Lancelin South Water

Report to the Department of Health

For the period

1 October to 31 December 2023

Contents

1.0 Water Provider Information

Provider Contact Details	
Name of Company	Lancelin South Water
Company Address	Suite 2, Ground Floor 233 Adelaide Terrace, Perth WA 6000
Company Phone	08 9655 1555
Company Email	admin@lancelinsouthwater.com.au
Chief Executive Officer / Director	Yi Qiang, Lancelin South Water
CEO Email	chetqiang@vimg.com.au
DoH Liaison Officer	Blair Shackleton, Lancelin South Water
DoH Liaison Officer Email	Blair.shackleton@lancelinsouthwater.com.au

1.1 Our Water System

Location

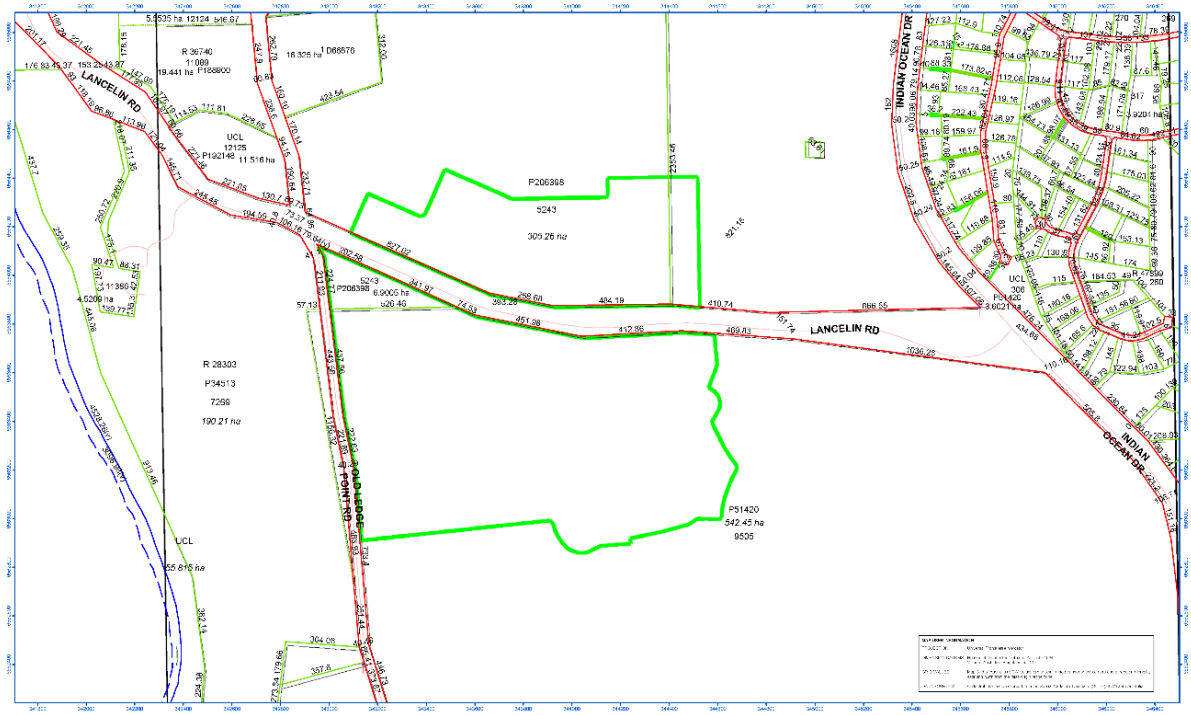
The Lancelin South development is located approximately 130 kilometres north of Perth and 2.2 kilometres southeast of the town of Lancelin, in the Shire of Gingin.

Licence Area

Lancelin South Water (LSW) holds a Water Services Licence (WL47) issued by the Economic Regulation Authority of Western Australia (ERAWA).

Lancelin South Water services the Lancelin South residential and commercial areas as indicated in Figure 1 below. Our Water Services Licence is available at the ERA web site at https://www.erawa.com.au/water/water-licensing/licence-holders#L

Figure 1 Lancelin South Operating Area



Our Infrastructure

Table 1: Summary of infrastructure

Infrastructure Summary	
Total number of connections[(1)] - June 2023	25
Number of Customers[(2)]	29
Total length of water mains	1.6 kilometres
Number of water quality localities	1
Chlorine residual target	0.4 to 0.6 mg/L

Note 1 Number of connections refers to properties connected to services and having regular meter readings collected.

Note 2 The number of customers is determined by the ERA as the number of customer accounts holders, which includes lots sold as well as lots under construction that may have not yet been connected to services.

Our Water Source

Lancelin South Water sources all water from a production bore tapping the Leederville aquifer within the Perth Basin. Two monitoring bores are installed to allow monitoring of any impacts on or risks to the groundwater source, either from our operation or from other parties.

Lancelin South Water holds a Licence to Take Water (GWL176077(2)) issued by Department of Water and Environmental Regulations (DWER).

Source Protection

A Drinking Water Source Protection Plan (DWSPP) has been developed by Lancelin South Water. Lancelin South Water will work cooperatively with the DoH, as described in the MoU, to ensure the safety of the water supply.

The production bore is located within our locked, chain mesh fenced Water Treatment Plant (WTP) compound. To protect our source water, a Wellhead Protection Zone has been proclaimed over the area of the WTP compound.

Abstraction Amounts

Lancelin South Water's Licence to Take Water (GWL176077(2)) allows annual extraction up to 470 megalitres (470 million litres) from the Leederville aquifer. Lancelin South Water typically abstract less than 10 ML/year of groundwater.

Water Treatment

The Lancelin South Water treatment plant incorporates four steps to treat the raw bore water to produce safe drinking water that is supplied to our customers:

- Raw groundwater abstracted from the production bore is dosed with sodium hypochlorite solution, then filtered through a catalytic filter media, DMI65, to remove dissolved metals. This water is supplied to the Lancelin South residents as non-potable water (not for drinking);
- The non-potable water is further treated by filtration through successively, granular activated carbon to remove dissolved organic contaminants and then 5 µm and 1 µm cartridges to ensure particulate matter in the water is removed;
- Part of this filtered water is then treated using reverse osmosis desalination to reduce the salinity of the water;
- The desalinated water and filtered water streams are then blended and stored in the Drinking Water Tank. Water in this tank is continuously recirculated and dosed with sodium hypochlorite solution to maintain a residual chlorine disinfectant concentration. The water at Lancelin South is not fluoridated.

Lancelin South Water supplies on average 156 kL/property of drinking water each year.

Distribution Network

Lancelin South Water's distribution network delivers drinking water to customers within the Lancelin South area. The network operates as one interconnected system. Materials used in the reticulation network are predominantly Polyvinyl Chlorine (PVC) and High Density Polyethylene (HDPE), approved under Australian Standard AS/NZS 4020 (Testing of Products for Use in Contact with Drinking Water) or complying with the Department of Health document Materials and Substances in Contact with Drinking Water requirements or as scheduled in the MoU with the Department of Health.

Lancelin South Water samples the raw (source) water (Source Sample Point) and treated water; treated water is sampled at the outlet of the treated water tank (Treated Water Sample Point) and from a sample tap located within the Lancelin South residential area (Consumer Sample Point).

A separate distribution network supplies non-potable water (not for drinking) to Lancelin South customers. This water supply is identified using 'purple pipes', including a separate purple water meter, and is marked as "Not for Drinking". A 'Non-potable Water – Household Guide' is available from the Lancelin South Water web site at http://www.lancelinsouthwater.com.au/forms-documents-and-publications/

Our Team

Employees and contractors involved with the Lancelin South Water drinking water system have appropriate training and experience to be demonstrably competent with the treatment, supply and monitoring of drinking water.

2.0 Performance Summary

Table 2 Microbial Water Quality 1 October 2023 to 31 December 2023

Compliance from 1 October to 31 December 2023				
		Total Number of samples (1)	**Number of samples compliant**	**Percent of samples compliant (%)**
Microbiological	*Escherichia coli (E.Coli)*	11	11	100
	Thermophilic *Naegleria*	5	5	100
	Naegleria Fowleri	1	1	100
Chemical	Health related	19	19	100
Radiological	Health related	2	2	100

Note 1: Number of samples taken for the quarter from the Treated Water Tank Sample Point and the Consumer Sample Point.

Appendix A of this report describes the Water Quality parameters that are measured by Lancelin South Water, the reasons that they are measured and how to interpret the results.

3.0 Microbiological Performance

Microbiological samples are collected from the Treated Water and Consumer sample point fortnightly and summarised in Table 3 below. Samples were analysed for thermotolerant coliforms, E. coli, Thermophilic *Naegleria* and *Naegleria fowleri* during the period. No microbial activity in relation to these parameters was detected during the three months at either of the sample locations.

Thermophilic Amoeba was detected at the Consumer sample point on the 30 November and in a repeat sample on 5 Dec 2023. The Department of Health was notified of the findings even though not required in accordance with our Memorandum of Understanding. The potable water pipeline was flushed and chlorine dosing increased slightly for an approximately 2 week period. Subsequent samples collected returned a "no detection" result for thermophilic amoeba.

Lancelin South Water remains fully compliant with the Australian Drinking Water Guidelines (ADWG) and the Memorandum of Understanding with the Department of Health in respect *to E. coli* and *N. fowleri.*

3.1 Microbiological – Exception Notifications

Microbial Water Quality Exceptions							
Locality	**Period Quarter**	**Date**	**Microbial Characteristic**	**MoU Alert Level**	**Remedial Action**	**DoH Notified**	**Close Out Date**
Lancelin South	Q4	01/10/23 to 31/12/23	NIL				

3.2 Treated Water Microbiological Water Quality

Table 3 Microbial Water Quality 1 October 2023 to 31 December 2023

Period	*Escherichia coli (E.Coli)*				*Thermophilic Naegleria*			*Naegleria Fowleri*		
	No of Samples	**No of non conforming samples**	**Maximum Individual Value**	**Compliance**	**No of Samples**	**Detected**	**Compliance**	**No of Samples**	**Detected**	**Compliance**
Oct-23	3	0	est <1	100	1	0	100	1[(1)]	0	100
Nov-23	4	0	est <1	100	2	0	100	NR	-	-
Dec-23	4	0	est <1	100	2	0	100	NR	-	-
Quarter Total	11	0	-	-	5	0	-	1	0	-
Quarter Performance	100%			-	100%		-	100%		-

Note 1: Additional analysis reported by laboratory, although not required.

4.0 Chemical – Health Related Performance

The results of water samples collected from the bore (raw water) and the treated water sample points (Treated Water Tank and Consumer Sample point) during the period are summarised in Table 4 below. The results show that the water supply provided by Lancelin South Water is fully compliant with ADWG guidelines, our MoU with the DoH and licence requirements with the ERA.

This period also includes annual bore water sampling for DWER reporting, results have been included below.

4.1 Chemical – Health Related – Exception Notifications

Health Related Chemical Water Quality Exceptions							
Locality	**Period Quarter**	**Date**	**Chemical Characteristic**	**MoU Alert Level**	**Remedial Action**	**DoH Notified**	**Close Out Date**
Lancelin South	Q4	01/10/23 to 31/12/23	NIL				

4.2 Chemical – Health Related - Results

Table 4 Chemical Health summary 1 October 2023 to 31 December 2023

Type	Unit	ADWG Guideline (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bore)		Distribution Water			
				Number Assessed	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value (mg/L)	% Compliance
Arsenic	mg/L	0.01	0.001	1	<0.001	NR			
Barium	mg/L	2.0	0.01	2	0.16	NR			
Beryllium	mg/L	0.06	0.001	2	<0.001	NR			
Boron	mg/L	4	0.05	2	<0.05	NR			
Copper	mg/L	2.0	0.001	NR		1	1	0.007	100
Lead	mg/L	0.01	0.001	NR		1	1	<0.001	100
Manganese	mg/L	0.5	0.005	1	0.071	1	1	0.020	100
Mercury	mg/L	0.001	0.0001	1	<0.0001	NR			
Molybdenum	mg/L	0.05	0.001	1	<0.001	NR			
Nickel	mg/L	0.02	0.001	1	<0.001	NR			
Nitrate	mg/L	50	0.01	2	<0.01	NR			

Type	Unit	ADWG Guideline (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bore)		Distribution Water			
				Number Assessed	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value (mg/L)	% Compliance
Selenium	mg/L	0.01	0.001	1	<0.001	NR			
Silver	mg/L	0.1	0.001	1	<0.001	NR			
Uranium	mg/L	0.017	0.001	1	<0.001	NR			
2,4,6-Trichlorophenol	mg/L	0.02	0.001	1	<0.001	NR			
2,4-Dichlorophenol	mg/L	0.2	0.001	1	<0.001	NR			
2-Chlorophenol	mg/L	0.3	0.001	1	<0.001	NR			
Free Chlorine [(1)(2)]	mg/L	5	-	NR		16	16	0.87	100

Note 1: Chlorine analysis is an on-site test. All others are results from NATA accredited laboratory.

Note 2 A target of 1.0 mg/L free chlorine (above ADWG aesthetic-based value of 0.6 mg/L) is set at the outlet of the treated water tank to ensure effective disinfection and maintain microbiological safety of drinking water through the reticulation system and to the customer. Free chlorine measured at the consumer sample point ranged from 0.02 mg/L to 0.66 mg/L in the 1 October to 31 December 2023 period.

Australian Drinking Water Guidelines	ADWG		Not Detected	ND
Becquerels per Litre	Bq/L		Not Required	NR
Colony Forming Units	CFU		Nephelometric Turbidity Units	NTU
Hazen Units	HU		Acidity/basicity	pH
Milligrams per Litre	mg/L		Micro Siemens per centimetre	µS/cm
Not Applicable	NA			

4.3 Chemical – Health related - Pesticides Results

Table 5 Chemical Health (Pesticide) summary 1 October 2023 to 31 December 2023

Type	Unit	ADWG Guideline (mg/L)	Lab Limit of Reporting (mg/L)	Source Water (Bore)		Distribution Water			
				Number Assessed	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value (mg/L)	% Compliance
Aldrin	mg/L	0.0003	0.000001	1	<0.000001				
Amitraz	mg/L	0.009	0.0001	2	<0.0001				
Amitrole	mg/L	0.009	0.001	2	<0.001				
Atrazine	mg/L	0.02	0.0001	2	<0.0001				
Azinphos Methyl	mg/L	0.03	0.001	2	<0.001				
Bromophos Ethyl	mg/L	0.01	0.000005	2	<0.000005				
Chlordane	mg/L	0.002	0.000002	2	<0.00001				
Chlorothalonil	mg/L	0.05	0.00001	2	<0.00001				
Chlorpyrifos	mg/L	0.01	0.000005	2	<0.000005				
Chlorpyrifos	mg/L	0.01	0.0001	2	<0.0001				
Clopyralid	mg/L	2	0.0004	2	<0.0004				
Diazinon	mg/L	0.004	0.00001	2	<0.00001				
Dicamba	mg/L	0.1	0.0001	2	<0.0001				
Diclofop Methyl	mg/L	0.005	0.0001	2	<0.0001				
Dieldrin	mg/L	0.0003	0.000001	2	<0.000001				
Dimethoate	mg/L	0.007	0.0001	2	<0.0001				
Diuron	mg/L	0.02	0.0005	2	<0.0005				
Endosulfan I	mg/L	0.02	0.0001	2	<0.0001				
Endosulfan II	mg/L	0.02	0.0001	2	<0.0001				
Endosulfan Sulfate	mg/l	0.02	0.0001	1	<0.0001				
Ethion	mg/L	0.004	0.00001	1	<0.00001				
Fenamiphos	mg/L	0.0005	0.001	1	<0.001				
Fenitrothion	mg/L	0.007	0.0001	1	<0.0001				
Fipronil	mg/L	0.0007	0.00002	1	<0.00002				
Fluometuron	mg/L	0.07	0.0001	1	<0.0001				
Fosamine	mg/L	0.03	0.01	1	<0.01				
Heptachlor	mg/L	0.0003	0.000001	1	<0.000001				
Hexazinone	mg/L	0.4	0.0004	1	<0.0004				
Lindane	mg/L	0.01	0.000001	1	<0.000001				
Malathion	mg/L	0.07	0.00001	1	<0.00001				
MCPA	mg/L	0.04	0.0001	1	<0.0001				

Type	Unit	ADWG Guideline (mg/L)	Lab Limit of Reporting (mg/L)	Source Water (Bore)		Distribution Water			
				Number Assessed	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value (mg/L)	% Compliance
Methoxychlor	mg/L	0.3	0.00002	1	<0.00002				
Metolachlor	mg/L	0.3	0.0002	1	<0.0002				
Metsulfuron Methyl	mg/L	0.04	0.0005	1	<0.0005				
Molinate	mg/L	0.004	0.0001	1	<0.0001				
o,p-DDT	mg/L	0.009	0.000001	1	<0.000001				
p,p-DDT	mg/L	0.009	0.000001	1	<0.000001				
Paraquat	mg/L	0.02	0.001	1	<0.001				
Parathion Methyl	mg/L	0.0007	0.00002	1	<0.00002				
Pentachlorophenol	mg/L	0.01	0.001	1	<0.001				
Picloram	mg/L	0.3	0.0002	1	<0.0002				
Propazine	mg/L	0.05	0.0001	1	<0.0001				
Propiconazole	mg/L	0.1	0.0004	1	<0.0004				
Simazine	mg/L	0.02	0.0001	1	<0.0001				
Temephos	mg/L	0.4	0.025	1	<0.025				
Terbutryn	mg/L	0.4	0.0001	1	<0.0001				
Triclopyr	mg/L	0.02	0.0001	1	<0.0001				
Trifluralin	mg/L	0.09	0.00001	1	<0.00001				
2,4,5-T	mg/L	0.1	0.0001	1	<0.0001				
2,4-D	mg/L	0.03	0.0001	1	<0.0001				

4.4 Chemical – Health Related - PFAS

No sampling of the source water or the consumer sample point was carried out for per- and polyfluoroalkyl substances (PFAS) over the period 1 October to 31 December 2023.

5.0 Physical and Chemical – Aesthetic Performance

The results of water samples collected from the bore (raw water) and the treated water sample points (Treated Water Tank and Consumer Sample point) during the period are summarised in Table 6 below.

5.1 Physical and Chemical – Aesthetic Results

Table 6 Aesthetic summary 1 October 2023 to 31 December 2023

Type	Unit	ADWG Guideline (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bore)		Distribution Water			
				Number Assessed	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value (mg/L)	% Compliance
Aluminium	mg/L	0.2	0.05	2	<0.05	1	1	<0.05	100
Ammonia	mg/L	0.5	0.02	2	0.39	1	1	0.09	100
Chloride[1]	mg/L	250	5	2	380	1	0	300	0
Colour [1]	HU	15	5	1	16	1	1	<5	100
Iron [1]	mg/L	0.3	0.01	1	2.7	1	1	0.04	100
Sodium	mg/L	180	0.5	2	140	1	1	100	100
Sulfate	mg/L	250	1	2	49	1	1	31	100
Total Hardness by Calculation[1]	mg/L	200	5	2	240	1	1	150	100
2-Chlorophenol [1] [3]	mg/L	0.0001	0.001	1	<0.001	NR			
2,4-Dichlorophenol[1] [3]	mg/L	0.0003	0.001	1	<0.001	NR			
2,4,6-Trichlorophenol[1]	mg/L	0.002	0.001	1	<0.001	NR			
Free Chlorine [2] [4]	mg/L	0.6	-	NR		16	10	0.87	63
pH [4]		6.5 – 8.5	0.1	9	7.27	15	15	7.62 – 8.18	100
Total Dissolved Solids [4]	mg/L	600	5	10	720	15	15	587	100
Turbidity [4]	NTU	5	0.1	1	31	16	16	1.80	100

Note 1: Source Water is treated to ensure parameters above ADWG aesthetic based values are addressed.

Note 2: A target of 1.0 mg/L free chlorine (above ADWG aesthetic-based value of 0.6 mg/L) is set at the outlet of the treated water tank to ensure effective disinfection and maintain microbiological safety of drinking water through the reticulation system and to the customer.

Note 3: The laboratory limit of reporting (LOR) for 2-Chlorophenol and 2,4-Dichlorophenol is 0.001 mg/L which are above the respective ADWG aesthetic related guideline values for these compounds and hence, the samples may not be compliant with the ADWG aesthetic related guidelines.

Note 4: Numbers of on-site test vs NATA accredited laboratory.

	Source Water - Site analysis	Source Water - Laboratory	Distribution – Site analysis	Distribution - Laboratory
pH	7	2	14	1
TDS	8 (calculated from Conductivity)	2	14	1
Free Chlorine	NR	NR	16	-
Turbidity	NR	1	15	1

6.0 Radiological Performance

The results of water samples collected from the bore (raw water) and the treated water sample point (Treated Water Tank) during the period are summarised in Table 7 below.

The results show that all samples were below the ADWG screening value for gross alpha activity and gross beta activity, of 0.5 Bq/L. The total estimated annual effective radiological dose from the source water, calculated in accordance with ADWG (v3.7), is below the Australian national reference level for drinking water of 1 mSv/year.

The source water is partially treated by reverse osmosis which will remove the naturally occurring radioactive materials responsible for alpha and beta activity, prior to supply to consumers. The radiological results from the distributed water supply indicate the water supplied by Lancelin South Water is fully compliant with ADWG.

6.1 Radiological – Exception Notifications

Radiological Water Quality Exceptions							
Locality	**Period Quarter**	**Date**	**Radiological Characteristic**	**MoU Alert Level**	**Remedial Action**	**DoH Notified**	**Close Out Date**
Lancelin South	Q4	01/10/23 to 31/12/23	NIL				

6.2 Radiological Results

Table 7 Radiological summary 1 October 2023 to 31 December 2023

Type	Unit	ADWG Guideline	Raw Water (Bore)			Distribution Water		
			Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value
Gross Alpha activity	Bq/L	0.5	1	1	0.101	1	1	0.113
Gross Beta activity – 40K	Bq/L	0.5	1	1	0.114	1	1	0.072

7.0 Sampling Summary

7.1 Sampling History (1 October to 31 December 2023)

Locality	Microbiological			Physical and Chemical			Radiological		
	Planned	Taken	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken
Lancelin South	16	16	100	144	144	100	4	4	100

7.2 Exceptions to Planned Sampling

Planned Sample Exceptions			
Locality	Characteristic (Microbial / Physical and Chemical / Radiological)	Number of Samples	Reason for missed sample
Lancelin South		NIL	

7.3 Planned Sampling

Regular fortnightly checks of pH, chlorine, turbidity and water temperature using handheld instrumentation at the WTP (Source and Treated Water sample points) and the Lancelin South sales office (Consumer sample point) are carried out by Urbaqua on behalf of Lancelin South Water.

8.0 General Notes / Other

During the Q4 period a water cartage contractor, working for Water Corporation, inadvertently drained the potable water tank and pipeline via a hydrant located at the residential estate. As the tank was drained, the opportunity was taken to clean the Treated Water storage tank.

During the refilling of the Treated Water Storage Tank, using both the on-site water treatment plant supplemented by carted water, after cleaning, routine sampling detected thermophilic amoeba at the Consumer sample point. As a precaution, the potable pipeline to the residential estate was flushed on 1 Dec 23 and chlorine dosing increased slightly for an approximately 2 week period. Additional sampling not included in this monthly report returned a “no detection” result for thermophilic amoeba.

Appendix A. Understanding Water Quality

Refer to the Australian Drinking Water Guidelines for more detailed information.

Parameter	Description	Management and Control
Micro-organisms & Pathogens *E. coli* *Naegleria*	Micro-organisms (or microbes) are microscopic living organisms, occurring naturally in our environment – in the air, in the soil and in water bodies. Some are beneficial to life, but some can have serious health impacts to humans. Pathogens (pathogenic micro-organisms) are micro-organisms that cause disease or illness. The most common and widespread health risk to people is associated with drinking water contamination by pathogens. Organisms associated with faecal matter from humans or other mammals cause several waterborne diseases. It is impossible to test for the presence of all pathogens that may be present in water. The ADWG recommends testing for the presence of *Escherichia coli* (*E. coli*) as an indicator of faecal pathogen contamination. Thermophilic *Naegleria* refers to a group of common water borne amoebae which includes *Naegleria fowleri*, the organism that causes the serious disease primary amoebic meningoencephalitis (PAM). *Naegleria fowleri* is an environmental pathogen which naturally lives in fresh warm water.	The ADWG state that thermotolerant coliforms/*E. coli* should not be present in a minimum 100 mL sample of drinking water. The Department of Health WA has notification protocols in place regarding *exception events* for pathogens. Lancelin South Water will immediately notify the Department of Health of any confirmed detection of thermotolerant coliforms, *E.coli* or *Naegleria* species in any sample for microbiological analysis. Lancelin South Water practice a multi-barrier approach to minimise the risk of microbial contamination.
Turbidity	Turbidity is the cloudiness sometimes seen in water. It is caused by small solid particles suspended in the water. The presence of particles in the water is an aesthetic problem but also impacts on the ability to adequately disinfect the water. Turbidity is usually reported as Nephelometric Turbidity Units (NTU). It is difficult to see turbidity below about 5 NTU with the naked eye.	The ADWG specify an aesthetic guideline for turbidity of 5 NTU. A turbidity of less than 1 NTU is desirable in drinking water for optimal disinfection. LSW remove turbidity from the water through multiple filtration stages.

<table>
<tr><th>Parameter</th><th>Description</th><th>Management and Control</th></tr>
<tr><td>Colour</td><td>Colour in natural water is due mainly to the presence of dissolved organic matter including humic and fulvic acids, which originate from soil and decaying vegetable matter. Colour can also be caused by high levels of dissolved iron or manganese.

The presence of turbidity in the water may appear as Colour – True Colour is the Colour present after removal of turbidity.</td><td>The ADWG value for colour is based on the colour that is just noticeable in a glass to the naked eye. This is generally accepted as 15 Hazen Units (HU).

LSW remove colour using granular activated carbon and reverse osmosis processes.</td></tr>
<tr><td>Metals</td><td>Metals can be present in natural waters from contact with rocks, soil, pipes and equipment. Many metals in water do not present a health hazard but some do.

Iron is present in the groundwater from the Leederville aquifer. Whilst not health related, elevated concentrations can discolour the water and can stain laundry.

Manganese is also present at low concentration in the groundwater. Manganese can discolour the water and stain laundry.</td><td>The ADWG specify an aesthetic guideline value of 0.3 milligrams per litre [1] (mg/L) for iron.

The ADWG specify a health guideline of 0.5 mg/L and an aesthetic guideline value of 0.1 mg/L for manganese.

LSW removes most metals from the source water through oxidation with sodium hypochlorite and filtration through catalytic media.</td></tr>
<tr><td>Total Dissolved Solids</td><td>Total Dissolved Solids (TDS) consist of inorganic (natural) salts and small amounts of organic matter dissolved in water. Water with low TDS can taste flat, while water with high TDS tastes salty and causes scaling in and corrosion of pipes, fittings and household appliances.

TDS includes sodium, potassium, calcium, magnesium, carbonate, bicarbonate, chloride, Sulfate, nitrate, phosphate, silica, dissolved metals, dissolved organic species and other less common elements.</td><td>The ADWG provide guidance in the palatability of drinking water according to TDS concentration, as shown below:

<table><tr><th>TDS (mg/L)</th><th>Quality</th></tr><tr><td>0 – 600</td><td>Good</td></tr><tr><td>600 – 900</td><td>Fair</td></tr><tr><td>900 – 1200</td><td>Poor</td></tr><tr><td>>1200</td><td>Unpalatable</td></tr></table>
Groundwater from our production bore is typically around 800 mg/L - 900 mg/L TDS. LSW desalinate the water using reverse osmosis to provide water to customers at below 500 mg/L.</td></tr>
</table>

Parameter	Description	Management and Control
Radionuclides	There are natural levels of radiation within the environment emanating from rocks and soil. Water from the Leederville aquifer (source for Lancelin South) typically has quite low levels of radionuclides. The radioactivity of radionuclides is reported in units of Becquerels per Litre (Bq/L)	The Australian Drinking Water Guidelines recommend a screening level of 0.5 Becquerels per Litre (Bq/L). LSW regularly monitor to ensure that the treated water is within the ADWG guidelines for radionuclides.
pH	pH is a measure of water acidity - pH 7 is neutral, low pH is acidic and high pH is alkaline. Low pH may cause corrosion to taps, water heaters and other household appliances. High pH may be associated with scaling.	The ADWG specify a lower and upper aesthetic value of 6.5 and 8.5 respectively. LSW source water is within the ADWG guidelines, and no specific pH adjustment is required.
Trihalomethanes	Trihalomethanes (THMs) may be present in drinking water as a by-product of disinfection using chlorination.	The ADWG health guideline for total THM is 0.25 mg/L, expressed as an average long-term exposure. LSW regularly monitor the drinking water to ensure that THM remains below guideline levels.
Pesticides Industrial chemicals	Pesticides are chemical compounds used for the control of 'pests' (including insects, weeds, fungi, rodents, etc). These compounds, when at high enough concentration may be toxic to humans, can enter the drinking water system through over-spray, wind-borne dust, transmission through groundwater and other mechanisms. Industrial chemicals of significance to water quality include synthetic organic compounds, many of which are, at high enough concentration, toxic to humans.	The ADWG provides health related guidelines for an extensive range of pesticides and industrial chemicals. The LSW groundwater source is protected by a P1 Wellhead protection zone and a Drinking Water Source Protection Plan. LSW regularly monitor the drinking water to ensure that no pesticide or other synthetic organic compound exceeds the respective guideline level.

Note:

(1) Milligram per litre (mg/L) is the commonly used unit for concentration, the mass of a constituent dissolved in 1 litre of water, generally synonymous with "parts per million" (ppm).