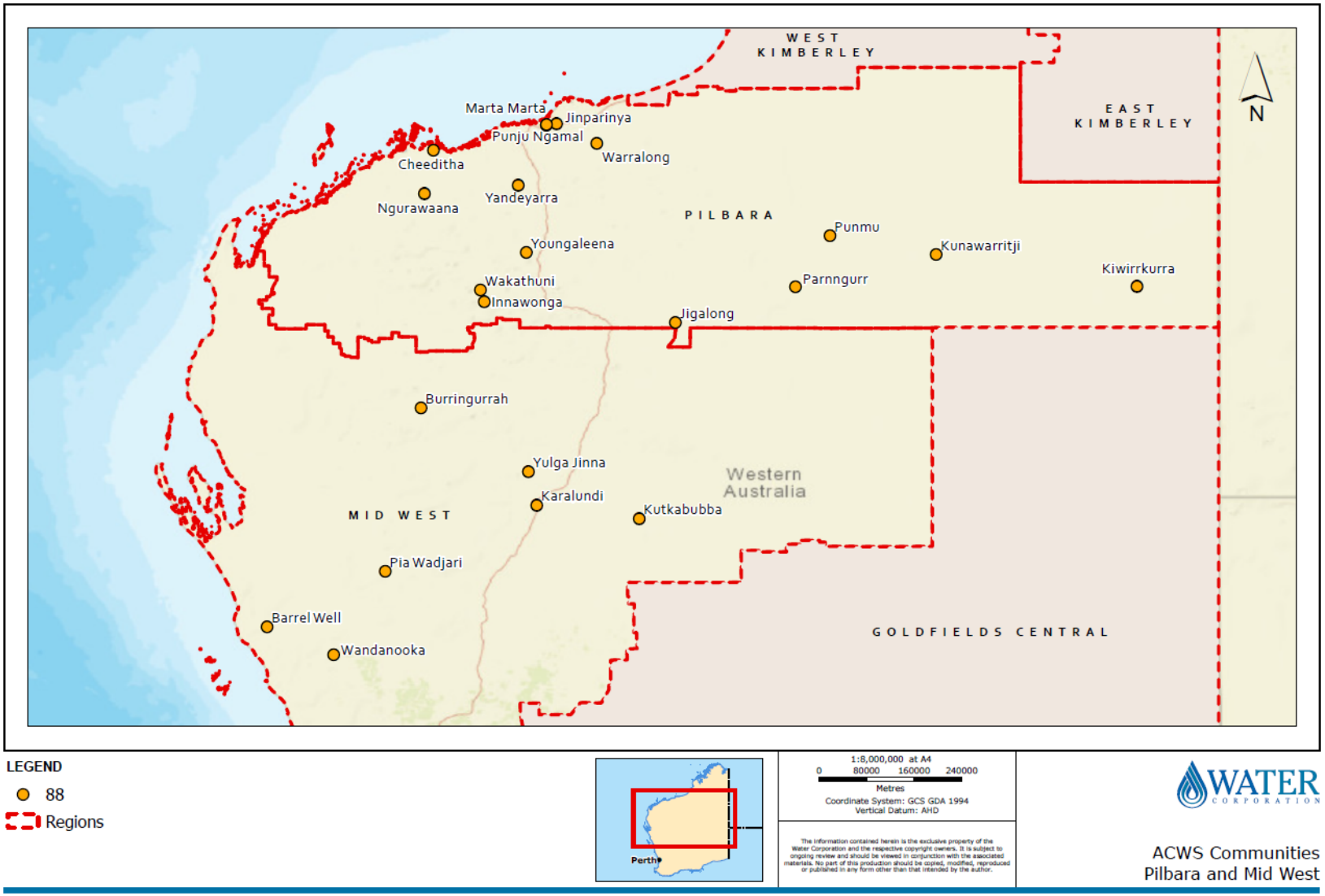


Figure 12: ACWS – Pilbara and Mid West

Appendix B – List of sampling parameters

Table 13: Sampling parameters – microbiological

Organism	Health Guideline Value
Escherichia coli	0 organisms per 100 ml
Naegleria tolerant to ≤ 42°C	No sample should contain *Naegleria fowleri* [1]
Burkholderia Pseudomallei	No sample should contain *Burkholderia Pseudomallei* [2]

Notes:

[1] Guideline set by DoH in Schedule 1 of the MoU - ADWG has not set a guideline value for this organism.

[2] Guideline as directed by DoH. Sampling only required in Kimberley communities where chlorine residual is not maintained.

Table 14: Sampling parameters – inorganic chemicals

Chemical	Health Guideline Value (mg/L)	Aesthetic Guideline Value (mg/L)
Chloride	Not set	250
Fluoride	1.5	Not set
Nitrate [3]	50	Not set
Silica	Not set	80
Sodium	Not set	180
Sulfate	Not set	250

Notes:

[3] Nitrate health guideline is for bottle-fed infants < 3 months of age. The health guideline for adults and children > 3 months is 100 mg/L.

Results should not exceed the health guideline value.

Table 15: Sampling parameters – metals

Metal	Health Guideline Value (mg/L)	Aesthetic Guideline Value (mg/L)
Aluminium (acid soluble aluminium) [4]	Not set	0.2
Antimony [3]	0.003	Not set
Arsenic [3]	0.01	Not set
Barium [3]	2	Not set
Beryllium [3]	0.06	Not set
Boron [3]	4	Not set
Cadmium [3]	0.002	Not set
Chromium (as Cr[VI]) [3]	0.05	Not set
Copper [3]	2	1
Iron [2]	Not set	0.3
Lead [3]	0.01	Not set
Manganese [4]	0.5	0.1
Mercury [3]	0.001	Not set
Molybdenum [3]	0.05	Not set
Nickel [3]	0.02	Not set
Selenium [3]	0.01	Not set
Silver [3]	0.1	Not set
Uranium [4]	0.017	Not set
Zinc [3]	Not set	3

Notes:

[3] These metals are shown as a group in the 'Metals' column of the summary of water quality test results (refer to *Appendix C*)

[4] Aluminium, iron, manganese, and uranium are individually listed in the summary of test results tables.

Results should not exceed the health guideline value.

Table 16: Sampling parameters – radiological

Parameter	Reference Value
Radium 226 & 228	1.0 mSv/yr (millisieverts per year)

Note:

As per ADWG, those communities with Annual Radiation Dose rates below the operational guideline of 0.3 mSv/year require routine monitoring every two years for groundwater supplies and five years for surface water supplies. Those communities above the operational guideline may need more frequent monitoring.

Table 17: Sampling parameters – physical characteristics

Characteristics	Health Guideline Value	Aesthetic Guideline Value
Alkalinity	Not set	Not set
Hardness as $CaCO_3$	Not set	200 mg/L
pH	Not set	6.5 – 8.5
Total dissolved solids	Not set	600 mg/L
True colour	Not set	15 TCU
Turbidity	Not set	5 NTU

Notes:

TCU = True colour units.

NTU = Nephelometric turbidity units.

Appendix C – Summary of water quality test results

Kimberley

Health-related Tables 1 and 2

Aesthetic Tables 3, 4 and 5

Non-drinking water supplied – Health-related Tables 6 and 7

Non-drinking water supplied – Aesthetic Tables 8, 9 and 10

Pilbara and Mid West

Health-related Tables 11 and 12

Aesthetic Tables 13, 14 and 15

Non-drinking water supplied – Health-related Tables 16 and 17

Non-drinking water supplied – Aesthetic Tables 18, 19 and 20

Goldfields Central

Health-related Tables 21 and 22

Aesthetic Tables 23, 24 and 25

Non-drinking water supplied – Health-related Tables 26 and 27

Non-drinking water supplied – Aesthetic Tables 28, 29 and 30

Kimberley communities receiving additional water for drinking and food preparation for the whole community at:

- Kadjina – bottled water for elevated turbidity and also manganese above the ADWG health guideline value.
- Munthamar – bottled water for elevated turbidity.

Refer to tables 6 – 10 for their reticulated water quality.

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Drinking Water Quality Annual Report Data 01/07/2023 to 30/06/2024

Table 1 Health related variables

AC Kimberley	*E. coli*				*Burkholderia pseudomallei*			Thermophilic *Naegleria*			Fluoride				
Community	Samples taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement met	Samples taken	Number of samples with *B. pseudomallei*	Requirement met	Samples taken	Samples with Thermophilic *Naegleria*	Requirement met	Samples taken	Concentration (mg/L)			Guideline met
												Min	Max	Mean	
Ardyaloon	24	0	0	✓	0	0	(1)	24	0	✓	2	0.7	0.8	0.8	✓
Balgo	24	0	0	✓	2	0	✓	24	0	✓	2	0.8	0.9	0.9	✓
Bayulu	22	0	0	✓	0	0	(1)	22	0	✓	2	0.2	0.2	0.2	✓
Beagle Bay	24	0	0	✓	0	0	(1)	24	0	✓	2	0.2	0.3	0.3	✓
Bidyadanga	24	0	0	✓	0	0	(1)	24	0	✓	2	0.3	0.4	0.4	✓
Bobieding	24	0	0	✓	0	0	(1)	24	0	✓	2	0.2	0.3	0.3	✓
Bow River	24	0	0	✓	0	0	(1)	24	0	✓	12	1.3	2.1	1.8	(4)
Budgarjook	25	2	2	(2)	0	0	(1)	26	0	✓	2	<0.1	<0.1	<0.1	✓
Burraluba	24	0	0	✓	0	0	(1)	24	0	✓	14	0.1	1.9	1.4	✓
Djarindjin	24	0	0	✓	0	0	(1)	24	0	✓	2	<0.1	<0.1	<0.1	✓
Djugerari	19	0	0	✓	0	0	(1)	19	0	✓	2	1.2	1.2	1.2	✓
Dodnun	24	0	0	✓	3	1	(2)	24	0	✓	2	0.1	0.2	0.2	✓
Doon Doon	24	0	0	✓	2	0	✓	24	0	✓	2	0.7	0.8	0.8	✓
Emu Creek	24	0	0	✓	1	0	✓	24	0	✓	2	<0.1	0.2	0.2	✓
Galeru Gorge	24	0	0	✓	0	0	(1)	24	0	✓	2	0.2	0.4	0.3	✓
Ganinyi	26	0	0	✓	1	0	✓	26	0	✓	2	0.4	0.5	0.5	✓
Imintji	26	0	0	✓	2	0	✓	26	0	✓	2	0.4	0.4	0.4	✓
Jarlmadangah	24	0	0	✓	0	0	(1)	24	0	✓	2	0.2	0.2	0.2	✓
Jimbalakadunj	29	0	0	✓	0	0	(1)	29	1	(3)	2	0.4	0.5	0.5	✓
Joy Springs	22	0	0	✓	0	0	(1)	22	0	✓	2	0.6	0.6	0.6	✓
Junjuwa	22	0	0	✓	0	0	(1)	22	0	✓	3	0.4	0.8	0.6	✓
Kalumburu	29	4	4	(2)	0	0	(1)	26	0	✓	2	0.2	0.2	0.2	✓
Kandiwal	24	0	0	✓	0	0	(1)	24	0	✓	2	0.4	0.4	0.4	✓
Karnparmi	22	0	0	✓	1	0	✓	22	0	✓	2	0.9	1.0	1.0	✓
Koorabye	18	0	0	✓	0	0	(1)	18	0	✓	2	1.0	1.1	1.1	✓

(1) No samples required in this 12-month period. (refer to *Appendix B - list of sampling parameters,* page 30).

(2) Non-compliance associated with microbiological performance criterion as defined in the MoU with DoH. Response protocols were implemented in accordance with DoH requirements, including issuing a temporary public advisory describing actions community members are advised to take until the return of safe drinking water supply to the community was verified.

(3) Thermophilic *Naegleria* detection (not *Naegleria fowleri*) - response protocols were implemented in accordance with DoH requirements, including issuing a temporary public advisory describing actions community members are advised to take until the return of safe water supply to the community was verified.

(4) Non-compliance associated with the health guideline value of fluoride, a naturally occurring characteristic of the source supplying this community. Additional water (bottled water) is supplied for children under 9 years of age.

Table 1 Health related variables

AC Kimberley	*E. coli*				*Burkholderia pseudomallei*			Thermophilic *Naegleria*			Fluoride				
Community	Samples taken	Number of samples >0 cfu/100mL	Max cfu/100mL	Requirement met	Samples taken	Number of samples with *B. pseudomallei*	Requirement met	Samples taken	Number of samples with Thermophilic *Naegleria*	Requirement met	Samples taken	Concentration (mg/L)			Guideline met
												Min	Max	Mean	
Kundat Djaru	29	0	0	✓	0	0	(1)	29	1	(3)	2	0.2	0.4	0.3	✓
Kupartiya	24	0	0	✓	0	0	(1)	24	0	✓	2	0.7	0.8	0.8	✓
Kupungarri	24	0	0	✓	0	0	(1)	24	0	✓	2	0.3	0.4	0.4	✓
La Djardarr Bay	24	0	0	✓	2	0	✓	24	0	✓	2	<0.1	0.2	0.2	✓
Lamboo Gunian	24	0	0	✓	0	0	(1)	24	0	✓	2	1.0	1.1	1.1	✓
Lombadina	26	0	0	✓	1	0	✓	26	0	✓	2	<0.1	0.1	0.1	✓
Looma New	24	0	0	✓	0	0	(1)	24	0	✓	2	<0.1	<0.1	<0.1	✓
Looma	24	0	0	✓	17	0	✓	24	0	✓	2	<0.1	<0.1	<0.1	✓
Mandangala	24	1	1	(2)	3	0	✓	24	0	✓	2	0.2	0.4	0.3	✓
Mindibungu	25	0	0	✓	0	0	(1)	25	0	✓	2	0.7	0.7	0.7	✓
Moongardie	24	0	0	✓	0	0	(1)	24	0	✓	2	1.1	1.4	1.3	✓
Mulan	24	0	0	✓	0	0	(1)	24	0	✓	2	0.9	0.9	0.9	✓
Muludja	24	1	1	(2)	0	0	(1)	24	0	✓	2	0.2	0.3	0.3	✓
Ngalingkadji	24	0	0	✓	0	0	(1)	24	0	✓	12	1.2	1.9	1.5	(5)
Ngallagunda	22	0	0	✓	0	0	(1)	22	0	✓	4	<0.1	0.3	0.2	✓
Ngumpan	26	2	4	(2)	0	0	(1)	26	2	(3)	2	0.3	0.4	0.4	✓
Ngurtuwarta	22	0	0	✓	0	0	(1)	22	0	✓	2	0.4	0.5	0.5	✓
Pandanus Park	24	0	0	✓	0	0	(1)	24	0	✓	3	<0.1	0.3	0.2	✓
Ribinyung Dawang	24	0	0	✓	1	0	✓	24	0	✓	2	0.5	0.5	0.5	✓
Wangkatjungka	28	0	0	✓	0	0	(1)	28	0	✓	2	0.7	0.8	0.8	✓
Warmun	24	0	0	✓	0	0	(1)	24	0	✓	2	0.8	0.9	0.9	✓
Wurrenranginy	26	0	0	✓	0	0	(1)	26	0	✓	2	0.7	0.8	0.8	✓
Yakanarra	20	0	0	✓	0	0	(1)	20	0	✓	3	0.5	0.7	0.6	✓
Yirralallem	20	0	0	✓	1	0	✓	20	0	✓	2	0.1	0.2	0.2	✓
Yiyili	24	0	0	✓	0	0	(1)	24	0	✓	2	0.4	0.7	0.6	✓
Yungngora	25	0	0	✓	2	0	✓	24	0	✓	4	0.6	0.8	0.7	✓

(1) No samples required in this 12-month period. (refer to *Appendix B - list of sampling parameters,* page 30).

(2) Non-compliance associated with microbiological performance criterion as defined in the MoU with DoH. Response protocols were implemented in accordance with DoH requirements, including issuing a temporary public advisory describing actions community members are advised to take until the return of safe drinking water supply to the community was verified.

(3) Thermophilic *Naegleria* detection (not *Naegleria fowleri*) - response protocols were implemented in accordance with DoH requirements, including issuing a temporary public advisory describing actions community members are advised to take until the return of safe water supply to the community was verified.

(5) Elevated fluoride is a naturally occurring characteristic of the source supplying this community, in agreement with DoH a strategy has been developed to manage this through source selection and increased monitoring.

Table 2 Health related variables

AC Kimberley	Metals		Nitrate					Radiological		Uranium				
Community	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met
				Min	Max	Mean					Min	Max	Mean	
Ardyaloon	2	✓	2	6.8	7.3	7.1	✓	2	✓	2	<0.001	<0.001	<0.001	✓
Balgo	2	✓	2	17.0	20.0	18.5	✓	2	✓	2	0.003	0.003	0.003	✓
Bayulu	2	✓	2	3.1	4.0	3.6	✓	2	✓	2	0.004	0.005	0.005	✓
Beagle Bay	2	✓	2	3.0	3.3	3.15	✓	1	✓	2	<0.001	<0.001	<0.001	✓
Bidyadanga	2	✓	2	20.0	22.0	21.0	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Bobieding	2	✓	2	6.9	7.1	7.0	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Bow River	2	✓	2	5.8	7.3	6.6	✓	0	(1)	13	0.009	0.018	0.015	✓
Budgarjook	2	✓	2	2.6	3.4	3.0	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Burraluba	3	✓	3	0.29	1.4	0.7	✓	0	(1)	13	<0.001	0.017	0.014	✓
Djarindjin	2	✓	2	2.1	2.5	2.3	✓	2	✓	2	<0.001	<0.001	<0.001	✓
Djugerari	2	✓	2	0.49	0.57	0.5	✓	0	(1)	2	0.002	0.004	0.003	✓
Dodnun	2	✓	2	<0.05	<0.05	<0.05	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Doon Doon	2	✓	2	2.6	3.3	3.0	✓	0	(1)	2	0.001	0.001	0.001	✓
Emu Creek	2	✓	2	1.4	1.5	1.5	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Galeru Gorge	2	✓	2	1.2	1.6	1.4	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Ganinyi	2	✓	2	0.58	0.67	0.63	✓	0	(1)	2	0.002	0.005	0.004	✓
Imintji	2	✓	2	<0.05	0.35	0.2	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Jarlmadangah	2	✓	2	19.0	32.0	25.5	✓	0	(1)	2	<0.001	0.002	0.0015	✓
Jimbalakadunj	2	✓	2	0.59	0.84	0.7	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Joy Springs	2	✓	2	6.1	6.5	6.3	✓	0	(1)	2	0.002	0.002	0.002	✓
Junjuwa	3	✓	3	8.8	12.0	9.9	✓	3	✓	3	0.004	0.005	0.004	✓
Kalumburu	2	✓	2	0.07	0.12	0.095	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Kandiwal	2	✓	2	<0.05	<0.05	<0.05	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Karnparmi	2	✓	2	10	11	10.5	✓	0	(1)	2	0.008	0.009	0.0085	✓
Koorabye	2	✓	2	0.12	0.17	0.1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓

(1) No samples required in this 12-month period. (refer to *Appendix B - list of sampling parameters*, page 30).

Table 2 Health related variables

AC Kimberley	Metals		Nitrate					Radiological		Uranium				
Community	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met
				Min	Max	Mean					Min	Max	Mean	
Kundat Djaru	2	✓	2	3.6	3.8	3.7	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Kupartiya	2	✓	2	12.0	16.0	14.0	✓	0	(1)	2	0.005	0.005	0.005	✓
Kupungarri	2	✓	2	0.18	0.28	0.2	✓	0	(1)	2	0.004	0.005	0.005	✓
La Djardarr Bay	2	✓	2	2.7	2.8	2.75	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Lamboo Gunian	2	✓	2	29.0	38.0	33.5	✓	0	(1)	2	0.008	0.01	0.009	✓
Lombadina	2	✓	2	7.1	8.2	7.6	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Looma New	2	✓	2	2.9	3.6	3.2	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Looma	2	✓	2	4.1	4.2	4.2	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Mandangala	2	✓	2	2.7	3.0	2.9	✓	0	(1)	2	<0.001	0.001	0.001	✓
Mindibungu	2	✓	2	16.0	19.0	17.5	✓	1	✓	2	<0.001	<0.001	<0.001	✓
Moongardie	2	✓	2	9.4	12.0	10.7	✓	0	(1)	2	0.006	0.006	0.006	✓
Mulan	2	✓	11	24.0	35.0	29.4	✓	0	(1)	2	0.003	0.004	0.004	✓
Muludja	2	✓	2	2.1	3.4	2.8	✓	0	(1)	2	0.002	0.002	0.002	✓
Ngalingkadji	2	✓	2	0.16	0.19	0.175	✓	0	(1)	3	<0.001	0.014	0.005	✓
Ngallagunda	4	✓	4	<0.05	0.2	0.1	✓	0	(1)	4	<0.001	0.004	0.00175	✓
Ngumpan	2	✓	2	2.8	3.2	3.0	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Ngurtuwarta	2	✓	2	3.3	3.5	3.4	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Pandanus Park	3	✓	15	65	78	74	(7)	0	(1)	3	<0.001	0.001	0.001	✓
Ribinyung Dawang	2	✓	2	<0.05	<0.05	<0.05	✓	0	(1)	2	0.001	0.002	0.0015	✓
Wangkatjungka	2	✓	2	0.18	0.3	0.24	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Warmun	2	✓	2	4.1	7.0	5.6	✓	0	(1)	2	0.001	0.003	0.002	✓
Wurrenranginy	2	✓	2	0.88	1.0	0.94	✓	0	(1)	2	0.001	0.002	0.002	✓
Yakanarra	3	✓	3	14.0	17.0	15.3	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Yirralallem	2	✓	2	2.2	2.3	2.25	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Yiyili	2	✓	2	0.52	0.61	0.6	✓	0	(1)	2	0.001	0.002	0.0015	✓
Yungngora	4	✓	4	<0.05	1.1	0.35	✓	0	(1)	4	<0.001	<0.001	<0.001	✓

(1) No samples required in this 12-month period. (refer to *Appendix B - list of sampling parameters*, page 30).

(7) Non-compliance associated with the infant health guideline value of nitrate, a naturally occurring characteristic of the source supplying this community. Additional water (bottled water) is supplied for formula preparation for infants under 3 months of age.

Table 3 Aesthetic (non-health related) variables

AC Kimberley	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Ardyaloon	2	82	87	85	(10)	2	<0.05	<0.05	<0.05	✓	2	210	210	210	✓	2	54	130	500	✓
Balgo	2	110	110	110	(10)	2	<0.05	<0.05	<0.05	✓	2	340	390	365	(11)	2	390	420	405	(12)
Bayulu	2	330	370	350	(10)	2	<0.05	<0.05	<0.05	✓	2	80	93	87	✓	2	360	360	360	(12)
Beagle Bay	2	6.8	7.8	7	(10)	2	<0.05	<0.05	<0.05	✓	2	29	29	29	✓	2	13	14	14	✓
Bidyadanga	2	100	120	110	(10)	2	<0.05	<0.05	<0.05	✓	2	160	180	170	✓	2	86	100	93	✓
Bobieding	2	11	11	11	(10)	2	<0.05	<0.05	<0.05	✓	2	69	93	81	✓	2	44	46	45	✓
Bow River	2	350	380	365	(10)	2	<0.05	<0.05	<0.05	✓	2	13	17	15	✓	2	160	240	200	✓
Budgarjook	2	6.4	7.8	7	(10)	2	<0.05	<0.05	<0.05	✓	2	26	26	26	✓	2	11	14	13	✓
Burraluba	3	250	550	433	(10)	3	<0.05	<0.05	<0.05	✓	3	15	35	24	✓	3	230	260	250	(12)
Djarindjin	2	18	18	18	(10)	2	<0.05	<0.05	<0.05	✓	2	200	200	200	✓	2	67	77	72	✓
Djugerari	2	190	210	200	(10)	2	<0.05	<0.05	<0.05	✓	2	180	180	180	✓	2	300	350	325	(12)
Dodnun	2	9.2	10	10	(10)	2	<0.05	<0.05	<0.05	✓	2	5.1	7.1	6	✓	2	<5	7.5	6.25	✓
Doon Doon	2	460	490	475	(10)	2	<0.05	<0.05	<0.05	✓	2	20	25	23	✓	2	300	400	350	(12)
Emu Creek	2	<5	<5	<5	(10)	2	<0.05	<0.05	<0.05	✓	2	9.5	11	10	✓	2	<5	<5	5	✓
Galeru Gorge	2	330	350	340	(10)	2	<0.05	<0.05	<0.05	✓	2	15	26	21	✓	2	260	340	300	(12)
Ganinyi	2	180	240	210	(10)	2	<0.05	<0.05	<0.05	✓	2	20	38	27	✓	2	190	220	205	(12)
Imintji	2	460	490	475	(10)	2	<0.05	<0.05	<0.05	✓	2	16	85	51	✓	2	360	430	395	(12)
Jarlmadangah	2	140	160	150	(10)	2	<0.05	<0.05	<0.05	✓	2	17	25	21	✓	2	120	140	130	✓
Jimbalakadunj	2	240	260	250	(10)	2	<0.05	0.100	0.075	✓	2	370	370	370	✓	2	59	61	60	✓
Joy Springs	2	300	320	310	(10)	2	<0.05	<0.05	<0.05	✓	2	19	25	22	✓	2	310	310	310	(12)
Junjuwa	3	230	290	263	(10)	3	<0.05	<0.05	<0.05	✓	3	60	75	67	✓	3	200	230	210	(12)
Kalumburu	2	55	270	163	(10)	2	<0.05	<0.05	<0.05	✓	2	6.5	9.4	8	✓	2	40	57	49	✓
Kandiwal	2	150	160	155	(10)	2	<0.05	<0.05	<0.05	✓	2	5.4	6.2	6	✓	2	110	140	125	✓
Karnparmi	2	380	420	400	(10)	2	<0.05	<0.05	<0.05	✓	2	230	240	235	✓	2	360	410	385	(12)
Koorabye	2	240	270	255	(10)	2	<0.05	<0.05	<0.05	✓	2	340	340	340	✓	2	100	110	105	✓

(10) No guideline value available as per ADWG 2011.

(11) Elevated chloride is characteristic of the source supplying this community.

(12) Elevated hardness is characteristic of the source supplying this community.

Table 3 Aesthetic (non-health related) variables

AC Kimberley	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Kundat Djaru	2	21	25	23	(10)	2	<0.05	<0.05	<0.05	✓	2	45	53	49	✓	2	22	25	24	✓
Kupartiya	2	260	270	265	(10)	2	<0.05	<0.05	<0.05	✓	2	94	110	102	✓	2	270	270	270	(12)
Kupungarri	2	600	610	605	(10)	2	<0.05	<0.05	<0.05	✓	2	53	82	68	✓	2	480	580	530	(12)
La Djardarr Bay	2	31	35	33	(10)	2	<0.05	<0.05	<0.05	✓	2	130	160	145	✓	2	42	47	45	✓
Lamboo Gunian	2	510	600	555	(10)	2	<0.05	<0.05	<0.05	✓	2	62	81	72	✓	2	350	470	410	(12)
Lombadina	2	9.6	11	10	(10)	2	<0.05	<0.05	<0.05	✓	2	180	190	185	✓	2	350	470	410	(12)
Looma New	2	<5	6	6	(10)	2	<0.05	<0.05	<0.05	✓	2	8	8.4	8	✓	2	<5	<5	<5	✓
Looma	2	16	20	18	(10)	2	<0.05	<0.05	<0.05	✓	2	17	17	17	✓	2	11	13	12	✓
Mandangala	2	190	210	200	(10)	2	<0.05	<0.05	<0.05	✓	2	<5	5.4	5	✓	2	150	170	160	✓
Mindibungu	2	90	92	91	(10)	2	<0.05	<0.05	<0.05	✓	2	84	98	91	✓	2	96	110	103	✓
Moongardie	2	300	320	310	(10)	2	<0.05	<0.05	<0.05	✓	2	54	70	62	✓	2	240	250	245	(12)
Mulan	2	180	190	185	(10)	2	<0.05	<0.05	<0.05	✓	2	440	460	450	(11)	2	380	450	415	(12)
Muludja	2	150	150	150	(10)	2	<0.05	<0.05	<0.05	✓	2	32	34	33	✓	2	150	160	155	✓
Ngalingkadji	2	330	360	345	(10)	2	<0.05	<0.05	<0.05	✓	2	470	600	535	(11)	2	200	210	205	(12)
Ngallagunda	4	<5	590	151	(10)	4	<0.05	<0.05	<0.05	✓	4	5.7	74	24	✓	3	<5	<5	<5	✓
Ngumpan	2	340	350	345	(10)	2	<0.05	<0.05	<0.05	✓	2	22	36	29	✓	2	370	420	395	(12)
Ngurtuwarta	2	86	110	98	(10)	2	<0.05	<0.05	<0.05	✓	2	65	91	78	✓	2	110	130	120	✓
Pandanus Park	3	32	35	33	(10)	3	<0.05	<0.05	<0.05	✓	3	230	270	253	✓	3	120	140	133	✓
Ribinyung Dawang	2	160	230	195	(10)	2	<0.05	<0.05	<0.05	✓	2	11	14	13	✓	2	180	220	200	✓
Wangkatjungka	2	240	250	245	(10)	2	<0.05	<0.05	<0.05	✓	2	220	260	240	✓	2	190	200	195	✓
Warmun	2	440	510	475	(10)	2	<0.05	<0.05	<0.05	✓	2	18	32	25	✓	2	280	470	375	(12)
Wurrenranginy	2	400	430	415	(10)	2	<0.05	<0.05	<0.05	✓	2	10	12	11	✓	2	270	420	345	(12)
Yakanarra	3	64	86	74	(10)	3	<0.05	<0.05	<0.05	✓	3	29	54	39	✓	3	270	420	345	(12)
Yirralallem	2	<5	<5	<5	(10)	2	<0.05	0.090	0.070	✓	2	5.6	7.3	7	✓	2	<5	6.6	5.8	✓
Yiyili	2	180	220	200	(10)	2	<0.05	<0.05	<0.05	✓	2	16	27	22	✓	2	130	200	165	✓
Yungngora	4	260	280	275	(10)	4	<0.05	<0.05	<0.05	✓	4	150	160	157	✓	4	8.2	8.5	8.4	✓

(10) No guideline value available as per ADWG 2011.

(11) Elevated chloride is characteristic of the source supplying this community.

(12) Elevated hardness is characteristic of the source supplying this community.

Table 4 Aesthetic (non-health related) variables

AC Kimberley	Iron					Manganese					pH					Silica				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (pH units)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Ardyaloon	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.3	6.6	6.4	(16)	2	30	41	36	✓
Balgo	2	<0.01	0.02	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.3	7.4	7.4	✓	2	17	19	18	✓
Bayulu	2	0.01	0.04	0.03	✓	2	<0.005	<0.005	<0.005	✓	2	7.8	8.0	7.9	✓	2	37	37	37	✓
Beagle Bay	2	<0.01	0.02	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.0	6.1	6.0	(16)	2	37	39	38	✓
Bidyadanga	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.4	7.4	6.9	✓	2	86	110	98	(18)
Bobieding	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	5.9	6.2	6	(16)	2	60	61	61	✓
Bow River	2	<0.01	0.02	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.6	8.2	7.9	✓	2	61	64	63	✓
Budgarjook	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	5.9	5.9	5.9	(16)	2	39	45	42	✓
Burraluba	3	<0.01	<0.01	<0.01	✓	3	<0.005	<0.005	<0.005	✓	3	7.2	8.3	7.9	✓	3	37	46	42	✓
Djarindjin	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	5.6	6	5.8	(16)	2	33	46	40	✓
Djugerari	3	0.05	0.29	0.18	✓	2	<0.005	0.022	0.014	✓	2	7.7	8.8	7.9	✓	2	23	23	23	✓
Dodnun	2	<0.01	0.44	0.225	✓	2	<0.005	0.020	0.012	✓	2	5.7	5.9	5.8	(16)	2	13	18	16	✓
Doon Doon	2	<0.01	0.02	0.015	✓	2	<0.005	<0.005	<0.005	✓	2	7.6	8.1	7.85	✓	2	75	77	76	✓
Emu Creek	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	5.6	5.8	5.7	(16)	2	19	20	20	✓
Galeru Gorge	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	8	8.0	8	✓	2	25	29	27	✓
Ganinyi	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.7	8	7.35	✓	2	46	49	48	✓
Imintji	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.4	8.1	7.75	✓	2	74	78	76	✓
Jarlmadangah	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.5	7.8	7.65	✓	2	34	56	45	✓
Jimbalakadunj	2	<0.01	0.06	0.035	✓	2	<0.005	<0.005	<0.005	✓	2	8.1	8.4	8.25	✓	2	20	21	21	✓
Joy Springs	2	<0.01	0.02	0.015	✓	2	<0.005	<0.005	<0.005	✓	2	7.8	8.1	7.95	✓	2	30	30	30	✓
Junjuwa	3	<0.01	<0.01	<0.01	✓	3	<0.005	<0.005	<0.005	✓	3	7.3	8.4	7.77	✓	2	28	29	29	✓
Kalumburu	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.1	7.3	6.7	✓	2	17	20	19	✓
Kandiwal	4	0.66	1.1	0.857	(13)	2	0.100	0.160	0.130	(14)	2	7	7.4	7.2	✓	2	77	79	78	✓
Karnparmi	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.9	7.8	7.35	✓	2	41	41	41	✓
Koorabye	2	0.02	0.05	0.035	✓	2	<0.005	0.005	0.005	✓	2	8.2	8.3	8.25	✓	2	24	25	25	✓

(13) Elevated iron is a naturally occurring characteristic of the source supplying this community.

(14) Manganese is a naturally occurring characteristic of the source supplying this community. It can accumulate in tanks and pipes and resuspend during periods of rapid changes to water flow.

(16) Low pH is a characteristic of the source supplying this community.

(18) Silica is a naturally occurring characteristic of the source supplying this community.

Table 4 Aesthetic (non-health related) variables

AC Kimberley	Iron					Manganese					pH					Silica				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (pH units)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Kundat Djaru	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6	7.6	6.8	✓	2	21	28	25	✓
Kupartiya	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.7	7.8	7.75	✓	2	51	55	53	✓
Kupungarri	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.2	7.9	7.55	✓	2	48	54	51	✓
La Djardarr Bay	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.1	6.2	6.15	(16)	2	71	84	78	✓
Lamboo Gunian	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.2	8.2	7.7	✓	2	76	83	80	✓
Lombadina	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	5.6	6.1	5.85	(16)	2	37	46	42	✓
Looma New	2	<0.01	<0.01	<0.01	✓	2	<0.005	0.006	0.006	✓	2	5.7	6.0	5.85	(16)	2	20	20	20	✓
Looma	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.2	6.5	6.35	(16)	2	28	28	28	✓
Mandangala	2	0.05	0.1	0.075	✓	2	<0.005	<0.005	<0.005	✓	2	6.9	7.4	7.15	✓	2	23	33	28	✓
Mindibungu	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.3	7.5	7.4	✓	2	46	52	49	✓
Moongardie	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.7	8.3	8	✓	2	64	70	67	✓
Mulan	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.6	7.7	7.65	✓	2	61	66	64	✓
Muludja	2	<0.01	0.05	0.03	✓	2	<0.005	0.009	0.007	✓	2	7.2	7.7	7.45	✓	2	37	37	37	✓
Ngalingkadji	2	<0.01	0.01	0.01	✓	2	0.013	0.014	0.014	✓	2	8.3	8.4	8.35	✓	2	20	24	22	✓
Ngallagunda	4	0.01	0.02	0.015	✓	4	<0.005	<0.005	<0.005	✓	4	5.7	8.2	6.5	✓	4	16	48	26	✓
Ngumpan	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.7	7.8	7.75	✓	2	21	25	23	✓
Ngurtuwarta	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.5	6.6	6.55	✓	2	21	22	22	✓
Pandanus Park	3	<0.01	0.02	0.013	✓	3	<0.005	<0.005	<0.005	✓	3	6.3	6.7	6.5	✓	3	86	91	89	(18)
Ribinyung Dawang	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.6	7.9	7.25	✓	2	57	60	59	✓
Wangkatjungka	12	0.11	0.44	0.218	✓	9	0.021	0.065	0.040	✓	2	7.8	7.9	7.85	✓	2	18	22	20	✓
Warmun	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.9	8.2	8.05	✓	2	69	70	70	✓
Wurrenranginy	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.6	7.9	7.75	✓	2	69	70	70	✓
Yakanarra	3	<0.01	0.01	0.01	✓	3	<0.005	<0.005	<0.005	✓	3	7.4	8.7	8.1	✓	3	67	70	68	✓
Yirralallem	2	0.03	0.07	0.05	✓	2	<0.005	<0.005	<0.005	✓	2	5	5.7	5.35	(16)	2	16	16	16	✓
Yiyili	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7	7.8	7.4	✓	2	34	42	38	✓
Yungngora	4	<0.01	0.03	0.016	✓	4	0.017	0.040	0.031	✓	4	8.2	8.6	8.4	✓	4	29	31	30	✓

(16) Low pH is a characteristic of the source supplying this community.

(18) Silica is a naturally occurring characteristic of the source supplying this community.

Table 5 Aesthetic (non-health related) variables

AC Kimberley	Sodium					Sulfate					Total Dissolved Solids					True Colour					Turbidity				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (TCU)			Guideline met	Samples taken	Value (NTU)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Ardyaloon	2	93	140	117	✓	2	19	21	20	✓	2	310	490	400	✓	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Balgo	2	150	160	155	✓	2	170	190	180	✓	2	840	1000	920	(20)	2	<5	<5	<5	✓	2	0.2	0.4	0.3	✓
Bayulu	2	49	58	54	✓	2	20	22	21	✓	2	540	560	550	✓	2	<5	<5	<5	✓	2	0.2	0.3	0.3	✓
Beagle Bay	2	18	18	18	✓	2	1.3	1.4	1.4	✓	2	77	78	77.5	✓	2	<5	<5	<5	✓	2	0.2	0.4	0.3	✓
Bidyadanga	2	99	120	110	✓	2	18	27	23	✓	2	290	460	375	✓	2	<5	<5	<5	✓	2	0.1	0.2	0.3	✓
Bobieding	2	41	42	42	✓	2	1.4	1.6	1.5	✓	2	160	200	180	✓	2	<5	<5	<5	✓	2	0.2	0.5	0.4	✓
Bow River	2	72	76	74	✓	2	1.9	8.1	5	✓	2	390	440	415	✓	2	<5	<5	<5	✓	2	0.2	0.2	0.2	✓
Budgarjook	2	17	18	18	✓	2	<1	1.3	1.2	✓	2	71	78	74.5	✓	2	<5	<5	<5	✓	2	0.4	0.5	0.5	✓
Burraluba	3	13	160	104	✓	3	<1	4.4	2.1	✓	3	230	650	477	✓	3	<5	<5	<5	✓	3	0.1	0.2	0.2	✓
Djarindjin	2	85	100	93	✓	2	18	28	23	✓	2	250	400	325	✓	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Djugerari	2	140	170	155	✓	2	220	310	265	✓	2	800	870	835	(20)	2	<5	<5	<5	✓	3	0.9	2.4	1.9	✓
Dodnun	2	2	5	4	✓	2	<1	<1	<1	✓	2	24	26	27	✓	2	<5	<5	<5	✓	4	1.1	5.6	2.7	(21)
Doon Doon	2	62	73	68	✓	2	10	12	11	✓	2	510	520	515	✓	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Emu Creek	2	6	7	6	✓	2	<1	<1	<1	✓	2	26	38	32	✓	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Galeru Gorge	2	16	19	18	✓	2	5.5	7.5	6.5	✓	2	370	430	400	✓	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Ganinyi	2	38	43	41	✓	2	27	33	30	✓	2	270	330	300	✓	2	<5	<5	<5	✓	2	0.2	0.2	0.2	✓
Imintji	2	35	75	55	✓	2	2	3	2.5	✓	2	330	560	445	✓	2	<5	<5	<5	✓	2	<0.1	0.4	0.3	✓
Jarlmadangah	2	19	43	31	✓	2	7.3	24	15.7	✓	2	250	250	250	✓	2	<5	<5	<5	✓	2	<0.1	0.3	0.2	✓
Jimbalakadunj	2	420	440	430	(19)	2	240	320	280	✓	2	1300	1400	1350	(20)	2	<5	<5	<5	✓	2	<0.1	1.5	0.8	✓
Joy Springs	2	21	22	22	✓	2	5.1	6.8	6	✓	2	350	370	360	✓	2	<5	<5	<5	✓	2	0.2	0.3	0.3	✓
Junjuwa	3	62	73	67	✓	3	16	18	17	✓	2	450	480	463	✓	3	<5	<5	<5	✓	2	<0.1	0.2	0.1	✓
Kalumburu	2	7	9	8	✓	2	<1	<1	<1	✓	2	68	75	71.5	✓	2	<5	<5	<5	✓	2	0.1	0.3	0.2	✓
Kandiwal	2	12	15	14	✓	2	<1	1.3	1.2	✓	2	160	160	160	✓	2	<5	<5	<5	✓	2	1.5	3.2	2.4	✓
Karnparmi	2	140	170	155	✓	2	30	38	34	✓	2	940	980	960	(20)	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Koorabye	2	300	370	335	(19)	2	170	190	180	✓	2	1200	1200	1200	(20)	2	<5	<5	<5	✓	2	0.4	0.8	0.6	✓

(19) Elevated sodium is characteristic of the source supplying this community.

(20) Elevated TDS is characteristic of the source supplying this community.

(21) Elevated turbidity is due to naturally occurring iron which is characteristic of the source supplying this community. An ongoing water quality advisory, to boil all water prior to drinking and food preparation and avoid getting water up the nose, is in place.

Table 5 Aesthetic (non-health related) variables

AC Kimberley	Sodium					Sulfate					Total Dissolved Solids					True Colour					Turbidity				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (TCU)			Guideline met	Samples taken	Value (NTU)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Kundat Djaru	2	26	32	29	✓	2	7.6	9.7	8..7	✓	2	130	140	135	✓	2	<5	<5	<5	✓	11	0.2	0.6	0.4	✓
Kupartiya	2	71	75	73	✓	2	43	43	43	✓	2	480	500	490	✓	2	<5	<5	<5	✓	2	0.1	0.4	0.3	✓
Kupungarri	2	74	80	77	✓	2	1.8	3.1	2.5	✓	2	560	690	625	(20)	2	<5	<5	<5	✓	2	<0.1	0.3	0.2	✓
La Djardarr Bay	2	79	79	79	✓	2	6.1	6.8	6.5	✓	2	260	320	290	✓	2	<5	5.8	5	✓	2	0.4	0.5	0.5	✓
Lamboo Gunian	2	120	130	125	✓	2	17	22	20	✓	2	650	750	700	(20)	2	<5	<5	<5	✓	2	<0.1	0.2	0.1	✓
Lombadina	2	82	94	88	✓	2	20	29	25	✓	2	300	380	340	✓	2	<5	<5	<5	✓	2	<0.1	0.3	0.2	✓
Looma New	2	3	5	4	✓	2	1.4	1.4	1.4	✓	2	19	30	24.5	✓	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Looma	2	11	12	12	✓	2	3.6	4.1	3.9	✓	2	56	74	65	✓	2	<5	<5	<5	✓	2	0.2	0.3	0.3	✓
Mandangala	2	14	15	15	✓	2	<1	1.2	1.1	✓	2	210	250	230	✓	2	<5	<5	<5	✓	2	0.1	0.2	0.2	✓
Mindibungu	2	75	77	76	✓	2	71	81	76	✓	2	290	390	340	✓	2	<5	<5	<5	✓	2	0.4	0.4	0.4	✓
Moongardie	2	69	70	70	✓	2	25	26	26	✓	2	440	440	440	✓	2	<5	<5	<5	✓	2	0.1	0.4	0.3	✓
Mulan	2	210	240	225	(19)	2	190	250	220	✓	2	1200	1300	1250	(20)	2	<5	<5	<5	✓	2	0.2	0.3	0.3	✓
Muludja	2	27	32	30	✓	2	11	11	11	✓	2	250	270	260	✓	2	<5	<5	<5	✓	2	0.1	0.3	0.2	✓
Ngalingkadji	2	470	540	505	(19)	2	240	270	255	✓	2	1600	1600	1600	(20)	2	<5	<5	<5	✓	2	0.3	0.7	0.5	✓
Ngallagunda	4	3	79	22	✓	4	<1	2.1	1.4	✓	4	15	1100	295	✓	2	<5	6.8	6	✓	4	0.1	0.3	0.2	✓
Ngumpan	2	11	12	12	✓	2	<1	9.1	5.1	✓	2	400	410	405	✓	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Ngurtuwarta	2	54	66	61	✓	2	32	41	36.5	✓	2	350	370	360	✓	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Pandanus Park	3	130	140	133	✓	3	9.7	14	11.2	✓	3	590	660	620	(20)	2	<5	<5	<5	✓	3	<0.1	0.3	0.2	✓
Ribinyung Dawang	2	22	25	25	✓	2	4.1	4.6	4.4	✓	2	250	260	255	✓	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Wangkatjungka	2	200	200	200	(19)	2	110	110	110	✓	2	790	800	795	(20)	2	<5	<5	<5	✓	12	0.8	3.5	2.0	✓
Warmun	2	69	70	69	✓	2	25	39	32	✓	2	520	630	575	✓	2	<5	<5	<5	✓	2	<0.1	0.3	0.2	✓
Wurrenranginy	2	34	38	36	✓	2	26	26	26	✓	2	450	480	465	✓	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Yakanarra	3	37	45	40	✓	3	14	17	15.3	✓	3	170	240	197	✓	2	<5	6	6	✓	3	0.1	0.4	0.2	✓
Yirralallem	2	2	3	2	✓	2	<1	1.6	1.3	✓	2	18	42	30	✓	2	<5	<5	<5	✓	2	0.3	2.1	1.2	✓
Yiyili	2	31	31	31	✓	2	16	21	18.5	✓	2	240	310	275	✓	2	<5	<5	<5	✓	2	0.1	0.1	0.1	✓
Yungngora	4	180	230	210	(19)	4	<1	<1	<1	✓	4	560	590	580	✓	2	<5	<5	<5	✓	4	0.2	1	0.6	✓

(19) Elevated sodium is characteristic of the source supplying this community.

(20) Elevated TDS is characteristic of the source supplying this community.

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Table 6 Health related variables – non-drinking water supplied

AC Kimberley	*E. coli*				*Burkholderia pseudomallei*			Thermophilic *Naegleria*			Fluoride				
Community	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with *Burkholderia*	Requirement Met	Samples Taken	Samples with Thermophilic *Naegleria*	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met
												Min	Max	Mean	
Kadjina	16	0	0	✓	0	0	(1)	16	1	(3)	2	0.6	0.6	0.6	✓
Munthamar	26	0	0	✓	0	0	(1)	26	0	✓	2	0.4	0.4	0.4	✓

(1) No samples required in this 12-month period. (refer to *Appendix B - list of sampling parameters*, page 30).

(3) Thermophilic *Naegleria* detection (not *Naegleria fowleri)* - response protocols were implemented in accordance with DoH requirements, including issuing a temporary public advisory describing actions community members are advised to take until the return of safe water supply to the community was verified.

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Table 7 Health related variables – non-drinking water supplied

AC Kimberley	Metals		Nitrate					Radiological		Uranium				
Community	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met
				Min	Max	Mean					Min	Max	Mean	
Kadjina	2	✓	2	<0.05	0.2	0.1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Munthamar	2	✓	3	0.14	0.29	0.21	✓	0	(1)	2	0.001	0.002	0.002	✓

(1) No samples required in this 12-month period. (refer to *Appendix B - list of sampling parameters*, page 30).

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Table 8 Aesthetic (non-health related) variables – non-drinking water supplied

AC Kimberley	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Kadjina	2	51	59	55	(10)	2	<0.05	<0.05	<0.05	✓	2	18	19	19	✓	2	58	61	60	✓
Munthamar	2	240	280	260	(10)	2	<0.05	<0.05	<0.05	✓	2	16	20	18	✓	2	160	190	175	✓

(10) No guideline value available as per ADWG 2011.

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Table 9 Aesthetic (non-health related) variables - non-drinking water supplied

AC Kimberley	Iron					Manganese					pH					Silica				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (pH units)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Kadjina	8	0.57	12	12.79	(13)	8	0.130	1.800	0.397	(15)	2	6.4	6.8	6.6	✓	2	52	53	53	✓
Munthamar	12	<0.01	0.28	0.1	✓	9	0.020	0.049.	0.040	✓	2	7	7.6	7.3	✓	2	35	36	36	✓

(13) Elevated iron is a naturally occurring characteristic of the source supplying this community.

(15) Manganese is a naturally occurring characteristic of the source supplying this community. It can accumulate in tanks and pipes and resuspend during periods of rapid changes to water flow. This community exceeds the health guideline value, additionl water (bottled water) is provided for drinking due to elevated turbidity.

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Table 10 Aesthetic (non-health related) variables - non-drinking water supplied

AC Kimberley	Sodium					Sulfate					Total Dissolved Solids					True Colour					Turbidity				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (TCU)			Guideline met	Samples taken	Value (NTU)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Kadjina	2	11	13	12	✓	2	15	16	16	✓	2	120	150	135	✓	2	<5	<5	<5	✓	7	1.0	16.0	3.8	(22)
Munthamar	2	37	46	42	✓	2	1.9	2.1	2	✓	2	280	310	295	✓	2	<5	<5	<5	✓	11	0.1	3.4	1.2	(22)

(22) Elevated turbidity is due to naturally occurring iron which is characteristic of the source supplying this community. An ongoing water quality advisory, to boil all water prior to drinking and food preparation and avoid getting water up the nose, is in place, additional water (bottled water) is also supplied for drinking and food preparation for the whole community.

Pilbara and Mid West communities receiving additional water for drinking and food preparation for the whole community:

- Burringurrah – bottled water for uranium above the ADWG health guideline value.
- Kiwirrkurra – bottled water for fluoride above the ADWG health guideline value.
- Pia Wadjari – bottled water for uranium above the ADWG health guideline value.
  Refer to tables 16 to 20 for their reticulated water quality.

Drinking Water Quality Annual Report Data 01/07/2023 to 30/06/2024

Table 11 Health related variables

AC Pilbara - Mid West	*E. coli*				Thermophilic *Naegleria*			Fluoride				
Community	Samples taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement met	Samples taken	Samples with Thermophilic *Naegleria*	Requirement met	Samples taken	Concentration (mg/L)			Guideline met
									Min	Max	Mean	
Barrel Well	24	0	0	✓	27	0	✓	3	<0.1	1.0	0.4	✓
Cheeditha	24	0	0	✓	24	0	✓	2	1.0	1.0	1.0	✓
Innawonga	24	0	0	✓	24	0	✓	3	0.8	1.2	1.0	✓
Jigalong	24	0	0	✓	24	0	✓	2	0.6	0.6	0.6	✓
Jinparinya	24	0	0	✓	24	0	✓	2	0.5	0.7	0.6	✓
Karalundi	22	0	0	✓	23	0	✓	2	<0.1	<0.1	<0.1	✓
Kunawarritji	24	0	0	✓	24	0	✓	11	1.1	1.9	1.4	✓
Kutkabubba	22	0	0	✓	22	0	✓	2	0.4	0.5	0.5	✓
Marta Marta	24	0	0	✓	24	0	✓	2	0.5	0.6	0.6	✓
Ngurawaana	24	0	0	✓	24	0	✓	2	1.1	1.2	1.2	✓
Parnngurr	22	0	0	✓	22	0	✓	12	0.4	0.9	0.7	✓
Punju Ngamal	24	0	0	✓	24	0	✓	2	0.5	0.7	0.6	✓
Punmu	24	0	0	✓	24	0	✓	2	0.6	0.7	0.7	✓
Wakathuni	24	0	0	✓	24	0	✓	3	0.6	0.7	0.7	✓
Wandanooka	24	0	0	✓	24	0	✓	2	0.6	0.7	0.7	✓
Warralong	23	0	0	✓	23	0	✓	2	0.8	0.9	0.9	✓
Yandeyarra	24	0	0	✓	24	0	✓	2	1.1	1.1	1.1	✓
Youngaleena	24	0	0	✓	24	0	✓	2	0.6	0.7	0.7	✓
Yulga Jinna	24	0	0	✓	24	0	✓	2	0.6	0.7	0.7	✓

Table 12 Health related variables

AC Pilbara - Mid West	Metals		Nitrate					Radiological		Uranium				
Community	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Guideline Met	Samples taken	Concentration (mg/L)			Guideline met
				Min	Max	Mean					Min	Max	Mean	
Barrel Well	3	✓	3	<0.05	0.08	0.06	✓	0	(1)	3	<0.001	<0.001	<0.001	✓
Cheeditha	2	✓	2	1.7	6.9	4.3	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Innawonga	3	✓	3	14.0	15.0	15.0	✓	0	(1)	3	0.002	0.004	0.003	✓
Jigalong	2	✓	12	34.0	41.0	38.0	(8)	0	(1)	2	<0.001	<0.001	<0.001	✓
Jinparinya	2	✓	2	4.1	4.2	4.2	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Karalundi	2	✓	2	0.9	1.5	1.2	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Kunawarritji	2	✓	10	56.0	69.0	61.0	(7)	0	(1)	4	<0.001	<0.001	<0.001	✓
Kutkabubba	2	✓	10	57.0	68.0	64.0	(7)	0	(1)	2	<0.001	<0.001	<0.001	✓
Marta Marta	2	✓	2	4.1	4.1	4.1	✓	0	(1)	2	0.005	0.008	0.0065	✓
Ngurawaana	2	✓	2	1.7	4.9	3.3	✓	0	(1)	2	0.002	0.002	0.002	✓
Parnngurr	2	✓	4	15.0	29.0	23.0	✓	0	(1)	12	0.004	0.006	0.005	✓
Punju Ngamal	2	✓	2	4.1	4.2	4.2	✓	0	(1)	2	0.005	0.007	0.006	✓
Punmu	2	✓	2	4.1	4.2	4.2	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Wakathuni	3	✓	3	14.0	15.0	15.0	✓	0	(1)	3	0.008	0.009	0.0086	✓
Wandanooka	2	✓	11	34.0	43.0	39.0	(8)	0	(1)	2	<0.001	<0.001	<0.001	✓
Warralong	2	✓	2	0.31	0.33	0.32	✓	0	(1)	2	0.002	0.003	0.0025	✓
Yandeyarra	2	✓	2	9.9	10.0	10.0	✓	0	(1)	12	<0.001	0.003	0.0013	✓
Youngaleena	2	✓	2	19.0	23.0	21.0	✓	0	(1)	2	0.001	0.002	0.0015	✓
Yulga Jinna	2	✓	10	41.0	55.0	46.0	(7)	0	(1)	2	0.003	0.004	0.0035	✓

(1) No samples required in this 12-month period. (refer to *Appendix B - list of sampling parameters*, page 30).

(7) Non-compliance associated with the infant health guideline value of nitrate, a naturally occurring characteristic of the source supplying this community. Additional water (bottled water) is supplied for formula preparation for infants under 3 months of age.

(8) Elevated nitrate is a naturally occurring characteristic of the source supplying this community and has the potential to exceed the infant health guideline value, additional water (bottled water) is supplied for formula preparation for infants under 3 months of age.

Table 13 Aesthetic (non-health related) variables

AC Pilbara - Mid West	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Barrel Well	3	8.5	31	23	(10)	3	<0.05	<0.05	<0.05	✓	3	28	38	32	✓	3	<5	18	13	✓
Cheeditha	2	170	220	195	(10)	2	<0.05	<0.05	<0.05	✓	2	72	82	77	✓	2	130	230	180	✓
Innawonga	3	530	570	550	(10)	3	<0.05	0.060	0.053	✓	3	250	300	277	(11)	3	530	670	617	(12)
Jigalong	2	97	99	98	(10)	2	<0.05	<0.05	<0.05	✓	2	50	60	55	✓	2	130	180	155	✓
Jinparinya	2	210	240	225	(10)	2	<0.05	<0.05	<0.05	✓	2	330	370	350	(11)	2	300	360	330	(12)
Karalundi	2	6	6	6	(10)	2	<0.05	<0.05	<0.05	✓	2	<5	<5	<5	✓	2	<5	<5	<5	✓
Kunawarritji	2	140	150	145	(10)	2	<0.05	<0.05	<0.05	✓	2	260	260	260	(11)	2	360	440	400	(12)
Kutkabubba	2	150	170	160	(10)	2	<0.05	<0.05	<0.05	✓	2	68	98	83	✓	2	210	260	235	(12)
Marta Marta	2	210	240	225	(10)	2	<0.05	0.060	0.055	✓	2	330	360	345	(11)	2	300	360	330	(12)
Ngurawaana	2	460	470	465	(10)	2	<0.05	<0.05	<0.05	✓	2	53	120	87	✓	2	370	440	405	(12)
Parnngurr	2	110	170	140	(10)	2	<0.05	<0.05	<0.05	✓	2	39	61	50	✓	2	100	110	105	✓
Punju Ngamal	2	210	240	225	(10)	2	<0.05	<0.05	<0.05	✓	2	340	370	355	(11)	2	310	370	340	(12)
Punmu	2	230	240	235	(10)	2	<0.05	<0.05	<0.05	✓	2	230	230	230	✓	2	73	75	74	✓
Wakathuni	3	500	540	523	(10)	3	<0.05	<0.05	<0.05	✓	3	430	450	440	(11)	3	780	850	807	(12)
Wandanooka	2	59	64	62	(10)	2	<0.05	<0.05	<0.05	✓	2	560	580	570	(11)	2	89	93	91	✓
Warralong	2	280	290	285	(10)	2	<0.05	<0.05	<0.05	✓	2	62	100	81	✓	2	180	200	190	✓
Yandeyarra	2	330	350	340	(10)	2	<0.05	<0.05	<0.05	✓	2	150	150	150	✓	2	220	250	235	(12)
Youngaleena	2	210	210	210	(10)	2	<0.05	<0.05	<0.05	✓	2	77	90	84	✓	2	220	320	270	(12)
Yulga Jinna	2	220	240	230	(10)	2	<0.05	<0.05	<0.05	✓	2	180	250	215	✓	2	250	280	265	(12)

(10) No guideline value available as per ADWG 2011.

(11) Elevated chloride is characteristic of the source supplying this community.

(12) Elevated hardness is characteristic of the source supplying this community.

Table 14 Aesthetic (non-health related) variables

AC Pilbara - Mid West	Iron					Manganese					pH					Silica				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (pH units)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Barrel Well	3	0.01	0.04	0.02	✓	3	<0.005	<0.005	<0.005	✓	3	6.0	6.7	6.4	(17)	3	1.4	2.0	1.7	✓
Cheeditha	2	<0.01	0.03	0.02	✓	2	<0.005	<0.005	<0.005	✓	2	8.1	8.2	8.2	✓	2	30	61	46	✓
Innawonga	3	<0.01	0.06	0.04	✓	3	<0.005	<0.005	<0.005	✓	3	7.5	8.4	8	✓	3	63.0	69.0	67.0	✓
Jigalong	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7	7.8	7.4	✓	2	14	15	15	✓
Jinparinya	2	<0.01	0.02	0.015	✓	2	<0.005	<0.005	<0.005	✓	2	8.0	8.2	8.1	✓	2	50.0	52.0	51.0	✓
Karalundi	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.0	6.0	6.0	(17)	2	<0.1	1	0	✓
Kunawarritji	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.6	7.7	7.7	✓	2	69.0	80.0	75.0	✓
Kutkabubba	2	<0.01	0.01	0.01	✓	2	<0.005	0.008	0.007	✓	2	7.4	8	7.7	✓	2	87	94	91	(18)
Marta Marta	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.9	7.9	7.9	✓	2	51.0	52.0	52.0	✓
Ngurawaana	3	<0.01	0.02	0.02	✓	2	<0.005	<0.005	<0.005	✓	2	7.6	7.8	7.7	✓	2	41	45	43	✓
Parnngurr	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.6	8.3	8.0	✓	2	20.0	46.0	33.0	✓
Punju Ngamal	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	8.1	8.1	8.1	✓	2	50	52	51	✓
Punmu	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.8	8.3	8.1	✓	2	20.0	24.0	22.0	✓
Wakathuni	3	<0.01	0.03	0.02	✓	3	<0.005	0.006	0.005	✓	3	8	8.1	8.0	✓	3	53	60	56	✓
Wandanooka	2	0.01	0.03	0.02	✓	2	<0.005	<0.005	<0.005	✓	2	6.4	7	6.7	✓	2	120.0	120.0	120.0	(18)
Warralong	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	8.1	8.2	8.2	✓	2	34	37	36	✓
Yandeyarra	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	8.4	8.4	8.4	✓	2	77.0	78.0	78.0	✓
Youngaleena	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.5	7.7	7.6	✓	2	86	97	92	(18)
Yulga Jinna	2	<0.01	0.03	0.02	✓	2	<0.005	<0.005	<0.005	✓	2	8.1	8.4	8.3	✓	2	34.0	37.0	36.0	✓

(17) Low pH is a result of the reverse osmosis treatment and is not a health concern.

(18) Elevated silica is characteristic of the source supplying this community.

Table 15 Aesthetic (non-health related) variables

AC Pilbara - Mid West	Sodium					Sulfate					Total Dissolved Solids					True Colour					Turbidity				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (TCU)			Guideline met	Samples taken	Value (NTU)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Barrel Well	3	17	26	22	✓	3	<1	<1	<1	✓	3	46	120	73	✓	3	<5	9.1	6.4	✓	3	0.1	0.2	0.2	✓
Cheeditha	2	42	49	46	✓	2	46	53	50	✓	2	310	330	320	✓	2	<5	<5	<5	✓	2	0.1	0.1	0.1	✓
Innawonga	3	190	200	197	(19)	3	220	240	233	✓	3	1200	1200	1200	(20)	3	<5	<5	<5	✓	3	<0.1	0.2	0.2	✓
Jigalong	2	38	38	38	✓	2	36	39	38	✓	2	270	270	270	✓	2	<5	8.1	7	✓	2	<0.1	0.3	0.2	✓
Jinparinya	2	140	150	145	✓	2	56	70	63	✓	2	790	940	865	(20)	2	<5	8.3	6.7	✓	2	<0.1	0.2	0.2	✓
Karalundi	2	3	4	3	✓	2	<1	2	2	✓	2	<5	<5	<5	✓	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Kunawarritji	2	130	130	130	✓	2	180	180	180	✓	2	860	870	865	(20)	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Kutkabubba	2	35	50	43	✓	2	37	47	42	✓	2	360	390	375	✓	2	<5	<5	<5	✓	2	0.1	0.2	0.2	✓
Marta Marta	2	140	140	140	✓	2	56	68	62	✓	2	770	890	830	(20)	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Ngurawaana	2	85	94	90	✓	2	22	36	29	✓	2	700	830	765	(20)	2	<5	<5	<5	✓	3	0.1	0.1	0.1	✓
Parnngurr	2	46	72	59	✓	2	22	22	22	✓	2	230	440	335	✓	2	<5	<5	<5	✓	4	0.2	0.2	0.2	✓
Punju Ngamal	2	140	140	140	✓	2	57	70	64	✓	2	810	920	865	(20)	2	<5	13	9	✓	2	<0.1	0.3	0.2	✓
Punmu	2	240	250	245	(19)	2	130	140	135	✓	2	710	810	760	(20)	2	<5	<5	<5	✓	2	<0.1	0.3	0.2	✓
Wakathuni	3	160	180	170	✓	3	260	280	267	✓	3	1300	1500	1400	(2)	3	<5	<5	<5	✓	3	<0.1	0.2	0.1	✓
Wandanooka	2	350	350	350	(19)	2	54	54	54	✓	2	1200	1200	1200	(20)	2	<5	<5	<5	✓	2	0.3	0.3	0.3	✓
Warralong	2	70	90	80	✓	2	17	24	21	✓	2	430	630	530	✓	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Yandeyarra	2	120	140	130	✓	2	32	33	33	✓	2	590	620	605	(20)	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Youngaleena	2	33	39	36	✓	2	63	64	64	✓	2	500	560	530	✓	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Yulga Jinna	2	140	150	145	✓	2	130	160	145	✓	2	590	720	655	✓	2	<5	<5	<5	✓	2	0.1	0.1	0.1	✓

(19) Elevated sodium is characteristic of the source supplying this community.

(20) Elevated TDS is characteristic of the source supplying this community.

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Table 16 Health related variables – non-drinking water supplied												
AC Pilbara - Mid West	***E. coli***				**Thermophilic *Naegleria***			**Fluoride**				
Community	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic *Naegleria*	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met
									Min	Max	Mean	
Burringurrah	20	0	0	✓	20	0	✓	11	0.8	1.3	1.1	✓
Kiwirrkurra	23	0	0	✓	23	0	✓	12	0.6	2.8	1.7	(6)
Pia Wadjari	26	0	0	✓	26	0	✓	2	0.9	1.1	1.0	✓

6) Non-compliance associated with the health guideline value of fluoride, a naturally occurring characteristic of the source supplying this community. Additional water (bottled water) is supplied for the whole community for drinking and food preparation.

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Table 17 Health related variables – non-drinking water supplied														
AC Pilbara - Mid West	**Metals**		**Nitrate**					**Radiological**		**Uranium**				
Community	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Reference met	Samples taken	Concentration (mg/L)			Guideline met
				Min	Max	Mean					Min	Max	Mean	
Burringurrah	2	✓	11	59	70	65.8	(7)	0	(1)	11	0.009	0.031	0.023	(9)
Kiwirrkurra	2	✓	12	12	47	28	✓	0	(1)	12	0.001	0.015	0.006	✓
Pia Wadjari	2	✓	11	37	46	43	✓	3	✓	12	0.022	0.033	0.0275	(9)

(1) No samples required in this 12-month period. (refer to *Appendix B - list of sampling parameters*, page 30)

(7) Non-compliance associated with the infant health guideline value of nitrate, a naturally occurring characteristic of the source supplying this community. Additional water (bottled water) is supplied for formula preparation for infants under 3 months of age.

(9) Non-compliance associated with the health guideline value of uranium, a naturally occurring characteristic of the source supplying this locality. Additional water (bottled water) is supplied for the whole community for drinking and food preparation.

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Table 18 Aesthetic (non-health related) variables – non-drinking water supplied

AC Pilbara - Mid West	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples Taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Burringurrah	2	180	200	190	(10)	2	<0.05	0.07	0.06	✓	2	300	350	325	(11)	2	390	420	405	(12)
Kiwirrkurra	2	120	450	285	(10)	2	<0.05	<0.05	<0.05	✓	2	62	220	141	✓	2	56	380	218	(12)
Pia Wadjari	2	98	110	104	(10)	2	<0.05	<0.05	<0.05	✓	2	390	420	405	(11)	2	150	170	160	✓

(10) No guideline value available as per ADWG 2011.

(11) Elevated chloride is characteristic of the source supplying this community.

(12) Elevated hardness is characteristic of the source supplying this community.

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Table 19 Aesthetic (non-health related) variables – non-drinking water supplied

AC Pilbara - Mid West	Iron					Manganese					pH					Silica				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (pH units)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Burringurrah	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	8.1	8.3	8.2	✓	2	68	83	76	✓
Kiwirrkurra	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.5	8.2	7.9	✓	2	23	140	82	(18)
Pia Wadjari	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.3	7.3	7.3	✓	2	60	62	61	✓

(18) Elevated silica is characteristic of the source supplying this community.

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Table 20 Aesthetic (non-health related) variables – non-drinking water supplied

AC Pilbara - Mid West	Sodium					Sulfate					Total Dissolved Solids					True Colour					Turbidity				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (TCU)			Guideline met	Samples taken	Value (NTU)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Burringurrah	2	170	170	170	✓	2	120	120	120	✓	2	800	1200	1000	(20)	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Kiwirrkurra	2	46	220	133	✓	2	15	91	53	✓	2	170	960	565	✓	2	<5	<5	<5	✓	2	<0.1	<0.1	<0.1	✓
Pia Wadjari	2	260	260	260	(19)	2	120	130	125	✓	2	910	1000	955	(20)	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓

(19) Elevated sodium is characteristic of the source supplying this community.

(20) Elevated TDS is characteristic of the source supplying this community.

Goldfields Central communities receiving additional water for drinking and food preparation for the whole community:

- Tjukurla – bottled water for fluoride above the ADWG health guideline value.
  Refer to tables 26 – 30 for its reticulated water quality.

Goldfields Central communities with dual water supply systems are Mt Margeret, Patjarr, and Tjuntjuntjara.

Refer to tables 21 – 25 for their reticulated drinking water quality and tables 26 – 30 for their non-drinking water reticulated water supply quality.

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Table 21 Health related variables

AC Goldfields Central	*E. coli*				Thermophilic *Naegleria*			Fluoride				
Community	Samples taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic *Naegleria*	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met
									Min	Max	Mean	
Blackstone	24	0	0	✓	24	0	✓	2	0.3	0.4	0.4	✓
Cosmo Newberry	24	0	0	✓	22	0	✓	2	0.3	0.3	0.3	✓
Jameson	24	0	0	✓	24	0	✓	3	0.1	0.2	0.1	✓
Mt Margaret *	22	0	0	✓	20	0	✓	2	<0.1	0.6	0.35	✓
Mulga Queen	22	0	0	✓	20	0	✓	2	0.7	0.7	0.7	✓
Patjarr *	23	0	0	✓	23	0	✓	11	<0.1	1.2	0.2	✓
Tjirrkarli	26	0	0	✓	26	1	(3)	2	0.7	0.7	0.7	✓
Tjuntjuntjara *	20	0	0	✓	20	0	✓	10	0.3	1.5	0.6	✓
Wanarn	24	0	0	✓	24	0	✓	2	0.5	0.5	0.5	✓
Warakurna	52	0	0	✓	52	0	✓	4	0.4	0.6	0.5	✓
Warburton	24	0	0	✓	24	0	✓	2	0.8	0.9	0.9	✓
Wingellina	24	0	0	✓	24	0	✓	2	0.7	0.9	0.8	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. Non-drinking water is supplied to all other taps and is not intended for drinking.

(3) Thermophilic *Naegleria* detection (not *Naegleria fowleri*) - response protocols were implemented in accordance with DoH requirements, including issuing a temporary public advisory describing actions community members are advised to take until the return of safe water supply to the community was verified.

Table 22 Health related variables

AC Goldfields Central	Metals		Nitrate					Radiological		Uranium				
Community	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met
				Min	Max	Mean					Min	Max	Mean	
Blackstone	2	✓	12	30	33	32	(8)	0	(1)	2	<0.001	<0.001	<0.001	✓
Cosmo Newberry	2	✓	11	33	43	37	(8)	0	(1)	2	<0.001	<0.001	<0.001	✓
Jameson	3	✓	13	22	43	33	(8)	0	(1)	3	<0.001	<0.001	<0.001	✓
Mt Margaret *	2	✓	10	3.7	82	19	(7)	0	(1)	2	<0.001	<0.001	<0.001	✓
Mulga Queen	2	✓	10	49	60	56	(7)	0	(1)	2	<0.001	<0.001	<0.001	✓
Patjarr *	3	✓	12	2.8	81	11	(7)	0	(1)	3	<0.001	<0.001	<0.001	✓
Tjirrkarli	2	✓	12	21	29	25	✓	0	(1)	2	<0.001	<0.001	<0.001	✓
Tjuntjuntjara *	2	✓	10	12	54	19	(7)	0	(1)	9	0.005	0.01	0.006	✓
Wanarn	2	✓	12	58	70	64	(7)	3	✓	2	<0.001	<0.001	<0.001	✓
Warakurna	4	✓	4	11	13	12	✓	3	✓	4	<0.001	0.001	0.001	✓
Warburton	2	✓	12	24	77	51	(7)	0	(1)	2	<0.001	<0.001	<0.001	✓
Wingellina	2	✓	12	52	67	61	(7)	1	✓	2	0.003	0.003	0.003	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. Non-drinking water is supplied to all other taps and is not intended for drinking.

(1) No samples required in this 12-month period. (refer to Appendix B - list of sampling parameters, page 30).

(7) Non-compliance associated with the infant health guideline value of nitrate, a naturally occurring characteristic of the source supplying this community. Additional water (bottled water) is supplied for formula preparation for infants under 3 months of age.

(8) Elevated nitrate is a naturally occurring characteristic of the source supplying this community and has the potential to exceed the infant health guideline value, additional water

Table 23 Aesthetic (non-health related) variables

AC Goldfields Central	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Blackstone	2	400	430	415	(1)	2	<0.05	<0.05	<0.05	✓	2	85	85	85	✓	2	490	510	500	(12)
Cosmo Newberry	2	57	60	62	(1)	2	<0.05	<0.05	<0.05	✓	2	60	82	71	✓	2	50	58	54	✓
Jameson	3	43	53	48	(1)	3	<0.05	<0.05	<0.05	✓	3	22	30	26	✓	3	47	73	58	✓
Mt Margaret *	2	9.4	12	11	(1)	2	<0.05	<0.05	<0.05	✓	2	11	14	13	✓	2	<5	<5	<5	✓
Mulga Queen	2	150	160	155	(1)	2	<0.05	<0.05	<0.05	✓	2	110	110	110	✓	2	130	130	130	✓
Patjarr *	3	26	72	46	(1)	3	<0.05	<0.05	<0.05	✓	3	8.1	360	129	✓	3	22	330	130	✓
Tjirrkarli	2	55	56	56	(1)	2	<0.05	<0.05	<0.05	✓	2	190	190	190	✓	2	210	220	205	(12)
Tjuntjuntjara *	2	140	210	175	(1)	2	<0.05	<0.05	<0.05	✓	2	27	110	67	✓	2	160	190	175	✓
Wanarn	2	54	54	54	(1)	2	<0.05	0.050	0.050	✓	2	350	410	380	(11)	2	380	380	380	(12)
Warakurna	4	77	81	80	(1)	4	<0.05	<0.05	<0.05	✓	4	180	240	160	✓	4	180	200	195	✓
Warburton	2	160	190	175	(1)	2	<0.05	<0.05	<0.05	✓	2	150	170	130	✓	2	260	350	305	(12)
Wingellina	2	330	350	340	(1)	2	<0.05	<0.05	<0.05	✓	2	200	210	205	✓	2	400	430	415	(12)

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. Non-drinking water is supplied to all other taps and is not intended for drinking.

(10) No guideline value available as per ADWG 2011.

(11) Elevated chloride is characteristic of the source supplying this community.

(12) Elevated hardness is characteristic of the source supplying this community.

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Table 24 Aesthetic (non-health related) variables

AC Goldfields Central	Iron					Manganese					pH					Silica				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (pH units)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Blackstone	2	0.01	0.02	0.015	✓	2	<0.005	<0.005	<0.005	✓	2	7.9	8.5	8.2	✓	2	69.0	74.0	72.0	✓
Cosmo Newberry	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.7	7.1	6.9	✓	2	15.0	19.0	17.0	✓
Jameson	3	.0.01	0.02	0.013	✓	3	<0.005	<0.005	<0.005	✓	3	6.1	6.8	6.4	(17)	3	9.3	14.0	12.1	✓
Mt Margaret *	2	0.01	0.01	0.01	✓	4	<0.005	<0.005	<0.005	✓	2	6.1	6.5	6.3	(17)	2	1.7	1.7	1.7	✓
Mulga Queen	2	<0.01	0.02	0.015	✓	2	0.006	0.008	0.007	✓	2	7.7	7.8	7.8	✓	2	30.0	34.0	32.0	✓
Patjarr *	3	<0.01	<0.01	<0.01	✓	3	<0.005	<0.005	<0.005	✓	3	6.2	7.4	6.6	✓	3	0.8	73.0	24.9	✓
Tjirrkarli	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.3	7.3	6.8	✓	2	54.0	61.0	57.5	✓
Tjuntjuntjara *	2	0.01	0.05	0.03	✓	4	<0.005	<0.005	<0.005	✓	2	7.6	8.2	7.9	✓	2	6.0	11.0	8.5	✓
Wanarn	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	6.9	7.2	7.1	✓	2	50.0	54.0	52.0	✓
Warakurna	4	<0.01	0.02	0.012	✓	4	<0.005	<0.005	<0.005	✓	4	6.9	7.6	7.2	✓	4	20.0	25.0	22.3	✓
Warburton	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	8	8.1	8.1	✓	2	43.0	46.0	44.5	✓
Wingellina	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	8.1	8.5	8.3	✓	2	65.0	73.0	69.0	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. Non-drinking water is supplied to all other taps and is not intended for drinking.

(17) Low pH is a result of the reverse osmosis treatment and is not a health concern.

Table 25 Aesthetic (non-health related) variables

AC Goldfields Central	Sodium					Sulphate					Total Dissolved Solids					True Colour					Turbidity				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (TCU)			Guideline met	Samples taken	Value (NTU)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Blackstone	2	45	61	53	✓	2	28	40	34	✓	2	460	600	530	✓	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Cosmo Newberry	2	65	71	68	✓	2	22	23	23	✓	2	230	300	265	✓	2	<5	<5	<5	✓	2	0.1	0.3	0.2	✓
Jameson	3	20	34	28	✓	3	7	11	9	✓	3	120	180	157	✓	3	<5	<5	<5	✓	3	0.1	0.3	0.2	✓
Mt Margaret *	2	16	18	17	✓	2	<1	<1	<1	✓	2	53	61	57	✓	2	<5	<5	<5	✓	2	0.1	0.1	0.1	✓
Mulga Queen	2	110	120	115	✓	2	66	78	72	✓	2	530	530	530	✓	2	<5	<5	<5	✓	2	0.3	0.4	0.4	✓
Patjarr *	3	10	160	63	✓	3	<1	170	57	✓	3	54	770	305	✓	3	<5	<5	<5	✓	3	<0.1	0.6	0.3	✓
Tjirrkarli	2	100	110	105	✓	2	140	140	140	✓	2	480	620	550	✓	2	<5	6.6	6	✓	2	0.1	0.1	0.1	✓
Tjuntjuntjara *	2	37	85	61	✓	2	42	60	51	✓	2	370	430	400	✓	2	<5	<5	<5	✓	2	0.2	0.4	0.3	✓
Wanarn	2	150	160	155	✓	2	140	150	145	✓	2	860	960	910	(20)	2	<5	<5	<5	✓	2	0.1	0.2	0.2	✓
Warakurna	4	120	130	125	✓	4	89	100	95	✓	4	540	580	555	✓	4	<5	<5	<5	✓	4	0.1	0.2	0.2	✓
Warburton	2	74	83	79	✓	2	53	80	67	✓	2	660	950	805	(20)	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓
Wingellina	2	150	190	170	✓	2	100	110	105	✓	2	740	880	810	(20)	2	<5	<5	<5	✓	2	<0.1	0.1	0.1	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. Non-drinking water is supplied to all other taps and is not intended for drinking.

(20) Elevated TDS is characteristic of the source supplying this community.

Table 26 Health related variables – non-drinking water supplied

AC Goldfields Central	*E. coli*				Thermophilic *Naegleria*			Fluoride				
Community	Samples taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement met	Samples taken	Samples with Thermophilic *Naegleria*	Requirement met	Samples taken	Concentration (mg/L)			Guideline met
									Min	Max	Mean	
Mt Margaret *	22	0	0	✓	20	0	✓	12	0.6	1.0	0.8	✓
Patjarr *	24	0	0	✓	24	0	✓	11	0.9	1.3	1.1	✓
Tjukurla	26	0	0	✓	26	0	✓	12	1.3	2.1	1.7	(6)
Tjuntjuntjara *	20	0	0	✓	20	0	✓	10	0.2	1.0	0.6	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. This water is supplied to all other taps and is not intended for drinking.

(6) Non-compliance associated with the health guideline value of fluoride, a naturally occurring characteristic of the source supplying this community. Additional water (bottled water) is supplied for the whole community for drinking and food preparation.

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Table 27 Health related variables - non-drinking water supplied

AC Goldfields Central	Metals		Nitrate					Radiological		Uranium				
Community	Samples taken	Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Reference met	Samples taken	Concentration (mg/L)			Guideline met
				Min	Max	Mean					Min	Max	Mean	
Mt Margaret *	2	✓	10	16	100	79	(7)	0	(1)	2	<0.001	0.001	0.001	✓
Patjarr *	2	✓	11	73	89	80	(7)	0	(1)	2	<0.001	<0.001	<0.001	✓
Tjukurla	3	✓	13	36	46	41	(8)	0	(1)	3	0.003	0.005	0.004	✓
Tjuntjuntjara *	2	✓	10	7.3	70	19	(7)	0	(1)	10	0.003	0.008	0.0057	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. This water is supplied to all other taps and is not intended for drinking.

(1) No samples required in this 12-month period.

(7) Non-compliance associated with the infant health guideline value of nitrate, a naturally occurring characteristic of the source supplying this community. Additional water (bottled water) is supplied for formula preparation for infants under 3 months of age.

(8) Elevated nitrate is a naturally occurring characteristic of the source supplying this community and has the potential to exceed the infant health guideline value, additional water (bottled water) is supplied for formula preparation for infants under 3 months of age.

Table 28 Aesthetic (non-health related) variables - non-drinking water supplied

AC Goldfields Central	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Mt Margaret *	2	230	240	235	(10)	2	<0.05	<0.05	<0.05	✓	2	300	340	320	(11)	2	290	300	295	(12)
Patjarr *	2	69	73	71	(10)	2	<0.05	0.05	0.05	✓	2	300	360	330	(11)	2	330	340	335	(12)
Tjukurla	3	310	400	363	(10)	3	<0.05	<0.05	<0.05	✓	3	200	310	260	(11)	3	590	680	620	(12)
Tjuntjuntjara *	2	130	150	140	(10)	2	<0.05	<0.05	<0.05	✓	2	110	110	110	✓	2	120	160	140	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. This water is supplied to all other taps and is not intended for drinking.

(10) No guideline value available as per ADWG 2011.

(11) Elevated chloride is characteristic of the source supplying this community.

(12) Elevated hardness is characteristic of the source supplying this community.

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Table 29 Aesthetic (non-health related) variables - non-drinking water supplied

AC Goldfields Central	Iron					Manganese					pH					Silica				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (pH units)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Mt Margaret *	2	<0.01	<0.01	<0.01	✓	2	<0.005	<0.005	<0.005	✓	2	8.1	8.1	8.1	✓	2	40.0	45.0	42.5	✓
Patjarr *	2	<0.01	0.01	0.01	✓	2	<0.005	<0.005	<0.005	✓	2	7.2	7.3	7.3	✓	2	67.0	73.0	70.0	✓
Tjukurla	3	<0.01	0.02	0.01	✓	3	<0.005	<0.005	<0.005	✓	3	7.8	8.4	7.9	✓	3	85.0	90.0	87.3	✓
Tjuntjuntjara *	2	<0.01	0.01	0.01	✓	4	<0.005	<0.005	<0.005	✓	2	7.6	8.2	7.9	✓	2	6.4	6.6	6.5	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. This water is supplied to all other taps and is not intended for drinking.

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Table 30 Aesthetic (non-health related) variables - non-drinking water supplied

AC Goldfields Central	Sodium					Sulphate					Total Dissolved Solids					True Colour					Turbidity				
Community	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Concentration (mg/L)			Guideline met	Samples taken	Value (TCU)			Guideline met	Samples taken	Value (NTU)			Guideline met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Mt Margaret *	2	250	270	260	(19)	2	140	170	155	✓	2	900	1200	1050	(20)	2	<5	<5	<5	✓	2	0.1	0.1	0.1	✓
Patjarr *	2	160	170	165	✓	2	160	160	160	✓	2	810	960	885	(20)	2	<5	<5	<5	✓	2	<0.1	0.2	0.2	✓
Tjukurla	3	210	240	223	(19)	3	270	370	323	✓	3	1200	1400	1300	(20)	3	<5	<5	<5	✓	3	<0.1	0.4	0.2	✓
Tjuntjuntjara *	2	73	80	77	✓	2	37	44	41	✓	2	410	420	415	✓	2	<5	<5	<5	✓	4	0.2	0.4	0.3	✓

* Dual reticulation system supplies this community. Drinking water is supplied to a tap in the kitchen. This water is supplied to all other taps and is not intended for drinking.

(19) Elevated sodium is characteristic of the source supplying this community.

(20) Elevated TDS is characteristic of the source supplying this community.