Decision Report

Application for Works Approval

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

Works Approval Number	W6743/2022/1
Applicant	Water Corporation
File number	DER2022/000493
Premises	Broome North Water Resource Recovery Facility Crab Creek Road BROOME WA 6725 Lot 1502 on Plan 75036 Certificate of Title Volume 2805 Folio 367
Date of report	14 March 2023
Decision	Works approval granted

Jarrod Abrahams
Digitally signed by Jarrod Abrahams
Date: 2023.03.14 16:11:35 +08'00'

MANAGER WASTE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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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 construction and operation of the premises. As a result of this assessment, works approval W6743/2022/1 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 15 September 2022, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction works relating to a new lined 80 ML storage dam (storage of treated wastewater), spillway and interconnecting pipework to existing storage dam 1.

Construction works are currently progressing to upgrade the facility to increase the design capacity from 3.77 ML/day to 7.0 ML/day and a staged increase to the operational capacity of the pivot irrigation system which supports the disposal of the treated wastewater. These existing works are authorised under Works Approval W6451/2020/1 (issued 23 April 2021).

The premises is approximately 12 km northwest of the Broome town centre.

The premises relates to the category and assessed production capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6677/2022/1. 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 works approval W6743/2022/1.

2.3 Proposed works

The premises currently operates as prescribed premises Category 54: Sewage facility and Category 61: Liquid waste facility under licence L9094/2017/1. The current licenced capacity under Category 54 and Category 61 is 3.5 ML/day and 1,200 tonnes/annum respectively. The future design capacity will be 7.0 ML/day under Category 54 and 2,400 tonnes/annum under Category 61, as authorised under Works Approval W6451/2020/1). There is no change to the design or licence capacity associated with this application.

The works associated with the proposal include:

- Construction of a lined 80ML storage dam;
- Construction of a spillway;
- Interconnecting pipework; and
- Operation of the premises.

The existing wastewater treatment process will be operational during the entirety of the proposed construction works.

The storage dam will be lined with a bituminous geomembrane (BGM) liner. The BGM liner material will be nominally 4 mm thick with a sand top surface finish and polyester anti-root under surface finish. The BGM liner willl be designed and manufactured specifically for use as a water retaining geomembrane and will have a water permeability of 6 x 10^{-14} m/s.

The existing DN400 HDPE outlet from storage dam 1 will have the existing blank plate removed and a new DN500 fibre reinforced plastic (FRP) inlet/ outlet pipe installed to feed the new storage dam.

A new concrete access chamber will be installed to provide access for maintenance of the isolation valves between the two storage dams.

Figure 1 depicts the proposed site layout, while Figure 2 depicts the civil plan of the proposed storage dam.

Figure 1. Proposed Site Layout

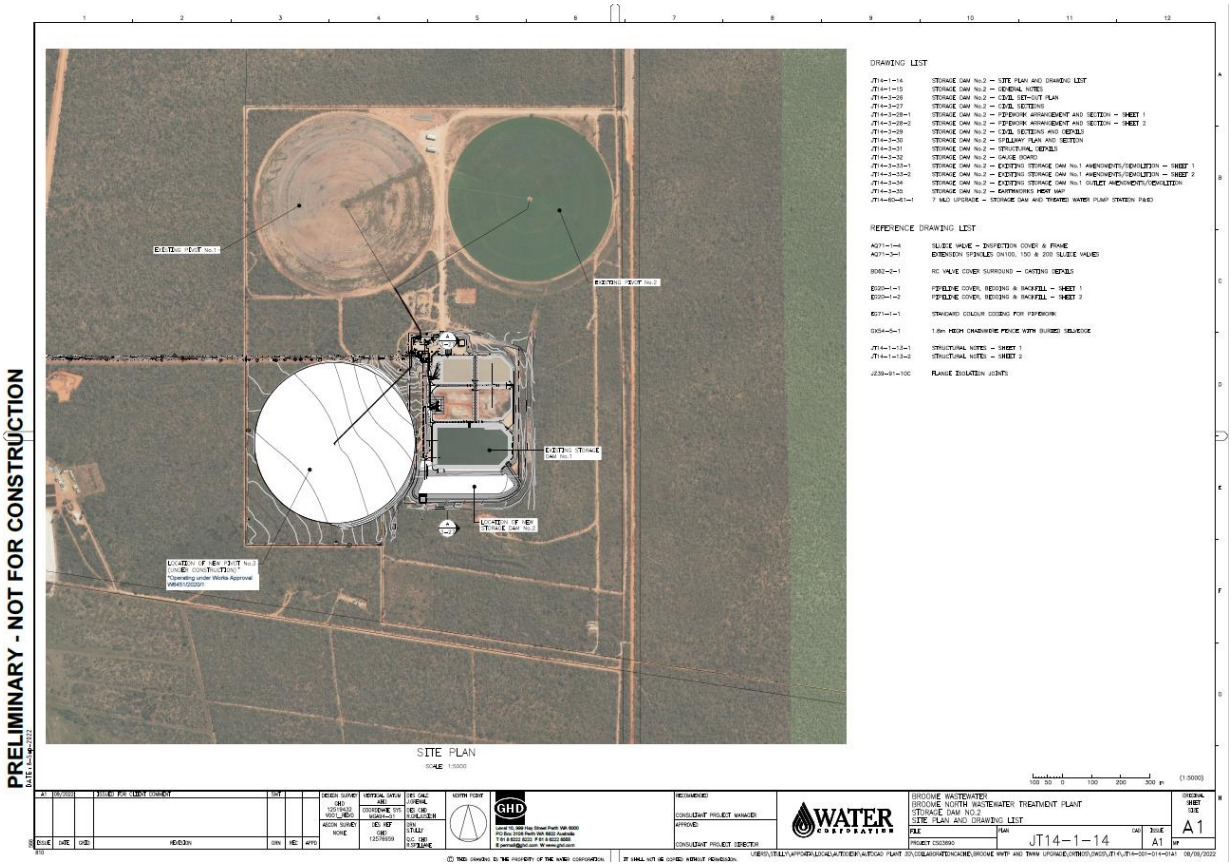
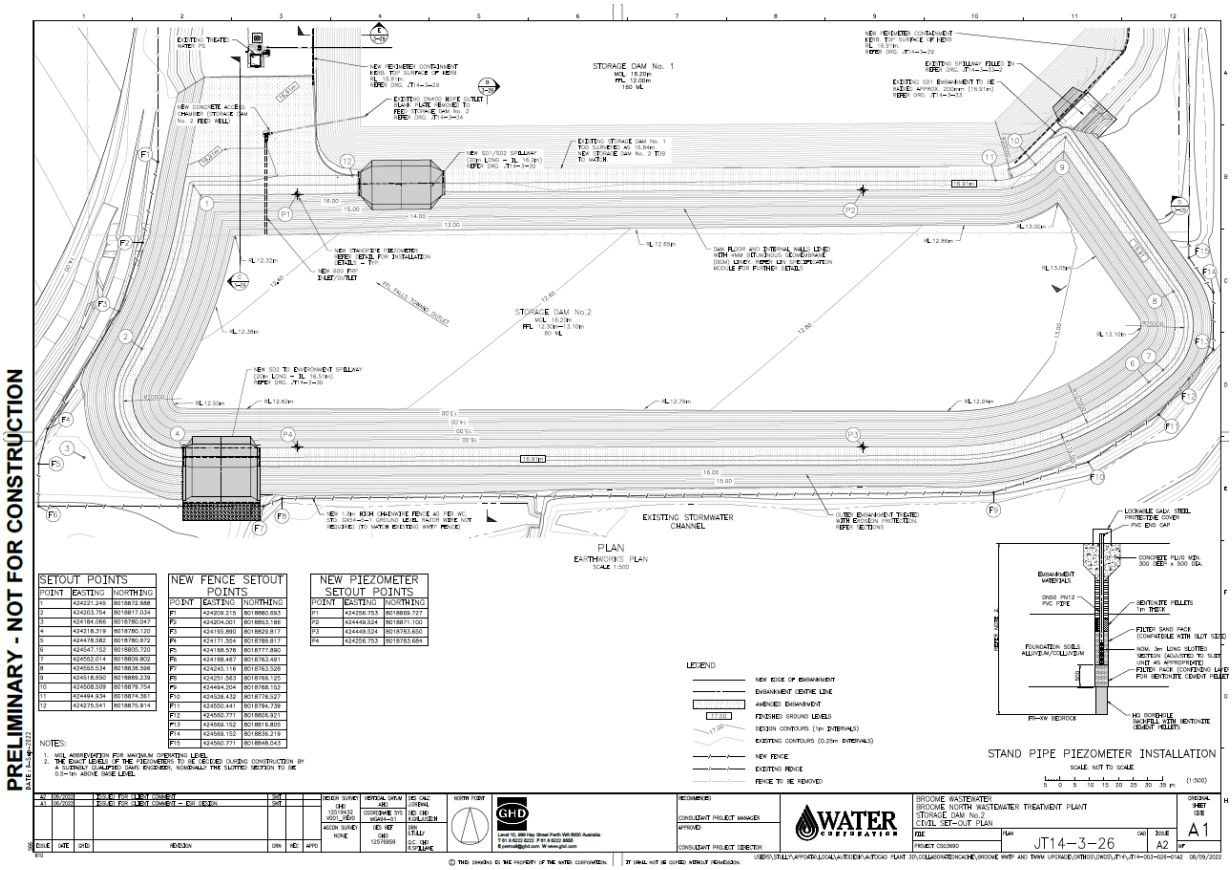


Figure 2. Storage Dam Site Civil Plan



2.3.1 Groundwater monitoring

The current licence L9094/2017/1 for the premises includes requirements for monitoring of ambient groundwater quality. Due to the layout of the proposed storage dam, three monitoring wells (wells 3/20, 09/10 and 13/10) will potentially require decommissioning prior to construction works commencing, depending on their location within the footprint of the works.

As such, new wells may be required to be installed in appropriate locations to satisfy the requirements of licence L9094/2017/1. On completion of the construction works, these new wells will be installed in suitable down gradient positions of the proposed storage dam to provide similar data as the existing wells.

The department has determined that that the decommissioning and replacement of those wells impacted by construction works will be managed through this works approval to ensure appropriate regulation of the works. Upon completion of the works authorised under the works approval, licence L9094/2017/ will be amended to reflect the new monitoring well details and locations.

2.4 Part V Division 2 of the EP Act (Clearing of Native Vegetation)

The applicant's current state-wide clearing permit CPS 185/9 (granted on 19 April 2022) allows for the clearing of native vegetation for new water services infrastructure. The proposed works will require the clearing of approximately 7.5 hectares of native vegetation, predominately for the dam footprint.

It is noted that while the application form stated approximately 7.5 hectares of clearing is required, the flora and fauna survey in support of the application (GHD, 2020) and aerial imagery

indicate that only a 4.77 hectare area is vegetated within the proposed clearing footprint.

Due to this clearing, the application was referred to Native Vegetation Regulation within the department, with the following advice provided"

- No *Environment Protection and Biodiversity Conservation Act 1999*, *Biodiversity Conservation Act 2016* listed flora, nor Priority flora listed by the Department of Biodiversity, Conservation and Attractions were recorded within the survey area.
- The proposed clearing is not likely to have a significant impact on habitat for the Greater Bilby.
- Noting the extent of the proposed clearing, it is unlikely that the proposed clearing is at variance with any of the clearing principles.
- No conservation covenant or offset requirements are applicable to the application area

Given the above, it is likely that Clearing Permit CPS 185/9 provides adequate authorisation for the clearing of 4.77 hectares of native vegetation for the purpose of the constructing the 80 ML storage dam, spillway and interconnecting pipework to the existing Storage Dam 1.

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 construction and operation which have been considered in this decision report are detailed in Table 1 below. Table 1 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Civil and construction works to facilitate modifications. Vehicle movements on unsealed access roads.	Air/windborne pathway causing impacts to health and amenity	- A Construction environmental management plan (CEMP) will be prepared prior to construction and will include, but is not limited to, the following controls: - The project will utilise pre-cast concrete structures that will reduce construction timeframes and limit the construction works conducted onsite, thus reducing the potential for dust emissions; - Hardstand areas will be created around infrastructure areas; this will reduce the dust

Emission	Sources	Potential pathways	Proposed controls
			emissions during operations; - Opportunistic visual inspections of dust plumes and dust emissions on site will be undertaken during construction period on a daily basis to ensure dust control measures are implemented and effective; - Wetting/ dust suppression of unsealed surfaces using benign dust suppressants will be used on disturbed areas; as required during construction; - Site preparation and excavations (cut and fill) will not be conducted if wind conditions are extreme, where practicable; - Weather forecasts will be checked daily and high risk weather conditions (windy, hot and dry) will be monitored and additional wetting/dust suppressant used on unsealed surfaces during these conditions; - Trucks are to be washed down before leaving the premises to stop the spread or generation of dust offsite during construction activities; - Speed limited on site will be adhered to on unsealed and sealed roads/tracks.

Emission	Sources	Potential pathways	Proposed controls
Noise		Air/windborne pathway causing impacts to health and amenity	- A CEMP will be prepared prior to construction and will include, but is not limited to, the following controls: - During the construction phase, noise levels will be similar to those associated with normal construction projects involving the use of construction plant, equipment and power tools; - Works will be conducted in accordance with the *Environmental Protection (Noise) Regulations 1997*; - Construction will be undertaken during the hours of 7am and 7pm Monday to Friday, however should works be required outside these times Water Corporation will seek relevant approvals from DWER and the Local Government authority, prepare a Noise Management Plan and undertake community consultation in accordance with the *Environmental Protection (Noise) Regulations 1997*; - Vehicles and equipment will be fitted with appropriate noise controls; - All workers to wear appropriate PPE (including ear protection, as required) during construction works; - All plant, equipment and vehicles will be regularly inspected and maintained; - The Contractor is required to ensure works are conducted in accordance with Section 4 of AS2436-2010.
Wastewater discharge to the environment	Construction of storage dams and associated pipework	Overland flow and infiltration to soil and groundwater	- There will be no direct discharge of treated wastewater to the land during construction stage. - In the event of an emergency, or unexpected failures within the upgraded facility, incoming wastewater will be managed within the BNWRRF.
Spills of hydrocarbons from vehicles and equipment	Installation of wastewater infrastructure	Overland flow and infiltration to soil and groundwater	- The *Environmental Protection (Unauthorised Discharge*) *Regulations 2004* apply. - All hazardous chemicals and hydrocarbons required on site are to be stored in appropriately bunded areas compliant with AS1940 and AS192 to contain any potential leaks or spills; - Appropriate spill kits, containment and

Emission	Sources	Potential pathways	Proposed controls
			recovery equipment, personal protective equipment and relevant operator instructions/emergency procedure guides for the management of waste and chemicals associated with activities will be kept and maintained on site; - Spill kits will be strategically located throughout the site; - Appropriate spill response equipment for hazardous materials will be identified and readily accessible in areas where hazardous materials are stored; - All fuel will be stored within self-bunded tanks; - All semi-mobile equipment will be fitted with a spill kit; - All staff and contractors involved in the handling of hazardous chemicals and fuels will be suitably trained; - Scheduled maintenance and servicing of equipment and vehicles is to be conducted offsite as per manufacturer's specifications; - Any spills will be controlled, contained and cleaned up in accordance with a Spill Management Procedure; - Hardstand areas created will be sufficiently graded and bunded to contain spills or accidental discharges to land/waters; - Hydrocarbon and chemical storage areas will be inspected on a regular basis; - Spill kits will be inspected on a regular basis and replenished as required; - During operations, all chemicals will be stored in purpose built areas that comply with AS3780: The storage and handling of corrosive substances. This includes hardstands and bunds capable of containing a major failure of storage tanks.
Time-limited operation			
Odour	Ongoing operation of the storage pond	Air/windborne pathway causing impacts to health and amenity	- Existing operational controls consistent with Licence L9094/2017/1. - The dam will store treated wastewater. - The throughput does not increase and surface areas of the ponds receiving and treating the raw wastewater remain the same.

Emission	Sources	Potential pathways	Proposed controls
			- The separation distances are the same as the upgraded layout.
Wastewater discharge to the environment	Loss of containment	Overland flow and infiltration to soil and groundwater	- Existing operational controls consistent with Licence L9094/2017/1. - Works will occur alongside the existing operating plant. - The probabilistic water balance results found the construction of an additional 80 ML Storage Dam No.2 will result in no overflows occurring until 2037 due to increased evaporation provided by that additional storage dam. - 10% AEP containment will be met until 2051. - The volume of treated wastewater that would overflow during potential emergency discharge is predicted to be less than the overflow event that took place in 2018.

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 2 and Figures 3 and 4 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 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Residential dwelling within the Broome Common Stockyards (within premises L7864)	790 m west of the Premises boundary
Broome Airport and Industrial Park	2 km north
Sensitive receptor – Morrell Park aboriginal community homestead	1.4 km west of the Premises boundary and 1.5 km west of the nearest irrigation area.
Industrial receptor – Cattle saleyard office/sheds	800 m west of the Premises boundary and 1.4 km west of the nearest pond infrastructure.
Broome townsite residential dwellings	3.95 km west to the nearest dwelling on Manilya Road

Environmental receptors	Distance from prescribed activity
Underlying groundwater – Pindan Sands aquifer Broome Sandstone aquifer	Groundwater monitoring conducted by the Licence Holder indicates that the two aquifers are hydraulically connected in the area, as the lower part of the Pindan Sands is difficult to distinguish from the upper Broome Sandstone (GHD 2020a). This is consistent with the existing regional interpretation that the Pindan Sands and Broome Sandstone are hydraulically continuous and considered to be a single unconfined groundwater resource in the Broome area (DOW 2012). Regional hydrogeological mapping indicates that the groundwater table underneath the site is approximately 10-15 mbgl, with depth to groundwater increasing to the north-east and east of the site. Annual reporting for the 2019/2020 period recorded the following depths to groundwater at the Premises and offsite monitoring network: • Pindan Sands aquifer: 5.90 – 6.05 mbgl (3.1 – 5.95 m AHD) • Broome Sandstone aquifer: 5.75 - 17.80 mbgl (2.49 – 4.95 m AHD) Regional information indicates that groundwater flow is in a southwesterly direction towards Roebuck Bay and Dampier Creek, with a hydraulic gradient of approximately 0.001. No licensed/registered groundwater abstraction bores are located within 1 km of the Premises (based on available GIS dataset –WIN Groundwater Sites).
Important wetlands – Western Australia Dampier Creek Roebuck Bay Roebuck Bay Plains System Willie Creek Wetland	Permanent surface water of Dampier Creek is approximately 2 km south-west The Roebuck Bay wetland area is approximately 900m southwest from the Premises boundary (upper reaches of the system wetlands inundation area) Roebuck Bay Plains System- 5.9 km south-west (Commonwealth Department of Agriculture, Water and The Environment 2020)
Surface water – Dampier Creek	Permanent surface water of Dampier Creek is located approximately 2 km southwest of the Premises boundary, 2.4 km southwest of the nearest irrigation area and 2.75 km southwest of the treated wastewater storage pond.
Parks and Wildlife Managed Lands and Waters Crown Reserve ID: R 51380	1.5 km south-west of the Premises are lands vested in Yawuru Native Title Holders Aboriginal Corporation RNTBC and Conservation Commission of WA for the purpose of Conservation, recreation and traditional customary Aboriginal use and enjoyment. A map of the vested lands is shown in Figure 4 below.
RAMSAR Wetland - Roebuck Bay Site ID: 479	The RAMSAR wetland starts approximately 5.5 km south-east of the Premises boundary and is intertidal area that includes mangroves, mudflats and a sheltered bay within the Roebuck Bay Marine Park. The classification does not extend over the entirety of Roebuck Bay, it commences east of the Broome townsite to the south and extends to Sandy

	Point and covers an area of approximately 34,119 ha (Roebuck Bay Working Group 2020)
Threatened Ecological Communities (TEC) - Species-rich faunal community of the intertidal mudflats of Roebuck Bay	The Premises is situated within the buffer area of the TEC. The TEC is listed as vulnerable under the *Biodiversity Conservation Act 2016* (WA) (BC Act).
Threatened Ecological Communities (TEC) Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act)	The Monsoon (vine) thickets on coastal sand dunes of the Dampier Peninsula TEC is listed as vulnerable under the BC Act and endangered under the EPBC Act. Its habitat includes the coastal inundation areas surrounding Dampier Creek, the upper reaches of which are approximately 900 m southwest from the Premises boundary as shown in Figure 6 below. These thickets make up less than 0.01% of the Peninsula but support 25% of the plant species. Roebuck Bay Marine Park covers 304 km2 and includes the coastal inundation areas surrounding Dampier Creek as shown in Figure 5 below. The upper reaches of Dampier Creek flood plain are approximately 900 m west from the Premises boundary.
Public Drinking Water Source Area - Broome Water Reserve (P1)	2.4 km north and upgradient of the Premises boundary.

Figure 3: Prescribed premises boundary (supplied by applicant)

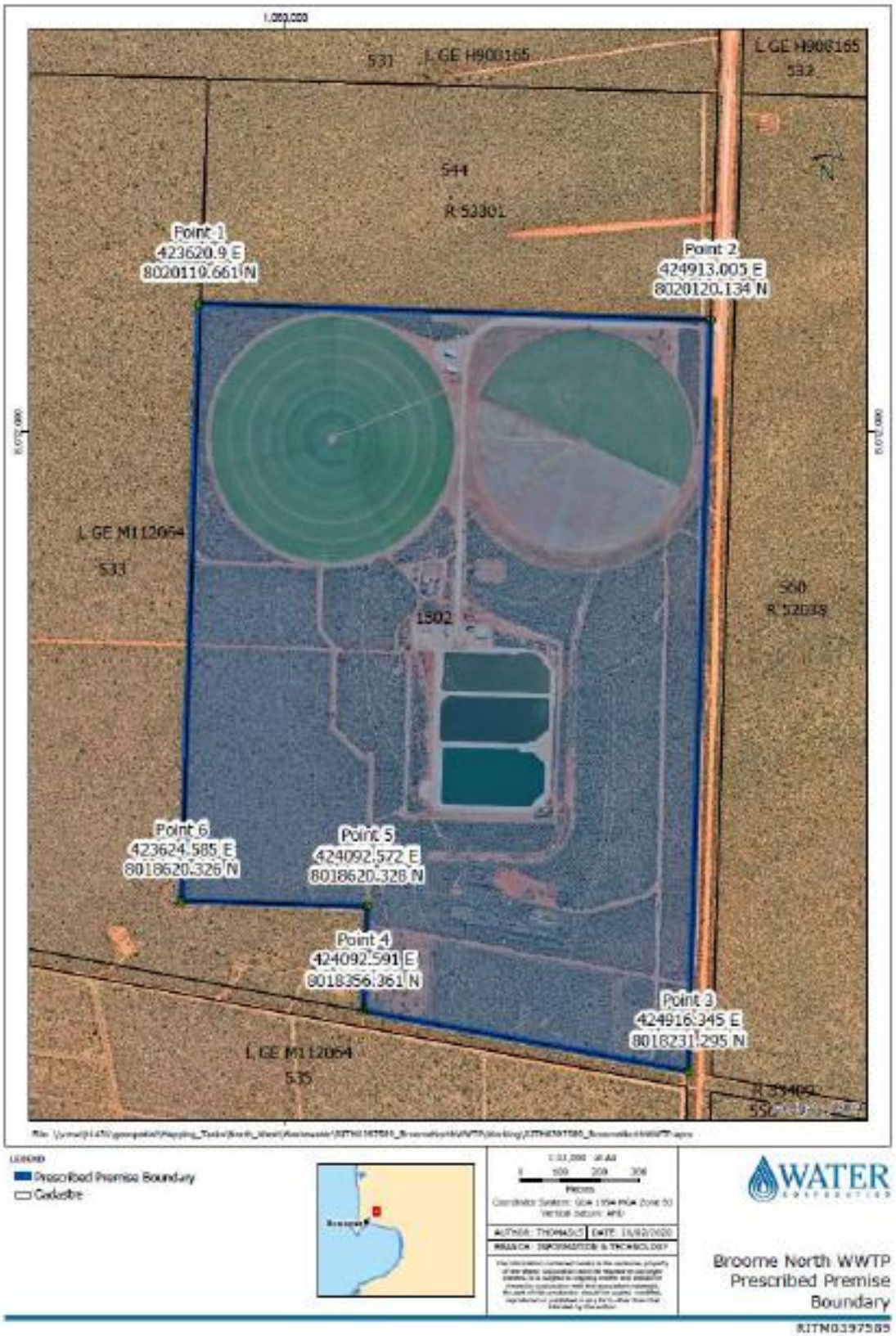
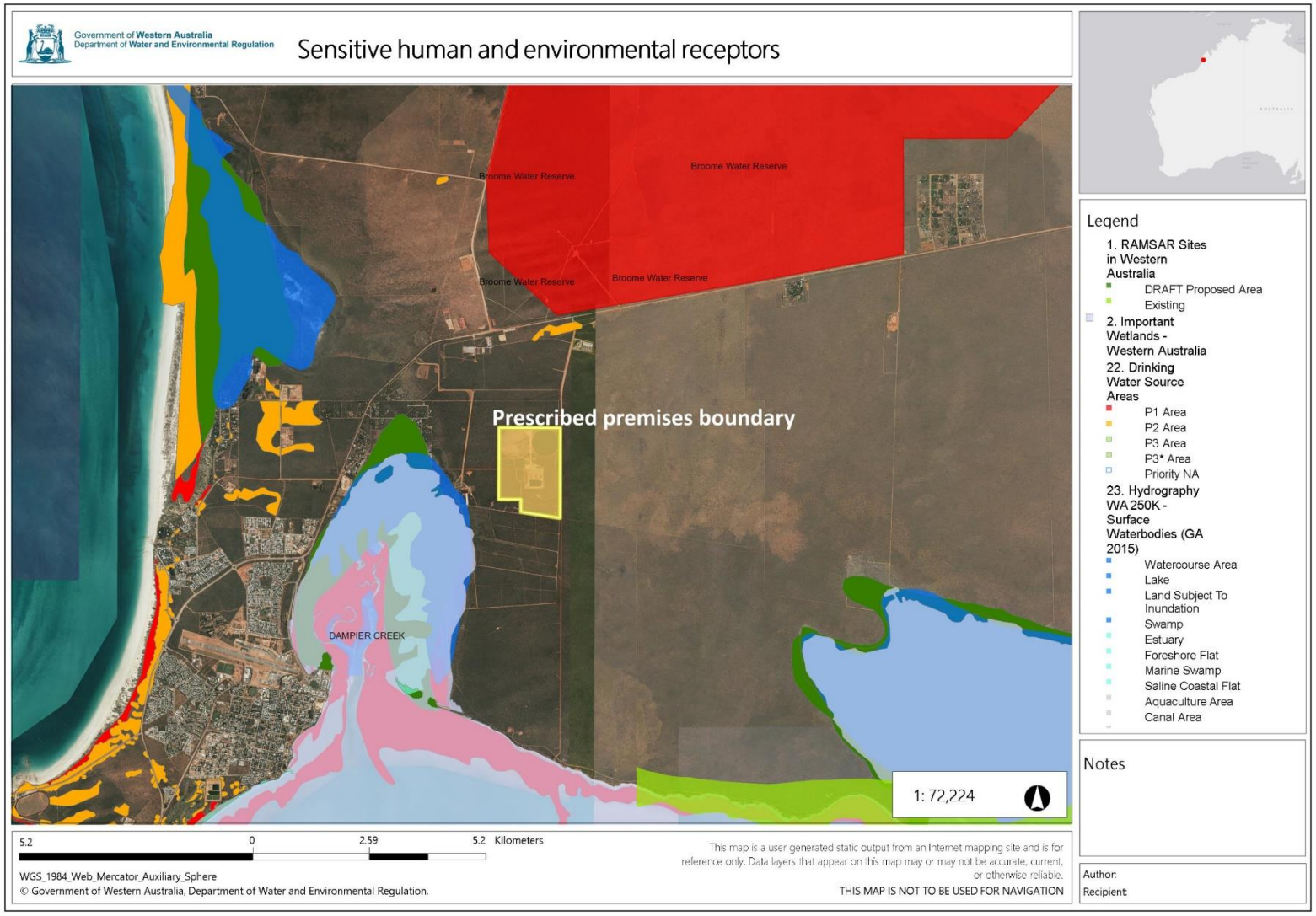


Figure 4: Distance to sensitive receptors



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 works approval 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 3.

Works approval W6743/2022/1that accompanies this decision report authorises construction and time-limited operations for the storage dam, spillway and interconnecting pipework to existing storage dam 1. The conditions in the issued works approval, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence amendment is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. wastewater treatment activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 3: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Vehicle movements on unsealed access roads. Civil and construction works to facilitate works.	Dust	Air / windborne pathway causing impacts to health and amenity	Residential premises located 1.4km north-west of the Premises at the Morrell Park Aboriginal Community Residential dwelling within the Broome Common Stockyards 790 m west of the Premises boundary	Refer to Section 3.1	C = Minor L = Possible **Medium Risk**	Y	**Conditions 1 and 2**	The applicant has committed to having a Construction Environmental Management Plan (CEMP) which will address the potential for dust emissions and provide mitigation measures. The works approval will specify the minimum requirements for the CEMP to manage noise emissions.
	Noise			Refer to Section 3.1	C = Slight L = Rare **Low Risk**	Y	**Conditions 1 and 2**	The works approval will specify the minimum requirements for the CEMP to manage noise emissions during works.
Vehicle movements on unsealed access roads Civil and construction works to facilitate works	Spills of hydrocarbons from vehicles and equipment	Overland flow and infiltration to soil and groundwater causing ecosystem disturbance	Groundwater and Roebuck Bay wetland area approximately 900m southwest from the Premises boundary	Refer to Section 3.1	C = Slight L = Rare **Low Risk**	Y	N/A	Minor hydrocarbon and chemical spillages are adequately regulated by the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.
Construction of pond and associated pipework	Treated wastewater	Overland flow and infiltration to soil and groundwater causing ecosystem disturbance	Groundwater and Roebuck Bay wetland area approximately 900m southwest from the Premises boundary	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	N/A	The existing conditions of Licence L9094/2017/1 provide sufficient control to mitigate the potential for adverse emissions through wastewater discharge.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Time-limited-operations operations								
Operation of infrastructure	Odour	Air / windborne pathway causing impacts to health and amenity	Residential premises located 1.4km north west of the Premises at the Morrell Park Aboriginal Community Residential dwelling within the Broome Common Stockyards 790 m west of the Premises boundary	Refer to Section 3.1	C = Moderate L = Possible **Medium Risk**	Y	**Condition 11**	The existing conditions of Licence L9094/2017/1 provide sufficient control to mitigate the potential for adverse odour emissions. The upgrade of the treatment capacity of the premises was previously assessed in works approval W6451/2020/1. Odour emissions relating to time-limited operations of Storage Dam No. 2 will not adversely impact odour emissions associated with the upgraded premises. There are no records of odour complaints pertaining to the premises in the previous 5 years within the department's Incidents and Complaints Management System.
Containment loss from wastewater treatment and storage infrastructure	Wastewater discharge to the environment	Surface runoff via pond overflow causing impacts to terrestrial and aquatic ecosystems Seepage through pond liners and soil causing impacts to groundwater, including downgradient receptors	Species-rich faunal community of the intertidal mudflats of Roebuck Bay Monsoon (vine) thickets on coastal sand dunes of the Dampier Peninsula (1.5 km from premises) Roebuck Bay (1.5 km from premises)	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Conditions 3, 6 and 7 **Conditions 4, 5, 8, 9 and 10**	See Section 3.3

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Increased risk of accidental release of wastewater via pump failure, pipeline ruptures	Wastewater discharge to the environment	Direct discharge to ground and infiltration to groundwater Lateral movement of impacted groundwater down-gradient of the site	Groundwater and Roebuck Bay wetland area approximately 900m southwest from the Premises boundary	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Conditions 3, 6 and 7 **Conditions 4, 5, 8, 9 and 10**	Conditions 4 and 5 require the submission of an Environmental Compliance Report to verify the works have been constructed in accordance with the relevant requirements.

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 overtopping

Due to cyclonic activity, Broome can be subject to extremely intense rainfall events (>300 mm/day), but also to multiple, less intense but long-duration events, (>1000 mm over a fortnight). These factors necessitated an assessment to be undertaken by the applicant to understand the overflow risks associated with the proposed storage dam. A *Storage Dam Capacity Assessment* (GHD Pty Ltd, September 2022) was undertaken to determine the appropriate size of the additional storage dam. The assessment utilised a probabilistic method that handled the dam as a dynamic system and modelled it over multiple long-duration simulations. The modelling was then validated against historic events at the premises to confirm accuracy.

The modelling concluded that a new 80 ML storage dam to complement the existing Storage Dam No. 1 will provide 10% annual exceedance probability (AEP) containment of the wastewater treatment plant until 2051.

The water balance model simulated daily treated wastewater storage volume from 2021 until 2055. A total of 2,720 'annual model runs' were executed (34 years using 80 climate scenarios), amounting to nearly 100,000 'daily model runs'. The large number of executed models generated a data set capable of estimating the probability and magnitude of potential overflows occurring until 2055.

The water balance model simulations were run assuming that the new storage dam will have a capacity of 80 ML and that 25-day minimum storage would be required to remove parasitic worms from the treated wastewater.

The results of the modelling determined that:

- An 80 ML Storage Dam No.2 will result in no overflows occurring until 2037 due to increased evaporation provided by that additional storage dam.
- An 80 ML Storage Dam No.2 will provide a low probability of any overflow occurring over the modelled period (i.e. until 2055).
- An 80 ML Storage Dam No.2 provides a 10% AEP containment until 2051.
- The volume of treated wastewater that would overflow during potential emergency discharge is predicted to be less than the overflow event that took place in 2018. The 2018 event was due to a 1.3% AEP (478 mm of rain in 48 hours) which caused 41.15 ML of treated wastewater to overflow via the emergency spillway of the storage dam.
- A large rainfall event would likely be required to trigger emergency discharge which would result in significant mixing and dilution with stormwater if an overflow were to occur.

3.3.1 Pathway of treated wastewater during an emergency discharge

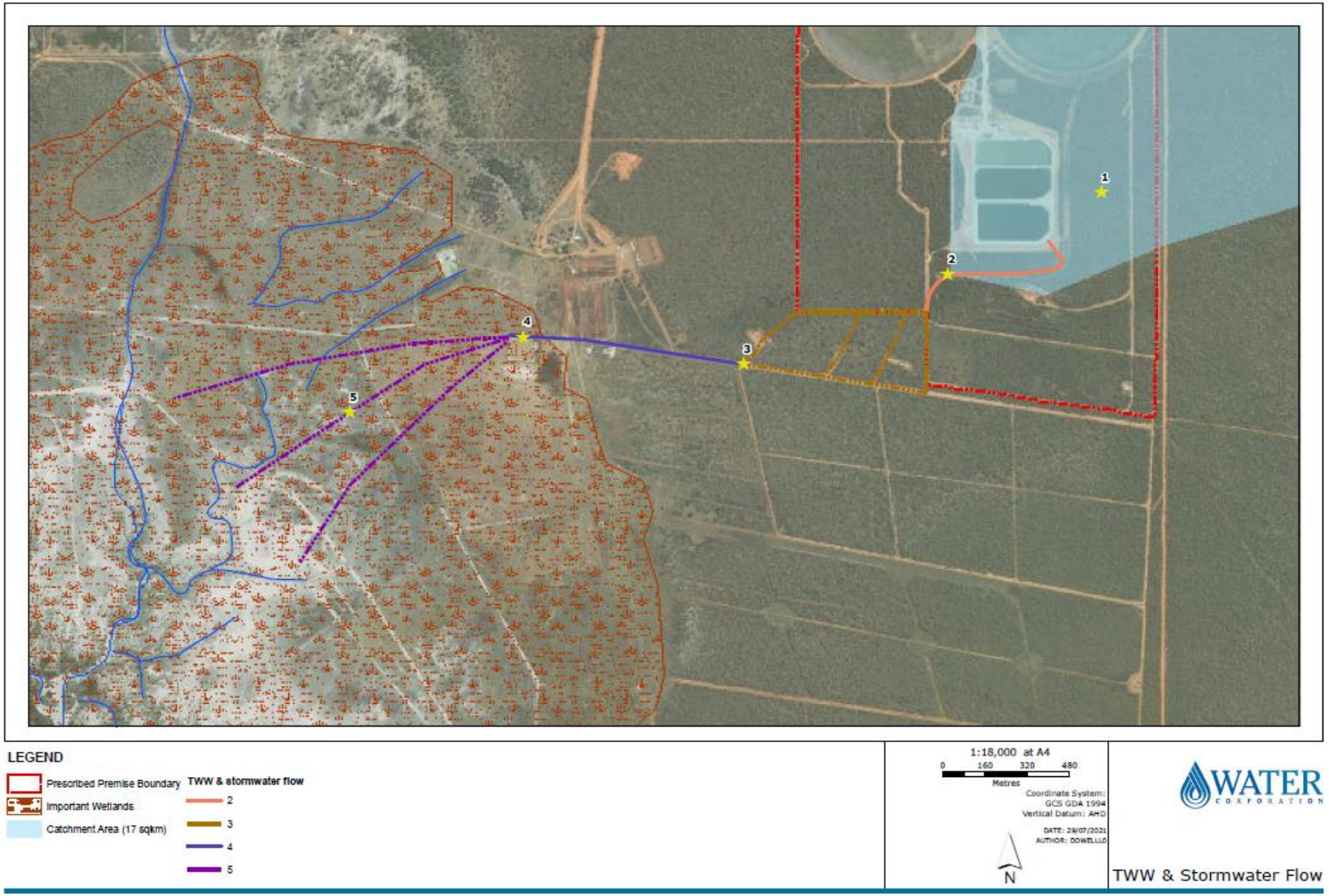
The premises is located within the downstream portion of a significant stormwater catchment discharging to Dampier Creek. The estimated pathway of discharged treated wastewater during an emergency event has been informed by observed flow during the overflow that happened in 2018.

The interpreted pathway of discharge is presented in Figure 5. The numbers shown in Figure 5 correspond to the description of the pathway below:

1. Runoff from the catchment northeast of the premises flows to the south of the existing storage dam. Some of the runoff is expected to flow into the drain to the east and south of the treatment ponds and storage dam. The catchment area is approximately 17 km2 and runoff ultimately discharges to Dampier Creek and Roebuck Bay.

2. Hydrological modelling and delineation of the catchment shows that during an overflow event, stormwater mixes with discharged treated wastewater, diluting nutrients and bacteria.
3. Mixed treated wastewater and stormwater flows to the west and southwest in drains adjacent to the roads and tracks, and overland to Broome Common Stockyards which is located approximately 2.8 km from the premises.
4. The drains extend to Broome Common Stockyards, where the surface water was observed to pond east of the storage dam during the 2018 overflow event.
5. From the Broome Common Stockyards, stormwater containing diluted treated wastewater is interpreted to flow overland towards Dampier Creek.

Figure 5: Discharge pathway (supplied by the Applicant)



Key findings:

1. The Delegated Officer considers that the proposed Storage Dam No. 2, in addition to the existing Storage Dam No.1, will provide sufficient capacity to provide 10% annual exceedance probability containment of treated wastewater.
2. Based on the 2018 1.3% AEP event, treated wastewater will become significantly diluted by stormwater during an overflow event, whereby it was estimated that the treated wastewater made up between 0.5% to 1.1% of the runoff from the Broome North subcatchment.

3.3.2 Determination

Based on the above information the Delegated Officer has determined the Consequence of odour emissions from the proposal to be **'Moderate'** (potential low-level off-site impacts at the local scale) while the Likelihood of the risk event occurring is **'Unlikely'**. The resulting risk rating is therefore deemed as **'Medium'**.

The Delegated Officer considers that the applicant's proposed controls and the existing conditions of Licence L9094/2017/1 provide sufficient control to mitigate the potential for adverse overflow emissions through wastewater discharge.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website	None received	N/A
Local Government Authority advised of proposal on 18 November 2022	The Shire of Broome responded on 5 December 2022 with no comments on the application.	N/A
Department of Health advised of proposal on 18 November 2022	The Department of Health responded on 15 December 2022 with no objection to the proposal subject to the following conditions: - The proposed storage dam design is to be engineering certified. - The final effluent is to continue to meet the water quality objectives associated with a 'low' exposure risk end use as required by Recycled Water Scheme Approval No. M19/00000. - As the proposal is in the Kimberley region and the recycled wastewater is proposed to be used for	The department notes the DoH's comments and advice in relation to wastewater treatment, disposal and approvals to be considered by the applicant. The works approval requires certification of the storage dam infrastructure by a suitably qualified

	grass crops for animal fodder, there are minimum detention times either within the treatment ponds or storage dam to ensure Helminths are adequately controlled. Testing and monitoring of Helminths will also be required to meet the guidelines for the non-potable uses of recycled water in Western Australia. - Any expansion to the recycled water scheme will require an updated recycled water quality management plan to be submitted to the DoH. - Any expansion to the recycled water scheme should demonstrate suitable set back distances from environmentally sensitive receptors, as well as suitable soil conditions and irrigation requirements to prevent over-application in accordance with the principals of AS 1547:2012. - The subject land is in a region that experiences significant problems with nuisance and disease carrying mosquitoes. Prior to development, the DoH recommends a Mosquito Management Plan (MMP) be developed and approved by both the DoH and the local government in which the proposal is based to ensure the risk to the community of exposure to nuisance and/or disease carrying mosquitoes is considered. This MMP should ensure the construction and expansion of the proposed Broome north waste resource recovery facility – additional storage dam meets the criteria within the chironomid midge and mosquito risk assessment guide for constructed water bodies (Midge Research Group, 2011) to ensure that the potential for on-site mosquito breeding is minimised. This document is available at: www.public.health.wa.gov.au/2/654/2/mosquitoes.pm The DoH has provided guides and templates for the development of suitable MMP's to assist land developers meet these requirements. Please see: Mosquito management (health.wa.gov.au) for additional support.	engineer (refer condition 4). Existing Licence L9094/2017/1 requires the monitoring of treated wastewater prior to discharge for reuse (refer Table 3.2.1 of L9094/2017/1), with *E. coli* one of the parameters to be monitored. The applicant has been provided with the recommendations in relation to the existing recycled waster scheme approvals and Mosquito Management Plan. An instrument granted by the department may provide a defence for the occupier for offences under Part V, Division 3 of the EP Act, provided the conditions contained within the Works Approval have been complied with. An instrument does not provide a defence for offences under other Western Australian legislation.
Department of Biodiversity, Conservation and Attractions advised of proposal on 18 November 2022	Department of Biodiversity, Conservation and Attractions responded on 1 December 2022 with no comments on the application.	N/A
International Livestock Pty Ltd advised of proposal on 18 November 2022	None received	N/A
Nyamba Buru Yawuru advised of proposal on 18 November 2022	None received	N/A

Applicant provided comments on draft documents on 14 February 2023 and 9 March 2023	Refer to Appendix 1	Refer to Appendix 1

5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

1. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
2. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
3. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2019, Guideline: Decision Making, Perth, Western Australia
5. DWER 2019, Guideline: Industry Regulation Guide to Licensing, Perth, Western Australia

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

Condition	Summary of applicant's comment	Department's response
Conditions 6, 7, 8 and 9	Remove requirement for Environmental commissioning report: The works approval stipulates three separate reports are required; environmental compliance report, environmental commissioning report and a final report on the time limited operations of the works. There is no process commissioning associated with the new storage dam. Commissioning will essentially entail opening the new isolation valve installed between the existing storage and new storage and monitoring flow until the water levels equalise. No further treatment occurs within the pond as its function is to store treated wastewater for additional treatment (filtration and chlorination) prior to disposal through irrigation.	The Delegated Officer considers the proposed change acceptable, and has removed commissioning requirements from the works approval. Due to the minimal process involved in the commissioning works, the risk associated with commissioning can be adequately captured within the construction and time-limited operations requirements.
Condition 3, Table 1, Row 5(d)	Replace individual bore IDs with "replacement of groundwater monitoring bores within the construction footprint": The works approval currently states three bores 3/20, 09/10 and 13/10 will be decommissioned. It is likely the works will not impact bore 3/20 so the wording should be changed to provide greater flexibility i.e. only decommission and replace bores within the construction footprint.	The Delegated Officer considers the proposed change acceptable, and has amended the wording throughout the works approval to ensure only those groundwater monitoring bores within the construction footprint will be decommissioned and replaced.
Condition 3, Table 1, Rows 3 and 4)	Request change to align with applicable Australian Standards – Minimum Construction Requirements for Water Bores in Australia, Fourth Ed (2020): Works approval currently references American standard ASTM D5092/D5092M-16 replace with "Minimum Construction Requirements for Water Bores in Australia, Fourth Ed (2020)"	The Delegated Officer considers the proposed change acceptable, noting that the *Minimum Construction Requirements for Water Bores in Australia, Fourth Ed* (2020) was developed by the National Uniform Drillers Licensing Committee and outlines the minimum requirements for constructing, maintaining, rehabilitating, and decommissioning water bores in Australia. DWER is also a member of the National Uniform Drillers Licensing Committee.

Condition	Summary of applicant's comment	Department's response
Condition 4	Increase period for submission of compliance report from 30 calendar days to 60 calendar days: To provide adequate time to collate all QA/QC documentation and allow for Third Party sign offs.	The Delegated Officer considers the proposed change acceptable, and has amended the timeframe for the submission.
Condition 10	Change reference of Environmental Commissioning Report to Environmental Compliance Report	Amended as per previous response.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY					
Application type					
Works approval	☒	(related to L9094/2017/1)			
Licence	☐	Relevant works approval number:		None	☐
		Has the works approval been complied with?		Yes ☐ No ☐	
		Has time limited operations under the works approval demonstrated acceptable operations?		Yes ☐ No ☐ N/A ☐	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?		Yes ☐ No ☐	
		Date Report received:			
Renewal	☐	Current licence number:			
Amendment to works approval	☐	Current works approval number:			
Amendment to licence	☐	Current licence number:			
		Relevant works approval number:		N/A	☐
Registration	☐	Current works approval number:		None	☐
Date application received		15 September 2022			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Water Corporation			
Premises name		Broome North Water Resource Recovery Facility			
Premises location		Register Number 1502/DP75036 Lot 1502 On Deposited Plan 75036			
Local Government Authority		Shire of Broome			
Application documents					
HPCM file reference number:					
Key application documents (additional to application form):		Appendix E Broome North Wastewater Treatment Plant Upgrade - Overflow Risk Assessment, Water Corporation (2022) Appendix F Broome North WWTP & TWWM Upgrade Storage Dam Capacity Assessment			
Scope of application/assessment					

Summary of proposed activities or changes to existing operations.	Works approval Construction works are currently underway to upgrade the facility to increase the design capacity from 3.77ML/day (ML/d) to 7.0ML/d and a staged increase to the operational capacity of the pivot irrigation system which supports the disposal of the TWW. The works are operating under Works Approval W6451/2020/1, approved by DWER on 23 April 2021. The works required under this works approval are the construction of a new lined 80ML storage dam, spillway and interconnecting pipework to existing storage dam 1.

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity
Category 54: Sewage facility premises	3 500 cubic metres per day	4,770 cubic meters per day (in accordance with W6451/2020/1)
Category 61: Liquid waste facility:	1 200 tonnes per annual period	2,400 tonnes per annual period (in accordance with W6451/2020/1)

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☐
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☐ No ☒	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	Certificate of title ☐ General lease ☐ Expiry: Mining lease / tenement ☐ Expiry: Other evidence ☐ Expiry:
Has the applicant obtained all relevant planning approvals?	Yes ☒ No ☐ N/A ☐	Approval: Expiry date: If N/A explain why? In accordance with the Planning Development Act 2005 (WA), Broome Town Planning Scheme

		No.6 was amended so that the site is zoned "Public Purposes (S: Sewerage)" on 22 December 2005. The site is subject to the SCA3 – Essential Services Buffer Area which provides a buffer around the Premises due to potential odour emissions and to protect the area from future urban encroachment.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☒ No ☐	CPS No: CPS185/9 Approximately 7.5ha by mechanical means
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	Application reference No: N/A Licence/permit No: N/A
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☐ No ☒	Application reference No: Licence/permit No: Licence / permit not required.
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☐ No ☒	Name: N/A Type: Has Regulatory Services (Water) been consulted? Yes ☐ No ☒ N/A ☐ Regional office:
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☒	Name: N/A Priority: P1 / P2 / P3 / N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes ☐ No ☐ N/A ☐
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	*Environmental Protection (Controlled Waste) Regulations* – Acceptance of K130 and K210 *Dangerous Goods Safety Act 2004* – Chlorine storage
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	If Yes include details of which EPP(s) here.

Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	If Yes, include details here, e.g. Site is subject to SO_2 requirements of Kwinana EPP.
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☐ No ☒	If Yes include details here. Classification: N/A Date of classification: N/A