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Report to the Department of Health

by

Lancelin South

for the period

1 October 2019 to 31 December 2019

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1.0 Water Provider Information

Table 1: Water Provider Contact Details

Name of Company	Lancelin South		
Company Address	PO Box 60, Lancelin, WA, 6044		
Company Phone	08 9655 1555	Fax	
Company Email	admin@lancelinsouthwater.com.au		
Chief Executive Officer	Joe Matthews		
CEO Email			
DoH Liaison Officer	Blair Shackleton, GHD		
DoH Liason Officer Email	Blair.shackleton@ghd.com		

Table 2: Lancelin South System Information

Number of consumers	13
Average water supplied (L/day)	218
Sources of water	100% groundwater
Treatment systems	Media filtration, GAC filtration, RO, chlorination
Length of mains	Approximately 1.6 km
Number of zones	1
Number of sample points	3 (Bore SP, treated water tank SP, consumer SP)

Source Details

Raw water for the Lancelin South residential development is sourced from a single production bore, tapping the Leederville aquifer within the Lancelin South water reserve, approximately 250 m east of the Lancelin South development. The catchment within the water reserve is natural bushland.

Distribution System

The fenced Water Treatment Plant is located at the existing bore site (adjacent to Lancelin Road). Treated and chlorinated water is stored in a single tank adjacent to the water treatment plant. Potable water is supplied via a gravity system through approximately 1,600 m of DN 250 and DN 300 PVC (polyvinyl chloride) pipeline along Lancelin Road Reserve with a distribution network currently of approximately 1,900 m of HDPE (high density polyethylene) pipeline.

2.0 Performance Summary

Table 3: Water Quality Meeting the Drinking Water Guidelines / Minister of Health’s Directions

	Number Assessed (1)	Number of Non-Compliant Analyses (2)	% Compliance
Microbiological Quality			
Thermotolerant Coliforms / <i>E.coli</i>	6	0	100%
Amoeba (Thermophilic Naegleria)	2	0	100%
Chemical Quality ⁽³⁾			
Chemical – Health related ⁽⁴⁾	6	0	100%
Chemical – Aesthetic ⁽⁵⁾	6	0	100%
Radiological	0	0	100%

Notes:

- (1) Number of samples taken for the quarter from Consumer Sampling Point
- (2) Number of samples that do not comply with the drinking water guidelines (ADWG).
- (3) Chemical performance is based on the results of the quarter.
- (4) Chemicals with ADWG Health guideline;
- (5) Chemicals with ADWG aesthetic guideline value

3.0 Microbial Performance

3.1 Microbiological - Exception Notifications

Nil incidents (1 Oct 2019 to the end of the reporting quarter).

3.2 Microbiological - Compliance Summary

Table 4: Microbiological compliance summary

	Sampling Point	Number of Analyses ⁽¹⁾	Number of Non-Compliant Analyses	% Compliance
<i>E. coli</i>	Treated Water Tank	2	0	100%
	Consumer	6	0	100%
Thermophilic <i>Naegleria</i>	Consumer	2	0	100%
<i>Naegleria fowleri</i>	Consumer	0 ⁽²⁾	0	100%
HPC	Treated Water Tank	0 ⁽³⁾	0	100%
	Consumer	0 ⁽³⁾	0	100%

Notes:

- (1) Microbiological assessment performed on 2 samples taken at Consumer sample point and 2 from Treated Water Tank sample point
- (2) No analyses for *N. fowleri* as no detection of thermophilic Naegleria
- (3) No analyses for HPC as chlorine detected in all treated water and consumer samples

4.0 Chemical - Health Related Performance

4.1 Chemical - Health Related - Exception Notifications

Nil incidents (1 Oct 2019 to the end of the reporting quarter).

4.2 Chemical - Health Related

Consumer Sample Point

No (0) samples were collected for laboratory analysis of physical and inorganic parameters from the Consumer Sample Point during this period.

Six (6) routine field measurements of residual chlorine were undertaken; none exceeded ADWG health related values.

Treated Water Sample Point

No (0) samples were collected for laboratory analysis of the potable water from the Treated Water Sample Point during this period.

Seven (7) routine field measurements were undertaken.

Table 5: Residual chlorine analyses

Sampling Point	No of Analyses	No of Analyses Non-Compliant ⁽¹⁾	% Compliance	Maximum value
Treated Water Tank Sampling Point	7 ⁽²⁾	0	100%	1.0
Consumer Sampling Point	6 ⁽²⁾	0	100%	1.0

Notes:

(1) Non-complying: <0.1 mg/L or >5.0 mg/L

(2) All analyses by field instrument.

Source Sampling Point

One (1) sample was collected in the reporting period for analysis of physical and inorganic parameters and pesticides in the source water from the Source Sample Point on 31/10/2019. Results are presented in Table 6 below. No parameters exceeded the ADWG health related values.

Table 6: Summary of health related analyses from source sampling point

Health Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
Arsenic – Total (0.01 mg/L)	1	0	100%	<0.001
Barium – Total (2 mg/L)	1	0	100%	0.16
Beryllium – Total (0.06 mg/L)	1	0	100%	<0.01
Boron – Total (4 mg/L)	1	0	100%	<0.05
Manganese – Total (0.5 mg/L)	1	0	100%	<0.06
Mercury – Total (0.001 mg/L)	1	0	100%	<0.0001
Molybdenum – Total (0.05 mg/L)	1	0	100%	<0.001
Nickel – Total (0.02 mg/L)	1	0	100%	<0.014
Nitrate Nitrogen, NO ₃ as N (11 mg/L)	1	0	100%	<0.07
Nitrite Nitrogen, NO ₂ as N (0.9 mg/L)	1	0	100%	<0.07
Silver – Total (0.1 mg/L)	1	0	100%	<0.001
Uranium – Total (0.017 mg/L)	1	0	100%	<0.001
Azinphos Ethyl (0.03 mg/L)	1	0	100%	<0.00002
Azinphos Methyl (0.03 mg/L)	1	0	100%	<0.00002
Bromophos Ethyl (0.01 mg/L)	1	0	100%	<0.0001
Carbofenthion (0.0005 mg/L)	1	0	100%	<0.00002
Chlordane (0.002 mg/L)	1	0	100%	<0.000001
Chlorfenvinphos (0.002 mg/L)	1	0	100%	<0.00002
Chlorofenvinphos (0.002 mg/L)	1	0	100%	<0.00002
Chlorpyrifos (0.01 mg/L)	1	0	100%	<0.00002
Diazinon (0.004 mg/L)	1	0	100%	<0.00001
Dichlorvos (0.005 mg/L)	1	0	100%	<0.0002
Dieldrin (0.0003 mg/L)	1	0	100%	<0.000002
Dimethoate (0.007 mg/L)	1	0	100%	<0.00002
Disulfoton (0.004 mg/L)	1	0	100%	<0.00005
Endosulfan I (0.02 mg/L)	1	0	100%	<0.000002

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Health Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
Endosulfan II (0.02 mg/L)	1	0	100%	<0.000002
Endosulfan Sulfate (0.02 mg/L)	1	0	100%	<0.000002
Ethion (0.004 mg/L)	1	0	100%	<0.00002
Ethoprophos (0.001 mg/L)	1	0	100%	<0.00001
Fenamiphos (0.0005 mg/L)	1	0	100%	<0.00001
Fenchlorophos (Ronnel)	1	0	100%	<0.01
Fenitrothion (0.007 mg/L)	1	0	100%	<0.002
Fensulfothion (0.01 mg/L)	1	0	100%	<0.00001
Fenthion (0.007 mg/L)	1	0	100%	<0.00005
Heptachlor (0.0003 mg/L)	1	0	100%	<0.000002
Lindane (0.01 mg/L)	1	0	100%	<0.000002
Malathion (0.07 mg/L)	1	0	100%	<0.00002
Methoxychlor (0.3 mg/L)	1	0	100%	<0.000002
Mevinphos (0.005 mg/L)	1	0	100%	<0.00002
Monocrotophos (0.002 mg/L)	1	0	100%	<0.00002
Omethoate (0.001 mg/L)	1	0	100%	<0.00001
Parathion (0.02 mg/L)	1	0	100%	<0.0002
Parathion Methyl(0.0007 mg/L)	1	0	100%	<0.0005
Pirimiphos Ethyl (0.0005 mg/L)	1	0	100%	<0.00001
Pirimiphos Methyl (0.09 mg/L)	1	0	100%	<0.00001
Profenofos (0.0003 mg/L)	1	0	100%	<0.00001
Sulprofos (0.01 mg/L)	1	0	100%	<0.00005
Temephos (0.04 mg/L)	1	0	100%	<0.00002
Terbufos (0.0009 mg/L)	1	0	100%	<0.00001
Tetrachlorovinphos (0.1 mg/L)	1	0	100%	<0.00001
Trichlorofon (0.007 mg/L)	1	0	100%	<0.00002

5.0 Chemical - Aesthetic Performance

5.1 Chemical - Aesthetic - Exception Notifications

One (1) of the two (2) field analyses for TDS (calculated from conductivity) collected at the Treated Water Tank SP exceeded the ADWG aesthetic guideline of 600 mg/L.

5.2 Chemical – Aesthetic

Consumer Sampling Point

No samples (0) sample were collected for analysis of physical and inorganic parameters in the potable water from the Consumer Sample Point during the period.

Six (6) routine field measurements were undertaken at the Consumer Sample point. No parameters exceed ADWG aesthetic related values.

Table 7: Summary of aesthetic related analyses from consumer sampling point

Aesthetic Characteristic (guideline limit)	Number of Analyses ⁽¹⁾	Number of Analyses Non- compliant	% Compliance	Maximum value
pH (6.5 – 8.5)	6	0	100%	7.0 - 7.7

Treated Water Tank Sampling Point

No (0) samples were submitted for laboratory analysis of physical or inorganic parameters in the potable water from the Treated Water Tank SP during the period.

Field measurements at the Treated Water SP recorded during routine maintenance visits to the WTP are summarised in Table 8 below. TDS was the only parameter to exceed ADWG aesthetic related values.

Table 8: Summary of aesthetic related analyses from Treated Water Tank sampling point

Aesthetic Characteristic (guideline limit)	Number of Analyses ⁽¹⁾	Number of Analyses Non- compliant	% Compliance	Maximum value
pH (6.5-8.5)	2 ⁽¹⁾	0	100%	7.3 - 7.7
TDS (600 mg/L)	2	1	50%	897 ⁽²⁾
Turbidity (5 NTU)	2	0	100%	1.2

Notes:

(1) All analyses by field instrument.

(2) Result by field instrument (calculated internally from conductivity measurement).

Source Sampling Point

One (1) sample was collected for analysis of physical parameters and pesticides in the source water from the Source Sample Point on 31/10/2019. The results are presented in Table 9 below.

Field measurements taken at the Source SP recorded during routine maintenance visits to the WTP are also summarised in Table 9.

Table 9: Summary of aesthetic related analyses from source sampling point

Aesthetic Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
pH (6.5-8.5)	2	0	100%	6.9 – 7.0
TDS (600 mg/L)	3	3	0%	908
Turbidity (5 NTU)	2	0	100%	1.53
Chloride (250 mg/L)	1	1	0	357
Sulphate (250 mg/L)	1	0	100%	24
Sodium (180 mg/L)	1	0	100%	162
Hardness (200 mg/L CaCO ₃)	1	1	0	244
Aluminium (Total) (0.2 mg/L)	1	1	100%	20
Ammonia – N (0.5 mg/L)	1	1	100%	0.13
Manganese (Total) (0.1 mg/L)	1	1	100%	0.06

6.0 Radiological Performance

One (1) sample was collected for radiological analysis in the source water from the Source Sample Point on 31/10/2019. The results can be seen in Table 10 below.

Table 10: Summary of Radiological analyses from source sampling point

Aesthetic Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
Gross Alpha (0.5 Bq/L)	1	0	100%	0.32
Gross Beta Activity (0.5 Bq/L)	1	0	100%	0.24

7.0 Sampling Programme

7.1 Summary of Achieved Versus Planned Sampling for Q4 2019

The planned sampling and analysis for the period 1 October to 31 December 2019:

- Microbiological testing from:
 - Treated water tank SP for
 - thermotolerant coliforms and *e. coli* – planned = 2, taken = 2;
 - thermotolerant amoeba – planned = 1, taken = 0.
 - Consumer SP for
 - thermotolerant coliforms and *e. coli* – planned = 3, taken = 6;
 - thermotolerant amoeba – planned = 3, taken = 2;
 - heterotrophic bacteria (HPC 37°C 2 days) – planned = 1, taken = 0.
 - heterotrophic bacteria (HPC 21°C 3 days) – planned = 1, taken = 0.
- Chemical testing from:
 - Source SP for Suite 4, 5 and R parameters.
 - Source SP for pH, conductivity and calculated TDS (routine field testing) – planned 18, taken 10.
 - Treated Water Tank SP for chlorine, pH, conductivity, calculated TDS and turbidity (routine field testing) – planned 30, taken 2.
 - Consumer SP for chlorine, pH and temperature (routine field testing) – planned 18, taken 16.

Table 11: Summary of achieved versus planned sampling

		Planned	Taken	% Taken
Microbiological	Treated Water SP	3	4	100%
	Consumer SP	10	13	100%
Chemical	Source SP	18	10	56%
	Treated Water SP	30	2	3%
	Consumer SP	18	18	100%
Radiological	Source SP	2	2	100%
	Treated Water SP	0	0	0%
	Consumer SP	0	0	0%

7.2 Planned Sampling Summary for Jan to March 2020 (Q1)

Table 12: Planned sampling program for Jan - Mar 2020 (Q1)

		Planned sampling	Frequency	Total No. of Analyses
Microbiological	Treated Water SP	Suite M1 (laboratory)	Once	3
	Consumer SP	Suite M1 (laboratory)	2 weeks	15
Chemical	Source SP	Field testing (pH, Cond'y, TDS)	2 weeks	18
	Treated Water SP	Field testing (Free chlorine, pH, Cond'y, TDS)	2 weeks	24
	Consumer SP	Field testing (Free chlorine, pH, Temp)	2 weeks	18
		Suite 1 (Laboratory)	Once	4
		Suite 6 (Laboratory)	Once	8

Note: Refer to Section 7.3 for details of laboratory analysis suites.

7.3 Routine Sampling Program

Lancelin South has developed a sampling program based primarily upon the Department of Health's published Small Community Sampling Grid (V2). The program identifies 3 sampling points being:

1. Source water (sampled from bore headworks);
2. Treated water (sampled from the outlet of the Treated [Potable] Water Storage Tank at the water treatment plant); and

3. Consumer water (sampled from an internal tap in the Lancelin South Sales Office within the Lancelin South development).

Water analyses are derived from:

1. Grab samples analysed in the field by hand held instruments; and
2. Samples submitted to a NATA accredited laboratory.

On-line instrumentation is installed within the water treatment plant to indicate correct operation of the plant. However, no instrumentation is currently installed to monitor water specifically at the three designated sampling points.

Table 13: Sampling summary - Field Checks

	Source SP	Treated Water SP	Consumer SP
Free Chlorine	-	Fortnightly	Fortnightly
pH	Fortnightly	Fortnightly	Fortnightly
Temperature	-	Fortnightly	Fortnightly
Conductivity	Fortnightly	Fortnightly	-
Calculated TDS	Fortnightly	Fortnightly	-
Turbidity	-	-	-

Table 14: Sampling summary - Microbiological

		Source SP	Treated Water SP	Consumer SP
Suite M1	Total Coliforms	-	3 Monthly	Fortnightly
	E.Coli			Monthly
	Amoeba			As required
Suite M2	Heterotrophic plate count	-	-	As required

Table 15: Sampling summary - Radiological

		Source SP	Treated Water SP	Consumer SP
Suite R	Gross Alpha	2 yearly *		
	Gross beta			

* To be reviewed – may be changed to 5 yearly if little variation or ongoing compliance demonstrated

Table 16: Sampling summary - physical and inorganic

		Source SP	Treated Water SP	Consumer SP
	Free Chlorine			6 monthly
Suite 1	pH	Annually		6 monthly
	TDS			
	Conductivity			
Suite 2	TSS			6 monthly *
	Turbidity			
	Colour			
	Alkalinity			
	Hardness			
	Chloride			
	Sulphate			
	Sodium			
	Potassium			
	Calcium			
	Magnesium			
	Aluminium - total			
	Ammonia - total			
	Iron - total			
Manganese - total				
Suite 3	Nitrite			6 monthly *
	Nitrate			
	Antimony – total			
	Cadmium - total			
	Chromium - total			
	Copper - total			
	Fluoride			
	Lead - total			
	Nickel - total			
	Zinc - total			
	Suite 4			
Barium				
Boron				
Mercury – total				
Molybdenum – total				
Selenium - total				
Suite 5	Beryllium	2 Yearly		
	Silver – total			
	Tin – total			
	Uranium – total			

* To be reviewed – may be changed to annually if little variation or ongoing compliance demonstrated

Table 17: Sampling summary - disinfection byproducts

		Source SP	Treated Water SP	Consumer SP
Suite 6	THMs - total			6 monthly *
	Chloroacetic acid			
	Dichloroacetic acid			
	Trichloroacetic acid			
	2-chlorophenol			
	2,4-dichlorophenol			
	2,4,6-trichlorophenol			
	Trichloroacetaldehyde			

* To be reviewed – may be changed to annually if ongoing compliance demonstrated

Table 18: Sampling summary - pesticides

		Source SP	Treated Water SP	Consumer SP
Suite 7	Aldrin (& Dieldrin)	Annually		
	Amitrole			
	Atrazine			
	Chlordane			
	Chlorfenviphos			
	Clopyralid			
	2,4-D			
	DDT			
	Diquat			
	Diuron			
	Endosulfan			
	Fosamine			
	Glyphosate			
	Heptachlor			
	Hexachlorobenzene			
	Hexazinone			
	Lindane			
	Molinate			
	Organophosphates – total			
	Paraquat			
	Pentachlorophenol			
	Picloram			
	Propiconazole			
Simazine				
Temephos				
Triclopyr				

8.0 General Notes/Other News

The WTP was upgraded in December 2019 and the following equipment replaced:

- Bore Pump and instrumentation
- Media Filtration / GAC
- RO
- Chlorination system
- Control System

The successfully commissioned new equipment has been operational since mid-December 2019.

Regular maintenance of the water treatment plant is undertaken by a specialist contractor. The contractor verifies operation of on-line instrumentation and checks basic water quality parameters using hand-held instruments through the plant on each visit.

Regular fortnightly checks of pH, chlorine and water temperature using hand held instrumentation at the WTP and the Lancelin South sales office are carried out by Lancelin South Water.

All samples prior to this quarter returned a pH within the ADWG aesthetic guideline range, temperature below 26°C and positive result for chlorine.