Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6122/2018/1
Applicant	Department of Communities
File Number	DER2018/000033
Premises	Beagle Bay Waste Water Treatment Plant Beagle Bay Aboriginal Community Part of Lot 9000 on Deposited Plan 73719
Date of Report	28 September 2018
Status of Report	Final

Table of Contents

1. Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
Applicant	Department of Communities
AACR	Annual Audit Compliance Report
AER	Annual Environment Report
ANZECC	Australian and New Zealand Environment and Conservation Council (ANZECC) 1997 *Australian Guidelines for Sewerage systems, Effluent Management*, National Water Quality Management Strategy.
BAC	Beagle Bay Aboriginal Community
BOD	Biochemical Oxygen Demand
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CS Act	*Contaminated Sites Act 2003* (WA)
Decision Report	refers to this document.
Delegated Officer	an officer under section 20 of the EP Act.
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the *Public Sector Management Act 1994* and is responsible for the administration of the *Environmental Protection Act 1986* along with other legislation.
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)

HDPE	High-density polyethylene
m^3	cubic metres
Minister	the Minister responsible for the EP Act and associated regulations
NEPM	National Environmental Protection Measure
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
Primary Activities	as defined in Schedule 2 of the Revised Licence
Risk Event	As described in *Guidance Statement: Risk Assessment*
RIWI Act	Rights in Water and Irrigation Act 1914
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UDR	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)
BWWTP	Beagle Bay Wastewater Treatment Plant
WWTP	Wastewater Treatment Plant
mg/L	milligrams per litre

2. Purpose and scope of assessment

The Applicant has applied for a works approval to refurbish and construct an additional Evaporation / Infiltration pond at the BWWTP on Lot 9000 on Deposited Plan 73719 BAC. The Premises is an existing Registered R1359/2003/1 WWTP that has been operating since 2003. The Premises was issued works approval W5531/2013/1 in March 2014 to upgrade the WWTP production and design capacity from 80m^3/day to 160m^3/day; however this upgrade work was not completed and the works approval expired in March 2017. The Applicant now intends to refurbish the existing BWWTP and construct an additional Evaporation / Infiltration pond:

- Construction of an additional new Evaporation / Infiltration pond with an area of 5,200m^3 that includes a freeboard of 500mm;
- The new Evaporation / Infiltration pond will incorporate HDPE lined embankment walls and anchor trench;
- The existing weir in the current evaporation pond will be removed to eliminate overflows; and
- A new overflow weir will be installed in the embankment of the new Evaporation / Infiltration pond.

All treated wastewater is to be fully contained within the WWTP including allowance for a 1:10 ARI rainfall event.

The construction is to allow a new WWTP production and design capacity of 175m^3/day to treat a balance capacity throughput of 110m^3/day to service a maximum of 525 persons; current population is 360 people.

2.1 Application details

Table 2 lists the documents submitted during the assessment process.

Table 2: Documents and information submitted during the assessment process

Document/information description	Date received
Application form	5 January 2018
Additional Information in Regards to Application Ref: CEO 2863/17 for a Works Approval for BWWWTP	16 January 2018
Additional Information Beagle Bay Effluent Design	8 February 2018

3. Background

The Applicant has applied for a Category 54 Sewage facility works approval to construct an additional Evaporation / Infiltration pond at the BWWTP at Lot 9000 on Deposited Plan 73719 BAC.

Table 3 lists the prescribed premises categories that have been applied for.

Table 3: Prescribed Premises Categories in the Existing Licence

Classification of Premises	Description	*Approved Premises production or design capacity or throughput*
54	Sewage facility; premises – (a) on which sewage is treated (excluding septic tanks) ; or (b) from which treated sewage is discharged onto land or into waters	175m^3/day

4. Overview of Premises

4.1 Operational aspects

The BWWTP treats wastewater for the BAC which currently services a population of approximately 360 people. BAC is located 120km north east of Broome. The BWWTP is located 580m to the north west of the community; refer to Figure 1. The current BWWTP consists of a four pond system which treats wastewater to a secondary standard and has a production and design capacity to treat up to 80m^3/day. The existing WWTP consists of a HDPE lined Primary pond and two HDPE lined Secondary ponds and one unlined Evaporation / Infiltration pond. The existing WWTP consistently overflows and this discharge enters the marine environment to the north of the WWTP.

Due to the condition of the existing BWWTP the Applicant intends to refurbish the existing BWWTP and construct an additional Evaporation / Infiltration pond:

- Construction of an additional new Evaporation / Infiltration pond of an area of 5,200m^3 that includes a freeboard of 500mm;
- The existing weir in the current evaporation pond will be removed to eliminate overflows; and
- A new overflow weir will be installed in the embankment of the new Evaporation / Infiltration pond.

Figure 2 provides an overview of the existing WWTP and proposed new BWWTP. There will also be associated construction of pipelines and inlet mains etc. Construction of the new WWTP is to allow for the WWTP production and design capacity to increase from 80m^3/day to 175m^3/day to treat a balance capacity throughput of 110m^3/day to service a maximum of 525 persons. The new Evaporation / Infiltration pond will be constructed to the southwest of the existing ponds. The proposed BWWTP is not designed to discharge untreated wastewater into the environment. Discharge of treated wastewater, which has undergone primary and secondary treatment, will only occur through infiltration to land in the two Evaporation / Infiltration ponds with the new additional Evaporation / Infiltration pond creating sufficient storage capacity so that overflows from the WWTP, as currently experienced, will cease. Table 4 provides the new BWWTP Evaporation / Infiltration pond dimensions.

Table 4 New Evaporation / Infiltration BWTTP pond dimensions

	Lining	Width (m)	Length (m)	Area (m^2)	Depth (m)
Evaporation / Infiltration pond 2	None	40.0	130.0	5200	1.0

Effluent targets for the BWWTP have been based on ANZECC 1997 guidelines. Table 5 provides the BWWTP effluent quality targets.

Table 5 BWWTP effluent quality targets

Effluent Targets		
BOD_5	30 mg/L	ANZECC (1997) Category C – secondary treatment for infiltration Appendix 6
TSS	40 mg/L	
TN	50 mg/L	
TP	12 mg/L	
Eschera coli	1000 cfu/100ml	WHO (2004) guideline
Helminth eggs	<1 egg/L	

Note: *E. coli* upper limit in ANZECC (1997) is 100,000 cfu/100mL

Wastewater samples were collected and analysed on 7 September 2016 and these results are compared to effluent quality targets in Table 6. The results indicate the current WWTP is treating wastewater within quality parameters and no further works are required to improve treatment. The construction of the new Evaporation / Infiltration pond is to build storage capacity to reduce overflow of effluent into the environment as currently occurs.

Table 6 BWWTP sample results compared to quality targets

Parameter	Influent Sample	Effluent Sample	Effluent target
BOD5	47 mg/L	13 mg/L	30 mg/L
TSS	27 mg/L	<5 mg/L	40 mg/L
Ammonia - N	57 mg/L	4.7 mg/L	-
TN	59 mg/L	9.2 mg/L	50 mg/L
TP	6.0 mg/L	5.1 mg/L	12 mg/L
E. coli	4,000,000	110	1000 cfu/100ml
Helminth eggs	8	<1	<1 egg/L

Note: Helminth egg positive results as nematode larva; no Hookworm detected.

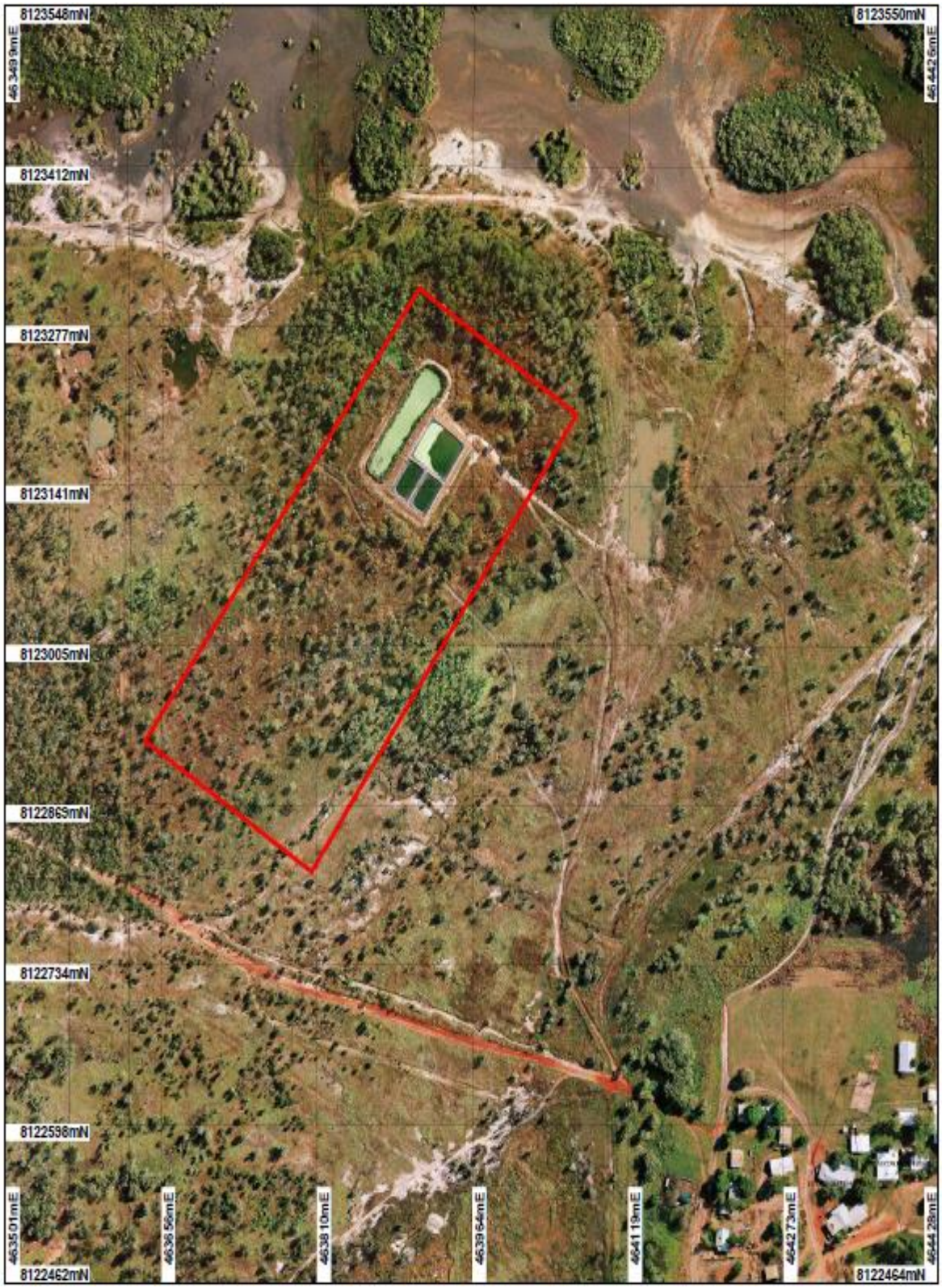


Figure 1 Beagle Bay Aboriginal Community WWTP.

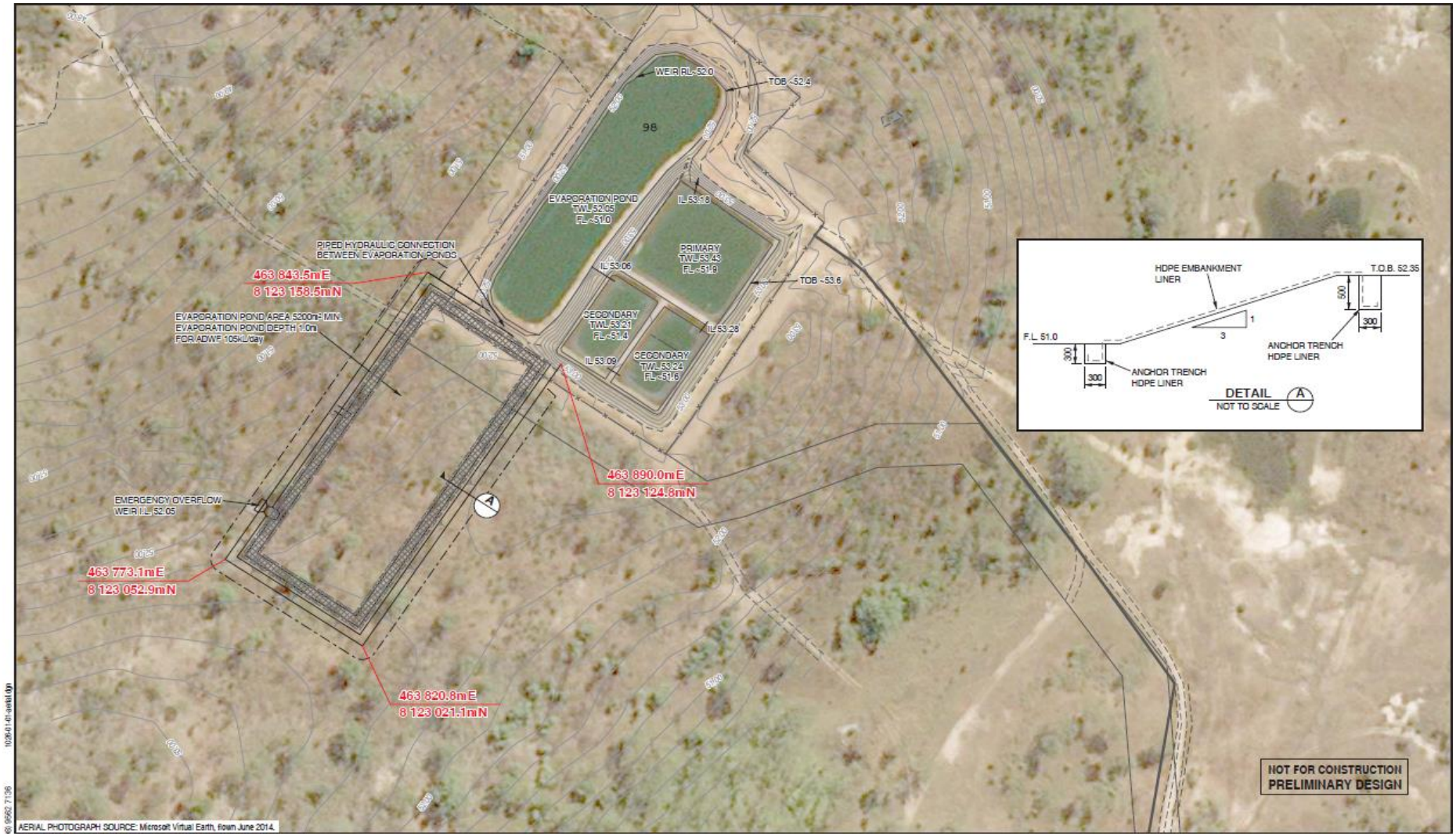


Figure 2 Existing and proposed new BWWTP

Works Approval: W6122/2018/1
File Number: DER2018/000033

4.2 Infrastructure

The sewage facility infrastructure, as it relates to Category 54 activities, is detailed in Table 7 and with reference to the Site Plan.

Table 7 lists infrastructure associated with the prescribed premises category.

Table 7: Sewage facility Category 54 infrastructure

	Infrastructure	**Site Plan Reference**
	Prescribed Activity Category 54	
Wastewater Treatment Plant		
1	Primary pond	Attachment 1 Site Plan
2	Secondary pond 1	
3	Secondary pond 2	
4	Evaporation / Infiltration pond 1	
5	New Evaporation / Infiltration pond 2	

5. Legislative context

5.1 Contaminated sites

The Premises appears to have no current classification status under the CS Act.

5.2 Other relevant approvals

5.2.1 Planning approvals

The Applicant identifies in the Application that the plan is compliant with Department of Planning / WAPC “Beagle bay Layout Plan1 (2016)” and does not require further approvals.

5.2.2 Department of Health

The Applicant identifies in the Application that the Applicant has submitted, in parallel to this application, an Application to Construct and Install Apparatus for the Treatment of Sewage to the Department of Health. Approval is pending.

5.3 Part V of the EP Act

5.3.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are:

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*

- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Publication of Annual Audit Compliance Reports (May 2016)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessments (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

5.3.2 Clearing

The Applicant applied for a concurrent Clearing Permit with the Works Approval Application.

On 13 August 2018 DWER Clearing Permit branch provided their Clearing assessment; refer to Attachment 2 and 3 for the assessment.

6. Modelling and monitoring data

6.1 Monitoring of discharges to land

The Application reports one sample frequency undertaken on 7 September 2016. Table 8 provides an overview of the monitoring results.

Table 8 BWWTP 7/09/2016 Monitoring results

Parameter	Influent Sample	Effluent Sample	Effluent target
BOD5	47 mg/L	13 mg/L	30 mg/L
TSS	27 mg/L	<5 mg/L	40 mg/L
Ammonia - N	57 mg/L	4.7 mg/L	-
TN	59 mg/L	9.2 mg/L	50 mg/L
TP	6.0 mg/L	5.1 mg/L	12 mg/L
E. coli	4,000,000	110	1000 cfu/100ml
Helminth eggs	8	<1	<1 egg/L

Note: Helminth egg positive results as nematode larva; no Hookworm detected.

Key finding:

The Delegated Officer has reviewed the information regarding Monitoring and has found:

1. *Applicant is proposing to construct a new Evaporation / Infiltration pond.*
2. *The Primary and two Secondary ponds are HDPE lined ponds and discharges to the environment will only occur from seepage from the two Evaporation / Infiltration ponds.*
3. *Effluent samples indicate treated effluent is less than WWTP design effluent targets (Table 6).*
4. *The construction is to allow a WWTP production and design capacity of 175m^3/day to treat a balance capacity throughput of 110m^3/day to service a maximum of 525 persons.*
5. *All treated wastewater is to be fully contained within the proposed BWWTP including allowance for a 1:10 ARI rainfall event.*

7. Consultation

The Application was advertised on 3 April 2018 seeking any public comment. No comments were received.

The Shire of Broome was notified of the Application on 22 March 2018. Shire of Broome provided comments in a letter dated 17 April 2018 advising that as the works are to be undertaken by or on behalf of a public utility no Development Approval is required from the Shire and the Shire does not wish to register any objections.

8. Location and siting

8.1 Siting context

The Premises is located on Lot 9000 on Deposited Plan 73719 BAC, and is located 580m north west of the Community. BAC is approximately 5-10m above sea level while the BWWTP is approximately 52m above sea level. Bobby creek is located 200m north of the WWTP and Beagle Bay is located 13km north west.

8.2 Residential and sensitive Premises

The distances to residential and sensitive receptors are detailed in Table 9.

Table 9: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Residential Premises	580m south east

8.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises. The distances to specified ecosystems are shown in Table 10. Table 10 also identifies the distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem.

The table has also been modified to align with the *Guidance Statement: Environmental Siting.*

Table 10: Environmental values

Specified ecosystems	Distance from the Premises
REWI Act Groundwater Areas	Premises lies within Canning Kimberley Proclaimed area – La Grange Groundwater Sub-area Management Plan (Draft) 2007
Biological component	**Distance from the Premises**
Threatened/Priority Fauna	1035 south east – P4 Bird – moderately certain.

8.4 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 11.

Table 11: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Coastal waterline	13km north west Beagle Bay	Recreational
Area subject to Inundation	90m north Bobby Creek tidal zone	Recreational
Water course	200m north Non-perennial Bobby Creek	Recreational
Groundwater	There are no bores located within 1000m of the WWTP based on available GIS dataset –WIN Groundwater Sites). Groundwater was not encountered with soil test pits and WWTP is 52 metres above ground level.	Water is used for potable use.

The land slopes gently to the north east towards Bobby Creek; the direction of current WWTP overflows. The overflow weir in Evaporation / Infiltration pond 1 will be removed as part of construction works and this will eliminate continued overflow to the north into Bobby Creek. An overflow weir in then be constructed in Evaporation / Infiltration pond 2 (new pond) which will direct any emergency overflow in a south westerly direction and away from the marine environment.

BAC resides within a region that is Cyclone prone region. BAC is approximately 4-10m above sea level but the BWWTP is located approximately 52m above ground level, which is the highest point in the immediate landscape, so the area surrounding the WWTP is prone to inundation from extreme rainfall events.

8.5 Soil type

DWER's GIS identifies the soil class as Coastal plains mainly beyond marine flooding influence: main soils are pedal calcareous earths (Gc2.22) with some associated highly calcareous earths (Gc1.12). On the seaward side are firstly samphire flats (Gc1.1) and then bare saline mud (Uf). Calcareous dunes (Uc1.11) commonly occur on the seaward edge of the plains. Occurs on sheet(s): 6,9

As part of the Application a geotechnical investigation was conducted by Local Geotechnics (January 2016) for the purpose of the BWWTP upgrade. The investigation included 12 test pits (TP29-TP40) in the planned WWTP expansion area; refer to figure 4 for an overview of the pit locations. Test pits where drilled to the target depth of 1.5m were possible. All soils were moist in the first stratum (0.4-0.5m) and occasionally moist or slightly moist at the lower stratum to 1.5m depth. The water table was not encountered in any test pit which was drilled to 1.5m depth. Test pit TP32 was laboratory tested as 86% sand, 14% non-plastic fines (silt) and the samples were poorly graded and almost no soil passed 2.36mm. Permeability testing results indicate permeability K_{20} = 1.25 x 10^{-7} m/s at 95%MMDD. Sandy soils have a high infiltration rate and water readily filters into the underlying strata and any overflow or infiltration

that seep into the soil will be filtered through physical, chemical and biological process to remove constituents in the effluent.

Figure 4 Test pit locations

9. Risk assessment

9.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

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. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Table 12 and 13.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Tables 12 and 13 below.

Table 12: Identification of emissions, pathway and receptors during construction

Risk Events						Continue to detailed Risk Assessment	Reasoning
Sources/Activities		Potential Emissions	Potential Receptors	Potential Pathway	Potential Adverse Impacts		
Construction, mobilisation and positioning of infrastructure	Vehicle movements when constructing and refurbishing new ponds	Noise from movement of heavy and light vehicles	Residential premises: 580m south east	Air / wind dispersion	Amenity impacts causing nuisance	No	The construction works are scheduled for 8 weeks only. Hours of work are 7am to 5pm excluding Sunday and Public holidays. Community will be advised prior to works commencing. Noise Management Plan submitted which states as part of Tender the Contractor must comply with the EP Noise Regs. The Delegated Officer has considered the separation distance between the source and receptors as a guide to inform the risk of noise emissions as not forseeable. Noise can be adequately regulated by the EP Noise Regs.

Risk Events						Continue to detailed Risk Assessment	Reasoning
Sources/Activities		Potential Emissions	Potential Receptors	Potential Pathway	Potential Adverse Impacts		
		Dust from movement of heavy and light vehicles	Residential premises: 580m south east	Air / wind dispersion	Health and amenity impacts - Potential suppression of photosynthetic and respiratory functions	No	The Applicant will employ a water cart to manage dust lift off and all areas will be watered down prior to excavation activities; so dust emissions will be limited. Dust management is stipulated as part of Tender for the Contractor The Delegated Officer has considered the separation distance between the source and receptors as a guide to inform the risk of dust emissions as not forseeable. Dust can be adequately regulated by section 49 of the EP Act.

Table 13: Identification of emissions, pathway and receptors during operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
Wastewater Treatment Plant	Operation of treatment ponds	Noise from operation of ponds and movement of light vehicles	Residential premises: 580m south east	Air / wind dispersion	Amenity impacts causing nuisance	No	There will only be very limited access to the BWWTP once operational so vehicle movement will be restricted and infrequent. The Delegated Officer considers the separation distance between the source and receptors as adequate to inform the risk of noise emissions as not foreseeable. Noise can be adequately regulated by the EP Noise Regs.
		Dust from movement of vehicles	Residential premises: 580m south east	Air / wind dispersion	Health and amenity impacts - Potential suppression of photosynthetic and respiratory functions	No	There will only be very limited access to the BWWTP once operational so vehicle movement will be restricted and infrequent. The Delegated Officer considers the separation distance between the source and receptors as adequate to inform the risk of dust emissions as not foreseeable. Dust can be adequately regulated by section 49 of the EP Act.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	Seepage	Treated effluent seepage from infiltration ponds to groundwater	Groundwater dependent ecosystems, subterranean fauna Groundwater was not encountered with soil test pits and WWTP is 52 metres above ground level.	Direct discharge	Land and groundwater – direct infiltration into soil and groundwater.	Yes	See section 9.4
	Treatment of sewage	Odour	Residential premises: 580m south east	Air / wind dispersion	Amenity impacts causing nuisance	No	The Delegated Officer considers the separation distance between the source and receptors as adequate to inform the risk of odour emissions as not foreseeable. Odour can be adequately regulated by section 49 of the EP Act.
	Sewage pond	Overtopping of ponds resulting in sewage discharge to land	Vegetation adjacent to discharge area	Direct discharge land and surface waters	Soil contamination inhibiting vegetation growth and survival Surface water contamination	Yes	See section 9.5

9.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 14 below.

Table 14: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 15 below.

Table 15: Risk criteria table

Likelihood		**Consequence**		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		**The following criteria has been used to determine the consequences of a Risk Event occurring:**		
			Environment	**Public health* and amenity (such as air and water quality, noise, and odour)**
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **onsite impacts**: mid-level • **offsite impacts local scale**: low level • **offsite impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*
"onsite" means within the Prescribed Premises boundary.

9.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 16 below:

Table 16: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

9.4 Risk Assessment – Seepage of treated effluent

9.4.1 Description of Operation- Seepage of treated effluent

The BWWTP will receive untreated sewage from the BAC sewerage infrastructure for treatment at the WWTP. Seepage of treated effluent will occur within the two Evaporation / Infiltration ponds. Seepage of treated effluent has the potential to infiltrate into groundwater beneath the WWTP. Any seepage of treated effluent has the potential to increase nutrients into the environment which can cause degradation of the environment or nitrification.

9.4.2 Identification and general characterisation of emission

The type of emission is direct discharge of treated wastewater from the ponds. The WWTP has a new design and production capacity of 175m^3/day to service a throughput of 110m^3/day with a large percentage of this volume infiltrating into the environment which would constitute treated sewage with low nutrient concentration(s). The frequency of seepage will be continuously daily.

9.4.3 Description of potential adverse impact from the emission

Alteration to groundwater that has the potential to disrupt ecological processes of groundwater with excess nutrients. Soil contamination may inhibit vegetation growth and cause health impacts to fauna.

9.4.4 Criteria for assessment

Relevant land and groundwater quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999;
- ANZECC & ARMCANZ (2000) – freshwater and marine waters criteria; and
- DoH 2011 – non-potable groundwater use.

9.4.5 Applicant controls

The BWWTP has a new design and production capacity of 175m^3/day to service a throughput of 110m^3/day. The capacity of the new BWWTP has been designed to cater for a population increase of up to 525 (current population of 360) and includes capacity for a 1:10 ARI rainfall event including a freeboard of 500mm.

9.4.6 Key findings

The Delegated Officer has reviewed the information regarding seepage and has found:

1. The WWTP has a new design and production capacity of 175m^3/day to service a throughput of 110m^3/day.
2. WWTP design includes inflow for a 1:10 ARI rainfall event including a freeboard of 500mm.
3. Treated effluent will only be discharged from the two Evaporation / Infiltration ponds via seepage; the new WWTP is not design to allow overflow.
4. Treated effluent samples indicate treated wastewater parameters will be less that respective effluent targets (Table 6).
5. The WWTP is approximately 52 metres above ground level.

9.4.7 Consequence

When seepage occurs, then the Delegated Officer has determined that the impact of seepage will be low level on-site impacts, minimal off-site impacts with Specific Consequence Criteria likely to be met. Therefore, the Delegated Officer considers the consequence of seepage to be **Minor**.

9.4.8 Likelihood of Risk Event

The Delegated Officer has determined that impacts from seepage could occur at some time. Therefore, the Delegated Officer considers the likelihood of Risk Event to be **Possible.**

9.4.9 Overall rating of seepage

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 15) and determined that the overall rating for the risk of seepage is **Medium**.

9.5 Risk Assessment – Overtopping of ponds

9.5.1 Description of Operation- Overtopping of ponds

The ponds will receive untreated sewage from the BAC sewerage infrastructure for treatment at the WWTP. Overtopping of the ponds could occur during normal operating procedures and in extreme rainfall events (cyclones and large storms) which occur in the region. Any overtopping has the potential to directly discharge untreated sewage into the vegetation adjacent to the treatment pond(s). Any overflow of untreated sewage has the potential to increase nutrients into the environment which can cause degradation of the environment or nitrification.

9.5.2 Identification and general characterisation of emission

The type of emission is direct discharge of untreated/treated wastewater from the ponds. The BWWTP has a new design and production capacity of 175m^3/day to service a throughput of 110m^3/day and depending on the type of incident (cyclone for example) a large percentage of this volume could overtop into the environment which would constitute untreated sewage high in nutrient concentration(s). It is however anticipated that the frequency of overtopping will be very low to rare and generally only for a short duration; maximum of weeks in a cyclone for example if it occurred and the wastewater will be heavily diluted.

9.5.3 Description of potential adverse impact from the emission

Soil contamination may inhibit vegetation growth and cause health impacts to fauna. Potential impacts include eutrophication of fresh waters if untreated sewage was to enter the freshwater environment.

9.5.4 Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999;
- ANZECC & ARMCANZ (2000) – freshwater and marine waters criteria; and
- DoH 2011 – non-potable groundwater use.

9.5.5 Applicant controls

The BWWTP has a new design and production capacity of 175m^3/day to service a throughput of 110m^3/day. The capacity of the new BWWTP has been designed to cater for a population of 525 people (current population is 360) and a 1:10 ARI rainfall event including a freeboard of 500mm.

9.5.6 Key findings

The Delegated Officer has reviewed the information regarding overtopping and has found:

1. Bulk storage capacity for population of 525 includes upgrading the WWTP to a new production and design capacity of 175m^3/day to service a 110m^3/day throughput.
2. WWTP design includes inflow for a 1:10 ARI rainfall event including a freeboard of 500mm.
3. The WWTP design indicates treated wastewater parameters will less that respective effluent targets (Table 6).
4. In extreme rainfall events (1 in 10 year 72 hour rainfall event) it is unlikely that overflow from the ponds will reach the marine environment at Bobby creek 200m north.
5. BAC resides within a Cyclone prone region but the WWTP sits in the highest point in the immediate landscape 52m above ground level; however the area is likely prone to inundation from extreme rainfall events.

9.5.7 Consequence

If overtopping occurs, then the Delegated Officer has determined that the impact of overtopping will be low level on-site impacts, minimal off-site impacts with Specific Consequence Criteria likely to be met. Therefore, the Delegated Officer considers the consequence of overtopping to be **Minor**.

9.5.8 Likelihood of Risk Event

The Delegated Officer has determined that overtopping could occur at some time. Therefore, the Delegated Officer considers the likelihood of Risk Event to be **Possible.**

9.5.9 Overall rating of overtopping

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 15) and determined that the overall rating for the risk of overtopping is **Medium**.

9.6 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 17 below. Controls are described further in section 10.

Table 17: Risk assessment summary

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
1.	Seepage of wastewater	Sewage ponds	Infiltration to land and groundwater environment causing impacts on soil /vegetation and water quality.	Infrastructure and management controls.	Minor consequence Possible **Medium risk**	Acceptable subject to proponent controls conditioned / outcomes based controls
2.	Overtopping of wastewater	Sewage ponds	Overtopping to land and aquatic environment causing impacts on soil /vegetation and water quality.	Infrastructure and management controls.	Minor consequence Possible **Medium risk**	Acceptable subject to proponent controls conditioned / outcomes based controls

10. Regulatory controls

A summary of regulatory controls determined to be appropriate for the Risk Event is set out in Table 18. The risks are set out in the assessment in section 9 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed by the Applicant. The conditions of the Licence will be set to give effect to the determined regulatory controls.

Table 18: Summary of regulatory controls to be applied

		Controls **(references are to sections below, setting out details of controls)**
		10.1.1 Infrastructure and equipment
Risk Items (see risk analysis in section 9)	**1. Seepage**	●
	1. Overtopping	●

10.1 Works Approval and Licence conditions

Works Approval condition 1 of the Works Approval is to allow the Works Approval Holder to refurbish the existing WWTP and construct the new Evaporation / Infiltration pond and related pipework and weirs etc according to the specification outlined in condition 1. Works Approval condition 2 allows for minor departures if required. Works Approval condition 3 requires a construction compliance document be submitted by the Works Approval Holder to the CEO to ensure construction occurred with no material defects. Works Approval condition 4 requires the construction compliance document to identify and departures for works consistent with condition 2.

Clearing of 0.83 hectares is allowed under condition 5, Schedule 4 Plan.

The Applicant has not applied for a Licence however this assessment indicates the following conditions may be applicable in the event an application is submitted.

10.1.1 Infrastructure and equipment

Licence condition on Licence that ensures infrastructure and equipment specified is maintained in good working order.

Licence condition on the Licence that only allows sewage to be authorised to be accepted onto the premises with specific acceptance limits for the waste.

11. Determination of Works Approval and Licence conditions

The conditions in the issued Works Approval have been determined in accordance with the *Guidance Statement: Setting Conditions*.

The *Guidance Statement: Licence Duration* has been applied and the issued licence expires in 3 years from date of issue.

Table 19 provides a summary of the conditions to be applied to this works approval.

Table 19: Summary of conditions to be applied

Condition Ref	Grounds
Infrastructure and Equipment 1, 2, 3, 4 and 5	These conditions are valid, risk-based and contain appropriate controls.
Emissions 6	This condition is valid, risk-based and consistent with the EP Act.
Record-keeping 7 and 8	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the works approvals under the EP Act.

12. Applicant's comments

The Applicant was provided with the draft Decision Report and draft issued Works Approval on 20 August 2018. Refer to Appendix 2 for response and comments.

13. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

Based on this assessment, it has been determined that the Works Approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Stephen Checker

Digitally signed by Stephen Checker
Date: 2018.09.28 16:45:18 +08'00'

Stephen Checker
MANAGER WASTE INDUSTRIES
Delegated Officer
under section 20 of the *Environmental Protection Act 1986*

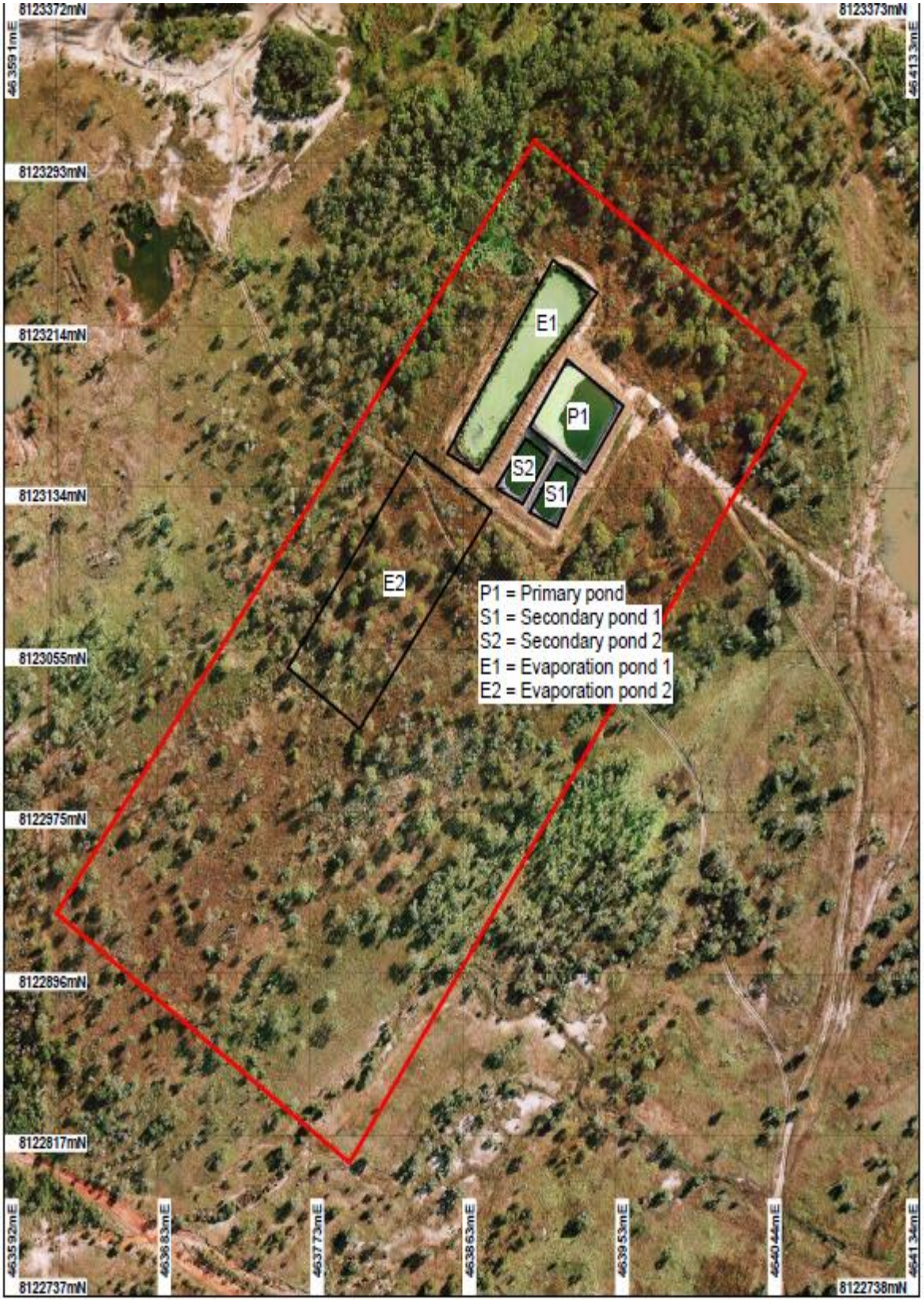
Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Desktop Environmental Risk Assessment, Beagle Bay Wastewater Treatment Pond Upgrade and Disposal, Prepared for Housing Authority, February 2017, Anders Environmental Consulting	Application	DWER records (A1595659)
2.	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
3.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
4.	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	DER 2016a	
5.	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2016b	
6.	DER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER 2016c	

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder comment	DWER response
Condition 2 table 2	'embankment walls (including anchor) must be GCL lined with a permeability of less than 10^{-9}m/s' No lining of the evaporation pond is required for environmental protection purposes. The HDPE lining was considered in the preliminary design as an embankment protection but could also be installed as 50mm – 130mm rock armour. This will be determined in detailed design	Comment accepted and Works Approval and Decision Report changed to reflect this change.

Attachment 1: Site Plan



Attachment 2: Clearing permit assessment report

Government of Western Australia
Department of Water and Environmental Regulation

Assessment Report

1. Application details

1.1. Permit application details

Permit application No.: 8018/1
Permit type: Works Approval / Licence Assessment

1.2. Applicant details

Applicant's name: Department of Communities

1.3. Property details

Property: Lot 9000 on Plan 73719, Dampier Peninsula
Local Government Authority: Broome, Shire of

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.83	-	Mechanical Removal	Waste disposal/management

1.5. Site Information

Clearing Description
The application is to clear 0.83 hectares of native vegetation within Lot 9000 on Plan 73719, Dampier Peninsula, for the purpose of upgrading the existing waste water treatment plant (figure 1). The current facility consists of a single evaporation pond which overflows into the surrounding environment. The facility services the remote aboriginal community of Beagle Bay.

Vegetation Description
The application area is mapped within the Dampierland Beard vegetation association 67, which is described as Grasslands, tall bunch grass savanna, sparse low tree; ribbon grass and paperbarks (Shepherd et al, 2001).

Vegetation Condition
Good; Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

The condition of the vegetation was determined through digital aerial imagery.

Comment
The local area is defined as a 10 kilometre radius measured from the perimeter of the application area.

Figure 1: Area applied to clear.

2. Avoidance and minimisation

In order to minimise environmental impacts associated with clearing, the applicant has commissioned an Environmental Management Plan that recommends:

- preparation of a weed management plan prior to construction;
- avoidance of trees where possible; and
- weed control within the overflow area following a greater than one in ten year storm event.

3. Assessment of application against clearing principles

The vegetation under application is defined within section 2 as Grasslands, tall bunch grass savanna, sparse low tree, ribbon grass and paperbarks. The application area occurs adjacent to the existing waste facility within a slight rise in the landscape (Anders Environmental Consulting, 2017).

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The local area surrounding the application area retains approximately 98 per cent native vegetation. The mapped Beard vegetation association retains approximately 99 per cent of its pre-European vegetation extent (Government of Western Australia, 2017). The waste water treatment plant (WWTP) is surrounded by native vegetation. As the mapped Beard vegetation association and the local area retain above the 30 per cent threshold, the application area is not considered to represent a significant remnant in an extensively cleared area.

Although the application area occurs 150 metres south of a wetland environment, no watercourses or wetlands have been mapped within the application area. Given this and as the WWTP is situated on a slight rise in the landscape, riparian vegetation is not likely to be impacted. It is also noted that the proposed upgrade is designed to reduce current impacts to riparian vegetation.

The application area is mapped within the Department of Biodiversity Conservation and Attractions (DBCA) Priority Ecological Community (PEC), 'Kimberley Vegetation Association 67', listed as Priority 3 by DBCA. The occurrence within which the application area is present covers 1,616 hectares. Priority 1, 2 and 3 ecological communities are defined as possible threatened ecological communities that do not meet survey criteria or that are not adequately defined. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status. Given the large area of the mapped ecological community, the position of the application area adjoining disturbance, the large amount of vegetation directly adjoining the application area, and the application area only representing less than 0.01 percent of the PEC's occurrence; the proposed clearing is not likely to significantly impact this PEC.

According to available datasets, a total of 12 Priority (P) flora taxa have been recorded within the local area. Noting the position of the application area adjacent to disturbance, the amount of contiguous adjoining vegetation, and small size of the proposed clearing, the application area is not likely to contain suitable habitat for conservation significant flora.

One threatened fauna species (Bilby, *Macrotis lagotis*) and one Priority 4 fauna species (*Gouldian Finch, Erythrura gouldiae)* has been recorded within the local area. Noting the position of the application area adjacent to disturbance, the amount of contiguous adjoining vegetation, as nesting habitat for the Bilby is not present within the application area and the extent of known habitat for the Gouldian Finch; the application area is not likely to be significant habitat for endemic fauna.

No threatened ecological communities (TEC) or threatened flora has been recorded within the local area. Given this, the position of the application area adjoining current disturbance and the amount of similar habitat directly surrounding the application area, the proposed clearing is not likely to contain a high biodiversity, impact on significant fauna habitat, impact on a TEC or rare flora and the vegetation under application is not likely to be significant within the local area.

Given the relatively small clearing area proposed, the extent of adjoining vegetation, as the cleared area will be maintained as an evaporation pond and as no watercourses or wetlands are present within the application area; the proposed clearing is not likely to deteriorate ground water or surface water quality, cause or exacerbate land degradation or exacerbate the intensity of flooding. The closest conservation reserve is located 50 kilometres from the application area and is therefore, not likely to be impacted by the proposed clearing.

Given the above, the proposed clearing is not likely to be at variance to any of the clearing principles.

4. Planning instruments and other relevant matters

Clearing permit application CPS 4761/1 has previously been granted over the application area for development of the waste water treatment facility. The clearing was not undertaken and CPS 4761/1 has since expired.

CPS 4761/1 was not found to be at variance to any of the clearing principles.

The application area is located within the Aboriginal Site of Significance 'Bobby Creek'. The works approval holder is required to comply with their requirements under the *Aboriginal Heritage Act 1972*.

The application area falls within the Canning-Kimberley Groundwater Area under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The works approval holder is required to comply with their requirements under the RIWI Act.

The Shire of Broome advised that as the works are to be undertaken by or on behalf of a public utility, Development Approval is not required (Shire of Broome, 2018).

5. Recommendation

Recommendation

An assessment of the environmental impacts of the proposed clearing has been undertaken in accordance with DWER's Regulatory Principles, taking into consideration the clearing principles contained in Schedule 5 of the EP Act. Section 62(1) of the EP Act provides for conditions to be placed on a works approval to prevent, control, abate or mitigate pollution or environmental harm. Recommended conditions are as follows:

1. Clearing authorised

The works approval holder shall not clear more than 0.83 hectares of native vegetation within the area cross-hatched yellow on attached Plan 8018/1.

Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

13 August 2018

6. References

Anders Environmental Consulting (2017) Desktop Environmental Risk Assessment Beagle Bay Wastewater Pond Upgrade and Disposal. Housing Authority Western Australia. February 2017. DWER ref: A1595651.

Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.

Government of Western Australia (2017) 2016 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2018. WA Department of Parks and Wildlife, Perth.

Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

Shire of Broome (2018) Works Approval Referral to Shire of Broome regarding propsoed upgrades to Beagle Bay Waste Water Treatment Plant, Beagle Bay. DWER Reference: A1657201.

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

GIS datasets

- Aboriginal Sites of Significance
- Conservation estate
- DPIRD Land degradation risk categories
- Pre-European vegetation
- RIWI Act, Groundwater Areas
- Threatened and Priority ecological communities
- Threatened and Priority flora
- Vegetation extent
- WA Herbarium

Attachment 3: Clearing permit Plan