WINDY HARBOUR DRINKING WATER SUPPLY

Quarterly Report

April 2024 to June 2024

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1.0 Administration

1.1 Water Provider Information

Water Provider Contact Details			
Name of Company	SHIRE OF MANJIMUP		
Company Address	PO BOX 1 MANJIMUP WA 6258		
Company Phone	97717777	Fax	97717771
Company Email	info@manjimup.wa.gov.au		
Chief Executive Officer	Mr Ben Rose		
CEO Email	ben.rose@manjimup.wa.gov.au		
Department of Health Liaison Officer	Mr Grayson Hindmarsh		
Department of Health Liaison Officer Email	health@manjimup.wa.gov.au		

1.2 Settlement Information

Windy Harbour is a small coastal settlement in an 'A' Class reserve on the southern coast of Western Australia, located in the D'entrecasteaux National Park 60 kilometres south of Pemberton.

The drinking water supply to the settlement is managed by the Shire of Manjimup. The settlement consists of 240 leases, with further room for expansion up to a maximum of 400 leases. A licensed nature-based caravan park is also located at Windy Harbour and has a maximum capacity of 140 patrons and water supply to the communal kitchen and toilet amenities servicing the caravan park is drawn from the settlement's reticulated water supply.

The settlement's primary use is a seasonal holiday destination and has a peak period from November to April. There is no permanent population and leaseholder agreements stipulate that lease holders can occupy the lease for a maximum aggregate of 90 days per annum. During peak periods the settlement supports a population of 2500 which includes both the settlement homes and a nature-based caravan park.

1.3 Drinking Water Quality Management and Commitment

The Shire of Manjimup is committed to the effective management of the water reticulation system and providing safe, high quality drinking water to consumers at Windy Harbour.

The Shire of Manjimup was granted an exemption in 2005 pursuant to the *Water Services Licencing Act 1995* for a licence to provide a water service. This exemption was granted due to its not-for-profit service and lease holder arrangements at Windy Harbour. Notwithstanding the exemption, approvals and reporting mechanisms must satisfy the Department of Health. This includes providing a safe water service and provision of a drinking water quality management plan.

In accordance with the *'Shire of Manjimup Windy Harbour Drinking Water Quality Management Plan 2016'* (DWQMP), the Shire is committed to-

- Managing water quality at all points along the delivery chain from source water to the consumer;
- Using a risk based approach for identifying and managing potential threats to water quality;
- Integrating the needs and expectations of our consumers, stakeholders, regulator and employees into any future planning;
- Establishing regular monitoring of the drinking water quality and effective reporting mechanisms to ensure relevant and timely information is provided which will promote confidence in the water supply and its management;
- Developing appropriate contingency planning and incident response capability;
- Continually improve our practices by assessing performance against corporate commitments and stakeholder expectations;
- Ensuring that all products used or contractors engaged in servicing the drinking water system are required to deliver on these management plan commitments.

The Shire of Manjimup is also committed to implementing the recommendations contained within Department of Water and Environmental Regulation's drinking water source protection assessment that are within the Shire's area of responsibility.

In addition to the Windy Harbour Drinking Water Supply, a signed non-potable camp rainwater tank is situated at the Nature Based Caravan Park, which is not monitored through the DWQMP. The water in this tank is not intended for drinking.

1.4 Catchment Details and System Information

The catchment for the Windy Harbour Drinking Water Supply groundwater supply is north-west of the settlement and extends approximately 5 kilometres inland from the coast and is 3 kilometres wide. The reserve set aside for the settlement is 190 hectares in area. The settlement and the catchment is entirely contained within the D'entrecasteaux National Park.

Land use in the catchment is predominantly natural vegetation, other than the water production infrastructure itself. Given the catchment land use is almost entirely national park, the level of catchment protection is high and the potential for threats to water quality is low.

A limestone quarry partially falls within the western boundary of the Windy Harbour Water Reserve. The quarry has Department of Water and Environmental Regulation (DWER) approval which stipulates best management practices are applied by the quarry proprietor to protect water quality.

The water demand is highly seasonal and directly proportional to occupation of the individual leaseholders' properties (dwellings) and visitors staying at the nature-based Caravan Park.

The water scheme comprises of two bores and a Smarta flow chlorinating disinfection system which uses sodium hypochlorite. The chlorination system is the only disinfection system within the drinking water system and is the single

most important barrier in protecting consumers against waterborne pathogens. The infrastructure for the bore and the chlorinator is fenced and locked up in secure bore compounds.

The treated water is pumped approximately one-kilometre up hill to a secure tank compound. The water is then gravity fed on demand to the reticulated water supply servicing the settlement, including the kitchen, toilets and amenities servicing the nature-based caravan park.

Management of the drinking water quality includes monthly sampling at the nominated points as per the DWQMP for microbiological, chemical health and chemical aesthetic characteristics. Shire staff monitor chlorine, microbial and chemical values.

1.5 Water Quality Parameters

The Water Quality analysis undertaken is categorised into three main performance areas being microbiological, chemical - health related values and chemical – aesthetic related values. The results are assessed for compliance in accordance with the Australian Drinking Water Guidelines 2011 (ADWG).

Table 1: Water quality parameters adopted from the Australian Drinking Water Guidelines (ADWG).

Turbidity	Turbidity is the cloudy appearance of water caused by the presence of suspended matter.	The Australian Drinking Water Guidelines specify an aesthetic guideline of 5 NTU. If disinfection is required, the turbidity of less than 1 NTU is desirable at the point of disinfection.
Colour	Colour in water originates mainly from natural drainage through soil and vegetation in a catchment.	The Australian Drinking Water Guidelines value for colour is based on the colour that is noticeable in a glass. This is generally accepted as 15 HU.
Iron	Iron occurs naturally in water as a result of contact with soil or rock in the catchment. Iron in the water does not present a health hazard.	The Australian Drinking Water Guidelines recommend that based on aesthetic consideration, the concentration of iron should not exceed 0.3 mg/L.
Hydrogen Sulfide	Hydrogen sulfide is formed in drinking water by the hydrolysis of soluble sulfides, or through the reduction of sulfate by the action of microorganisms. Hydrogen sulfide has an obnoxious 'rotten egg' odour.	Based on aesthetic considerations, the concentration of hydrogen sulfide in drinking water should not exceed 0.05 mg/L. No health based guideline has been set.
Total dissolved solids	Total dissolved solids (TDS) consist of inorganic (natural) salts and small amounts of organic matter dissolved in water. Total dissolved solids comprise sodium, potassium, calcium, magnesium, chloride, sulphate, bicarbonate, carbonate, silicon, organic matter, fluoride, iron, manganese, nitrate and phosphate.	Treated water quality containing TDS levels of below 500 mg/L is classified as good.
Microbial Pathogens	Thermophilic *Naegleria* refers to a group of amoeba which includes *Naegleria fowleri*, the organism that causes the waterborne disease primary amoebic meningoencephalitis. *Naegleria fowleri* is an environmental pathogen which naturally lives in fresh warm water. The most common and widespread health risk associated with drinking water is contamination by microorganisms. Organisms associated with the gut of humans and mammals cause the usual waterborne diseases. Tests are undertaken for *Escherichia coli* (*E. coli*).	The Department of Health WA has notification protocols in place regarding *Naegleria*. The Australian Drinking Water Guidelines state that the thermotolerant coliform E. *coli* should not be present in a 100 mL sample.

pH	pH is a measure of how acidic/basic water is. The range goes from 0 – 14, with 7 being neutral. pH is the measure of free hydrogen ion concentrations in the water.	The suggested aesthetic pH target from the Australian Drinking Water Guidelines is 6.5 to 8.5**.**
(THM's)Trihalomethanes	Refers to the total sum of a group of chemicals predominantly, chloroform, bromodichloromethane and bromoform along with other disinfection by-products.	The Australian Drinking Water Guidelines recommended maximum value is 0.25 mg/L

The ADWG are produced by the National Health and Medical Research Council (NHMRC) and are available from the NHMRC website at
http://nhmrc.gov.au/about-us/publications/australian-drinking-water-guidelines

1.6 Units

The following is an explanation of the units presented in this report

Units**:**	mg/L	Milligrams per Litre
	CFU/100mL	Colony Forming Units per 100 millilitres
	HU	Hazen Units (a unit of colour)
	NTU	Nephelometric Turbidity Units (a unit of turbidity)
	ug/L	Micrograms per Litre

1.7 Performance Summary

The Shire of Manjimup obtained 188 samples from the reticulation water supply during the April to June 2024 reporting period. Of these 33 were for microbiological quality, 75 for health-related chemical quality and 80 for aesthetic chemical quality. All samples were assessed pursuant to the ADWG.

There was one public complaint received concerning the quality of the water during this reporting period regarding discolouration. Results of any anomalies or exceedances with the recommended guideline values in microbiological or chemical parameters are forwarded to the WA Department of Health (DoH) as they occur.

Table 2: Summary of water quality analysis undertaken during April to June 2024

	No Assessed	No Within Guidelines	Variance
Microbial Quality			
E. coli	18	18	0
Thermophilic *Naegleria*	15	15	0
Chemical Quality			
Chemical – Health Related	75	75	0
Chemical – Aesthetic	80	68	12
Radiological Quality			
Gross Alpha (next due 2028)	0	0	0
Gross Beta (next due 2028)	0	0	0

2.0 Microbial Performance

2.1 Microbial – Exception Notifications

During the April to June 2024 quarter, the Shire of Manjimup collected a total of 33 microbiological samples at six nominated points in accordance with the DWQMP. There were no detections or reportable exceptions of either *Escherichia coli (E. coli)* or Thermophilic *Naegleria* species during the reporting period.

2.2 Microbiological – Compliance

Table 3: Summary of microbiological samples obtained during the period April to June 2024

No. of Bacteria Samples	*E. coli*		No. of Amoeba Samples	Thermophilic *Naegleria*	
	Non Comply	Comply		Non Comply	Comply
18	0	100%	15	0	100%

2.3 Microbiological - Performance

Microbiological results from the nominated sampling points were compliant pursuant to the ADWG Guidelines for the April to June 2024 quarter.

2.4 Microbial Incident Specific Information

There were no recorded microbial non-conforming results for *E. coli,* Thermotolerant Coliforms or Thermophilic *Naegleria* at the nominated sample points during the April to June 2024 quarter. There have also been no significant or reportable microbiological incidents in this reporting period.

3.0 Chemical – Health Related Performance

3.1 Chemical – Exception Notifications

Trihalomethanes (THM's) were not exceeded through the sampling period. However, the month of April 2024 was right on the threshold of exceeding the recommended value.

THMs (Trihalomethanes) are organic disinfection by-products and indicative of the natural organic matter in the source water prior to disinfection. The results for Trihalomethanes are a marked improvement from recent reporting periods. The Shire will continue to monitor individual and trending results via its monthly sampling program.

Table 4: Summary of Chemical Exception Notifications, Trihalomethanes during April to June 2024

Date of Sample	Characteristic	Unit	Health Related Recommended Value (Max)	Sample Result
Nil	Trihalomethanes	Mg/L	0.25	N/A

Figure 1: Trihalomethane (THM) values over the recent months (mg/L)

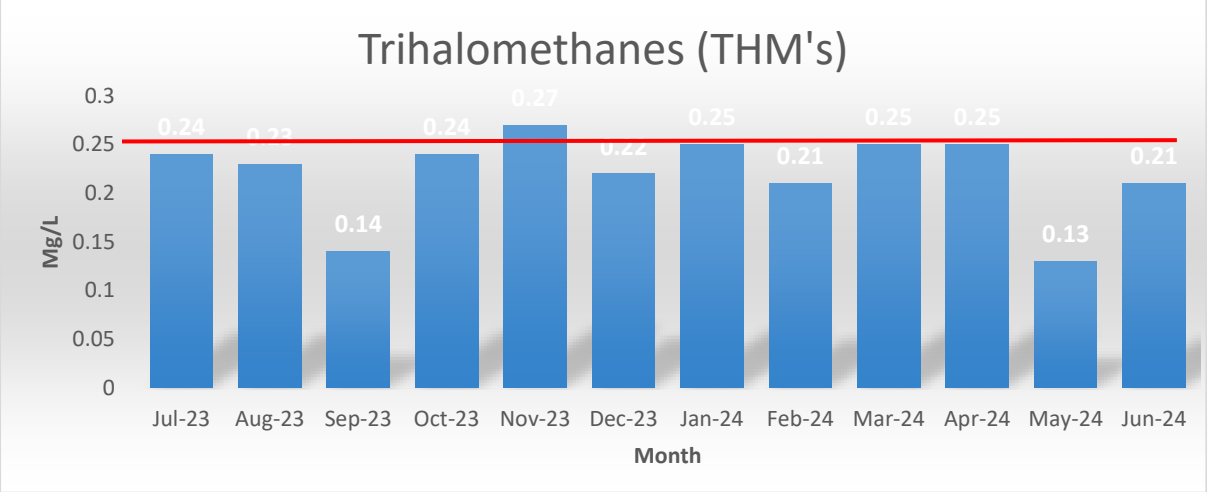
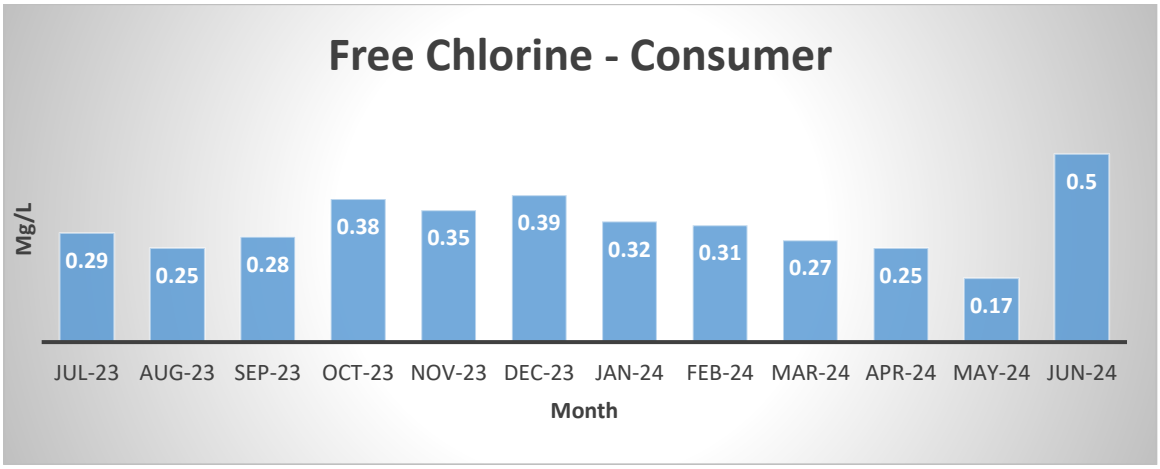


Figure 2: Free Chlorine values over the recent months at the consumer sampling point (mg/L)



Free Chlorine values were satisfactory for the period albeit low in May 2024. Notwithstanding, the microbiological quality of the water was not compromised and will continue to be maintained in the future.

3.2 Chemical - Health – Compliance

There are many chemical parameters that have a health-related guideline value pursuant to the ADWG. The Shire achieved compliance with guideline values for all chemical (health related) elements. Table 5 illustrates the group of health-related organic chemical disinfection by-products.

Table 5: Summary of chemical (health related) values for sampling obtained during April to June 2024 quarter.

	Chemical	Unit	Health Guideline Value	Max Value of Samples	No Assessed	No Within Guidelines	Compliance
Organic chemicals, disinfection by-products	Chloroacetic acid	mg/L	0.15	<0.05	3	3	100%
	Dichloroacetic acid	mg/L	0.1	<0.02	3	3	100%
	Trichloroacetic acid	mg/L	0.1	<0.02	3	3	100%
	Chloral hydrate	mg/L	0.1	<0.02	3	3	100%
	2 - Chlorophenol	mg/L	0.3	<0.00005	3	3	100%
	2,4 - Dichlorophenol	mg/L	0.2	<0.001	3	3	100%
	2, 4, 6 - Trichlorophenol	mg/L	0.1	<0.001	3	3	100%
	Trihalomethanes	mg/L	0.25	0.25	3	3	100%

The 6 monthly comprehensive sampling was undertaken in May 2024 as per DWQMP including pesticides, industrial hydrocarbons, and other inorganic chemicals. These May 2024 samples were in compliance with the ADWG recommended values. A comprehensive report on the 6 monthly sampling results will be tabled in the Annual Report.

4.0 Chemical – Aesthetic Related Performance

4.1 Chemical – Aesthetic - Results

The following table summarises the results for the aesthetic chemical characteristics during the reporting period. Whilst exceedances of aesthetic values for total dissolved solids, iron and colour can affect consumer experience, it is important to note that such exceedances do not pose a health risk to consumers.

There were no exception notifications (Level 2) submitted to the DoH during the April to June 2024 reporting period as the Aesthetic exceedances are not reportable.

True Colour at the Distribution Tank exceeded the maximum value in each month and Iron at the consumer exceeded the maximum value also each month. Furthermore, the Total Dissolved Solids at the consumer exceeded the recommended value on two occasions in April and June 2024.

Table 6: Summary of chemical (aesthetic) values for sampling obtained during April to June 2024 quarter.

Category	Chemical	Unit	Aesthetic Guideline Value	Max Value of Samples	No Assessed	No Within Guidelines	Compliance
Physical Characteristics	pH (all locations)	pH	6.5-8.5	6.95	18	18	100%
	Total Dissolved Solids (source)	mg/L	500	**530**	3	1	33.3%
	True Colour (distribution)	HU	15	**36**	**3**	**0**	0%
	Turbidity (source)	NTU	5	3.1	3	3	100%
	Turbidity (distribution)	NTU	1	**10**	3	2	66.6%
Other inorganic chemicals	Iron (distribution)	mg/L	0.3	**1.5**	3	0	0%

4.2 Chemical - Aesthetic – Incident Specific Information

Analysis of water samples obtained from the source, distribution and consumer sample points showed aesthetic values not being compliant with guidelines for 12 samples of the 80.

Total Dissolved Solids were not within the guidelines on two occasions, being April and June 2024 for the sampling period. True colour did not meet the guidelines value for any sample analogous with the other parameters that indicate high concentrations of inorganic matter. True colour represents the colour that remains after any suspended particles have been removed and while it can influence the appearance of water, it is not necessarily harmful to human health.

Iron levels exceeded the aesthetic maximum guideline value for every month this quarterly reporting period. This value is based on a taste threshold and there have been only one public complaint received concerning the aesthetic quality of the water during this reporting period. It has been at raised levels in past reporting periods and is inclusive with future sampling.

Raw water extracted from the bore(s) at Windy Harbour is typically characterised by naturally elevated levels of both total dissolved solids (>500mg/L) and iron (> 0.3 mg/L), and there is no pre-treatment process (filtration) in place to minimise these characteristics prior to chlorination at the present time.

Chlorine levels at various sample points exceeded the maximum aesthetic guideline value. It also fell below it during the reporting period at distribution points. This value is based on a taste threshold and there have been no public complaints received regarding chlorine. It is important to note that adequate disinfection is paramount for the provision of safe drinking water and free chlorine levels must be maintained.

5.0 Summary

This quarterly report describes the Windy Harbour drinking water quality performance for the April to June 2024 reporting period. Sampling and in house monitoring procedures are carried out in accordance with best industry practice and undertaken by Shire staff competent in aseptic technique.

It is pertinent to note the current DWQMP is currently under review by consultants that commenced in June 2024. The review is expected to be completed this calendar year in 2024. The review includes existing and emerging Hazardous Analysis Critical Control Points (HACCP) that effect the water quality and compliance with the ADWG.

The sampling program comprises of 6 compliance monitoring points, which includes the source water (bore), treated water tanks (distribution) and various locations at the extremities of the (consumer) system, allowing for the fair representation of the water supply in Windy Harbour. Water samples in the sampling schedule are analysed by approved NATA laboratories in Perth in accordance with the requirements of the Department of Health.

The report demonstrates that all samples obtained for microbiological analysis were within the parameters determined by the ADWG. Most of the samples acquired for chemical and physical characteristics were also compliant, exceptions being the aesthetic related values for true colour, turbidity, total dissolved solids and iron. The guidelines were not exceeded for Trihalomethanes, which has been a welcome result following the exceedances in the recent quarters.

The Shire's Environmental Health Officers will continue to closely monitor chemical analysis results going forward and respond accordingly to any anomalies that may pose a risk to human health.

The Shire of Manjimup is also committed to being transparent on its performance by providing the public with accurate and representative information in this report. This report aims to demonstrate to Windy Harbour residents, guests and visitors alike, the ongoing commitment to the sustainable production and provision of quality drinking water at Windy Harbour.

Any further enquiries or information regarding this report or any other matter pertaining to the Windy Harbour Drinking Water Supply can be obtained by emailing the Shire's Environmental Health Services Team at health@manjimup.wa.gov.au or by telephoning (08) 9771 7777.