Geraldton No. 2 Water Resource Recovery Facility

Supporting information for approvals under Part V of the Environmental Protection Act 1986

Licence Amendment Supporting Information – October 2024



Document Information

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Appendices

Appendix A	Proof of Occupier Status
Appendix B	2024 Detailed Site Investigation
Appendix C	Groundwater Monitoring Plan
Appendix D	Technical Modelling Advice



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Table of attachments

The following table shows how the mandatory attachments referenced in the Department of Water and Environmental Regulation (DWER) application form have been addressed in this document,

DWER Attachment	Description	Location in this document	Comment
1A	Proof of occupier status	Error! Reference source not found.	Refer also to Section 2.2
10	Proposed fee calculation	Section 4	N/A



1 Purpose

This document has been prepared to support an application for a Licence Amendment for the Geraldton No. 2 Water Resource Recovery Facility (WRRF).

2 Premise and Applicant Details

2.1 Occupier Details

Water Corporation is a statutory entity and was established by Section 4(1) of the *Water Corporations Act 1995* (WC Act). The Corporation is a body corporate (Section 4 of the WC Act) and as such does not have an ASIC company extract.

Water Corporation provides water, wastewater and drainage services to Perth and hundreds of towns and communities spread over 2.5 million square kilometres of Western Australia. Water Corporation holds many licences for Wastewater Treatment Plants (WWTPs) with the Department of Water and Environmental Regulation (DWER).

Water Corporation operates to an environmental management system certified to ISO 14001, which enables the systematic identification of environmental risks, setting of targets and development of environment improvement plans to reduce risks and ensure its activities are sustainable.

2.2 Premise Details

2.2.1 Premise location

The Geraldton No. 2 WRRF is located on Lot 1 & 2 on Diagram 57545 and Lot 3 on Diagram 72567, on Webberton Road, Wonthella in the City of Greater Geraldton.

Water Corporation is the owner for these lots as demonstrated by the attached Certificate of Titles (Appendix A).

2.2.2 Prescribed Activity

The Geraldton No. 2 WRRF has an existing Licence (L5961/1991/12) for operations in the prescribed premises under the category shown in Table 1.

Table 1 Prescribed Premise Category

Category	Description	Design Capacity	Production Capacity
54	Sewerage facility premises – (a) On which sewerage is treated (excluding septic tanks); or From which sewerage is discharged onto land or into waters.	3,500 m3 per day	3,500 m3 per day

2.2.3 Prescribed Premise Boundary

The existing premise boundary will not change due to this licence amendment.



3 Proposed Activities

The amendments are for the following conditions. Requested amendments from the current licence are **in red and bold**.

- Condition 3, Table 1: Waste acceptance
- Condition 5, Table 3: Containment infrastructure
- Condition 13, Table 5: Monitoring of emissions to land
- Condition 14, Table 6: Monitoring of inputs and outputs
- Condition 15, Table 7: Monitoring of ambient groundwater quality
- Conditions 16, 17 and 18: Triennial review
- Condition 22, Table 8: Environmental reporting requirements
- Condition 25, Table 10: Notification requirements
- Schedule 1; Figure 2: Map of emission and monitoring points
- Schedule 1; Figure 3: Map of site layout and monitoring bore locations
- Schedule 1; Figure 4: Map of premises layout

3.1 Description of proposed amendment

3.1.1 Condition 3, Table 1

Water Corporation is seeking to update the waste acceptance table to allow sewage (K130) waste to be tanked into the premises and discharged via the receival point.

Table 1 Waste acceptance

Waste	Waste Code	Quantity Limit	Specification
Sewage – waste from the reticulated sewerage system	K130	3,500 m3/day	 Accepted through sewer inflow(s) only. Tanked into the premises and discharged directly into the primary pond only, via the receival point.
Septage Wastes	K210		 Tanked into the premises and discharged directly into the primary pond only, via the receival point.

3.1.2 Condition 5, Table 3

Water Corporation is seeking to update infrastructure details for screenings at the inlet works and to include infiltration area ponds IP1, IP3 and IP4 in the containment infrastructure.



Table 2 Containment Infrastructure

Storage vessel or compound	Material	Infrastructure details
Inlet works	Screenings	Stored in a sealed bin located on a which is surrounded by a bunded hardstand area, which returns sludge leachate to the start of the treatment process. (a) Must be stored in an impermeable receptacle or container; (b) The storage container must be located on a hardstand area that is graded to a collection drain which returns sludge leachate to the start of the treatment process; and (c) The licence holder must dispose of all collected screenings from the pre-treatment area, via a controlled waste carrier to a licensed landfill.
Ponds 1-2	Wastewater	Lined to achieve a permeability of no greater than 1x10 ⁻⁹ m/s or equivalent.
Distribution chamber	Wastewater	Unlined, in-situ soils.
Ponds IP1, IP3 and IP4 (infiltration)	Wastewater	Unlined, in-situ soils.
Ponds IP5-IP8 (Infiltration)	Wastewater	Unlined, in-situ soils. The infiltration ponds shall be maintained to ensure that the combined total capacity of the ponds does not exceed 28 ML.
	Sewage Sludge	Temporary or permanent infrastructure to consist of a bunded hardstand or lined area (lined to achieve a permeability of less than 10-9 m/s or equivalent), capable of preventing surface run-off of leachate and sludge and which includes a leachate collection system. The sewage sludge geobag laydown area should be managed such that: (a) stormwater runoff is prevented from entering the area; (b) discharges/ leachate from the area are directed to the primary pond.

3.1.3 Condition 13, Table 5

Condition 13 Table 5 includes limits for emissions for land for three parameters (pH, Total Nitrogen and Total Phosphorus) at emission point M2. These limits appear to have been taken from the short-term trigger values (STV) in irrigation water-derived form ANZECC & ARMCANZ (2000). These guidelines apply to commercial and agricultural applications and do not usually apply to an urban setting.

Furthermore, the STVs are based on maintaining crop yield and were developed to minimise the build-up of contaminants in surface soils during irrigation and to present direct toxicity of contaminants in irrigation waters to standing crops. Short-term irrigation water guidelines apply for up to 20 years of irrigation.

The STV should be considered on a site-specific basis relative to; crop uptake; crop sensitivity to excess nitrogen concentrations; irrigation load; removal of nitrogen from the irrigated site in harvestable portions of crops; volatilisation/ denitrification losses; and fertiliser nitrogen applied. These calculations do not consider the concentrations of soil nitrogen through soil leaching.



Given TWW is infiltrated in a series of on-site infiltration ponds and is not applied to soil as irrigation water, these limits are not relevant, and Water Corporation proposes to remove them from Table 5.

Additionally, the emission point reference M3 has been updated to include the functional location (FL) number in Table 5. The limit of 3,500 m³/day should also been removed as this is the assessed production/design capacity and applies to the inflow only.

Table 5: Monitoring of emissions to land

Emission point reference	Parameter	Limits	Units	Average Period	Frequency
M3 (Outflow meter – FL No. S0037860)	Volumetric flow rate	3,500	m³/day	Monthly	Continuous
M2	pH ¹	6.8 - 8.5	pH units	Spot Sample	Quarterly
(Monitoring	Total suspended solids	*	mg/L		
point – FL	Total dissolved solids	•			
No. S4000068)	5-day Biochemical oxygen demand	-			
	Total Nitrogen	125			
	Total Phosphorus	12			
	Ammonium-nitrogen				
	Nitrate-nitrogen	-			
	Nitrite-nitrogen	-			
	Escherichia coli (E.coli)2	*	cfu/100mL		
	Aluminium	-	mg/L	Spot Sample	Annual
	Arsenic	+			
	Beryllium	+			
	Boron	-			
	Cadmium	-	al la company		
	Chromium	0			
	Cobalt	-			
	Copper	-			
	Fluoride	-			
	Lead	-			
	Mercury	±.	4		
	Nickel	-			
	Selenium				
	Zinc				

Note 1: In-field non-NATA accredited analysis permitted.

Note 2: Actual units are to be reported except where the result is greater than the highest detectable level of 24,000 cfu/100mL. In this case the reporting of the highest detectable level is permitted.



3.1.4 Condition 14, Table 6

Three monitoring point refences in Table 6 are incorrect or incomplete. The functional location (FL) number for the inflow meter (M1) was incorrectly referencing the inflow sample point and should been updated. The FL number for the outflow meter (M3) and the meter at bore A1/97 have been added. These references have been updated in Schedule 1, Figure 2: Map of emission monitoring points (discussed in Section 3.1.9.).

Table 6: Monitoring of inputs and outputs

Input/Output	Monitoring point reference	Parameter ¹	Units	Averaging Period	Frequency
Sewage received	Inflow meter (M1 – \$4000066 \$Z011980)	Volumetric flow rate (cumulative)	m ³ /day	Monthly	Continuous
Treated wastewater discharged from the final treatment pond to on- site infiltration area	Outflow meter (M3 – S0037860)	Volumetric flow rate (cumulative)	m³/day	Monthly	Continuous
Septage received into the premises	Tankered waste receivable point	Volumetric flow rate (cumulative)	m³/day	Monthly	Continuous
Redraw of groundwater	Outflow meter from production bore 'A1/97' – W4018469	Volumetric flow rate (cumulative)	m ³ /day	Monthly	Continuous

Note 1: In-field non-NATA accredited analysis permitted.

3.1.5 Condition 15, Table 7

The well network was established in 1994 and has been incrementally expanded since then, the most recent wells were installed during a 2024 detailed site investigation (Senversa, 2024a). The monitoring network is now far more widespread and designed to capture down-hydraulic gradient groundwater quality and assess attenuation.

Water Corporation has prepared a groundwater monitoring plan (GMP) (Senversa, 2024b) to document the proposed augmented monitoring locations, and sampling and analytical approaches that will be relied upon to collect ambient groundwater quality monitoring data under Condition 15 of the licence. A secondary objective of the GMP is to support continued representative data collection to demonstrate that site-related groundwater impacts remain stable and pose a low acceptable risk to relevant off-site environmental values.



Given that stability of the nitrate plume has been demonstrated at the site (Senversa, 2024b), biannual monitoring (i.e. post-summer and post-winter) of nutrients, total dissolved solids, pH and *E.coli* is considered adequate. Since metals are not considered the primary risk driver in groundwater (Senversa, 2024b), annual monitoring is deemed sufficient. Groundwater flow direction has been consistently shown to the west south-westerly towards the Indian Ocean; therefore, annual gauging of standing water levels is adequate.

The 2024 detailed site investigation report (Senversa, 2024a) is included in Appendix B.

The GMP (Senversa, 2024b) is included in Appendix C and proposed changes are illustrated in the table below.

Table 7: Monitoring of ambient groundwater quality

Monitoring point reference and location	Parameter	Limits	Units	Averaging period	Frequency
Monitoring and production	Standing water level	-	m(BGL)	Spot sample	Six monthly Annual
bores:	Electrical conductivity		µs/cm		Six monthly
Production bore:	Total dissolved solids	-	mg/L		
A1/97 Shallow	Total nitrogen				
monitoring	Total phosphorus	-			
bores:	Ammonium as N				
1/94,	Nitrate + Nitrite as N				
2/94,	pH ¹	6.5-8.5	pH		Monthly
3/94,	E.coli ²	<1,000	Cfu/100ml		Six monthly Annual
4 /94,	Aluminium	-	mg/L		
5/94, 6/94,	Arsenic	-			
8/94,	Beryllium	-			
9/94,	Boron	-			
10/94,	Cadmium	1.50			
1/17,	Chromium	4			
2/17,	Cobalt	-			
3/17,	Copper	-			
4/17,	Fluoride				
5/17, and 6/17,	Lead	-			
1/20,	Mercury	-			
6/20,	Nickel	-			
8/20,	Selenium	-			
10/20, 2/22, 1/24, 5/24 and 7/24 Intermediate monitoring bores: 7/94, 2/20, 5/20,	Zinc	-			



Monitoring point reference and location	Parameter	Limits	Units	Averaging period	Frequency
7/20, 9/20, 11/20, 4/24 and 6/24 (as defined within Schedule 1: Maps Figure 3)					

Note 1: In-field non-NATA accreditation analysis permitted,

Note 2: Actual limits are to be reported except where the result in greater than the highest detectable levels of 24,000 cfu/100mL. In this case the reporting of the highest detectable level is permitted.

3.1.6 Conditions 16, 17 and 18

The expanded groundwater monitoring well network and proposed augmented ambient groundwater monitoring to be executed under condition 15 of the licence will provide a better understanding of nutrient attenuation and offer regulatory and operational controls based on empirical evidence as opposed to validation of a non-empirical, low confidence groundwater model. Considering this, Conditions 16 and 17 of the licence should be removed.

The well network was established in 1994 and has been incrementally expanded since then, the most recent wells were installed in 2024 (Senversa, 2024). The monitoring network is now far more widespread and designed to capture down-hydraulic gradient impacts and assess attenuation. Water Corporation considers that the improved bore network has closed out condition 18 of the licence noting that the purpose of the additional wells was not to validate Rockwater 2009.

Further technical justification for the removal of Conditions 16, 17 and 18 is provided in the technical modelling advice (Water Corporation, 2024) included in Appendix D.

16. The licence holder must undertake a triennial review of the ambient groundwater monitoring data to validate the 'Rockwater Report 2010' modelling data, as submitted for the new infiltration pends. The review shall incorporate all monitoring and production bere ambient quality data obtained since initiating discharge to the new infiltration pends (IP5-IP8). The triennial review shall consider:

- (a) the 'Rockwater Report 2010' modelling data, as submitted for the new infiltration ponds;
- (b) 'Australian Guidelines for Water Recycling Managed Aquifer Recharge, July 2009';
- (c) the 'ANZECC 2000' guidelines;
- (d) nutrient loads to the irrigation and infiltration areas; and
- (e) groundwater directional flow

17. The licence holder must submit the triennial review (as defined in condition 16 to the CEO by 25 February 2020 and by 25 February every three years thereafter.



18. The licence holder must include in the initial triennial review (to be submitted by 25 February 2020 in accordance with Condition 16, a timeline for the installation of additional bores for monitoring the MAR area, to be located on the basis of validating the modelled extent of the wastewater plume after 10 years of infiltration, as outlined within Section 10.1 of the 'Rockwater, 2010' report.

3.1.7 Condition 22, Table 8

Water Corporation proposes to update Condition 22 Table 8 to include additional reporting parameters for the monitoring of ambient groundwater quality.

Table 8: Environmental reporting requirements

Condition or table (if relevant)	Parameter			
	Summary of any failure of malfunction of any pollution control equipment and are environmental incidents that have occurred during the annual period and any action taken			
Table 4	Summary of emissions to land			
Table 5	Summary of monitoring of emissions to land			
Table 6	Summary of monitoring of inputs/outputs			
Table 7	Summary of monitoring of ambient groundwater quality a) A clear statement of the scope of work carried out; (b) A description of the field methodologies employed; (c) an assessment of reliability of field procedures and laboratory results; (d) an interpretive summary and assessment of the results against relevant assessment levels, with rational provided to justify why assessment levels have been assigned; (e) an interpretive summary and assessment of results against previous monitoring results; and (f) trend graphs to provide a graphical representation of historical results			
	and to support the interpretive summary.			
Condition 19				

3,1,8 Condition 25, Table 10

Water Corporation requests to update Table 10 given the limits have been proposed to be removed from Condition 13, Table 5.

Table 10: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement ¹	Format or form ²
•	Taking a treatment pond offline for maintenance	Notify 72 hours prior to any action taking place	None specified
•	Removal of sludge from a treatment pond	No less than 14 days prior to removal.	None specified
Condition 13 Table 5 Condition 15 Table 7	Breach of any limit specific in the Licence	Part A: As soon as practicable but no later than 5 pm of the next usual working day.	N1



Condition or table (if relevant)	Parameter	Notification requirement ¹	Format or form ²
		Part B: As soon as practicable	
Condition 12	Calibration report	As soon as practicable.	None specified

Note 1: Notification requirements in the Licence shall not negate the requirement to comply with a72 of the Act

Note 2: Forms are in Schedule 2.

3.1.9 Schedule 1, Figure 2. Map of emission monitoring points

The site schematic has been improved to show the infiltration areas and the location of the emission monitoring points. This schematic should replace Figure 2 in the licence.

3.1.10 Schedule 1, Figure 3. Map of site layout and ambient groundwater monitoring bore locations

The map of ambient groundwater monitoring locations has been updated to show the proposed monitoring locations related to Condition 15. This map should replace Figure 3 in the licence.

3.1.11 Schedule 1, Figure 4: Map of premises layout

Water Corporation requests that Figure 4 is removed from the licence as the information is provided in the updated version of Figure 2 (Section 3.1.9).

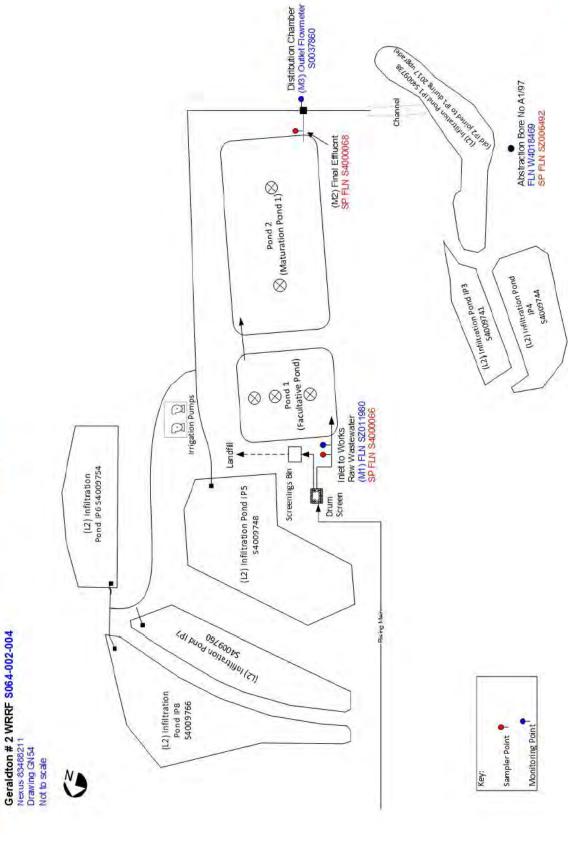






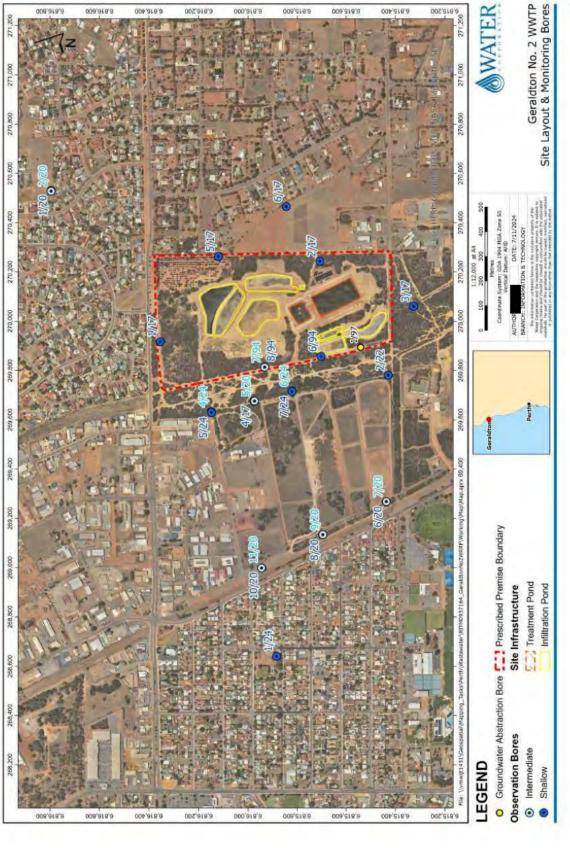
Amendment Supporting Information

Schedule 1; Figure 2: Map of emission and monitoring points



Amendment Supporting Information

Schedule 1; Figure 3: Map of ambient groundwater monitoring locations





4 Fee Calculation

Please refer to Attachment 10.

5 References

ANZECC & ARMCANZ (2000). Australian and New Zealand guidelines for fresh and marine water quality. Volume 3. Primary industries (Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand: Canberra.) Available from: https://www.waterquality.gov.au/sites/default/files/documents/anzecc-armcanz-2000-guidelines-vol3.pdf

Senversa (2024a). Geraldton No. 2 Wastewater Resource Recovery Facility. *Stage 2 Detailed Site Investigation*. Appendix B

Senversa (2024b). Geraldton No. 2 Wastewater Resource Recovery Facility. *Groundwater Monitoring Plan*. Appendix C.



Appendix A Proof of Occupier Status



WESTERN



TITLE NUMBER

Volume F

Folio 40

1776

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



LAND DESCRIPTION:

LOT 1 ON DIAGRAM 57545

REGISTERED PROPRIETOR:

(FIRST SCHEDULE)

WATER CORPORATION OF 629 NEWCASTLE STREET, LEEDERVILLE

(A G163535) REGISTERED 30/4/1996

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:

(SECOND SCHEDULE)

 THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 1776 FOL 40.

Warning:

A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1776-40 (1/D57545)

PREVIOUS TITLE: 1727-604

PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.

LOCAL GOVERNMENT AUTHORITY: CITY OF GREATER GERALDTON

RESPONSIBLE AGENCY: WATER CORPORATION

WESTERN



TITLE NUMBER

Volume

Folio 41

1776

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



LAND DESCRIPTION:

LOT 2 ON DIAGRAM 57545

REGISTERED PROPRIETOR:

(FIRST SCHEDULE)

WATER CORPORATION OF 629 NEWCASTLE STREET, LEEDERVILLE

(A G163535) REGISTERED 30/4/1996

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:

(SECOND SCHEDULE)

- THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 1776 FOL 41.
- N900776 MEMORIAL, CONTAMINATED SITES ACT 2003 REGISTERED 18/5/2018.

Warning:

A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1776-41 (2/D57545)

PREVIOUS TITLE: 1727-604

PROPERTY STREET ADDRESS: 259 WEBBERTON RD, WONTHELLA. LOCAL GOVERNMENT AUTHORITY: CITY OF GREATER GERALDTON

RESPONSIBLE AGENCY: WATER CORPORATION

WESTERN



TITLE NUMBER

Volume

Folio

1796

262

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



LAND DESCRIPTION:

LOT 3 ON DIAGRAM 72567

REGISTERED PROPRIETOR:

(FIRST SCHEDULE)

WATER CORPORATION OF 629 NEWCASTLE STREET, LEEDERVILLE

(A G163535) REGISTERED 30/4/1996

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:

(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.

Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1796-262 (3/D72567)

PREVIOUS TITLE: 1776-42

PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.

LOCAL GOVERNMENT AUTHORITY: CITY OF GREATER GERALDTON

RESPONSIBLE AGENCY: WATER CORPORATION