Bioscience

**Integrating Resource Management**

# Nutrient and Irrigation Management Plan

**Prepared on behalf of**

**WAMMCO International**

**Katanning Abattoir**

**Nutrient and Irrigation Management Plan**
*WAMMCO International – Katanning Abattoir*

*Prepared by*
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**Document Control**

| Issue | Date | Author | Reviewer | Approved |
|---|---|---|---|---|
| 1 | 16/10/24 | Bhavyata Lugun | Peter Keating | PK |
| 2 | 14/04/2025 | Bhavyata Lugun | Peter Keating | PK |

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# Introduction

This Nutrient and Irrigation Management Plan (NIMP) was developed by Bioscience as per the guidelines of Water Quality Protection Note 33 (WQPN 33, 2010 Nutrient and Irrigation Management Plans) on behalf of Western Australian Meat Marketing Co-operative Limited, WAMMCO.

WAMMCO is seeking to increase the slaughtering capacity of its existing operation, a rise from a licence limit of 1.2 million to 2.4 million carcasses per year on Lot 27983 Great Southern Hwy, Katanning, WA, 6317 (282.7 ha). The proposed expansion will see the labour force on site rise by approximately 100 people to a total of 450 employees. The number of paddocks utilised to temporarily keep sheep will remain constant, but the increase in sheep kept temporarily on pasture still fits within the allowable DPIRD stocking rate for paddocks.

Water is supplied via Water Corporations' Pinwernying Dam, which is fed from Harris Dam near Collie. Wastewater from slaughterhouses, rendering plants, and boning rooms, is used for irrigation after undergoing primary (anaerobic) and secondary (aerobic) treatment whilst water from lairage and yard cleaning is diverted to a manure settling pond, before transfer to the anaerobic pond. The proponent is planning to use reverse-osmosis plant to re-use part of the water from the final wastewater treatment pond for non-potable water in non-food handling areas such as wet scrubbers and cooling towers.

# 1 Summary of the Land Use Proposal

**Proponent's name:** Marc Chambers
**Contact details:** 0407779613
**Site location:** WAMMCO International – Great Southern Katanning Abattoir
**Project description:** The proponent is planning to expand the operation of the slaughtering facility to about twice the current operation using an existing building that has not been used for at last 15 years. The new slaughter floor will see a rise to 2.4 million carcasses in production capacity with an incremental commissioning in stages applied. The expansion will increase the on-site labour force by almost 100 people, reaching 450 personnel.
**Timetable:** Proponent is planning to commission the second killing floor between July and September 2025.

# 2 Project Setting

## 2.1 Zoning

The site is zoned as 'Special use' zones under the Shire of Katanning Scheme No. 5. It is identified under the SU8 special use zones in Katanning Scheme area. The use of the site is

approved by the local government to include an abattoir, water storage, stockyards & skin-drying sheds and other associated complementary uses (SoK,2017).

## 2.2 Project Description

### *2.2.1 Infrastructure and Setback*

The 253.2 ha lot consists of an abattoir complex comprising of the two sheep yard areas, two skin sheds, slaughtering rooms, large cool rooms, the rendering plant and wastewater system with reverse osmosis plant, and paddocks for holding livestock until they are ready for slaughter and processing. Wastewater produced from the abattoir, rendering facility and boning rooms first go through a filtration/settlement process before being conveyed to the anaerobic ponds where anaerobic digestion starts the degradation of organic matter and stabilization of sludge. Overflow effluent is then syphoned to aerobic and maturation ponds until it can be used for irrigation. 158 ha of land is used for irrigation (**Figure 1**).

### *2.2.2 Livestock*

WAMMCO Abattoir operates under license (L5199/1983/12) issued under the Schedule 1 of Environmental Protection Regulations 1987. The operation is classified as a prescribed premises with assessed production capacity for Category 15,16 and 55 shown in Table 1 below.
Sheep are brought in every operating day from all over Western Australia. Excess sheep from daily slaughter are turned out onto irrigated paddocks, until they can be added to the daily input. At the time of visit, there were about 600 merinos (mostly wethers) kept on the paddocks until ready to be slaughtered. With the expansion of the venture, the number of sheep temporarily kept on site may increase to 1000.

**Table 1: Prescribed current premises category description**

| Prescribed premises category description | Assessed production/design capacity |
|---|---|
| Category 15: Abattoir | 47,000 liveweight tonnes per year |
| Category 16: Rendering operations | 4900 tonnes per year |
| Category 55: Livestock saleyard or holding pen | 1,200,000 animals per year |

# 3 Land Use and Nutrient Application Details

The proposed expansion of the prescribed activity aims to double its operation capacity by having a second slaughter floor while implementing a closed system, with no net discharge to the external environment outlined more in *Section 7.3*. *Conditions 7-9* govern the treatment of wastewater, while *Condition 11* governs the management of the treatment ponds under WAMMCO's licence (**Appendix A**).

According to the license issued under Reference Number L5199/1983/12 compliant to *Condition 13*, license holder is obliged to ensure nutrient loading rates are not exceeded in the application of wastewater for irrigation:

a) Nitrogen – less than 250kg/ha/yr; and

b) Phosphorus – less than 60 kg/ha/yr.

Soil samples collected on irrigated paddocks during a site visit were tested. Results show high phosphorus concentration as shown in Table 2 below.

*Section 7.3* describes approaches to be implemented by proponent with the aim of managing the current elevated phosphorus concentration in soil, namely by producing pasture, cutting and baling silage for export to better balance nutrient mass input and enable better control of export to the external environment in a valuable and benign way as animal feed.

**Table 2: Phosphorus and Nitrogen concentration results of soil sampled on field trip**

| Sample ID | Paddock number | Nitrogen Conc (kg/ha) | Phosphorus conc (kg/ha) |
|---|---|---|---|
| **2024_1087** | 3 | 24.42 | 119.13 |
| **2024_1088** | 3 | 24.585 | 135.795 |
| **2024_1089** | 3 | 18.4965 | 120.78 |
| **2024_1090** | 3 | 28.71 | 102.465 |
| **2024_1091** | 4 | 17.952 | 88.275 |
| **2024_1092** | 4 | 23.925 | 133.98 |
| **2024_1093** | 4 | 48.51 | 143.715 |
| **2024_1094** | 1 | 20.1135 | 128.7 |
| **2024_1095** | 5 | 20.2455 | 104.115 |
| **2024_1096** | 6 | 18.216 | 61.875 |

# 4 Local Rainfall, Evaporation and Interception

The climate of the area is characterized by the Mediterranean climate comprising cool wet winters and hot dry summers.

Average annual rainfall (Bureau of Meteorology) recorded at Katanning weather station (010916) is 436.8 mm, with most of the rain falling between May and August. Table 3 shows the monthly average rainfall at Katanning weather station (010916).

Evaporation is likely to be similar to the Kojonup Area, which has an annual evaporation of 1433.7 mm, which is three times the annual average rainfall. Monthly evaporation typically exceeds monthly rainfall between September and May each year which will be the main times of irrigation.

**Table 3: Rainfall and Evaporation at Katanning and Kojonup Weather Station (Bureau of Meteorology)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average rainfall (mm) | 18.5 | 13.6 | 22.8 | 28.5 | 46.9 | 56.2 | 61.6 | 59.7 | 47.7 | 30.9 | 22.7 | 21.9 | 436.8 |
| Mean Monthly Evaporation (mm) | 220.1 | 190.4 | 164.3 | 93.0 | 58.9 | 42.0 | 43.4 | 55.8 | 75.0 | 111.6 | 156.0 | 223.2 | 1433.7 |

Note that rainfall only exceeds evaporation in the three winter months.

# 5 Soils and Landform Description

## 5.1 Land Contours

The lot's 2 m terrain contour is depicted in **Figure 2**. The topography of the lot is gently sloping, with a 0.2% gradient that runs up the slope in a northwestward direction.

## 5.2 Soil Lithology

Soil samples were collected as multiple cores from the irrigated paddocks during a site visit by Bioscience on the 12th of September 2024. Samples were ID'd as shown in **Table 4** below. Results are attached in **Appendix B**. Soil pH ($H_2O$) ranged from 6.03 - 6.60 displaying ideal pH for pasture growth throughout the lot. High phosphorus content can be explained by a combination of wastewater used for irrigation purpose, sheep manure exceeding uptake by pasture. Management of nutrient levels in soil is explained in *Section 7.3.*

**Table 4: Soil Sample ID**

| SAMPLE ID | CLIENT ID | Paddock number |
|---|---|---|
| **2024_1087** | 3 | 3 |
| **2024_1088** | 4 | 3 |
| **2024_1089** | 5 | 3 |
| **2024_1090** | 6 | 3 |
| **2024_1091** | 7a | 4 |
| **2024_1092** | 7b | 4 |
| **2024_1093** | 8 | 4 |
| **2024_1094** | Freezer paddock | 1 |
| **2024_1095** | Behind pond | 5 |
| **2024_1096** | Next to creek | 6 |

## 5.3 Groundwater

There will be no digging or substantial earthworks. Increased slaughtering will be carried out in an existing building that was previously used for a beef slaughter and a pork processing area. The building has not been used for 15 years.

Previous work by WAMMCO to explore the feasibility of installing solar panels dug to 8 m depth and found subsurface soils are mostly gravelly clays. Ground water was not encountered.

# 6 Water Resource Description and Use

## 6.1 Water Used Resource

Water is supplied via Water Corporations' Pinwernying Dam to be used in the slaughter rooms, evisceration areas and, the sheep yards and sheds for cleaning, sterilising equipment and washdown. Water is stored in two dams; one clay lined and the other with gravel situated in the northern section of the site. The abattoir is currently using 218,970kL of water per year and is envisaging using 393 ML/year for the expansion of the operation. Due to the increased demand of water and to reduce overall water use, the owner decided to implement Reverse-Osmosis to treat water from the final wastewater pond to re-use for non-potable water in non-food handling areas.

## 6.2 Sensitive Water Resources

### *6.2.1 Wetlands*

The property is not mapped within the Geomorphic Wetlands Area. However, the site is located south of and downgradient of the Katanning Catchment Area located immediately north of the site.

### *6.2.2 Pinwernying Dam and Public Drinking Water Source Areas*

Site is located south of the Katanning Catchment Area, mapped as a Public Drinking Water Source Area by the Department of Water and Environmental Regulation mapping **(Figure 3).** Water is stored in the Pinwernying dam located in Katanning Catchment Area and gets chlorinated twice before supplying to the town for drinking water purposes (SoK,2017).

## 6.3 Seasonal or Occasional Flooding / Waterlogging

The eastern and southern sections of the site are mapped within the extent of 1 in 100 (1%) AEP Flooding as shown in (**Figure 4)** by the Department of Water and Environmental Regulation Floodplain mapping. In events of high rainfall, floods are managed by the large-scale tree-lined drainage on the eastern and southern boundaries of the Lot.

# 7 Site Management

## 7.1 Stocking Rate

Under Schedule 1 of Environmental Protection Regulations 1987, the reviewed production capacity of the livestock saleyard is currently at 1,200,000 animals per year. Sheep are transported to site every operation day from farms around Western Australia. They are kept in stockyards until they are ready to be slaughtered. Occasional daily excesses are placed in paddocks.

The DAF Stocking Rate Guidelines under the Department of Primary Industries & Regional Development are applied when determining the number of sheep to be kept in the paddocks

before being sent to the slaughterhouse. According to the land unit of the property (**Appendix B**), the land can hold 3720 DSE on the 122.5 ha of paddocks.

The proponent designed a production expansion of double the previous capacity of livestock saleyard. Nevertheless, the acceptable number of DSE remains constant as the proponent is planning to use the same number of paddocks for sheep grazing.

**Table 5: Number of sheep calculations according to Stocking Rate Guidelines for Rural Holdings**

| *Type of Livestock* | *Dry Sheep Equivalent* | *Total acceptable DSE* | *Number of Sheep* |
|---|---|---|---|
| Sheep | 1.0 | 3720 | 3720 |

## 7.2 Irrigation Scheme

### *7.2.1 Standpipe & travellers irrigator*

Water from the evaporation pond (which is the final aerobic pond) is used for irrigating the paddocks with standpipe & traveller irrigators. Irrigation is carried out during dry season when the evaporation rate is higher than rainfall as mentioned in *Section 4* to make sure nutrients are absorbed by pasture and do not escape to the soil and hence, to minimise the possibility of introduction to the open environment. The owner will ensure irrigation is not undertaken during occasion of wet and windy weather.
The irrigation water will be tested quarterly to ensure nutrient loading mentioned in *Section 3* is maintained prior to application.

## 7.3 Nutrient Mass Balance

Soil pH demonstrates slightly acidic pH and low salinity from soil test results. However, phosphorus levels are high with a low phosphorus retention Index (PRI) despite the high organic carbon present in soil (**Appendix B**). This suggests past irrigation was not balanced nutrient input and output. This will be addressed with throughput expansion by cutting, baling and exporting silage.

Pasture species are best selected based on climate, soil conditions and feed demand as determined by the type of livestock and cropping system in place. (DPIRD,2024a). The proponent is advised to grow bulk pasture of Lucerne with companion species of Cocksfoot, tall fescue and ryegrass. Leguminous crops are added due to their nitrogen - fixing characteristics and high demand for phosphorus.

To better account for high phosphorus content and low PRI soil, intensification in pasture production is recommended to be harvested within a larger area in order to achieve a negative nutrient mass balance. Harvested pasture will be cut and baled as silage due to its higher feed content and net NPK export to local farmers.

To support nutrient removal, only 70% of the height of standing pasture will be harvested and baled as silage per cutting, as the remainder is utilized for pasture regrowth and animal

feeding. Under optimal conditions for maximum yield of mixed pasture and with the expansion of irrigation to 158 hectares, the paddocks are expected to produce a total of 15.5 tonnes of silage per day, based on a production rate of 140 kg/ha/day (DPIRD, 2024b). This production corresponds to the removal of 100.43 kg/ha/yr of phosphorus, assuming a phosphorus extraction rate of 2.8 kg per tonne of fresh silage (Agfact, 2003). Pasture will be mown and baled as silage up to three times annually, facilitating the export of approximately 15.87 tonnes of phosphorus per year. Silage operations will be contracted to a local farmer who will opportunistically determine which paddocks are best suited to silage production on a day by day, week by week basis.

This calculation below accounts for the increased throughput of 56,160 tHSCW (tonnes of Hot Standard Carcass weight) resulting from the proposed development, representing a 212% increase over the current operational capacity. The relationship between irrigation effluent, throughput capacity and phosphorus concentration has been analyzed over time and applied to estimate the phosphorus input levels in the projected irrigation effluent for the expanded operation. Table 6 shows a summary of the anticipated nutrient mass balance. It is also estimated that approximately 30% of the generated wastewater will undergo reverse osmosis treatment, as outlined in Section 6.1.1.

**Table 6: Summary of Nutrient Mass Balance**

| | Nutrient mass balance | Phosphorus (kg/ha/yr) | Area of irrigation | Tonnes of Phosphorus(yr) |
|---|---|---|---|---|
| 2023 | P Input | 39.13 | 122.50 | 4.79 |
| | P Output | 100.43 | 122.50 | 12.30 |
| 2024 | P Input | 34.24 | 158.00 | 5.41 |
| | P Output | 100.43 | 158.00 | 15.87 |
| 2025 | P Input | 45.80 | 158.00 | 7.24 |
| | P Output | 100.43 | 158.00 | 15.87 (exported) |

According to the table, as output exceeds input, pasture growth is likely to decline. Thus, the number of cuts of silage per year is expected to be reduced as soil phosphate is depleted and thereafter the input of nutrients will match output as silage.

## 7.4 Waste Management

### *7.4.1 Waste Stabilization Pond Systems*

An anticipated amount of 393 ML of water is expected from the expansion of the operation. Wastewater goes through a primary and secondary treatment stage before being used for irrigation. The primary treatment stage, being in a capped anaerobic digestion pond, is used for the process of breaking down degradable organic matter into simpler chemicals (nutrient ions) to be reused in the environment. The anaerobic pond is also used for further stabilizing wastewater with the settlement of solids. The effluent is then syphoned to a maturation pond (aerobic) fed by gravity (**Figure 5**).

# 8 Protection of Natural Water Resources

Soil and water samples will be collected from Pinwernying Creek monthly as a monitoring commitment stated as Condition 18 under the premise license to ensure soil health and runoff are not compromised. Soil samples will be tested for nutrients levels (Nitrate and Phosphorus) and total dissolved salts. Should any elevation in nutrient levels be recorded, *Section 7.2.1* will be reviewed with the view to applying more diluted wastewater less frequently. In this case, wastewater must be tested prior to irrigation and used accordingly.

The Katanning Catchment Area is located 500m North of the abattoir effluent disposal area. If the license holder takes the responsibility of being compliant with *Condition 11* of the license L5199/1983/12 to ensure there is no overtopping or erosion of effluent from wastewater treatment ponds, as it is uphill there is no direct risk to the Pinwernying Dam.

# 9 Vegetation Management

## 9.1 Native vegetation

The Katanning catchment area includes a combination of native vegetation, revegetated land and a wetland environment which is located at the top of the Pinwernying Dam. The lot consists of native vegetation fenced to be preserved to help in the mitigation of land degradation. On the other hand, vegetation has been planted selectively around the pondage system and in paddocks to provide natural shelter for stock. Despite the operation growth, native trees are not cleared to accommodate for more pasture as the increase in the number of sheep to be kept on the site still falls within the DSE capacity of available paddocks. WAMMCO is considering planting additional trees to further safeguard and enhance the environment.

# References

(Dennis et al., 2000) Stocking Rate Guidelines for Rural Small Holdings. *Swan Coastal Plain and Darling Scarp, Western Australia*. February 2000.

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(DPIRD,2018) 'Lucerne - the plant and its establishment'. Department of Primary Industries and Regional Development. Agriculture and Food. https://www.agric.wa.gov.au/pasture-establishment/lucerne-plant-and-its-establishment?page=0%2C5

(DPIRD,2024a) 'Pasture species'. Department of Primary Industries and Regional Development. Agriculture and Food. https://www.agric.wa.gov.au/crops/pastures/pasture-species#:~:text=Pastures%20in%20the%20south%2Dwest,now%20developed%20for%20specific%20niches.

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(Agfact, 2003) ‘Lucerne for pasture and fodder’.Agfact; NSW Agricultural. P2.2.25, Third Edition. https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0010/164737/p2225pt1.pdf

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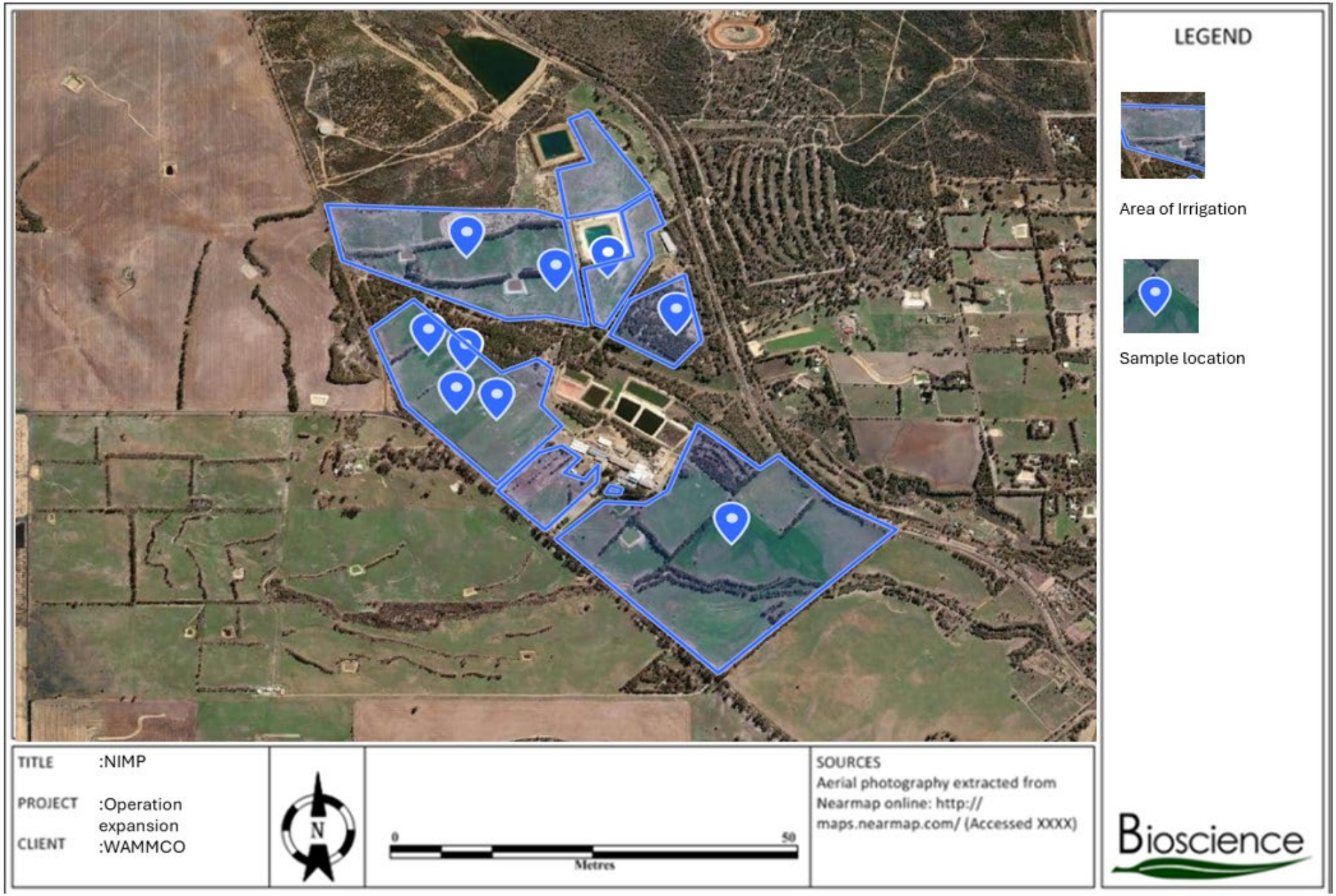
# Figures

Figure 1 : Area of Irrigation



# Figure 2: 2m contour map


15/10/2024, 13:17:53

LGA

2 metre contours (DPIRD-072)

1:18,056

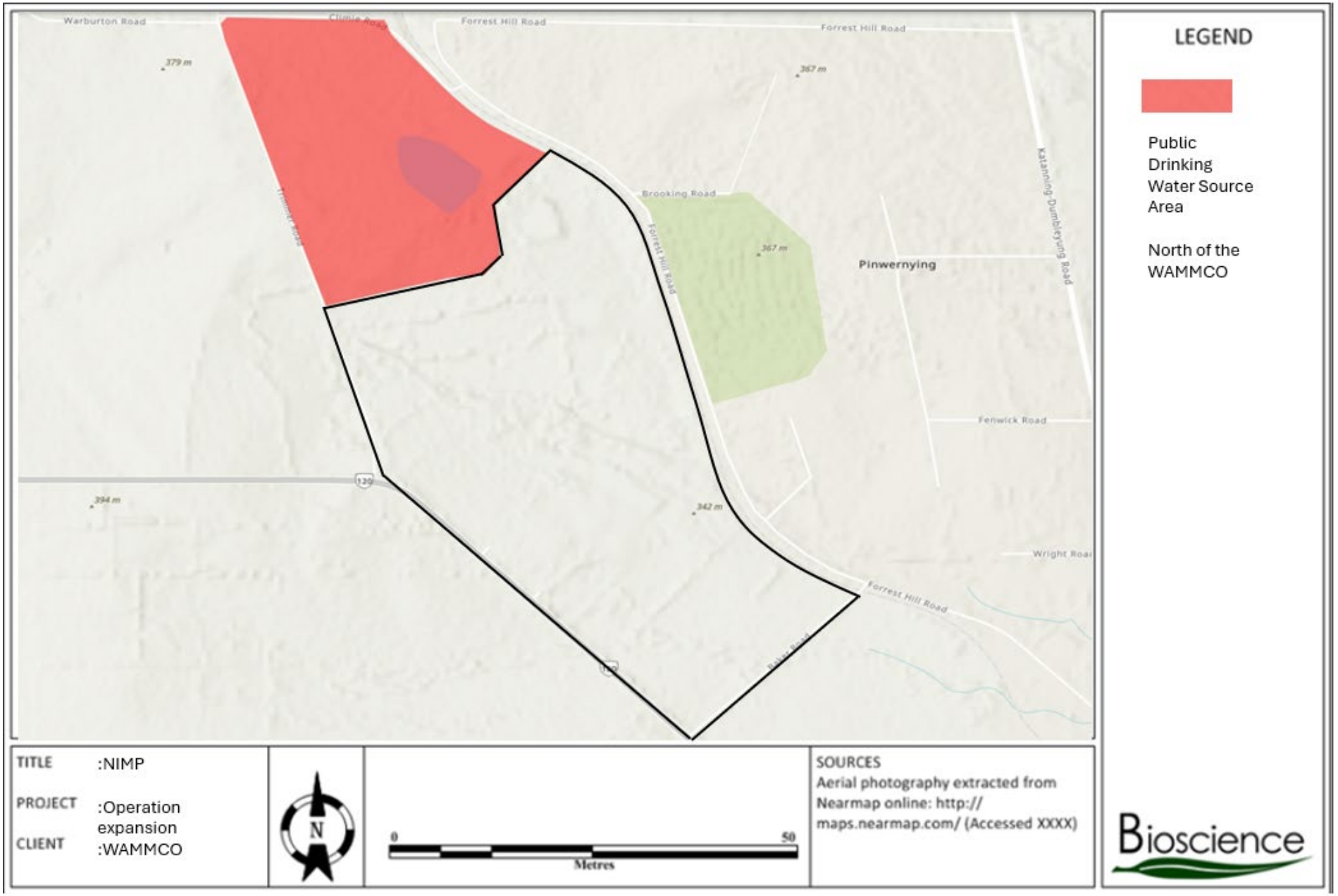
0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

LANDGATE/SLIP, SLIP/LANDGATE, Esri Community Maps Contributors, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, SLIP/Landgate, Esri, Geoscience Australia, NASA, NGA, USGS, Landgate / SLIP

powered by SLIP

Figure 3: Public Drinking Water Sources



# Figure 4: Extend of flood mapping


15/10/2024, 13:53:36

LGA

FPM Extent of Flooding (DWER-017)

Extent of 1 in 100 (1%) AEP flooding

Extent of study - 1 in 100 (1%) AEP

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

SLIP / LANDGATE, LANDGATE/SLIP, SLIP/LANDGATE, Esri Community Maps Contributors, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, SLIP/ Landgate, Esri, Geoscience Australia, NASA, NGA, USGS, Landgate / SLIP

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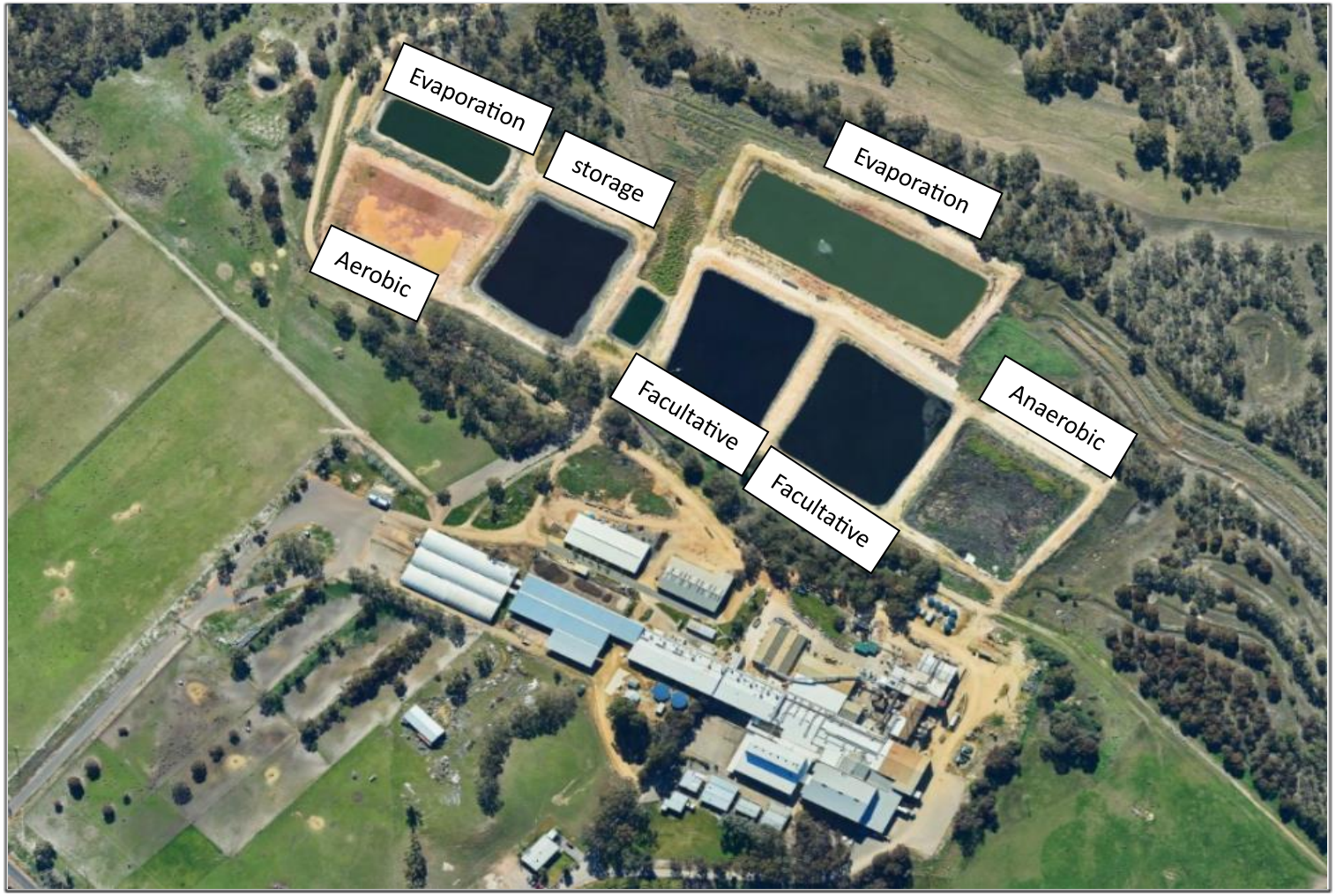
Figure 5: Location of ponds




LEGEND

Figure 5: Location of Ponds

| | |
|---|---|
| TITLE | NIMP |
| PROJECT | Operation expansion |
| CLIENT | WAMMCO |

N

0 50

Metres

SOURCES
Aerial photography extracted from Nearmap online: http://maps.nearmap.com/ (Accessed XXXX)

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# Appendices

# Appendix A

Government of Western Australia
Department of Water and Environmental Regulation

# Licence

| | |
|---|---|
| **Licence number** | L5199/1983/12 |
| **Licence holder** | Western Australian Meat Marketing Co-operative Ltd |
| **Registered business address** | Unit 1/3 De Vlamingh Avenue<br>EAST PERTH WA 6004 |
| **DWER file number** | DER2014/001668 |
| **Duration** | 16/10/2011 to 15/10/2029 |
| **Amendment date** | 31/07/2024 |
| **Premises details** | WAMMCO International – Katanning Abattoir<br>Great Southern Hwy<br>KATANNING WA 6317<br><br>Legal description –<br>Lot 3 on Diagram 42266<br>As shown in the premises map in Schedule 1 |

| Prescribed premises category description (Schedule 1, Environmental Protection Regulations 1987) | Assessed production/design capacity |
|---|---|
| Category 15: Abattoir | 47,000 liveweight tonnes per year |
| Category 16: Rendering operations | 4,900 tonnes per year |
| Category 55: Livestock saleyard or holding pen | 1,200,000 animals per year |

This amendment is granted to the licence holder, subject to the attached conditions, on 31 July 2024, by:

**Daniel Hartnup**
**SNR ENVIRONMENTAL OFFICER, PROCESS INDUSTRIES**
**STATE-WIDE DELIVERY**
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

# Licence history

| Date | Ref number | Summary of changes |
|---|---|---|
| 15/09/2011 | L5199/1983/12 | Licence renewal |
| 21/06/2012 | L5199/1983/12 | Licence Amendment |
| 29/04/2016 | L5199/1983/12 | Notice of Amendment of Licence Expiry Dates – extended Licence expiry date to 15 October 2019 |
| 26/06/2019 | W6230/2019/1 | Upgrade to primary wastewater treatment infrastructure |
| 09/10/2019 | L5199/1983/12 | Licence amendment application to authorise works for the installation and operation of the RO plant and operation of new DAF plant. Includes CEO initiated amendment to extend the licence expiry date to 15 October 2021, and update licence format. |
| 10/06/2021 | L5199/1983/12 | Licence amendment application to authorise disposal of brine and purge wastewater from RO plant to evaporation ponds (Pond 6 and Pond 7). |
| 31/07/2024 | L5199/1983/12 | CEO-initiated amendment to extend the duration by 5 years. |

# Interpretation

In this licence:

(a) the words 'including', 'includes' and 'include' in conditions mean 'including but not limited to', and similar, as appropriate;
(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
(c) where tables are used in a condition, each row in a table constitutes a separate condition;
(d) any reference to an Australian or other standard, guideline or code of practice in this licence:
  (i) if dated, refers to that particular version; and
  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;
(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and
(f) unless specified otherwise, all definitions are in accordance with the EP Act.

**NOTE:** This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

# Licence conditions

The licence holder must ensure the following conditions are complied with:

## Premises operation

### Dust – general requirement

**1.** The licence holder must not allow visible dust to cross the boundary of the premises.

### Stack – dark smoke emissions

**2.** The licence holder must ensure the emission of dark smoke from any chimney stack does not continue for greater than a period of 4 minutes in aggregate in any 1-hour period.

3. The licence holder must ensure the emission of dark smoke from the entire licensed premises does not continue for greater than a period of 20 minutes in aggregate in any 24-hour period.

## Rendering plant – Gas treatment system

4. The licence holder must operate the rendering facility such that the gas emission treatment system is operational whenever the cooker(s) is (are) in use.

5. The licence holder must direct all condensable gases from the cooker(s) to the condensers.

## Waste material

6. The licence holder must:

   (a) ensure all animal waste material is rendered or disposed off-site within 24-hours of the slaughter of the animal or receival of the material;
   (b) ensure all animal waste material disposed off-site is directed to a licensed landfill or rendering facility; and
   (c) notify the CEO in writing prior to disposing of any animal waste material in accordance with condition 6(b) of this licence.

## Wastewater treatment

7. The licence holder must direct all wastewater generated by the abattoir, through a solid trap, rotary screen and fat separation (DAF) equipment prior to discharge to the wastewater treatment ponds.

8. The licence holder must direct all wastewater generated by the rendering facility through a solid trap, rotary screen and fat separation (DAF) equipment prior to discharge to the wastewater treatment ponds.

9. The licence holder must direct all wastewater generated by the lairage run-off and truck washdown through a solid settlement sump prior to discharge to the wastewater treatment ponds.

## Discharge to Pinwernying Creek

10. The licence holder must ensure raw, treated or other contaminated wastewaters are not discharged to the Pinwernying Creek or its tributaries.

## Management of wastewater treatment ponds (except evaporation ponds)

11. The licence holder must manage and operate the wastewater treatment ponds in a manner such that:

   (a) all uncontaminated stormwater is diverted away from the ponds, to minimise the threat of erosion of pond embankments or flooding;
   (b) leakage from, or overtopping of the ponds does not occur;
   (c) trapped overflows are maintained on the discharge from the anaerobic treatment pond to prevent carry over of surface floating matter to the subsequent treatment ponds;
   (d) aerobic and maturation pond surfaces are kept clear of floating matter and algal mats. Vegetation on inner pond embankments of ponds shall not interfere with the integrity of pond walls or adequate water surface aeration, or mask overtopping or other leakage. Vegetation on the anaerobic pond shall not interfere with the integrity of the crust; and
   (e) a crust is maintained on the anaerobic pond(s) to minimise the emission of offensive odours and to enhance the breakdown of unstable organic matter.

## Treated wastewater irrigation

12. The licence holder must dispose of treated wastewaters by irrigation such that:

(a) wastewater is evenly distributed over the irrigation area;
(b) no soil erosion or ponding of wastewaters occurs;
(c) a healthy vegetation cover is maintained over the effluent irrigation areas;
(d) there is no direct runoff, spray drift or discharge beyond the boundaries of the premises; and
(e) irrigation shall not occur onto flooded areas.

**13.** The licence holder must manage the application of wastewater to the irrigation areas to ensure that the following nutrient loading rates are not exceeded:

(a) nitrogen – less than 250 kg/ha/yr; and
(b) phosphorus – less than 60 kg/ha/yr.

## Monitoring

### General monitoring

**14.** The licence holder must ensure that all water samples are collected, preserved and analysed in accordance with AS/NZS 5667.

**15.** The licence holder must submit all water samples to a laboratory with current NATA accreditation for the analyses specified for analysis in accordance with the current "Standard Methods for Examination of Water and Wastewater-APHA-AWWA-WEF".

**16.** The licence holder must maintain a device for measuring monthly cumulative volumes of wastewater discharged from the final outlet of the pond system for irrigation to land.

### Monitoring of emissions to land

**17.** The licence holder must, every three months, collect a representative sample of wastewater discharged to the on-site irrigation area, for the following parameters:

(a) pH;
(b) 5-day biochemical oxygen demand ($BOD_5$);
(c) total suspended solids;
(d) total dissolved solids;
(e) total nitrogen; and
(f) total phosphorus.

### Surface water monitoring

**18.** The licence holder must collect samples of water from Pinwernying Creek ("the creek") of which the premises is part of the headwaters, in accordance with the requirements of Table 1.

**Table 1: Pinwernying Creek water sampling requirements**

| Sampling location | Parameters analysed[1] | Sampling frequency |
|---|---|---|
| A = the point where the creek passing under Trimmer Road enters the licensed premises, as shown in Schedule 1 Premises map. | Total nitrogen, Total phosphorus, Oil and grease | **Monthly** (with the sample to be collected on the same day each month). Samples shall also be collected the day following a heavy rainfall event (that is, where more than 25 mm of rainfall is received over a 24 hour period)<br>Sampling shall commence **1 May each year** or the week of first flow in the creek, whichever occurs first, and conclude 30 September each year or when flow in the creek ceases, whichever occurs last. |
| B = the point where the creek branch that passes through point A leaves the premises, as shown in Schedule 1 Premises map. | | |

*Note 1: All measurements are to be reported in mg/L.*

### Solid waste removal

19. The licence holder must, aside from those materials referred to in condition 20, remove solid waste generated at the premises (including desludging waste) for off-site disposal.

20. The licence holder must only bury animal carcasses and solid animal waste material on the premises.

21. The licence holder must take the following measures when burying waste referred to in condition 20 on the premises:

    (a) dispose of waste in a defined trench at least 50 m from the premises boundary or a watercourse or a water body;
    (b) cover waste with at least 230 mm of cover material at least weekly;
    (c) ensure the base of the trench is at least two metres above the highest known groundwater table; and
    (d) cover waste with a final soil cover of at least one metre.

## Records and reporting

### Annual reporting requirements

22. The licence holder must submit to the CEO by 1 February in each year, a copy of an Annual Environmental Report containing data collected during the period beginning 1 January and ending on 31 December the previous year. The report shall contain, but not be limited to:

    (a) monitoring data or other collected data required by any condition of this licence (data should be provided in tables and in graphical format);
    (b) an explanation of the monitoring data in comparison with past monitoring data collected for previous licences issued under Part V of the Act for the premises;
    (c) the number and type of complaints received including complainants name, address, nature of complaint (where appropriate cross referenced with prevailing wind directions) and action taken;
    (d) any changes to site boundaries, location of groundwater monitoring bores, surface drainage channels and on-site or off-site impacts or pollution;
    (e) the monthly number of animals and tonnages of meat processed; and
    (f) the annual tonnage of material rendered.

23. The licence holder must:

    (a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and
    (b) prepare and submit to the CEO by **1 February** after the end of that annual period an Annual Audit Compliance Report in the approved form.

## Works

### Infrastructure and equipment – Reverse Osmosis Plant

24. The licence holder must construct and/or install the infrastructure listed in Table 2 in accordance with the requirements in that table.

**Table 2: Design and construction requirements**

| Infrastructure | Design specifications | Infrastructure location |
|---|---|---|
| 1 x *Integra* l INT BW30-200 model Reverse Osmosis Plant | 4 sets of housings (pressure vessels rated to pressure of 300psi) each containing 3 spiral wound thin film composite polyamide membranes | Schedule 1: Figure 5 - Map of reverse osmosis plant and associated |

| Infrastructure | Design specifications | Infrastructure location |
|---|---|---|
| Pumps[1] and associated infrastructure | 1 x low pressure stainless steel feed pump (4kW motor) and low pressure PVC piping (treated wastewater in-feed line) | infrastructure |
| | 1 x 36 inch automatic, back washable filter | |
| | Depth filters – 2 housings per train with 5 micron and 1 micron cartridge filters. Suspended solids filter housings with 5 x 40 inch filter elements | |
| | 1 x high pressure stainless steel pump (15kW motor) | |
| Control panel | Control panel including alarm system, on/off auto switch for pumps and LED display for monitored values | |
| Storage tanks | 2 x 50kl feed water tank | |
| | 4 x 50kL permeate tanks | |
| Permeate distribution pipeline | 300 mm diameter PVC pipeline (as shown in Works plan – location of Reverse Osmosis plant and associated infrastructure) | |

*Note 1: Noise emissions from all operating centrifugal pumps is <85 dB.*
*Note 2: Quarterly membrane cleaning cycle products consist of a mixture of citric acid, caustic soda and ethylene diamine tetra acetic acid (EDTA).*

**25.** The licence holder must not depart from the requirements specified in Column 2 of Table 2 in condition 24 except:

(a) where such departure does not increase risks to public health, public amenity or the environment; and
(b) all other conditions in this licence are still satisfied.

**26.** Subject to condition 25, within 30 days of the completion of the works specified in Column 1 of Table 2 in condition 24, the licence holder must provide to the CEO a report from a suitably qualified Engineer, including photographs of specified infrastructure, confirming each item of infrastructure or component of infrastructure specified in Column 1 of Table 2 in condition 24 has been constructed with no material defects and to the requirements specified in Column 2 of Table 2 in condition 24.

**27.** Where a departure from the requirements specified in Column 2 of Table 2 in condition 24 occurs and is of a type allowed by condition 25, the licence holder must provide to the CEO a description of, and explanation for, the departure along with the certification required by condition 25(b).

## Works – record keeping

**28.** The licence holder must maintain accurate books including information, reports and data in relation to the works and the books must:

(a) be legible;
(b) if amended, be amended in such a ways that the original and subsequent amendments remain legible or are capable of retrieval;
(c) be retained for at least 3 years from the date the books were made;
(d) be available to be produced to an inspector or the CEO.

**29.** The licence holder must comply with a department request within 14 days from the date of the department request or such other period as agreed to by the inspector or the CEO.

## Infrastructure and equipment – Evaporation pond liner construction

**30.** The licence holder must construct and/or install the infrastructure listed in Table 3 in accordance with the requirements in that table.

**Table 3: Design and construction requirements**

| Infrastructure | Design specifications | Infrastructure location |
|---|---|---|
| Pond 6 and 7– clay liners | Compacted clay subgrade layer which is constructed in accordance with the requirements specified in Schedule 2 | Schedule 1 – Figure 4: Map of wastewater treatment ponds |

## Works compliance reporting – pond liner

**31.** The licence holder must, within 30 days of each item of critical containment infrastructure specified in condition 30 being constructed:

(a) undertake an audit of their compliance with the requirements of condition 30; and
(b) prepare and submit to the CEO a Critical Containment Infrastructure Report on that compliance.

**32.** The report required by condition 31, must include as a minimum:

(a) certification by a suitably qualified engineer that each of the items of critical containment infrastructure, or components thereof, as specified in condition 30, have been constructed in accordance with the relevant requirements specified in that condition;
(b) as constructed plans and a detailed site plan showing the location and dimensions for each item of infrastructure or component thereof, as specified in condition 30;
(c) photographic evidence of the installation of the infrastructure; and
(d) be signed by a person authorised to represent the licence holder and contains the printed name and position of that person.

## Works operation – RO plant and evaporation ponds

**33.** The licence holder may only commence the discharge of RO Plant brine and purge waste water to Ponds 6 and 7 in accordance with condition 34:

(a) where the CEO has notified the licence holder that the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 31 meets the requirements of that condition; or
(b) where at least 5 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 31 has been submitted to the CEO.

**34.** The licence holder must ensure that the site infrastructure and equipment listed in Table 3 and located at the corresponding location is maintained and operated in accordance with the corresponding operational requirement set out in Table 4.

**Table 4: Infrastructure and equipment requirements**

| Site infrastructure and equipment | Operational requirement | Infrastructure location |
|---|---|---|
| RO Plant – brine and purge waste water | The licence holder must ensure:<br>• all waste water generated as a result of daily flushing and other periodic cleaning of reverse osmosis plant filter membranes is directed to Pond 6 only; and | Schedule 1 – Figure 4: Map of wastewater treatment ponds and Figure 5: Map of reverse osmosis plant |

| Site infrastructure and equipment | Operational requirement | Infrastructure location |
|---|---|---|
| | • waste water from pond 7 is not to be discharged or irrigated to land at any time. | and associated infrastructure |
| Pond 6 and Pond 7 - Evaporation ponds | The licence holder must ensure:<br>• all uncontaminated stormwater is diverted away from the ponds, to minimise the threat of erosion of pond embankments or flooding;<br>• leakage from, or overtopping of the ponds does not occur; and<br>• vegetation on inner pond embankments of ponds shall not interfere with the integrity of pond walls or mask overtopping or other leakage. | Schedule 1 – Figure 4: Map of wastewater treatment ponds |

## Ponds 6 and 7 – clay liner requirements

### Liner material

**35.** The liner material must be homogeneous in nature and properties, with no sandy patches exceeding the liner specification or rocks retained on a 37.5 mm sieve. Any non-conforming liner material must be removed and replaced with conforming soil. Where necessary, soils may be blended or have bentonite clay mixed in to achieve desired uniformity and geo-technical characteristics.

**36.** The liner material properties must not be altered by acidic or alkaline content of the contained waste.

### Liner construction

**37.** Liners must be installed in at least two layers of equal thickness to ensure adequate compaction is achieved and to minimise the risk of leakage. The liner material must be moisture-conditioned to achieve the maximum (in place) design soil density exceeding the 95 per cent maximum dry density (MDD) determined using AS 1289.5.2.1 (2003) and AS 1289 5.4.2 (2007).

**38.** The minimum thickness of the compacted soil liner must be 300 mm and construction tolerances must be within 50 mm.

**39.** The completed liner must uniformly cover both the base and perimeter of Pond 6 and 7 to achieve one integrated holding facility.

**40.** Test cores must be taken from the completed Pond 6 and 7 as follows:

(a) one in the base of each pond, one in each side wall and samples at 30m linear intervals for the length of the one wall that was considered non-compliant;
(b) each soil sample core must have its coefficient of permeability determined via an accredited soil testing laboratory in accordance with AS 1289.6.7.1 (2001). The maximum acceptable core coefficient of permeability is $1x10^{-9}$ m/s when subjected to 1 m pressure head of water; and
(c) core test holes must be filled with cement slurry, bentonite or other suitable sealant.

# Definitions

In this licence, the terms in Table 5 have the meanings defined.

**Table 5: Definitions**

| Term | Definition |
|---|---|
| animal waste material | means blood, bone, fat, offal and condemned carcasses |
| Annual Audit Compliance Report (AACR) | means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website) |
| annual period | means a 12-month period commencing from 1 January until 31 December in that same year |
| APHA-AWWA-WEF | means American Public Health Association (APHA) – American Water Works Association (AWWA) – Water Environment Federation (WEF); |
| AS/NZS | means the most recent version (unless otherwise stated) of the specified Australian and New Zealand Standard as jointly published by Standards Australia International Ltd, Sydney and Standards New Zealand, Wellington |
| AS/NZS 5667 | means the most recent version and the relevant parts of the Australian and New Zealand series of guidance standards on Water Quality Sampling; (see also AS/NZS) |
| AS 3543 | means the Australian Standard AS 3543: *Use of standard Ringelmann and Australian Standard miniature smoke charts* |
| brine | refers to the concentrated salt waste generated as a result of the automatic daily flushing of filter membranes in the reverse osmosis water treatment plant |
| CEO | means Chief Executive Officer.<br>CEO for the purposes of notification means:<br>Director General<br>Department administering the *Environmental Protection Act 1986*<br>Locked Bag 10<br>Joondalup DC WA 6919<br>info@dwer.wa.gov.au |
| condition | means a condition to which this licence is subject under s.62 of the EP Act |
| critical containment infrastructure | means the items of infrastructure listed in condition 30 |
| Critical Containment Infrastructure Report | means a report to satisfy the CEO that works of critical containment infrastructure have been constructed in accordance with condition 30 |
| DAF | means dissolved air flotation and refers to part of the primary wastewater treatment infrastructure used for suspended solids and fats separation and removal |
| dark smoke | refers to smoke classified in accordance with AS 3543 as having a Ringelmann shade 4 or greater |
| dB | means decibel, a unit of measurement of sound level |
| Department | means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act |
| EP Act | means the *Environmental Protection Act 1986* (WA) |
| gas emission treatment system | refers to the wet scrubber and the condenser unit and associated interconnecting transmission pipelines (treating condensable gases) prior to vapour being emitted to air via the condenser unit outlet as shown in the |

| Term | Definition |
|---|---|
| | rendering plant infrastructure plan in Schedule 1 |
| heavy rainfall | means where more than 25 millimetres of rainfall is received over a 24 hour period |
| irrigation area | means the areas designated for disposal of treated wastewater as depicted in the premises map in Schedule 1 |
| licence | means this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within |
| licence holder | refers to the occupier of the premises being the person to whom this licence has been granted, as specified at the front of this licence |
| NATA | National Association of Testing Authorities, Australia |
| permeate | refers to the portion of the reverse osmosis feedwater collected after it has passed through all the RO membranes, otherwise referred to as the product water |
| Pond system 1 | refers to the series of anaerobic (1) and aerobic ponds (3) for the treatment, storage and evaporation of wastewaters generated by the abattoir and rendering operations and transferred to the ponds following primary treatment through a solids trap, screening and fats separation unit, as shown in the wastewater treatment ponds plan in Schedule 1 |
| premises | refers to the premises to which this licence applies, as specified at the front of this licence and as shown on the map in Schedule 1 to this licence |
| psi | means pounds per square inch, a unit of measurement of pressure |
| PVC | means polyvinyl chloride |
| RO | means reverse osmosis |
| solid waste | means waste that:<br>(a) has an angle of repose of greater than 5 degrees; and<br>(b) does not contain, or is not comprised of, any free liquids; and<br>(c) does not contain, or is not comprised of, any liquids that are capable of being released when the waste is transported; and<br>(d) does not become free flowing at or below 60 degrees Celcius or when it is transported; and<br>(e) is generally capable of being moved by a spade at normal temperatures (i.e. is spadable) |
| Suitably qualified civil engineer | a person who:<br>(a) holds a Bachelor of Engineering; and<br>(b) has a minimum of five years of experience in the area of civil engineering |
| treated wastewater/s | refers to wastewater from abattoir and rendering operations that has undergone anaerobic and aerobic treatment prior to reaching the third and final wastewater pond in Pond system 1 |
| works | refers to the installation of a reverse osmosis plant as described in conditions 24 - 27 of this licence |
| WWTS | means wastewater treatment system |
| WQPN 27 | refers to the document Water Quality Protection Note 27, *Liners for containing pollutants, using engineered soils*, Department of Water, August 2013 |

**END OF CONDITIONS**

# Schedule 1: Maps

## Premises map

The boundary of the prescribed premises is shown (red line) in the map below (Figure 1). The yellow lines show the boundaries to authorised irrigation areas.


**Figure 2: Map of Katanning abattoir – key infrastructure**

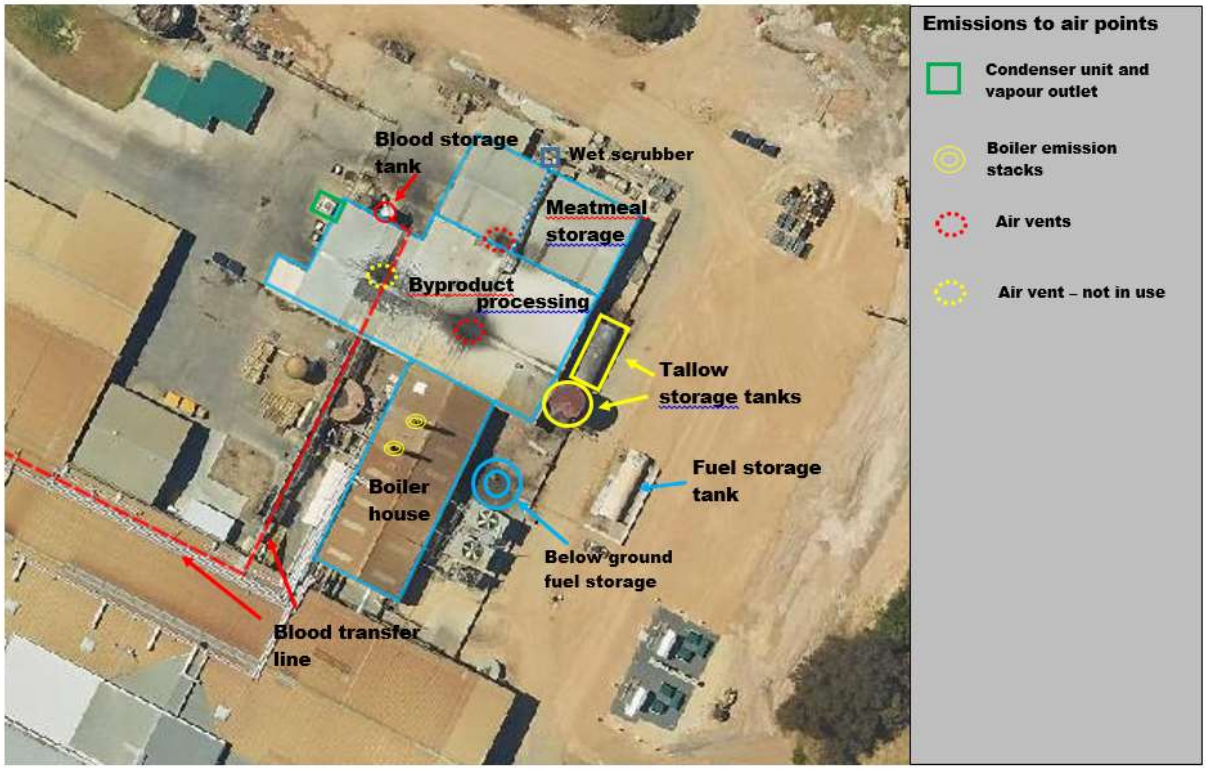


**Figure 3: Map of rendering plant – key infrastructure**


**Figure 4: Map of wastewater treatment ponds – Pond system 1 & Pond system 2**

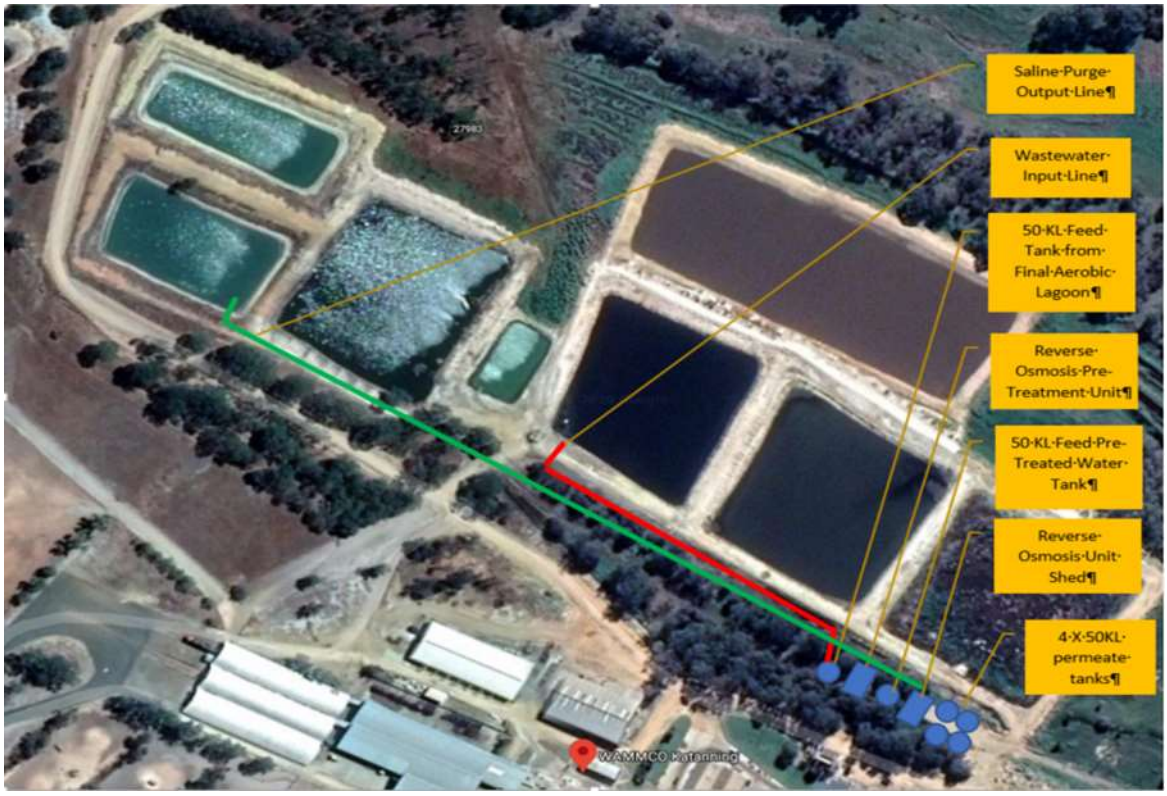


**Figure 5: Map of reverse osmosis plant and associated infrastructure**

# Appendix B

| | | 2024_1087 | 2024_1088 | 2024_1089 | 2024_1090 | 2024_1091 | 2024_1092 | 2024_1093 | 2024_1094 | 2024_1095 | 2024_1096 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 | 4 | 5 | 6 | 7a | 7b | 8 - to confirm | freezer paddock | close to pond (behind) | next to pond (near creek) |
| **Analyte** | **Unit** | | | | | | | | | | |
| | | | | | | | | | | | |
| Electrical Conductivity | mS/cm | 0.087 | 0.07 | 0.056 | 0.076 | 0.045 | 0.062 | 0.091 | 0.057 | 0.05 | 0.071 |
| pH - CaCl2 | - | 5.1 | 5.33 | 5.09 | 5.25 | 5.14 | 5.16 | 5.43 | 4.93 | 4.69 | 4.81 |
| pH - H2O | - | 6.33 | 6.55 | 6.31 | 6.6 | 6.37 | 6.33 | 6.38 | 6.35 | 6.27 | 6.03 |
| Exchangeable Potassium | mg/kg | 189 | 115 | 95.2 | 133 | 78.3 | 154 | 74.5 | 68.6 | 137 | 82 |
| Exchangeable Sodium | mg/kg | 135 | 38 | 4.11 | 65.8 | 17.5 | 31.3 | 76.4 | 5.27 | 52 | 110 |
| Exchangeable Magnesium | mg/kg | 242 | 146 | 189 | 177 | 147 | 217 | 101 | 109 | 84.4 | 100 |
| Exchangeable Calcium | mg/kg | 632 | 346 | 380 | 371 | 371 | 430 | 492 | 331 | 197 | 312 |
| Nitrate-N | mg/kg | 4.7 | 3.8 | 2.7 | 7 | 4.5 | 4.2 | 10.6 | 3.8 | 2.6 | 3.8 |
| Ammonium-N | mg/kg | 10.1 | 11.1 | 8.51 | 10.4 | 6.38 | 10.3 | 18.8 | 8.39 | 9.67 | 7.24 |
| Phosphate-P | mg/kg | 72.2 | 82.3 | 73.2 | 62.1 | 53.5 | 81.2 | 87.1 | 78 | 63.1 | 37.5 |
| Carbon | % | 7.12 | 6.49 | 10.30 | 7.98 | 6.85 | 5.68 | 4.92 | 4.22 | 4.44 | 4.67 |
| Organic Matter | % | 12.10 | 11.00 | 17.50 | 13.60 | 11.60 | 9.66 | 8.37 | 7.18 | 7.55 | 7.94 |
| PRI | | <0.35 | 0.51 | <0.35 | <0.35 | <0.35 | 7.12 | 4.43 | 10.2 | 7.95 | 13 |
| Bulk Density g/cm^3 | | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| Depth (cm) | | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Nitrate-N | kg/ha | 7.755 | 6.27 | 4.455 | 11.55 | 7.425 | 6.93 | 17.49 | 6.27 | 4.29 | 6.27 |
| Ammonium-N | kg/ha | 16.7 | 18.3 | 14.0 | 17.2 | 10.5 | 17.0 | 31.0 | 13.8 | 16.0 | 11.9 |
| Phosphate-P (Colwell P) | kg/ha | 119 | 136 | 121 | 102 | 88.3 | 134 | 144 | 129 | 104 | 61.9 |
| | | | | | | | | | | | |
| Nitrogen (Nitrate + Ammonium) | kg/ha | 24.4 | 24.6 | 18.5 | 28.7 | 18.0 | 23.9 | 48.5 | 20.1 | 20.2 | 18.2 |

| Parameter | 2024_1087 | 2024_1088 | 2024_1089 | 2024_1090 | 2024_1091 | 2024_1092 | 2024_1093 | 2024_1094 | 2024_1095 | 2024_1096 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 6 | 7a | 7b | 8 - to confirm | freezer paddock | close to pond (behind) | next to pond (near creek) |
| Texture | Sand | Sand | Sand | Sand | Sand | Sandy loam | Sandy loam | Sandy loam | Sand | Sand |
| Colour | Light Brown | Light Grey | Light Grey | Light Grey | Light Grey | Light Brown | Light Grey | Light Brown | Light Grey | Light Brown |
| Gravel % | 5 | 4 | 4 | 5 | 5 | 3 | 2 | 4 | 6 | 4 |