



ANNUAL WATER QUALITY REPORT

1 JULY 2021 – 30 JUNE 2022

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INTRODUCTION

INTRODUCTION

Purpose of this document

Our commitment to compliance with health related and non-health related water quality criteria of the Australian Drinking Water Guidelines (ADWG) is firmly established and reinforced through our Memorandum of Understanding (MoU) with the Department of Health. This document, in accordance with Section 11 of the MoU, reports the water quality performance for the period 1 July 2021 to 30 June 2022.

In addition to presenting water quality results and performance against the ADWG, this report describes the processes Lancelin South Water (LSW) uses to collect, treat and distribute drinking water to our customers.

Table 1 Drinking Water Quality Results 1 July 2021 to 30 June 2022 at a glance

Water Quality Incidents	
Incidents reportable to Department of Health	0
Health related characteristics	Compliance
<i>Escherichia coli</i>	100%
<i>Naegleria</i>	100%
Chemical	100%
Pesticides	100%
Radiological	100%
Chlorine Disinfection	100%
Non-health characteristics	Compliance
Aesthetic characteristics (excluding chlorine)*	99%

Our Drinking Water Quality Policy

Lancelin South Water is committed to ensuring that drinking water supplied to our customers is safe, provided sustainably and meets or exceeds our customer expectations.

Our water is regularly monitored to ensure it meets the health-related criteria set out in the Australian Drinking Water Guidelines.

We will achieve this by:

- Safely managing water quality throughout the treatment process from the source to the consumer taps;
- Using a risk-based approach in our operations, in which potential threats to water quality are identified and managed;
- Undertaking regular water quality monitoring and public reporting of results;
- Robust contingency planning and incident response capabilities;
- Operating and maintaining our treatment plant and infrastructure following best practice principles;
- Continually assessing and upgrading plant and equipment to ensure performance;
- Maintaining communications with stakeholders and regulators;
- Welcoming consumer feedback on water quality;
- Carrying out verification of performance and management systems via external auditing.

INTRODUCTION

Drinking Water Quality Management Framework

Lancelin South Water bases its Drinking Water Quality Management System on the Framework for Management of Drinking Water Quality, within the Australian Drinking Water Guidelines (ADWG) endorsed by the National Health and Medical Research Council. This Framework:

- defines benchmark water quality guidelines and values for drinking water quality management;
- defines a preventative approach to the management and operation of a drinking water system, encompassing all steps in water production from source to consumer.

The WA Department of Health and Lancelin South Water signed a Memorandum of Understanding (MoU) in June 2019, which runs for 5 years. It describes the requirements for compliance with microbiological, chemical and radiological drinking water quality criteria. The MoU is publicly available from the Lancelin South Water web site at:

[LSW Forms-Documents-Publications](#)

The Lancelin South Water MoU incorporates the preventative water management strategy, from source to consumer, outlined in the ADWG Framework for Management of Drinking Water Quality. The MoU is structured to reflect the 12 guiding elements of the Framework and thereby integrates all facets of the drinking water quality management and assurance system. The MoU covers items such as the agreed monitoring program, management practices and procedures, approved chemicals and material to be used within the drinking water system, data

management and reporting mechanisms and the type of incident and emergency responses required.

We report our performance quarterly to the Department of Health. Until replaced with the Annual Water Quality report, quarterly Water Quality reports are publicly available on the Lancelin South web site at:

[LSW Forms-Documents-Publications](#)

Lancelin South Water recognises and supports the ongoing work of the Advisory Committee for the Purity of Water¹.

Customer Service

Lancelin South Water operates under Water Services Licence number WL47, issued by the WA Economic Regulation Authority (ERA). We report annually to the ERA and are regularly audited against the Water Services Code of Conduct (Customer Service Standards).

Lancelin South Water can be contacted as follows:

- Phone 08 9655 1555
- Email admin@lancelinsouthwater.com.au

Useful Links

[Lancelin South Water](#)

[Department of Health - Water Unit](#)

[NHMRC Australian Drinking Water Guidelines](#)

[Economic Regulation Authority WA - Water](#)

[Department of Water and Environmental Regulation – Water](#)

¹ More information on the Advisory Committee for the Purity of Water can be found at: [Advisory Committee for the Purity of Water \(health.wa.gov.au\)](http://health.wa.gov.au)

UNDERSTANDING WATER QUALITY

UNDERSTANDING WATER QUALITY

Refer to the [Australian Drinking Water Guidelines](#) for more detailed information.

Parameter	Description	Management and Control
Micro-organisms & Pathogens	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 ADWG state that thermotolerant coliforms / <i>E. coli</i> should not be present in a minimum 100 mL sample of drinking water.
<i>E. coli</i>	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 <i>Escherichia coli</i> (<i>E. coli</i>) as an indicator of faecal pathogen contamination.	The Department of Health WA has notification protocols in place regarding <i>exception events</i> for pathogens. Lancelin South Water will immediately notify the Department of Health of any confirmed detection of thermotolerant coliforms, <i>E.coli</i> or <i>Naegleria species</i> in any sample for microbiological analysis.
<i>Naegleria</i>	Thermophilic <i>Naegleria</i> refers to a group of common water borne amoebae which includes <i>Naegleria fowleri</i> , the organism that causes the serious disease primary amoebic meningoencephalitis (PAM). <i>Naegleria fowleri</i> is an environmental pathogen which naturally lives in fresh warm water.	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.

UNDERSTANDING WATER QUALITY

Parameter	Description	Management and Control										
Colour	<p>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.</p> <p>The presence of turbidity in the water may appear as Colour – True Colour is the Colour present after removal of turbidity.</p>	<p>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).</p> <p>LSW remove colour using granular activated carbon and reverse osmosis processes.</p>										
Metals	<p>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.</p> <p>Iron is present in the groundwater from the Leederville aquifer. Whilst not health related, elevated concentrations can discolour the water and can stain laundry.</p> <p>Manganese is also present at low concentration in the groundwater. Manganese can discolour the water and stain laundry.</p>	<p>The ADWG specify an aesthetic guideline value of 0.3 milligrams per litre¹ (mg/L) for iron.</p> <p>The ADWG specify a health guideline of 0.5 mg/L and an aesthetic guideline value of 0.1 mg/L for manganese.</p> <p>LSW removes most metals from the source water through oxidation with sodium hypochlorite and filtration through catalytic media.</p>										
Total Dissolved Solids	<p>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.</p> <p>TDS includes: sodium, potassium, calcium, magnesium, carbonate, bicarbonate, chloride, sulphate, nitrate, phosphate, silica, dissolved metals, dissolved organic species and other less common elements.</p>	<p>The ADWG provide guidance in the palatability of drinking water according to TDS concentration, as shown below:</p> <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> <p>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.</p>	TDS (mg/L)	Quality	0 – 600	Good	600 – 900	Fair	900 – 1200	Poor	>1200	Unpalatable
TDS (mg/L)	Quality											
0 – 600	Good											
600 – 900	Fair											
900 – 1200	Poor											
>1200	Unpalatable											

UNDERSTANDING WATER QUALITY

Parameter	Description	Management and Control
Radionuclides	<p>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.</p> <p>The radioactivity of radionuclides is reported in units of Becquerels per Litre (Bq/L)</p>	<p>The Australian Drinking Water Guidelines recommend a screening level of 0.5 Becquerels per Litre (Bq/L).</p> <p>LSW source water is within the ADWG guidelines, and no specific treatment is required for radionuclides.</p>
pH	<p>pH is a measure of water acidity - pH 7 is neutral, low pH is acidic and high pH is alkaline.</p> <p>Low pH may cause corrosion to taps, water heaters and other household appliances. High pH may be associated with scaling.</p>	<p>The ADWG specify a lower and upper aesthetic value of 6.5 and 8.5 respectively.</p> <p>LSW source water is within the ADWG guidelines, and no specific pH adjustment is required.</p>
Trihalomethanes	<p>Trihalomethanes (THMs) may be present in drinking water as a by-product of disinfection using chlorination.</p>	<p>The ADWG health guideline for total THM is 0.25 mg/L, expressed as an average long-term exposure.</p> <p>LSW regularly monitor the drinking water to ensure that THM remains below guideline levels.</p>
Pesticides Industrial chemicals	<p>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.</p> <p>Industrial chemicals of significance to water quality include synthetic organic compounds, many of which are, at high enough concentration, toxic to humans.</p>	<p>The ADWG provides health related guidelines for an extensive range of pesticides and industrial chemicals.</p> <p>The LSW groundwater source is protected by a P1 Wellhead protection zone and a Drinking Water Source Protection Plan.</p> <p>LSW regularly monitor the drinking water to ensure that no pesticide or other synthetic organic compound exceeds the respective guideline level.</p>

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).

OUR WATER SYSTEM

OUR WATER SYSTEM

Location

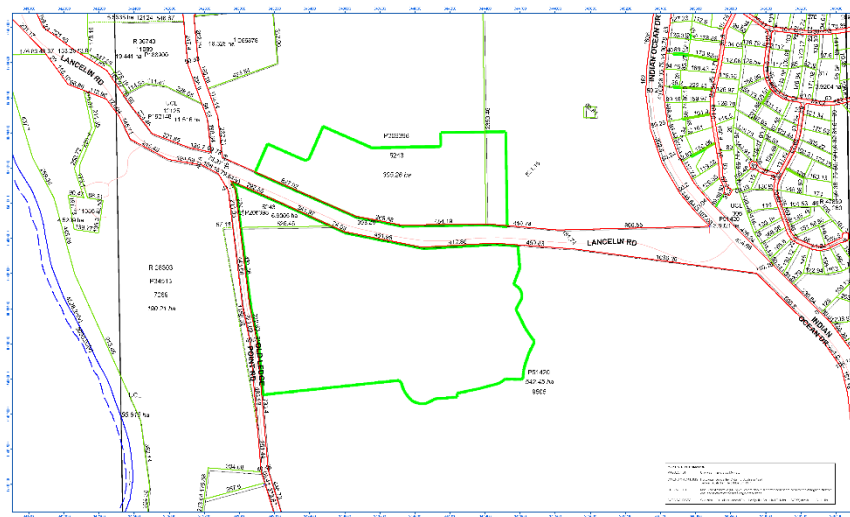
The Lancelin South development is located approximately 130 kilometres north of Perth and 2.2 kilometres south east of the town of Lancelin, in the Shire of Gingin.

Licence Area

Lancelin South Water 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 the map below. Our Water Services Licence is available at the ERA web site at

<https://www.erawa.com.au/water/water-licensing/licence-holders#L>



Our Infrastructure

Total number of connections (July 2021)	22
Number of Customers	28
Total length of water mains	1.6 km
Number of water quality localities	1
Chlorine residual target	0.4 to 0.6 mg/L

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 as required by the DoH as part of the MoU.

The production bore is located within our locked, chain mesh fenced Water Treatment Plant (WTP) compound. To protect our source water, a P1 Wellhead Protection Zone has been proclaimed over the area of the WTP compound.

OUR WATER SYSTEM

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 using production bore 3/09. Lancelin South Water typically abstract less than 10 ML/year of groundwater.

Table 2 Bore Water Extraction Amounts

Reporting Period	Megalitres (ML)
1 July 2021 to 30 June 2022	5.9
1 July 2020 to 30 June 2021	5.7
1 July 2019 to 30 June 2020	6.3
1 July 2018 to 30 June 2019	4.3
1 July 2017 to 30 June 2018	9.7

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:

1. 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 for garden watering (not for drinking);
2. 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;
3. Part of this filtered water is then treated using reverse osmosis desalination to reduce the salinity of the water;
4. 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.

Drinking water supplied by Lancelin South Water is not fluoridated.

Lancelin South Water supplies on average 209 L/day of drinking water to each customer connection.

Distribution Network

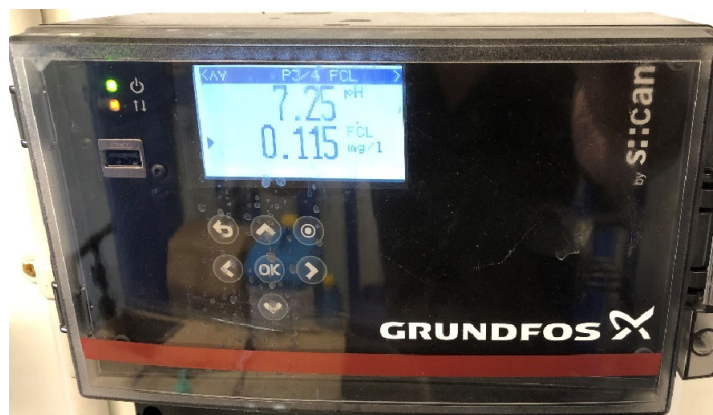
Lancelin South Water's distribution network delivers drinking water to customers within the Lancelin South area. The network operates as one interconnected system. Materials used in the reticulation network are predominantly PVC and HDPE. They are approved under Australian Standard AS/NZS 4020 (Testing 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.

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 WATER SYSTEM

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.



Incident Response

Whilst Lancelin South Water makes all effort to prevent incidents from occurring, there will inevitably be equipment malfunctions, human errors, extreme weather conditions or unforeseen events that adversely affect our operations. Lancelin South Water has plans in place to respond to and manage such events such that water quality impacts are minimised.

During the year, a mock incident exercise, considering the impact of a water quality incident immediately prior to the Christmas holiday break, was held jointly with Lancelin South Water and Department of Health representatives. Attendees at the exercise considered availability of Lancelin South personnel and contractors, ability to obtain bottled water during the holiday period if required, and the ability to obtain parts and materials to implement any necessary repairs. The exercise identified some minor items resulting in improvements to the Lancelin South Water incident response plans.

SYSTEM OPERATION

SYSTEM OPERATION

Customer Service

Lancelin South Water are committed to ensuring our customers are satisfied with the quality of water they receive.

Table 3: History of Customer Complaints

Period	Number of Customer Complaints Regarding Water Quality
1 July 2021 – 30 June 2022	1
1 July 2020 – 30 June 2021	1
1 July 2019 – 30 June 2020	Nil
1 July 2018 – 30 June 2019	Nil
1 July 2017 – 30 June 2018	Nil

One customer complaint regarding powdery residue that was noticed building up on the shower floor tiles. The powder was determined to be from a build-up of water hardness in the household pipes after the system had been off for several weeks while the property was being sold. The complaint was received in August 2021. The issue was completely resolved within 19 days, the length of time was due to additional water quality sampling being required and scheduling a suitable collection time with the owner of the property.

Lancelin South Water Annual and recent Quarterly Water Quality reports are publicly available from the [Lancelin South Water website Reports page](#).



Notifiable incidents

During the period 1 July 2021 to 30 June 2022 there were no (0) water quality incidents that were reportable to the Department of Health.

SYSTEM OPERATION

Improvements

Lancelin South Water are committed to carrying out regular servicing and maintenance of equipment and infrastructure to ensure that drinking water quality is not compromised at any time. We implement system and management improvements as required to maintain reliability of service and minimise risk to quality of water supplied to customers.

Water Monitoring

Lancelin South Water monitoring of water quality occurs at 3 levels:

1. Continuous monitoring by on-line instrumentation with out-of-specification values raising an alarm, relayed automatically to service personnel;
2. Periodic monitoring by personnel in the field using hand held analytical equipment;
3. Periodic sampling with analysis by NATA² registered laboratories.

Sampling and field monitoring are performed in accordance with industry standards. All microbial, detailed chemical and radiological analysis is carried out by a laboratory accredited by NATA for the required analyses.



² NATA – [National Association of Testing Authorities](#)

DRINKING WATER QUALITY RESULTS

DRINKING WATER QUALITY RESULTS

Drinking Water Compliance - Microbiological

There were no recorded microbiological non-conformances recorded during the 1 July 2021 to 30 June 2022 reporting period.

Results for the period are included in Table 4 below.

Table 4 Microbiological Samples 1 July 2021 to 30 June 2022 (From Consumer and Treated Water Sample Point)

Characteristic	Number of Samples Analysed	Unit	ADWG Limit	Number of Samples NOT meeting ADWG limit	% Compliance
<i>Escherichia coli</i>	41	CFU / 100 mL	0	0	100
Thermophilic <i>Naegleria</i>	14	organisms / 250 mL	ND ⁽¹⁾	0	100
<i>Naegleria fowleri</i>	7 ⁽²⁾	organisms / 250 mL	ND ⁽¹⁾	0	100

Notes:

(1) ND = Not detected

(2) Analysis for *Naegleria fowleri* is usually only performed when a test for Thermophilic *Naegleria* returns a positive result. The results for *Naegleria fowleri* reported above have been provided by the laboratory for an unknown reason.

DRINKING WATER QUALITY RESULTS

Drinking Water Compliance - Chemical - Health Related

All samples collected (71) at the Consumer Sample Point during the 1 July 2021 to 30 June 2022 reporting period were compliant with ADWG Health related guideline.

The results for the period are included in Table 5 below.

Table 5 Chemical – Health Related – Compliance Summary 1 July 2021 to 30 June 2022 (from Consumer Sample Point)

Characteristic	Number of Samples Analysed	Unit	ADWG Health Limit	Maximum Value	Number of Samples NOT meeting ADWG limit	% Compliance
Free Chlorine	28	mg/L	5	1.08	0	100
Fluoride	2	mg/L	1.5	0.3	0	100
Nitrite Nitrogen, as NO ₂	2	mg/L	3	0.03	0	100
Nitrate Nitrogen, as NO ₃	2	mg/L	50	1.59	0	100
Antimony	2	mg/L	0.003	<0.001	0	100
Cadmium	2	mg/L	0.002	<0.0001	0	100
Chromium	2	mg/L	0.05	<0.001	0	100
Copper	4	mg/L	2	0.024	0	100
Lead	4	mg/L	0.01	0.002	0	100
Manganese	3	mg/L	0.5	<0.01	0	100
Nickel	2	mg/L	0.02	0.01	0	100
2-Chlorophenol	2	mg/L	0.3	<0.001	0	100

DRINKING WATER QUALITY RESULTS

Characteristic	Number of Samples Analysed	Unit	ADWG Health Limit	Maximum Value	Number of Samples NOT meeting ADWG limit	% Compliance
2,4-Dichlorophenol	2	mg/L	0.2	<0.001	0	100
2,4,6-Trichlorophenol	2	mg/L	0.02	<0.001	0	100
Pentachlorophenol	2	mg/L	0.01	<0.001	0	100
Total THM's	2	mg/L	0.25	0.04	0	100
Chloroacetic acid	2	mg/L	0.15	<0.002	0	100
Dichloroacetic acid	2	mg/L	0.1	<0.002	0	100
Trichloroacetic acid	2	mg/L	0.1	<0.002	0	100
Chloral Hydrate	2	mg/L	0.1	<0.002	0	100

No sampling for pesticides (from Consumer Sample Point) was carried over the Compliance period 1 July 2021 to 30 June 2022.

DRINKING WATER QUALITY RESULTS

Drinking Water Compliance - Chemical - Aesthetic

During the 1 July 2021 to 30 June 2022 reporting period, twenty one (21) samples of a total of twenty-nine (28) samples (75%) indicated Free Chlorine concentration above the ADWG Aesthetic related guideline of 0.6 mg/L. To ensure effective disinfection and maintain microbial safety of drinking water at the Consumer Sample Point, Lancelin South Water has made an operating decision to target a residual free chlorine concentration slightly above the ADWG aesthetic guideline.

The laboratory limit of reporting for 2-chlorophenol and for 2,4-dichlorophenol of 0.001 mg/L is above the ADWG aesthetic limit for these compounds of 0.0001 mg/L and 0.0003 mg/L respectively. Two samples each of these two disinfectant by-products from the Consumer Sample Point taken during the 1 July 2021 to 30 June 2022 reporting period are reported therefore as non-compliant with the ADWG aesthetic guideline.

Table 6 Chemical – Aesthetic Related – Compliance Summary 1 July 2021 to 30 June 2022 (from Consumer Sample Point)

Characteristic	Number of Samples Analysed	Unit	ADWG Aesthetic Limit	Maximum Value	Number of Samples NOT meeting ADWG limit	% Compliance
pH	29	pH Units	6.5-8.5	8.2	0	100
Total Dissolved Solids Dried	8	mg/L	600	610	1	88
Turbidity	29	NTU	5	0.14	0	100
Colour (True)	2	PCU	15	<5	0	100
Free Chlorine	28	mg/L	0.6	1.08	21	25
Chloride	3	mg/L	250	220	0	100
Sulfate	3	mg/L	250	18	0	100
Ammonia Nitrogen	3	mg/L	0.5	<0.02	0	100
Sodium	1	mg/L	180	80	0	100

DRINKING WATER QUALITY RESULTS

Characteristic	Number of Samples Analysed	Unit	ADWG Aesthetic Limit	Maximum Value	Number of Samples NOT meeting ADWG limit	% Compliance
Total Hardness by Calculation	3	mg CaCO ₃ /L	200	160	0	100
Aluminium	3	mg/L	0.2	<0.01	0	100
Iron	3	mg/L	0.3	0.04	0	100
Zinc	2	mg/L	3	0.2	0	100
2-Chlorophenol	2	mg/L	0.0001	<0.001	2 ^(refer footnote)	0 ^(refer footnote)
2,4-Dichlorophenol	2	mg/L	0.0003	<0.001	2 ^(refer footnote)	0 ^(refer footnote)
2,4,6-Trichlorophenol	2	mg/L	0.002	<0.001	0	100

Note:

The laboratory limit of reporting (LOR) is 0.001 mg/L, which is above the ADWG guideline value and hence the analysis is reported as non-compliant.

DRINKING WATER QUALITY RESULTS

Drinking Water Quality - Radiological

All samples collected (2) at the Consumer Sample Point during the 1 July 2021 to 30 June 2022 reporting period were compliant with ADWG Radiological related guidelines. The results for the period are included in Table 7 below.

The radioactivity of radionuclides is reported in units of Becquerels per Litre (Bq/L).

Table 7 Radiological – Compliance Summary 1 July 2021 to 30 June 2022 (from Consumer Sample Point)

Aesthetic Characteristic	Number of Samples Analysed	Unit	ADWG Radiological screening level	Maximum Value	Number of Samples NOT meeting ADWG limit	% Compliance
Gross Alpha	1	Bq/L	0.5	0.08	0	100
Gross Beta activity - 40K	1	Bq/L	0.5	0.08	0	100

Drinking Water Quality - Other

No sampling for PFAS from the Consumer Sample Point was carried over the Compliance period 1 July 2021 to 30 June 2022.

SOURCE WATER QUALITY RESULTS

SOURCE WATER QUALITY RESULTS

The source water is not required to meet ADWG. However, where the source water does not meet the ADWG, treatment is applied to make the water suitable for drinking.

[Source Water Quality - Chemical - Health Related](#)

No samples from the Source Water Sample Point taken during the 2021 to 2022 reporting period were outside the ADWG health related guidelines (excluding pesticides, see below).

SOURCE WATER QUALITY RESULTS

Table 8 Chemical – Health Related – Analysis Summary 1 July 2021 to 30 June 2022 (Source Water Sample Point)

Characteristic	Number of Samples Analysed	Unit	ADWG Health Limit	Maximum Value	Number of Samples NOT meeting ADWG limit
Free Chlorine	1	mg/L	5	0.02	0
Nitrate Nitrogen, as NO ₃	6	mg/L	50	1.46	0
Nickel	3	mg/L	0.02	0.002	0
Manganese	2	mg/L	0.5	0.06	0
Arsenic	3	mg/L	0.01	<0.001	0
Barium	3	mg/L	2	0.17	0
Beryllium	3	mg/L	0.06	<0.01	0
Boron	3	mg/L	4	0.07	0
Mercury	3	mg/L	0.001	<0.0001	0
Molybdenum	3	mg/L	0.05	<0.005	0
Selenium	2	mg/L	0.01	<0.001	0
Silver	3	mg/L	0.1	<0.005	0
Uranium	3	mg/L	0.017	<0.005	0
Pentachlorophenol	1	mg/L	0.01	<0.001	0

SOURCE WATER QUALITY RESULTS

Analyses for the pesticide Fenamiphos, Parathion Methyl and Terbufos and have Levels of Reporting above the ADWG health related guideline value. Hence, analyses for these pesticides from the source Water Sample Point taken during the 1 July 2021 to 30 June 2022 reporting period are considered as potentially outside the ADWG health related guideline value. However, the source water is treated such that the concentration of these compounds will be reduced and hence are unlikely to be present in the treated water at levels above health related guidelines.

Table 9 Chemical Pesticides – Health Related – Analysis Summary 1 July 2021 to 30 June 2022 (Source Water Sample Point)

Characteristic	Number of Samples Analysed	Unit	ADWG Health Limit	Maximum Value	Number of Samples NOT meeting ADWG limit
Aldrin	2	mg/L	0.0003	<0.00001	0
Aldrin + Dieldrin (total)	1	mg/L	0.0003	<0.00001	0
Amitraz	1	mg/L	0.009	<0.0001	0
Amitrole	1	mg/L	0.009	<0.001	0
Atrazine	1	mg/L	0.02	<0.0001	0
Azinphos Methyl	2	mg/L	0.03	<0.001	0
Bromophos Ethyl	1	mg/L	0.01	<0.000005	0
Chlordane	2	mg/L	0.002	<0.00001	0
Chlorofenvinphos	1	mg/L	0.002	<0.001	0
Chlorothalonil	1	mg/L	0.05	<0.00001	0
Chlorpyrifos	2	mg/L	0.01	<0.01	0
Chlorpyrifos	1	mg/L	0.01	<0.0001	0

SOURCE WATER QUALITY RESULTS

Characteristic	Number of Samples Analysed	Unit	ADWG Health Limit	Maximum Value	Number of Samples NOT meeting ADWG limit
Clopyralid	1	mg/L	2	<0.0004	0
Diazinon	2	mg/L	0.004	<0.001	0
Dicamba	1	mg/L	0.1	<0.0001	0
Dichlorvos	1	mg/L	0.005	<0.001	0
Diclofop Methyl	1	mg/L	0.005	<0.0001	0
Dieldrin	2	mg/L	0.0003	<0.00001	0
Dimethoate	2	mg/L	0.007	<0.001	0
Disulfoton	1	mg/L	0.004	<0.001	0
Diuron	1	mg/L	0.02	<0.0005	0
Endosulfan I	3	mg/L	0.02	<0.001	0
Endosulfan II	3	mg/L	0.02	<0.001	0
Endosulfan Sulfate	3	mg/L	0.02	<0.001	0
Ethion	2	mg/L	0.004	<0.00001	0
Fenamiphos	1	mg/L	0.0005	<0.001	1 (refer footnote)
Fenitrothion	3	mg/L	0.007	<0.001	0
Fensulfothion	1	mg/L	0.01	<0.001	0

SOURCE WATER QUALITY RESULTS

Characteristic	Number of Samples Analysed	Unit	ADWG Health Limit	Maximum Value	Number of Samples NOT meeting ADWG limit
Fenthion	1	mg/L	0.007	<0.001	0
Fipronil	1	mg/L	0.0007	<0.00002	0
Fluometuron	1	mg/L	0.07	<0.0001	0
Fosamine	1	mg/L	0.03	<0.01	0
Heptachlor	2	mg/L	0.0003	<0.00001	0
Hexazinone	1	mg/L	0.4	<0.0004	0
Lindane	2	mg/L	0.01	<0.00001	0
Malathion	2	mg/L	0.07	<0.001	0
MCPA	1	mg/L	0.04	<0.0001	0
Methoxychlor	2	mg/L	0.3	<0.00001	0
Metolachlor	1	mg/L	0.3	<0.0002	0
Metsulfuron Methyl	1	mg/L	0.04	<0.0005	0
Mevinphos	1	mg/L	0.005	<0.001	0
Molinate	1	mg/L	0.004	<0.0001	0
Monocrotophos	1	mg/L	0.002	<0.001	0
o,p-DDT	1	mg/L	0.009	<0.000001	0

SOURCE WATER QUALITY RESULTS

Characteristic	Number of Samples Analysed	Unit	ADWG Health Limit	Maximum Value	Number of Samples NOT meeting ADWG limit
Omethoate	2	mg/L	0.001	<0.001	0
p,p-DDT	1	mg/L	0.009	<0.001	0
Paraquat	1	mg/L	0.02	<0.001	0
Parathion Methyl	2	mg/L	0.0007	<0.001	1 (refer footnote)
Pentachlorophenol	1	mg/L	0.01	<0.001	0
Picloram	1	mg/L	0.3	<0.0002	0
Pirimiphos Methyl	1	mg/L	0.09	<0.01	0
Propazine	1	mg/L	0.05	<0.0001	0
Propiconazole	1	mg/L	0.1	<0.0004	0
Pyrazophos	1	mg/L	0.02	<0.001	0
Simazine	1	mg/L	0.02	<0.0001	0
Temephos	1	mg/L	0.4	<0.025	0
Terbufos	1	mg/L	0.0009	<0.001	1 (refer footnote)
Terbutryn	1	mg/L	0.4	<0.0001	0
Tetrachlorovinphos	1	mg/L	0.1	<0.001	0
Triclopyr	1	mg/L	0.02	<0.0001	0

SOURCE WATER QUALITY RESULTS

Characteristic	Number of Samples Analysed	Unit	ADWG Health Limit	Maximum Value	Number of Samples NOT meeting ADWG limit
Trifluralin	2	mg/L	0.09	<0.0001	0
2,4,5-T	1	mg/L	0.1	<0.0001	0
2,4-D	1	mg/L	0.03	<0.0001	0

Note:

The laboratory limit of reporting (LOR) for Fenamiphos, Parathion Methyl and Terbufos is 0.001 mg/L, which is above the ADWG health related guideline values for these compounds and hence, the samples may not be within the ADWG health related guidelines.

SOURCE WATER QUALITY RESULTS

Source Water Quality - Chemical - Aesthetic

Samples collected from the Source Water Sample Point during the 1 July 2021 to 30 June 2022 reporting period exceeded the ADWG aesthetic guidelines for total dissolved solids, chloride, total hardness and total iron.

The source water is treated prior to supply to consumers in Lancelin South to ensure that these water quality issues are addressed.

The results for the period are included in Table 10 below.

SOURCE WATER QUALITY RESULTS

Table 10 Chemical – Aesthetic related – Analysis Summary 1 July 2021 to 30 June 2022 (Source Water Sample Point)

Aesthetic Characteristic	Number of Samples Analysed	Unit	ADWG Aesthetic Limit	Maximum Value	Number of Samples NOT meeting ADWG limit
pH	30	pH Units	6.5-8.5	7.8	0
Total Dissolved Solids	11	mg/L	600	980	9
Turbidity	1	NTU	5	1.6	0
Suspended Solids	1	mg/L	<5	<5	0
Colour (True)	1	Hazen	15	<5	0
Free Chlorine	1	mg/L	0.6	0.02	0
Chloride	2	mg/L	250	350	1
Sulfate, as SO ₄	2	mg/L	250	31	0
Sodium	1	mg/L	180	150	0
Total Hardness	2	mg CaCO ₃ /L	200	260	1
Silica	3	mg/L	80	19	0
Aluminium	2	mg/L	0.2	<0.05	0
Iron	2	mg/L	0.3	1.9	1
Ammonia Nitrogen, as N	2	mg/L	0.5	0.39	0

SOURCE WATER QUALITY RESULTS

Source Water Quality - Radiological

One sample collected from the Source Water Sample Point during the 1 July 2021 to 30 June 2022 reporting period was outside the ADWG screening level for radiological parameters. The results for the period are included in Table 11 below.

A source water sample collected in November 2021 returned a gross beta reading of 0.55 Bq/L, slightly above the ADWG screening level. Repeat samples collected in January and April 2022 both reported gross beta well below the ADWG screening level.

Radioactivity is reported in units of Becquerels per Litre (Bq/L).

Table 11 Radiological – Compliance Summary 1 July 2021 to 30 June 2022 (Source Water Sample Point)

Aesthetic Characteristic	Number of Samples Analysed	Unit	ADWG Radiological screening level	Maximum Value	Number of Samples NOT meeting ADWG limit
Gross Alpha	4	Bq/L	0.5	0.2	0
Gross Beta activity - 40K	4	Bq/L	0.5	0.55	1

Source Water Quality - Other

No sampling for PFAS from the Source Sample Point was carried over the Compliance period 1 July 2021 to 30 June 2022.