



Application for Licence

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number L6755/1996/10

Applicant Pilbara Iron Company (Services) Pty Ltd

ACN 107 210 248

Application number APP-0029611

Internal number INS-0003295

Premises Dampier Wastewater Treatment Plant

Legal description -
Lot 362 on Plan 14280
DAMPIER WA 6713

As defined by the premises map attached to the issued licence

Date of report 4 June 2026

Decision Licence granted

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the operation of the premises. As a result of this assessment, Licence L6755/1996/10 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary and overview of premises

On 10 June 2025, the Pilbara Iron Company (Services) Pty Ltd (the applicant) submitted an application for a renewal of Licence L6755/1996/9 for the Dampier Wastewater Treatment Plant (WWTP), located on Lot 362 on Plan 14280 (the premises) to the department under section 57 of the *Environmental Protection Act 1986* (EP Act).

The premises is located adjacent to the beach, approximately 400 metres west of the Dampier township. The Dampier WWTP services the township of Dampier and has capacity to process up to 900 m³ of sewage per day. The facility comprises Imhoff tanks, trickling bed filters, a humus tank, and a chlorination pit. Sludge extracted from the treatment process is temporarily stored onsite in a HDPE-lined sludge drying bed. Prior to discharge, the treated wastewater undergoes chlorination.

Under the existing licence, treated effluent is authorised for reuse via irrigation at Dampier Oval, Hampton Oval, and within the WWTP grounds. These irrigation areas are currently included within the prescribed premises boundary specified in Licence L6755/1996/9. Any treated wastewater not reused for irrigation is discharged to the marine environment via an ocean outfall.

As part of the department's assessment of the Dampier WWTP, including assessment undertaken during Works Approval W6928/2024/1, the appropriateness of including external recycled water irrigation areas within the prescribed premises boundary was reconsidered. This consideration reflected the extent of land under the applicant's direct control and contemporary guidance regarding the definition of prescribed premises. Accordingly, the scope of this licence renewal includes amendment of the prescribed premises boundary to align with these considerations.

As part of the department's assessment of the licence renewal, consideration will also be given to the outcomes of a Waste Assurance Part V Audit undertaken at the premises on 21 August 2025.

The premises relates to the category and assessed design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in licence L6755/1996/10. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in licence L6755/1996/10.

2.3 Works Approval W6928/2024/1

A works approval was granted on 29 July 2024 for the construction and time limited operation of a second 300 kL treated wastewater storage tank at the premises. The works approval assessment also considered the expansion of the recycled water reuse scheme to incorporate additional irrigation areas at Hardey Reserve, Fitzroy Park and the Esplanade (Figure 1).

The works approval included a change to limit the prescribed premises boundary to the extent of the WWTP cadastral lot, excluding the irrigation areas. The area under the applicant's control is limited to Lot 362 on Deposited Plan 14280. The irrigation areas comprising the ovals and parks within the Dampier townsite are under the management of the City of Karratha and not under the control of the applicant.

On 2 October 2025, Pilbara Iron Company (Services) Pty Ltd submitted an Environmental Compliance Report (ECR) in accordance with Condition 2 of Works Approval W6928/2024/1 for the second 300 kL treated wastewater storage tank. On 5 February 2026, the department determined that the ECR satisfied the requirements of Condition 1 of the works approval.

The premises is currently operating under time-limited operations (TLO), which commenced on 2 October 2025. On 4 March 2026, an amendment to the works approval was granted to extend the approved TLO period to align with the renewal date of Licence L6755/1996/9, allowing incorporation of the approved infrastructure into the renewed licence.

Accordingly, the changes authorised under Works Approval W6928/2024/1 have been included in this licence renewal.

2.4 Department of Health approval

On 14 July 2022, the Department of Health (DoH) issued Recycled Water Scheme Approval D48/0000, authorising the inclusion of additional irrigation sites at Hardey Reserve, Fitzroy Park, and The Esplanade. A complete list of recycled water reuse locations is provided below:

- WWTP lawns – Part of Crown Lease L3116/3468 and Lot 362 on Plan 14280
- Dampier Oval – Lot 247 on Plan 217466 The Esplanade
- Hampton Oval – Lot 166 on Plan 215598 The Esplanade
- Hardey Reserve – Lot 402 on Plan 17819 held under Reserve 48600
- Fitzroy Park – Drain Reserve 42159
- Shark Cage Beach Foreshore – Part of Crown Lease N104743 and Lot 23 on Plan 14280
- The Esplanade – Part of Crown Lease N104743

The DOH Recycled Water Scheme Approval sets limits for the quality of recycled water used in the irrigation scheme. These limits have previously been incorporated as conditions in the existing licence and are outlined in Table 1.

Table 1: Department of Health recycled water limits

Parameter	Compliance value	Monitoring frequency
<i>E.coli</i>	< 1000 cfu or MPN/100 mL	Monthly
Suspended solids	< 30 mg/L	Monthly
pH	6.5 – 8.5	Daily or continuous online
Disinfection (chlorine)	0.2 – 2.0 mg/L	Daily or continuous online



Figure 1: Recycled water reuse locations

2.5 Part IV of the EP Act

Ocean outfalls are typically considered for assessment under Part IV of the Environmental Protection Act 1986 (EP Act). As this is a long-standing licensed facility and records confirming whether the existing ocean outfall was previously assessed under Part IV could not be identified, the department considered whether the licence renewal would require referral to the Environmental Protection Authority (EPA) for assessment.

The licence renewal does not propose any changes to the existing ocean outfall, including its location, discharge characteristics, or treatment capacity. Based on the available information, the department considers that the existing outfall is unlikely to result in a significant environmental impact that would warrant referral to the EPA for assessment under Part IV of the EP Act.

The department also notes that there is no Ministerial Statement for the premises and that discharges from the ocean outfall can be appropriately regulated under Part V of the EP Act through licence conditions, including discharge limits and monitoring requirements. Accordingly, referral under Part IV of the EP Act is not required as part of this licence renewal.

2.6 Consolidation of Licence

As part of this renewal the department has consolidated the licence by incorporating changes made under the Amendment Notices as summarised in Table 2.

Table 2: Licences consolidated in this amendment

Instrument	Issued	Summary of approval
L6755/1996/9	16/05/2022	Notice of Amendment of Licence Reporting Requirements Section 59(2), Section 59(1)(a) and 59(1)(b) <i>Environmental Protection Act 1986</i> Licensed Prescribed Premises.

In consolidating the licence, the CEO has:

- updated the format and appearance of the licence;
- deleted the redundant AACR form set out in Attachment 2 of the previous licence and advises the licence holder to obtain the form from the department's website;
- revised licence condition numbers, and removed any redundant conditions and realigned condition numbers for numerical consistency; and
- corrected clerical mistakes and unintentional errors.

The full consolidation of licence conditions as they relate to this revised licence are detailed in Section 5.1. Previously issued Amendment Notices will remain on the department's website for future reference and will act as a record of the department's decision making.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020).

To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this decision report are detailed in Table 3 below. Table 3 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 3: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Noise	Operation of WWTP, sludge removal and sludge drying	Air/windborne pathway	<ul style="list-style-type: none"> Nil proposed.
Odour			<ul style="list-style-type: none"> A complaints register is maintained to record and manage any odour complaints received. Wastewater treatment and sludge handling infrastructure is routinely inspected and maintained to minimise the potential for odour generation. No significant odour impacts have been observed during routine operation of the WWTP to date.
Discharge of contaminated / potentially contaminated stormwater, wastewater, or sludge leaks and spills.	Wastewater and sludge handling activities, including operation of the sludge drying bed	Overland flow or seepage through soil with potential migration toward groundwater and the marine environment	<ul style="list-style-type: none"> Sludge drying beds are constructed with an HDPE liner to prevent seepage to underlying soils. Leachate generated from the sludge drying process is captured and managed, preventing uncontrolled release to the environment. Captured leachate and removed sludge are transported to an appropriately licensed facility for further treatment or disposal.
Treated wastewater containing contaminants (e.g. nutrients, heavy metals) Low quality treated wastewater containing contaminants (e.g. nutrients, heavy metals)	Discharge of treated wastewater to irrigation areas	Infiltration through soil with potential migration to groundwater and the marine environment	<ul style="list-style-type: none"> Wastewater is processed through Imhoff tanks, trickling filters and chlorination prior to irrigation. A monitoring program is implemented to verify final treated effluent quality. Nutrient concentration and loading limits are specified in the licence to manage contaminant inputs to land.

Emission	Sources	Potential pathways	Proposed controls
Treated wastewater containing pathogens at concentrations not fit for purpose	Discharge of treated wastewater to irrigation areas	Direct contact with pooling water or ingestion of irrigation mist	<ul style="list-style-type: none"> Treated wastewater is disinfected prior to irrigation through chlorination. Irrigation is restricted to overnight hours (1.00 am to 4.00 am) when public access to open spaces is unlikely, minimising potential exposure.
Chemical spill (chlorine)	Storage and handling of chlorine associated with wastewater disinfection	Seepage through soil with potential migration toward groundwater and the marine environment	<ul style="list-style-type: none"> Chlorine storage and handling areas are contained within AS 3780–compliant bunded areas to prevent uncontrolled releases. Stormwater from chemical storage and handling areas is captured and diverted to the WWTP system, preventing off-site discharge in the event of a spill. Chemical storage and handling infrastructure is managed in accordance with relevant standards to minimise the risk of leaks or spills.
<p>Treated wastewater containing contaminants (e.g. nutrients, pathogens, heavy metals)</p> <p>Low quality treated wastewater containing contaminants (e.g. nutrients, pathogens, heavy)</p>	Discharge of treated wastewater to ocean outfall	Direct discharge via outfall to the marine environment causing ecosystem disturbance	<ul style="list-style-type: none"> Wastewater is processed through Imhoff tanks, trickling filters and chlorination prior to irrigation. A monitoring program is implemented to verify final treated effluent quality. Nutrient concentration and loading limits are specified in the licence to manage contaminant inputs to the marine environment. Treated wastewater is primarily irrigated and only surplus is discharged to the marine environment via ocean outfall.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the applicant’s employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 4 and Figure 2 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)).

Table 4: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from activity / prescribed premises
Residential Premises	Residential strata unit development is located 280 m east of the WWTP Residential house 415 m east of the WWTP Residential house 550 m south-east of the WWTP
Mermaid Hotel	Located 150 m east of the premises boundary
Commercial premises (restaurants)	Closest are appx. 200 m and 400 m south of WWTP
Commercial premises Dampier Village Shopping Centre	Appx. 300 m east of WWTP
Early learning centre	Appx. 380 m east of WWTP
Dampier Catholic Church	Appx. 520 m south-east of WWTP
Dampier Primary School	Appx. 350 m south-east of the premises boundary
Users of public open spaces irrigated with treated wastewater	Located within public open space areas authorised for irrigation under the recycled water reuse scheme
Environmental receptors	Distance from activity / prescribed premises
Marine environment Indian Ocean	The beach is located immediately adjacent to the premises to the north. The ovals and irrigation areas are located adjacent to and along the beach front. Premises discharges directly into the ocean
Underlying groundwater (non-potable uses)	The premises is located within the Pilbara Groundwater and Pilbara Surface Water Areas under the <i>Rights in Water and Irrigation Act 1914</i> . The Dampier region is underlain by shallow crystalline bedrock with minimal natural porosity that does not support persistent groundwater. However, within the premises a thin layer of marine sand overlies the bedrock and may potentially support a very limited, seasonally variable freshwater lens. Groundwater movement is towards the Indian Ocean and groundwater is generally saline with limited extractive use.

Murujuga National Park DBCA Legislated Lands	Located approximately 3.3 km east of the premises boundary.
Threatened and Priority Fauna	Two vulnerable bird species, 11 specially protected migratory bird species, one Priority 4 bird species and two Priority 4 mammal species have been identified in the local vicinity of the premises boundary.
Cultural receptors	Distance from activity / prescribed premises
Aboriginal heritage sites	Aboriginal site DP 285 (ID 20367) public boundary is approximately 220 m east of the prescribed premises boundary and Realignment Site 1 (ID 22121) public boundary is approximately 500 m south of the prescribed premises boundary.

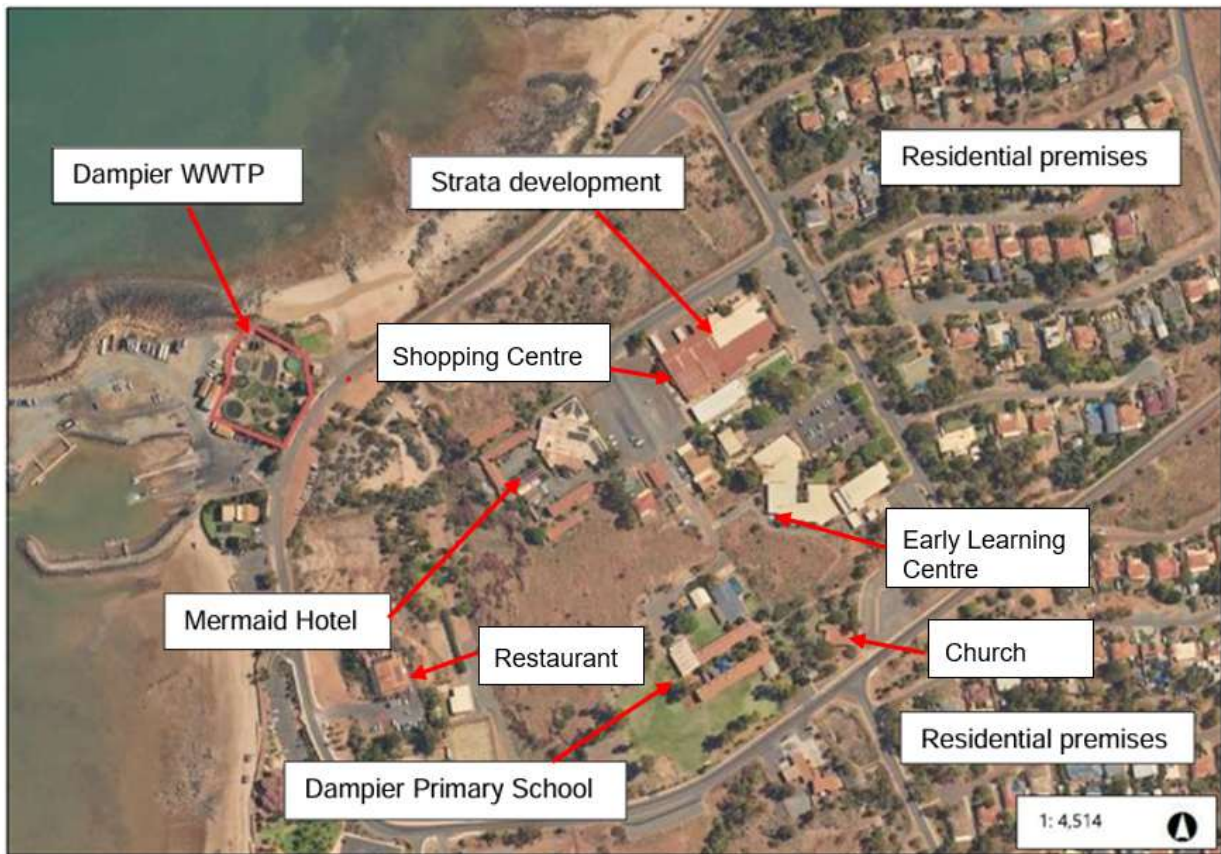


Figure 2: Distance to sensitive receptors

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

Licence L6755/1999/10 that accompanies this decision report authorises emissions associated with the operation of the premises.

The conditions in the issued licence, as outlined in Table 5 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 5: Risk assessment of potential emissions and discharges from the premises during operation

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls/delegated officer comments
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Operation of WWTP, sludge removal and sludge drying	Noise	Pathway: Air/windborne pathway Impact: Health and amenity	Human receptors listed in Table 3	Refer to Section 3.1	C = Minor L = Rare Low Risk	Y	Condition 10	Adequately managed by the <i>Environmental Protection (Noise) Regulations 1997</i> Any noise complaints are also required to be reported in accordance with the department's standard complaints record and reporting condition.
	Odour			Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Conditions 1, 9, 13	Previous environmental reports for the premises indicate that odour complaints are not typically received, and no unreasonable odours were observed during a DWER inspection conducted on 21 August 2025. Accordingly, the Delegated Officer considers that licence conditions requiring the recording and reporting of complaints provide an adequate level of regulatory oversight. The requirement to prevent unreasonable odour emissions is established under Part V, Section 49 of the <i>Environmental Protection Act 1986</i> , which makes it an offence to emit or cause emissions, including odour, that unreasonably interfere with the health, welfare, convenience, comfort or amenity of any person. In the absence of demonstrated impacts, and given the effectiveness of existing legislative controls, no additional licence conditions are considered necessary to manage this risk.

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls/delegated officer comments
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Leaks or spills of wastewater or sludge during operation	Discharge of contaminated/potentially contaminated stormwater, wastewater, or sludge into the environment	Pathway: Overland flow or seepage through soil with potential migration towards groundwater and the marine environment Impact: potential degradation of groundwater quality and potential impacts to marine flora and fauna	Beneficial uses of groundwater Indian Ocean/Marine environment	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	N	Condition 1	The sludge drying bed is used for the temporary storage and dewatering of wastewater sludge. The delegated officer considers that maintaining the integrity of the sludge drying bed liner is necessary to prevent the release of sewage, treated wastewater or associated leachate to soil and surrounding environments. Accordingly, licence conditions have been included requiring maintenance of the liner's impermeability.
Irrigation of treated wastewater to the WWTP grounds and public open space	Treated wastewater containing contaminants (e.g. nutrients, heavy metals) Low quality treated wastewater containing contaminants (e.g. nutrients, heavy metals)	Pathway: Infiltration through soil with potential migration towards groundwater and the marine environment Impact: potential degradation of groundwater quality and potential impacts to marine flora and fauna	Beneficial uses of groundwater Indian Ocean/Marine environment	Refer to Section 3.1	Refer to detailed risk assessment for irrigation of treated wastewater in Section 3.4			
Irrigation of treated wastewater to the WWTP grounds and public open space	Treated wastewater containing pathogens at concentrations not fit for purpose	Pathway: Direct contact with pooling water or ingestion of irrigation mist Impact: impacts to health of recreational users of public open spaces	Recreational users of public open space	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Conditions 6, 8	Regulated under DoH Recycled Water Scheme Approval

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls/delegated officer comments
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Storage and handling of chlorine associated with wastewater disinfection	Chemical spill (chlorine)	<p>Pathway: Infiltration through soil with potential migration towards groundwater and the marine environment</p> <p>Impact: potential degradation of groundwater quality and potential impacts to marine flora and fauna</p>	Beneficial uses of groundwater Indian Ocean/Marine environment	Refer to Section 3.1	C = Minor L = Rare Low Risk	Y	Condition 1	A compliance inspection undertaken on 21 August 2025 confirmed that chlorine associated with wastewater disinfection is stored within a sealed sea container and bunded area. Existing licence conditions require environmentally hazardous chemicals, including hypochlorite, to be stored within bunded areas in accordance with Australian Standard 3780, and any stormwater accumulating within the bunded area to be directed to the wastewater treatment system. The delegated officer considers that these existing conditions provide adequate control to manage the risk of chlorine spills, and no additional controls are required.
Discharge of treated wastewater via the ocean outfall	<p>Treated wastewater containing contaminants (e.g. nutrients, pathogens, heavy metals)</p> <p>Low quality treated wastewater containing contaminants (e.g. nutrients, pathogens, heavy metals)</p>	<p>Pathway: Direct discharge to the marine environment via the ocean outfall</p> <p>Impact: Localised ecosystem disturbance and potential impacts to marine flora and fauna</p>	Indian Ocean/Marine Environment	Refer to Section 3.1	Refer to detailed risk assessment for discharge via ocean outfall in Section 3.3			

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk Assessments* (DWER 2020).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

3.3 Detailed risk assessment for discharge via ocean outfall

3.3.1 Hazard characterisation and potential impacts

Treated wastewater discharged via the ocean outfall may contain residual contaminants typical of secondary treated and chlorinated domestic effluent, including nutrients, metals, dissolved organic carbon and microbial indicators. The licence holder has undertaken effluent characterisation and whole effluent toxicity (WET) testing and provided the results in support of the licence renewal.

Available effluent characterisation data indicate that several contaminants are present at concentrations exceeding relevant Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) Default Guideline Values for the protection of marine aquatic ecosystems. Exceedances were identified for a range of parameters, including metals known to be bioaccumulative toxicants. These contaminants should not exceed the applicable 80% species protection guideline values at any time. The identified exceedances indicate that the existing wastewater treatment plant is not capable of consistently achieving discharge quality aligned with contemporary environmental standards.

For some metals, including arsenic and chromium, speciation analysis was not undertaken. This limits the ability to compare monitoring results with applicable guideline values and increases uncertainty in the assessment of bioavailability and ecological risk.

Whole effluent toxicity testing has been undertaken. However, the results have not been adequately interpreted in accordance with current guidance. In the absence of appropriate evaluation, the information provided is insufficient to demonstrate that the discharge does not pose a risk to the marine environment.

Residual microbial contamination may also be present in treated wastewater despite disinfection. Enterococci are considered an appropriate faecal indicator for marine environments due to their persistence in saline conditions.

Treated wastewater is discharged via a dedicated offshore pipeline to marine waters managed for a high level of ecological protection. Exceedances of relevant guideline values indicate an increased risk to the receiving marine environment.

3.3.2 Criteria for assessment

The following criteria were considered in assessing potential impacts to the marine environment from discharge of treated wastewater via the ocean outfall:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018)
- *Technical Guidance for Protecting Western Australia's Marine Environment*
- Draft Australian Recreational Water Quality Guidelines (January 2026)

3.3.3 Applicant controls

Controls to manage risks associated with discharge of treated wastewater to the marine environment include wastewater treatment and disinfection processes, preferential reuse of treated effluent for irrigation, monitoring of treated wastewater quality, and compliance with licence conditions. These controls are summarised in Section 3.1.1, Table 3.

3.3.4 Key findings

The Delegated Officer considers:

1. Effluent characterisation data indicate that treated wastewater discharged via the ocean outfall contains contaminants at concentrations exceeding relevant Australian and New Zealand Guidelines for Fresh and Marine Water Quality Default Guideline Values, including for bioaccumulative metals such as copper and zinc.
2. The existing wastewater treatment plant is not capable of consistently achieving discharge quality that aligns with contemporary guideline values for protection of the marine environment.
3. Whole effluent toxicity testing has been undertaken. However, insufficient interpretation of the results means the information provided does not demonstrate that the discharge poses no risk to the marine environment.
4. In the absence of treatment plant upgrades and strengthened discharge controls, continued discharge of treated wastewater via the ocean outfall represents an elevated environmental risk compared with discharge quality that meets applicable guideline values.
5. Improvements to wastewater treatment processes are likely to be required to reduce contaminant concentrations in treated effluent and support the introduction of enforceable marine discharge criteria aligned with current guidelines.

3.3.5 Consequence

Effluent characterisation has identified contaminant concentrations, including bioaccumulative metals such as copper and zinc, that exceed applicable Australian and New Zealand marine water quality guideline values. The discharge occurs to a receiving environment managed for a high level of ecological protection, where compliance with guideline values is required to maintain environmental values.

Uncertainty remains regarding the magnitude and persistence of potential impacts due to limited metal speciation data and the absence of adequate interpretation of whole effluent toxicity testing, such that bioavailability, cumulative, and mixture effects cannot be reliably excluded.

In light of the sensitivity of the receiving environment, the exceedances of Australian and New Zealand marine water quality guideline values, and the identified uncertainties, a conservative consequence rating of **major** has been applied.

3.3.6 Likelihood of risk event

The likelihood of adverse effects to the marine environment arising from discharge of treated wastewater via the ocean outfall is assessed as **possible**, given the identification of contaminant concentrations exceeding applicable guideline values and the limitations of the existing wastewater treatment plant. Uncertainties associated with incomplete metal speciation and the lack of adequate interpretation of whole effluent toxicity testing results indicate that the probability of environmental harm cannot be discounted under current operating conditions.

3.3.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix and determined that the overall risk associated with discharge of treated wastewater to the marine environment is **high**.

3.3.8 Evaluation of risk acceptability and regulatory response

The risk assessment identifies that discharge of treated wastewater to the marine environment represents a high environmental risk, driven by exceedances of applicable Australian and New Zealand marine water quality guideline values, limitations of the existing wastewater treatment plant, and uncertainty with effluent characterisation and whole effluent toxicity assessment.

Consistent with the *Guideline: Risk Assessments*, a high-risk outcome requires strong and proactive regulatory controls to manage and reduce risk and address identified uncertainties. Accordingly, the licence includes conditions requiring the licence holder to prepare and submit a Wastewater Treatment Upgrade Strategy within 12 months of licence issue. This strategy is to provide a systematic assessment of existing treatment performance and limitations, identify and evaluate feasible treatment upgrade options, and outline an implementation program to improve treated wastewater quality.

In addition, strengthened monitoring and management controls are imposed to improve understanding and management of marine discharge risks during the interim period. These controls include requirements for whole effluent toxicity testing in accordance with current guidance, inclusion of appropriate microbial indicators, increased metals monitoring frequency, inclusion of dissolved organic carbon as a monitoring parameter, and improved sampling protocols to ensure monitoring data are representative of discharge conditions.

Over the longer term, implementation of wastewater treatment upgrades is expected to reduce contaminant concentrations in treated effluent and support alignment with contemporary guideline values for protection of the marine environment. Following implementation of these upgrades and review of improved monitoring data, Default Guideline Values in accordance with the latest *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* may be incorporated as enforceable discharge criteria for the ocean outfall. This staged regulatory approach supports continued operation of the premises while ensuring that identified risks are progressively reduced and marine environmental values are protected.

3.4 Detailed risk assessment for irrigation of treated wastewater

3.4.1 Hazard characterisation and potential impacts

The irrigation of treated wastewater to land is undertaken in accordance with the recycled water reuse scheme at the Dampier Wastewater Treatment Plant (WWTP). Irrigation areas include Dampier Oval, Hampton Oval, areas within the WWTP grounds, and authorised public open space and park areas within the Dampier townsite.

This assessment is informed by licence-required monitoring and annual reporting data provided by the licence holder, including contaminant loading calculations for land-based irrigation and ocean discharge, and treated wastewater quality monitoring data for the period 1 January 2024 to 30 June 2025.

Treated wastewater applied via irrigation comprises secondary treated and chlorinated domestic effluent containing residual nutrients, particularly total nitrogen and total phosphorus, at concentrations elevated relative to natural background levels in soils and groundwater. Trace concentrations of other contaminants and residual pathogens may also be present at levels typical of secondary treated and disinfected wastewater.

Although the design capacity of the Dampier WWTP is up to 900 m³ per day, the average volume of wastewater treated is approximately 193 m³ per day, with a portion applied to land through irrigation. Nutrient loading associated with irrigation of treated wastewater has the potential to exceed plant uptake capacity, resulting in accumulation of nutrients in soils over time. Where nutrient application exceeds plant uptake, nitrogen and phosphorus may leach below the root zone and migrate to underlying groundwater, with the potential for longer-term transport to the marine environment via groundwater discharge pathways.

Residual microbial contamination may be present despite chlorination. Potential exposure of the public and fauna may occur within irrigated public open space areas. However, risks are mitigated through wastewater disinfection, irrigation management practices, and controls applied under the recycled water reuse scheme.

3.4.2 Effluent characterisation and nutrient loading assessment

Nitrogen and phosphorus loading rates associated with irrigation of treated wastewater were assessed using Dampier Oval as a representative irrigation area, on the basis that nutrient application rates across other public open space irrigation areas within the recycled water reuse scheme are expected to be similar.

As a first-order assessment of nitrogen uptake capacity, the land area required for turf to assimilate applied nitrogen can be estimated using the following relationship (NSW EPA, 1998):

$$AN = (C \times Q) / LN$$

where:

- AN is the land area required for nitrogen uptake (m²);
- C is the concentration of nitrogen in treated wastewater (mg/L);
- Q is the daily irrigation volume (L/day); and
- LN is the average nitrogen uptake rate for turf (approximately 25 mg/m²/day).

Based on monitoring data, the average total nitrogen concentration in treated wastewater applied to Dampier Oval is approximately 22 mg/L, with an average irrigation volume of approximately 83 m³ per day (83,000 L/day). Using these values, the estimated land area required for turf to assimilate the applied nitrogen is approximately 73,000 m², compared with an estimated irrigated area of approximately 29,560 m².

This assessment applies conservative assumptions regarding turf nitrogen uptake and does not account for nitrogen losses through ammonia volatilisation or denitrification processes within soils. Notwithstanding these processes, it is considered likely that a proportion of applied nitrogen migrates below the root zone and leaches to underlying groundwater over time. A similar outcome is expected beneath other public open space areas included within the recycled water reuse scheme, noting that the level of wastewater treatment will remain unchanged.

Phosphorus loading was also assessed. Unlike nitrogen, phosphorus applied via wastewater irrigation is predominantly adsorbed by soil minerals and released slowly for plant uptake. This process limits short-term phosphorus mobility but results in a progressive accumulation of phosphorus in soils. Over time, sorption sites become saturated, allowing phosphorus to migrate deeper into the soil profile. Accordingly, wastewater irrigation schemes have a finite operational life governed by soil phosphorus retention capacity.

Available uptake data for turf indicate that phosphorus application rates at Dampier Oval may exceed plant uptake requirements, with similar outcomes likely across other irrigation areas.

3.4.3 Criteria for assessment

The following criteria were considered in assessing potential impacts to soils, groundwater, and the marine environment:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999*
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000)*
- *Department of Health (WA) 2011 – Non-potable Groundwater Use Guidelines*

3.4.4 Applicant controls

Controls to manage risks associated with treated wastewater irrigation include wastewater treatment and disinfection processes, irrigation management practices, monitoring of treated wastewater quality, and compliance with licence conditions specifying nutrient loading limits, monitoring, and reporting requirements. These controls are summarised in Section 3.1.1, Table 3.

3.4.5 Key findings

The Delegated Officer considers:

1. Nutrient loading from treated wastewater irrigation is likely to exceed plant uptake requirements across the recycled water reuse scheme, resulting in nutrient accumulation within soils.
2. Leaching of nutrients, particularly nitrogen, to underlying groundwater is considered likely to occur over time. However, the groundwater is generally saline and of limited beneficial use, which reduces the sensitivity of this receptor.
3. Nutrient migration to the marine environment via groundwater pathways is expected to occur over longer timeframes and be subject to attenuation processes when compared with direct ocean discharge.
4. In the local context, continued land application of treated wastewater, under controlled irrigation conditions, is expected to present a lower overall environmental risk than increased discharge of treated wastewater to the marine environment via the ocean outfall, which has been assessed as the higher-risk pathway in Section 3.3.
5. Existing nutrient loading limits are considered appropriate for the current licence renewal period, having regard to the assessed risks, receptor sensitivity, and available management options.
6. Progressive accumulation of phosphorus in soils represents a long-term constraint on the sustainability of the irrigation scheme, and reductions in nutrient loading are likely to be required over time.
7. Achieving long-term reductions in nutrient loading is expected to require improvements to wastewater treatment processes to reduce nutrient concentrations in treated effluent.

3.4.6 Consequence

The consequence of nutrient leaching to groundwater and subsequent indirect discharge to the marine environment is assessed as **moderate**, taking into account groundwater quality, receptor sensitivity, indirect transport pathways, transport times, and natural attenuation processes.

3.4.7 Likelihood of Risk Event

The likelihood of nutrient migration below the root zone and into groundwater beneath irrigated areas, with potential subsequent transport to the marine environment, is assessed as **possible**, given nutrient application rates relative to plant uptake capacity, the current level of wastewater treatment, and the influence of soil attenuation processes.

3.4.8 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix and determined that the overall risk associated with the irrigation of

treated wastewater is **medium**.

3.4.9 Evaluation of risk acceptability and regulatory response

The risk assessment identifies that nutrient loading from irrigation of treated wastewater is likely to exceed plant uptake requirements and may result in nutrient leaching to groundwater over time. However, the underlying groundwater is saline with limited beneficial use, and nutrient transport to the marine environment via groundwater is expected to occur over extended timeframes with opportunities for natural attenuation.

Reducing irrigation volumes to limit nutrient loading would require a corresponding increase in treated wastewater discharge to the marine environment via the ocean outfall. In the local context, increased marine discharge via the ocean outfall is considered to pose a greater environmental risk than continued land application under controlled irrigation conditions.

On this basis, the identified risk is considered acceptable for the current licence renewal period, subject to compliance with existing nutrient loading limits and monitoring requirements. No changes to nutrient loading limits are proposed at this time.

Notwithstanding the above, the assessment identifies longer-term sustainability constraints associated with continued irrigation at current nutrient concentrations. Over time, reductions in nutrient loading will be required to limit soil nutrient accumulation and extend the operational life of the recycled water reuse scheme. Achieving such reductions is expected to require progressive upgrades to the wastewater treatment process to lower nutrient concentrations in treated effluent, likely implemented over several years.

Accordingly, the licence includes a specified action requiring the preparation of a Wastewater Treatment Upgrade Strategy. This strategy will inform future consideration of amendments to licence conditions relating to treated wastewater quality and nutrient loading, ensuring that risks to soils, groundwater, and the receiving environment are progressively reduced over time.

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 4 September 2025	None received	N/A

Consultation method	Comments received	Department response
<p>Local Government Authority advised of proposal on 4 September 2025</p>	<p>The City of Karratha replied on 24 September 2025 noting that the current prescribed premises boundary is significantly larger than required for WWTP operations and includes public areas such as the foreshore and boat ramp. The City supports the recent amendment proposed through Works Approval W6928/2024/1 to restrict the premises boundary to the WWTP cadastral lot (Lot 362 on DP 14280) only, excluding irrigation areas and the ocean outfall. This amendment is supported as it more accurately reflects the operational footprint and avoids unnecessary inclusion of public land.</p>	<p>The City of Karratha's comments have been noted. As outlined in the application summary and assessment undertaken as part of this licence renewal, the department has reconsidered the appropriateness of the prescribed premises boundary, including through assessment completed under Works Approval W6928/2024/1. Consistent with that assessment, the licence boundary will be amended as part of this renewal to restrict the prescribed premises to the Dampier WWTP cadastral lot (Lot 362 on DP 14280) only. This amendment excludes external recycled water irrigation areas and public land and ensures the prescribed premises boundary accurately reflects the operational footprint and land under the applicant's direct control.</p>
<p>Department of Health (DoH) advised of proposal on 4 September 2025</p>	<p>No comments received.</p>	<p>N/A</p>
<p>Department of Planning, Lands and Heritage (DPLH), Aboriginal Heritage, advised of proposal on 4 September 2025</p>	<p>DPLH responded on 25 September 2025 advising that they had reviewed the application and confirmed the lease renewal area intersects the public boundary but does not intersect the actual boundaries of Aboriginal sites DP 285 (ID 20367) or Realignment Site 1 (ID 22121), noting several lodged places nearby. No objection is raised to the lease renewal. Land users are reminded that all Aboriginal sites, whether identified or not, are protected under the Aboriginal Heritage Act 1972, and any new heritage information must be reported to the Registrar. Engagement with the Ngarluma Aboriginal Corporation is recommended for matters relating to Traditional Owners.</p>	<p>The Department of Planning, Lands and Heritage's advice has been noted. As part of this licence renewal, the prescribed premises boundary has been amended in accordance with Works Approval W6928/2024/1 and is now restricted to the Dampier WWTP cadastral lot (Lot 362 on DP 14280). This amendment ensures the licensed area accurately reflects the operational footprint and land under the licence holder's control and avoids unnecessary inclusion of surrounding land.</p> <p>The licence holder is reminded of their ongoing obligations under the Aboriginal Heritage Act 1972. Aboriginal heritage places are protected whether identified or not, and any new information relating to Aboriginal heritage that arises must be reported to the Registrar in accordance with legislative requirements.</p> <p>The department notes that the amended prescribed premises boundary does not intersect the recorded boundaries of Aboriginal sites DP 285 (ID 20367) or Realignment Site 1 (ID 22121).</p>

Consultation method	Comments received	Department response
Applicant was provided with draft documents on 8 May 2026	Refer to Appendix 1	Refer to Appendix 1

5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that the application to renew licence L6755/1999/10 will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

The licence has been issued for a duration of five years. This duration reflects the assessed environmental risks associated with treated wastewater quality, particularly in relation to discharge via the ocean outfall, and the identified limitations of the existing wastewater treatment plant in consistently achieving contaminant concentrations aligned with contemporary guideline values.

The five-year licence term provides a proportionate regulatory response that enables continued operation while ensuring timely regulatory review following completion and implementation of the required Wastewater Treatment Upgrade Strategy and improved effluent characterisation. The licence duration allows the department to reassess environmental performance, residual risks, and the appropriateness of future discharge controls once identified treatment and monitoring improvements have been progressed.

5.1 Summary of amendments

Table 7 provides a summary of amendments to the licence and will act as record of implemented changes. All changes have been incorporated into the renewed licence as part of the renewal process.

Table 7: Consolidation of licence conditions and amendments

Existing condition	Condition summary	Revised licence condition	Conversion notes
N/A	Addition of Licence History table	N/A	Revised to current licensing format
N/A	Preamble	N/A - deleted	Revised to current licensing format with addition of an Interpretation section.
N/A	Definitions	Moved to Table 7 at the end of the licence.	Revised to current licensing format. Updated to remove redundant definitions and include new definitions.
1	Annual Environmental Report	13	Revised to current licensing format and to incorporate the Amendment Notice listed in Table 2.
2	Annual Audit Compliance Report	12	Revised to current licensing format and to incorporate the Amendment Notice listed in Table 2.
3	Odour Emissions	9	Updated to the current licensing format, with a complaints recording and reporting condition applying to all complaint types.

Existing condition	Condition summary	Revised licence condition	Conversion notes
4	Sewage Wastewater Treatment System	1	Operational requirements now listed in an infrastructure and equipment requirements table for each item of infrastructure/equipment as per current licensing format.
5	Discharge Points	2	Updated to current licensing format and to include additional irrigation areas at Hardey Reserve, Fitzroy Park and The Esplanade
6	Flow Monitoring Devices	5	Updated to include the maintenance of suitable devices for measuring flows to Hardey Reserve, Fitzroy Park and The Esplanade in addition to Dampier and Hampton Ovals.
7	Treated Wastewater Monitoring Program	6	Updated to current licensing format. Additional parameters included for Dissolved Organic Carbon (DOC) and <i>Enterococci</i> . Frequency for monitoring of metals increased from biannually to quarterly.
8, 9	Requirements for collection and analysis of water samples	7	Updated to current licensing wording to align monitoring and laboratory analysis requirements with contemporary standard conditions.
10	WWTP effluent quality criteria	8	Update to current licensing wording and renumbering of table and column numbers. Addition of a column specifying the discharge point.
11	Nutrient Loading Rates for Irrigation Areas	3	Updated to current licensing format and wording. Updates to table numbering.
12	Calculation of Contaminant Load	4	Update to condition wording to refer to Effluent Storage Tank TK05 as the discharge location and to remove Annual Environmental Reporting Requirements which have been moved to Condition 14, Table 6.
13	Bunding and Containment – environmentally hazardous chemicals	1	The requirements of this condition have been moved to the infrastructure and equipment table in Condition 1.
14	Bunding and Containment - stormwater	1	The requirements of this condition have been moved to the infrastructure and equipment table in Condition 1 and reworded for clarity. No changes have been made to the intent of the requirement.
15	Treatment Pond Maintenance	1	The requirements of this condition have been moved to the infrastructure and equipment table in Condition 1. An additional requirement has been added for the integrity of the sludge drying bed liner to be maintained.
N/A	Records – auditable books	10, 11	Inclusion of standard conditions for the maintenance of accurate and auditable books as per current licensing format.

Existing condition	Condition summary	Revised licence condition	Conversion notes
N/A	Specified actions – WET testing	14	Inclusion of condition requiring Whole Effluent Toxicity (WET) testing to be undertaken within 12 months of licence renewal.
N/A	Specified Actions – Wastewater Treatment Upgrade Strategy	15	Inclusion of condition for the preparation of a Wastewater Treatment Upgrade Strategy within 12 months of licence renewal.
Attachment 1	Plan of Premises	Schedule 1: Maps	New naming convention and update to premises map to show new premises boundary and layout.
Attachment 2	Annual Audit Compliance Report	N/A	Redundant attachment. Deleted from Licence Forms accessed at www.dwer.wa.gov.au

6. References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. NSW EPA, 1998. *Environment & Health Protection Guidelines: On-site Sewage Management for Single Households*. NSW technical Guidelines which are available from the following web site: www.olg.nsw.gov.au.
5. US EPA, 2006. *Process design manual, land treatment of municipal wastewater effluents*. US EPA Report EPA/625/R-06/016. The document is available from the following website: https://www.researchgate.net/publication/264300380_Process_Design_Manual_Land_Treatment_of_Municipal_Wastewater_Effluents.

Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
Condition 2 (Odour)	<p>The Licence Holder responded on 28 May 2026, advising that the proposed outcome-based odour condition is considered broader and more subjective than the existing wording, potentially creating uncertainty for compliance. The Licence Holder noted the Dampier WWTP's long operational history with minimal complaints and no unreasonable odour impacts identified during DWER inspections, and considers current complaint recording and reporting requirements to be appropriate. The Licence Holder requested that DWER retain the previous odour condition wording from Licence L6755/1996/9.</p>	<p>The Delegated Officer notes the Licence Holder's request to retain the previous odour condition. However, the obligations reflected in that condition are addressed through the updated complaints reporting condition in the <i>Records and Reporting</i> section of the licence.</p> <p>The Delegated Officer also notes that the requirement to avoid causing unreasonable odour impacts is already established under Part V, Section 49 of the <i>Environmental Protection Act 1986</i>, which makes it an offence to emit or cause an unreasonable emission, including odour, that interferes with the amenity of any person.</p> <p>Accordingly, the Delegated Officer has resolved to remove the condition, as it duplicates existing legislative requirements.</p>
Condition 14, Table 6 (Conditions 7 and 8 reporting requirements)	<p>The Licence Holder advised that the detailed reporting requirements for identifying sampling personnel, their qualifications and sampling procedures are administratively burdensome for routine monitoring. They noted that sampling is already undertaken in accordance with relevant Australian Standards and analysed by NATA-accredited laboratories, and requested that reporting be simplified to confirmation that suitably trained personnel conducted sampling in accordance with appropriate procedures and standards, rather than providing individual personnel and qualification details.</p>	<p>The Delegated Officer acknowledges the Licence Holder's concern that the original reporting requirements are administratively burdensome. The condition has been amended to streamline reporting by removing the requirement to provide detailed information on individual sampling personnel and their qualifications within Environmental Reports.</p> <p>The revised condition retains the requirement to report laboratory results, including NATA-accredited laboratory reports, and a description of sampling methods, while requiring the Licence Holder to provide confirmation that sampling is undertaken by appropriately qualified personnel in accordance with relevant standards and procedures. The condition also requires that supporting information on personnel competency and procedures is maintained and made available to the CEO upon request.</p> <p>The Delegated Officer considers this approach provides an appropriate balance between reducing administrative burden and maintaining sufficient assurance regarding the quality, integrity and traceability of monitoring data.</p>