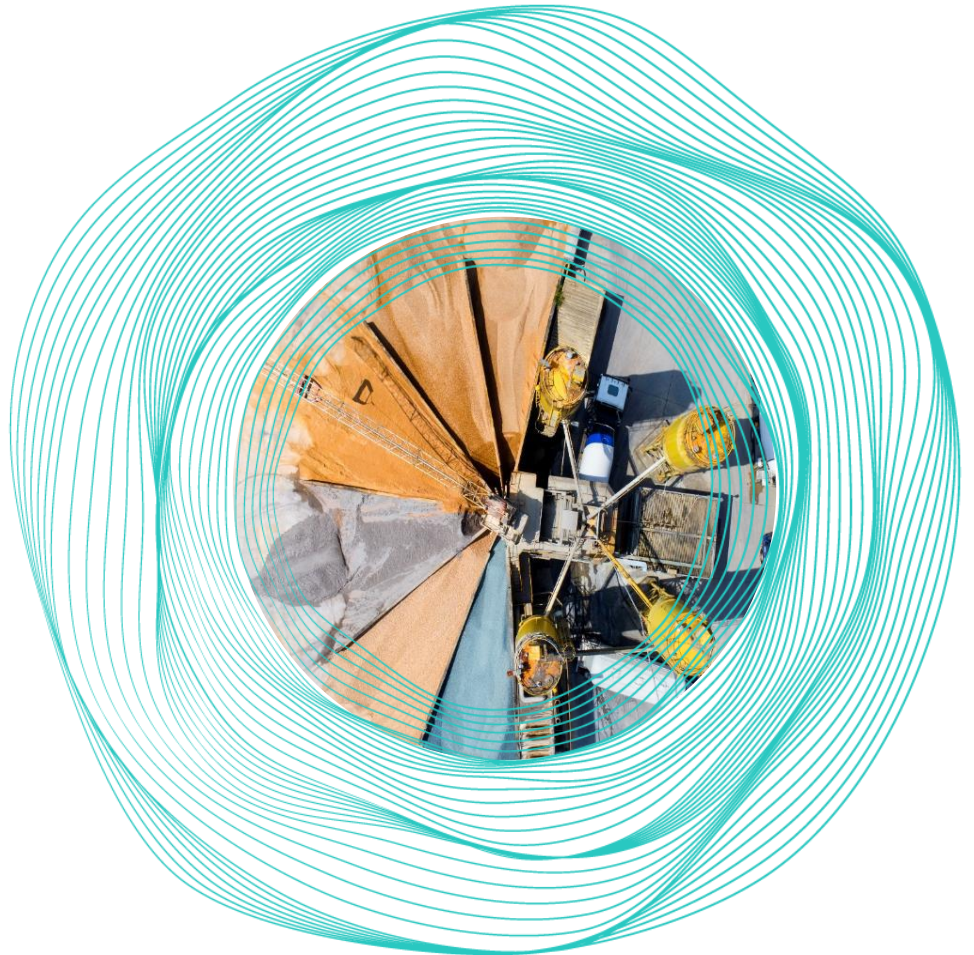




RATCH-AUSTRALIA KEMERTON PTY LTD

Kemerton Power Station Increased Operating Capacity

Referral Supporting Information Document



13 March 2023

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Executive summary

RATCH-Australia Kemerton Pty Ltd (RATCH) owns the Kemerton Power Station (KPS), located in the Kemerton Strategic Industrial Area (KSIA), approximately 22 km northeast of Bunbury in the southwest of Western Australia. The construction and operation of KPS were approved under Ministerial Statement 645 (MS 645) in 2004. The Proposal is to increase the approved operating capacity of KPS from 2,000 hours per year to 13,800 hours per year in order to provide required additional electricity generation capacity on the South West Interconnected System (SWIS).

The SWIS, which is the main electricity grid in Western Australia is undergoing significant changes, including forecast increases in demand on the network, the increase of intermittent renewable electricity generation capacity, and the imminent closure of coal power plants in Western Australia. These factors have resulted in a predicted shortfall in reserve capacity on the SWIS in the short to medium term.

The Proposal will provide security and stability, and required additional capacity on the SWIS in the short to medium term, during the period between coal fired power plants coming offline and the predicted significant increase in renewable generation capacity on the network. Increasing the operating capacity of the existing KPS facility avoids the potential environmental impacts associated with the development of new electricity generation facility, and the associated timeframes that would accompany the design, regulatory assessment and development of a new facility.

Environmental impacts associated with the Proposal were assessed against the EPA Statement of Environmental Principles, Factors and Objectives (Ref: 27). Greenhouse gas (GHG) emissions from the Proposal will exceed the EPA significant assessment threshold of 100,000 tonnes of CO₂-e per annum. GHG emissions have been identified as the single key environmental factor for the Proposal. As such, a GHG Management Plan for the Proposal has been prepared in line with the EPA Factor Guideline for GHG emissions (Ref: 20).

While the operation of KPS does produce GHG emissions, the Proposal has a lower emissions intensity than the coal fired power plants which have been earmarked to be decommissioned in order to achieve the State Governments ambition of net zero emissions by 2050. In the medium to long term, operation of KPS is anticipated to decrease in line with the predicted addition of renewable generation capacity on the SWIS. The Proposal therefore supports the long term transition of the SWIS to a predominantly renewables based grid, and the State Governments ambition of net zero emissions by 2050.

The Proposal represents a significant amendment to the existing MS 645 and is therefore being referred to the Environmental Protection Authority (EPA) under Section 38 of the *Environmental Protection Act 1986* (EP Act).

This referral supporting information document provides supporting information for the referral of the Proposal under Section 38 of the EP Act.

List of abbreviations

Abbreviation/term	Definition
AEMO	Australian Energy Market Operator
CSEP	Community and Stakeholder Engagement Plan
DBNGP	Dampier to Bunbury Natural Gas Pipeline
EP Act	Environmental Protection Act 1986 (WA)
GWh	gigawatt hours
KIP	Kemerton Industrial Park
km	Kilometer
KPS	Kemerton Power Station
KSIA	Kemerton Strategic Industrial Area
kL	kilolitre
kt	kilotonne
Kv	kilovolt
LGA	Local Government Area
MW	Megawatt
NM VOC	Non-methane volatile organic compound
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997</i>
PAH	Polycyclic aromatic hydrocarbons
PJ	petajoules
RATCH	RATCH-Australia Kemerton Pty Ltd
RATCH Group	RATCH Group PCL
CO₂-e	CO ₂ equivalent
WA	Western Australia
WEM	Wholesale Electricity Market
µg/m³	Microgram per square meter

1. Introduction

RATCH-Australia Kemerton Pty Ltd (RATCH, the Proponent) owns the Kemerton Power Station (KPS), located within the Kemerton Strategic Industrial Area (KSIA), approximately 22 kilometres (km) northeast of Bunbury, in the southwest of Western Australia (WA) (Figure 1-1). The KPS is a 260 Megawatt (MW) open cycle gas powered peaking power plant. The construction and operation of the KPS was approved under Ministerial Statement 645 (MS 645), which was published on 9 February 2004.

RATCH is seeking to increase the operating capacity of the KPS from 2,000 hours per annum to 13,800 hours per annum (the Proposal). The Proposal represents a significant amendment to the operation of the KPS, as documented in Schedule 1 (Attachment 6) of MS 645.

Due to a range of factors including the phase out of coal fired power plants in Western Australia (WA), the electrification of industry and homes, and the variable supply of renewable electricity available on the Wholesale Electricity Market (WEM), the Australian Energy Market Operator (AEMO) predicts an increase in unserved energy on the WEM and have highlighted the urgency of increasing generation capacity on the South West Interconnected System (SWIS). The Proposal will provide security and reliability to the WEM over the short to medium term, with utilisation of the KPS anticipated to decrease in the medium to long term in line with the addition of renewable generation capacity on the SWIS.

The Proposal relates only to increasing the operational capacity of the KPS and does not involve any clearing, development, construction or changes to existing equipment or infrastructure approved under MS 645.



Figure 1-1: Regional location

1.1 Purpose and scope

The Proposal represents a significant amendment to Schedule 1 (Attachment 6) of MS 645. Section 40AA of the *Environmental Protection Act 1986 (WA)* (EP Act) states that the Environmental Protection Authority (EPA) must assess a significant amendment in the context of an approved proposal and have regard to the combined effect that the implementation of the approved proposal and the significant amendment might have on the environment. As such, RATCH is referring the Proposal under Section 38 of the EP Act.

This Referral Supporting Information Document (the/this document) has been prepared to provide supporting information for the referral of the Proposal to the Environmental Protection Authority (EPA) under Section 38 of the EP Act. The intent of the document is to enable the EPA to determine if environmental impact assessment is required under Part IV of the EP Act and if so, to determine the level of assessment for the Proposal. The following guidance was considered in the preparation of this document:

- Instruction on how to prepare an Environmental Review Document (Ref: 23)
- Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual (Ref: 26)

1.2 Proponent details

The Proponent for the Proposal is RATCH-Australia Kemerton Pty Ltd (RATCH), a subsidiary of RATCH-Australia Corporation Pty Ltd. RATCH-Australia is an independent power producer with a 1.28 GW portfolio in Australia, comprising two gas-fired power stations, seven wind farms, two solar farms and a battery facility.

RATCH-Australia is part of the RATCH Group which owns power generation assets in Thailand, China, Indonesia and Laos, with further capacity under construction or in development throughout South-East Asia. The RATCH Group aims to become a leading value-orientated energy and infrastructure company in the Asia Pacific region.

The KPS is operated by Worley Power Services (WPS).

Proponent	RATCH-Australia Kemerton Pty Ltd
ACN	106 619 112
Address	Level 7, 111 Pacific Highway, North Sydney NSW, 2060
Contact details	Micheal Denham (KPS Plant Manager) (Worley Power Services) Micheal.Denham@worley.com (08) 9726 9350

2. Proposal

2.1 Background

The KPS is a 260 MW open cycle gas powered peaking power plant located within the KSIA, approximately 22 km northeast of Bunbury, in the southwest of WA. The KPS is owned by RATCH and operated by Worley Power Services (WPS).

The construction and operation of the KPS was approved under MS 645, which was published on 9 February 2004. The KPS commenced operation as a peaking power plant 2005, operating only during periods of high demand and providing essential system services to the SWIS. In line with increased demand for electricity and associated services provided by the KPS since its initial publication, MS 645 has undergone seven amendments under Section 45C of the EP Act, as detailed in Section 2.4.1.

2.2 Location

The KPS is located at 505 Treasure Road, Wellesley, WA, 6233. It is situated in the north eastern extent of the KSIA, approximately 22 km northeast of Bunbury, in the southwest of Western Australia WA. The KSIA is situated in the Shire of Harvey Local Government Area (LGA). It is the largest Strategic Industrial Area in the south west of WA, comprising 2,025 ha of Industrial Land, a 293 ha support area and an industry buffer of 5,473 ha (Ref: 5). The KSIA is connected to major roads, power and gas networks and is located 17 km northeast of the Bunbury Port. The regional location of the KPS is presented in Figure 1-1 and the Proposal is shown in Figure 2-1.

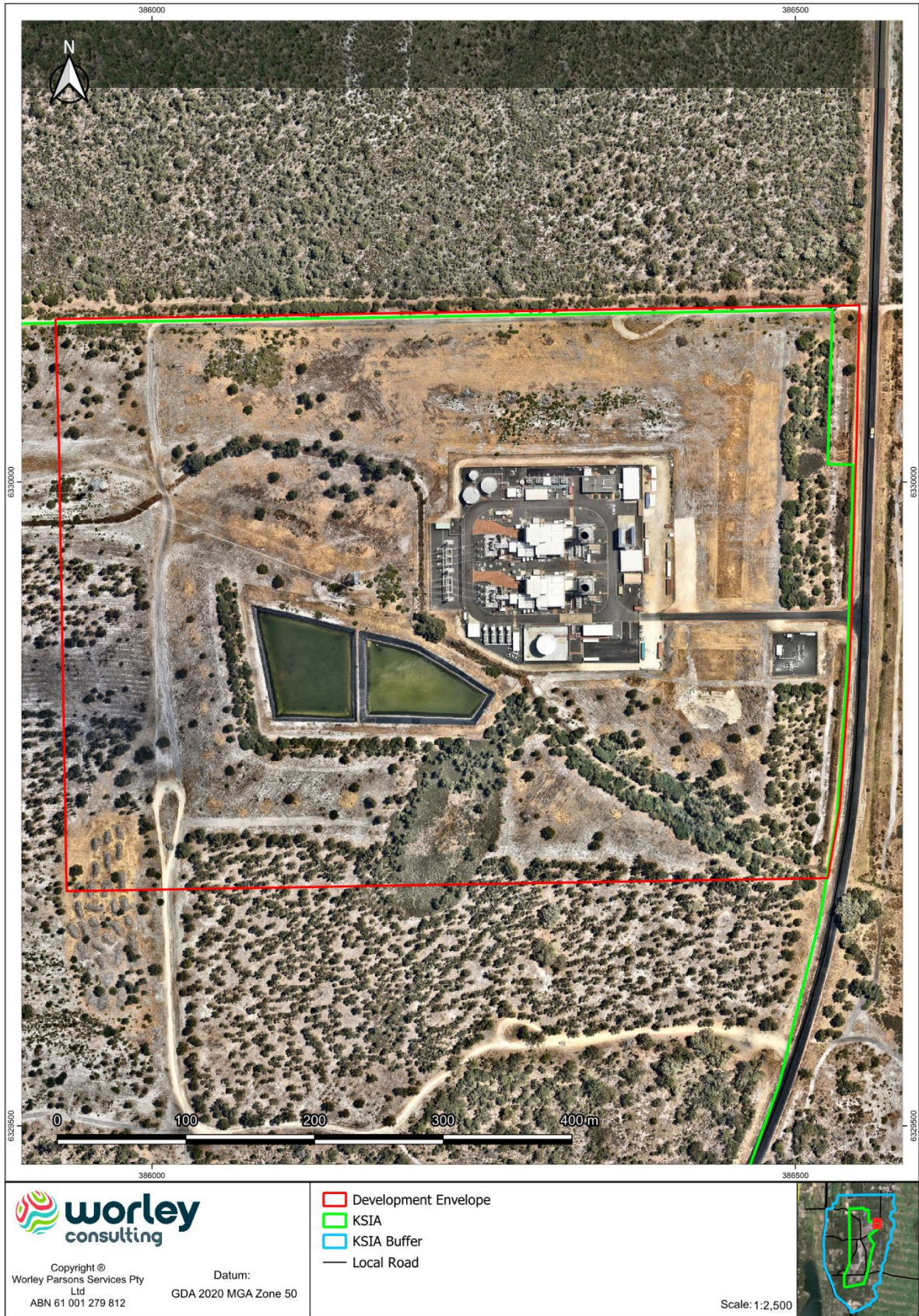


Figure 2-1: KPS location

2.3 Proposal description

RATCH is seeking to amend the approved operational quantities/descriptions of the KPS, as stated in Schedule 1 (Amendment 6) of MS 645. The Proposal represents a significant amendment to an approved proposal. The approved proposal, Kemerton Power Station, is described in Section 2.3.1, and a description of the Proposal is provided in Section 2.3.2.

2.3.1 Kemerton Power Station

RATCH-Australia (then Transfield Services) was selected through a competitive tendering process to construct and operate a peaking power station to assist Synergy (formally Verve Energy and before that Western Power) in meeting forecasted power generation needs for the South West Interconnected System (SWIS).

The KPS was referred to the EPA in 2003, and its construction and operation were approved under MS 645 in 2004 (refer to Section 0).

The KPS is a 260 MW open cycle gas powered peaking plant located in the KSIA. The facility commenced operation on 1 November 2005, after obtaining approval to be constructed and operated under MS 645. MS 645 has been amended a number of times, as detailed in Section 2.4.1.

The KPS consists of the following key infrastructure and equipment:

- 2 x 130.5 Megawatt (MW) Siemens V94.2 open cycle air-cooled gas turbine generators
- standby liquid fuel storage (2 Megalitres (ML) of ultra low sulphur diesel)
- ancillary buildings and infrastructure

The KPS operates predominantly using natural gas, with ultra low sulphur diesel used as a back up liquid supply where gas is not available – the dual fuel capability of the KPS means either fuel type can be used alternately. Gas is supplied to the KPS via a 4.94 km lateral branch from the Dampier to Bunbury Natural Gas Pipeline (DBNGP). Electricity produced by the KPS is exported to the SWIS via a 2 km 330 kilovolt (kV) transmission line to a 330 kV grid connection.

The KPS operates under two operating modes. The first mode (Mode 1) equates to operating approximately 10% of the time when periods of high demand occur. The second (Mode 2), spinning reserve, occurs when the plant is operating at very low load on gas in anticipation of times when high demand is likely to occur, such as when high summer temperature conditions give rise to high air conditioning use and associated increased electricity consumption loads. The spinning reserve mode equates to operating for 20% of the time at 55% load.

Each of the two off-board combustion chambers is equipped with Hybrid Burners, Patent Award 1986, developed by Siemens Power Generation. The burners technology is called Dry Low NOx. The essential difference, compared to conventional burners, is the capability of achieving low NOx and minimal CO emissions without water or steam injection.

By employing hybrid burners, gas turbines fired with natural gas can be operated in the load range from 50% to 100% base load with very low NOx emissions. Each of the gas turbines is fitted with a wet compression system. The wet compression is a process in which a large

quantity of water, in the form of fine droplets, is sprayed into the compressor inlet of a gas turbine. An inter-cooling effect is achieved as the water evaporates within the blade path of the compressor and cools the compressed air. The cooler denser air requires less energy to compress and this energy saving results in an increase in the efficiency and power output of the gas turbine.

In the event that the SWIS were to experience a major interruption or System Black event, the KPS is one of only three facilities on the SWIS that can be considered to restart the System. AEMO currently has a contract with KPS for the provision of a System Restart Service.

KPS approved operational extents under schedule 1 (Attachment 6) of MS 645 are shown in Table 2-1.

Element	Quantities/Description	
Energy generated per year	Approximately 480 Gigawatt hours (GWh)	
Plant operating modes	Mode 1 - Peaking plant for 10% of the time at 100% load	
	Mode 2 Spinning reserve for 20% of the time at 55% load	
Operating hours	2,000 hours per year	
Capacity factor	Approximately 21%	
Natural gas	Approximately 6 Petajoules (PJ) per year (1,800 hours per year) taken from the Dampier to Bunbury Natural Gas Pipeline (DBNGP)	
Liquid fuel (backup)	Up to 12 Megalitres (ML) per year ultra low sulphur diesel (200 hours per year). Sulphur content of diesel – 50 ppm maximum.	
Air emissions	Natural gas (based on 1,800 hours/year) taken from the DBNGP)	Liquid fuel (based on 200 hours/year at full load)
Oxides of nitrogen (NO_x)	<39.1 g/s (254 tonnes per annum (tpa))	<14.2 g/s (41.1 tpa)
Oxides of sulphur (SO_x)¹	0.0 g/s (negligible tpa)	4.06 g/s (2.292 tpa)
Oxides of sulphur (SO_x)²	0.0 g/s (negligible tpa)	0.406 g/s (0.146 tpa)
Particulate matter	2.0 g/s (12.96 tpa)	7.62 g/s (5.48 tpa)
Carbon monoxide (CO)	21.7 g/s (140.6 tpa)	20.9 g/s (15.07 tpa)
Polycyclic aromatic hydrocarbons (PAHs)	0.00087 g/s (0.0056 tpa)	0.016 g/s (0.0114 tpa)
Non-methane volatile organic compounds (NMVOCs)	0.83 g/s (5.38 tpa)	0.16 g/s (0.116 tpa)
Greenhouse gas emissions	Approximately 320,000 tpa CO ₂ -e (Assuming approximately 1800 hours per year operation on natural gas and 200 hours per year operation on liquid fuel)	
Average greenhouse gas intensity	667.6 kg CO ₂ -e/MWh (assuming approximately 1,800 hours per year operation on natural gas)	

Table 2-1: MS 645 Schedule 1 approved operational extents

¹ Emissions modelling based on the use of normal distillate (500 ppm sulphur content)

² Emissions modelling based on the use of ultra low normal distillate (50 ppm sulphur content)

2.3.2 The Proposal

RATCH is seeking to amend the approved operational quantities/descriptions currently detailed in Schedule 1 (Attachment 6) of MS 645.

A summary of the Proposal is presented in Table 2-2.

Proposal title	
Kemerton Power Station Increased Operation Hours	
Proponent name	RATCH-Australia Kemerton Pty Ltd
Short description	<p>The Proposal is to increase the Kemerton Power Station hours of operation from 2,000 hours/annum to 13,800 hours/annum.</p> <p>The construction and operation of the Kemerton Power Station was approved under Ministerial Statement 645 (published 9 February 2004) and the facility has been operating since 2015. The Proposal represents a significant amendment to the operating quantities/descriptions currently approved under Schedule 1 (Attachment 6) of Ministerial Statement 645.</p> <p>The Proposal is limited to increasing the hours of operation of the approved Kemerton Power Station facility and does not involve any clearing, construction, commissioning or development of new equipment or infrastructure.</p>

Table 2-2: Proposal summary

Proposal content elements, including those currently approved under MS 645 and proposed extents (the Proposal) are presented in Table 2-3.

Proposal element	Location / description	Existing Proposal extent, capacity or range	Proposed max extent, capacity or range	Combined max extent, capacity or range
Physical elements				
Kemerton Power Station extent	Figure 1-1	Kemerton Power Station (KPS) is located on an approximately 27 ha site in the Kemerton Strategic Industrial Area. The full extent of the existing site represents the Development Envelope.	No change	KPS is located on an approximately 27 ha site in the Kemerton Strategic Industrial Area (KSIA). The full extent of the existing site represents the Development Envelope.
KPS utilities, infrastructure and equipment	All within Development Envelope - Figure 2-1	Utilities, infrastructure and equipment <ul style="list-style-type: none"> • 2 x 130.5 MW Siemens V94.2 open cycle air-cooled gas turbine generators and associated stacks • 4x 1.8 MW black start generators • 1x 2 ML liquid fuel (diesel) storage tank • Supporting buildings and infrastructure (offices, X) 	No change	Utilities, infrastructure and equipment <ul style="list-style-type: none"> • 2 x 130.5 MW Siemens V94.2 open cycle air-cooled gas turbine generators and associated stacks • 4x 1.8 MW black start generators • 1x 2 ML liquid fuel (diesel) storage tank • Supporting buildings and infrastructure (offices, X) • Storage sheds

		<ul style="list-style-type: none"> Storage sheds Water treatment plant Water tanks 		<ul style="list-style-type: none"> Water treatment plant Water tanks
Operational elements				
Electricity production	N/A	Approximately 480 gigawatt hours (GWh) per year	Up to 2,108 GWh per year	Up to 2,108 GWh per year
Gas supply (natural gas)		Approximately 6 petajoules (PJ) per year	Up to 25.48 PJ per year	Up to 25.48 PJ per year
Operating hours (natural gas)		Up to 1,800 hours per year	Up to 13,600 hours per year (based on 2x turbine generators running at 6,800 hours per year)	Up to 13,600 hours per year (based on 2x turbine generators running at 6,800 hours per year)
Emissions intensity		667.6 kg CO ₂ -e/MWh (based on approximately 1,800 hours per year operation on natural gas.)	623 kg CO ₂ -e/MWh (based on 13,600 hours per year operating on natural gas).	623 kg CO ₂ -e/MWh (based on 13,600 hours per year operating on natural gas).
Liquid fuel supply (diesel)		Up to 12 megalitres (ML) per year	No change	Up to 12 megalitres (ML) per year
Operating hours (diesel)		Up to 200 hours per year	No change	Up to 200 hours per year
Emissions to air (natural gas)		Oxides of nitrogen (NO _x) – 254 tonnes per annum (tpa)	NO _x – up to 1,915 tpa	NO _x – up to 1,915 tpa
		Oxides of sulphur (SO _x) – 0.0 tpa	No change	SO _x – 0.0 tpa
		Oxides of sulphur (SO _x) – 0.0 tpa	No change	SO _x – 0.0 tpa
		Particulate matter – 12.96 tpa	Particulate matter - up to 98 tpa	Particulate matter - up to 98 tpa
		Carbon monoxide (CO) – 140.6 tpa	CO - up to 1,063 tpa	CO - up to 1,063 tpa
		Polycyclic aromatic hydrocarbons (PAHs) – 0.0056 tpa	PAHs - up to 0.0426 tpa	PAHs - up to 0.0426 tpa
		Non-methane volatile organic compounds (NMVOCs) – 5.38 tpa	NMVOCs – up to 40.7 tpa	NMVOCs – up to 40.7 tpa
Emissions to air (diesel)		NO _x – 41.1 tpa	No change	NO _x – 41.1 tpa
		SO _x – 2.292 tpa	No change	SO _x – 2.292 tpa
		SO _x – 0.146 tpa	No change	SO _x – 0.146 tpa
		Particulate matter – 5.48 tpa	No change	Particulate matter – 5.48 tpa
		CO – 15.07 tpa	No change	CO – 15.07 tpa
		PAHs – 0.0114 tpa	No change	PAHs – 0.0114 tpa

		NMVOCs – 0.116 tpa	No change	NMVOCs – 0.116 tpa
Noise emissions		Sound pressure levels < 35 dB(A) at KSIA boundary	No change	Sound pressure levels < 35 dB(A) at KSIA boundary
Greenhouse gas emissions				
Construction				
N/A – no construction activities				
Operation				
Scope 1	320 kilotonnes of CO2 equivalent (kt CO2-e) per year (composition of emissions scope not stated)		Up to 1,345 kt CO ₂ -e per year	
Scope 2			Up to 1.37 kt CO ₂ -e per year	
Scope 3			Up to 103 kt CO ₂ -e per year	
Rehabilitation				
N/A				
Commissioning				
N/A – no commissioning activities				
Decommissioning				
All above ground infrastructure to be decommissioned and removed. Below ground infrastructure to be decommissioned and removed or left in situ.				
Elements which affect extent of effects on environment				
Proposal time	Expected life	2005 - 2030	+ 15 years	40 years
	Project development	N/A	N/A	N/A
	Operation phase	25 years	+ 15 years	40 years
	Decommissioning	Approximately 2 years	No change	Approximately 2 years

Table 2-3: Proposal content elements

A summary of potential impacts, and proposed mitigations and environmental outcomes is presented in Table 2-4.

Key environmental factor	
Potential impacts	GHG Emissions
Mitigation hierarchy	<p>Avoid: The Proposal - increasing the operating capacity of the KPS, avoids potential environmental impacts associated with developing a new power generation facility.</p> <p>Reduce: The Proposal will provide required additional generation capacity to the SWIS at a lower emissions intensity than conventional coal powered power plants which are scheduled to cease operation by 2030 in support of the State Governments ambition of net zero emission by 2050.</p> <p>A GHG Management Plan which details mitigations has been prepared for the Proposal.</p>
Residual impacts, including assessment of significance	Under the maximum operating capacity of 13,800 hours, the Proposal is forecast to produce up to 1,335 ktCO ₂ -e per year. The forecast Scope 1 GHG emissions from the Proposal exceed the 100,000 tCO ₂ -e per annum significant impact threshold. Actual emissions are anticipated to fall below 1,345 ktCO ₂ -e, however due to the variable factors that drive the operation of the KPS, a conservative figure of 13,800 hours has been used to determine maximum potential GHG emissions.
Proposed environmental outcomes	While the Proposal will result in increased GHG emissions from KPS, it will provide required electricity to the SWIS at a lower emissions intensity than

	the coal fired power plants that are scheduled to come offline by 2030, as required to support the WA State Governments ambition of achieving net zero emissions by 2050. The Proposal will facilitate the transition of the SWIS to a predominantly renewables network, with operating hours and associated GHG emissions reducing over time in line with new renewable capacity being added to the network. No significant residual impacts have been identified and it is considered that the EPA's objective for GHG emissions will be met.
Assessment of offsets	N/A

Table 2-4: Summary of potential impacts, proposed mitigation and outcomes

2.4 Approval history

2.4.1 Ministerial Statement 645

The KPS was referred to the EPA by Transfield Services Kemerton Ltd Pty (Transfield Services) on 11 November 2003, under Section 38 of the EP Act. The EPA assessed the proposal, setting the level of assessment as Assessment on Referral Information (ARI) and publishing its Assessment Report (Bulletin No. 1121) on 8 December 2003. The KPS was subsequently approved by the Minister for the Environment on 9 February 2004 via Ministerial Statement 645 (MS 645). Transfield Services changed its name to RATCH-Australia Kemerton Pty Ltd on 7 February 2012.

MS 645 has undergone seven post assessment changes under Section 45C of the EP Act. Details of post assessment changes are presented in Table 2-5.

Attachment No.	Date approved	Details
1	10 October 2005	In Schedule 1, Table 1: Addition to liquid fuel (backup) of up to 300 hours ultra low sulphur diesel for the 2005/2006 financial year period (1 July 2005 - 30 June 2006).
2	20 April 2006	In Schedule 1, Table 1: Addition to liquid fuel (backup) of up to 300 hours ultra low sulphur diesel for the 2006/2007 financial year period (1 July 2006 - 30 June 2007).
3	19 December 2006	In Schedule 1, Table 1: Addition to liquid fuel (backup) of up to 600 hours ultra low sulphur diesel for the 2006/2007 financial year period (1 July 2006 - 30 June 2007).
4	6 December 2007	Increase in time of operation of the power station on liquid fuel (ultra low sulphur diesel) from 100 hours/year to 600 hours/year for the 2007-2008 financial year only.
5	5 September 2008	Increase in time of operation of the power station on liquid fuel (ultra low sulphur diesel) from 100 hours/year to 600 hours/year for the 2008-2009 financial year only. Note: the maximum allowable annual operating time for the power station (i.e. natural gas and liquid fuel operating hours combined) remains unchanged at 1,000 hours/year
6	9 December 2008	Increase in time of operation of the power station from 1,000 hours/year (900 hours/year on natural gas and 100 hours/year on liquid fuel) (ultra low sulphur diesel) to 2,000 hours/year (1,800 hours/year on natural gas and 200 hours/year on liquid fuel (ultra low sulphur diesel)
7	11 August 2023	Increase in operation of the power station from 2,000 hours per year to 13,800 hours per year on natural gas. Increased plant operating modes detailed in Table 2. Increased estimated capacity factor to 80%.

Attachment No.	Date approved	Details
		<p>Increased energy generated per year to 2,139 GWh. Increased authorised consumption of natural gas to 46 PJ. Increased greenhouse gas emissions detailed in Table 2. Increased air emissions detailed in Table 2.</p> <p>The Attachment is to have effect for a period of 12 months only from the date of approval after which, Attachment 6 to Statement 645 will recommence to have effect. Change to proposal under s45C approved on 11 August 2023.</p>

Table 2-5: MS 645 post assessment changes made under Section 45C of the EP Act

Given that the approved changes under Amendment 7 are temporary and limited to being in effect for a period of 12 months (approved on 11 August 2023), RATCH is seeking to amend MS 645 based on the operational conditions approved under Amendment 6.

RATCH have satisfied all environmental management conditions outlined in Schedule 2 of MS 645 (Ref: 39).

Per Condition 5-1 of MS 645, RATCH is required to submit compliance reports to the EPA on an annual basis. No non-compliances have been recorded in the past five years (2018 – 2023) (reports submitted to the EPA on an annual basis). Per condition 5-2 of MS 645, a five yearly performance review is required to be submitted to the EPA. The last five yearly performance review was submitted in 2020.

2.4.2 Ministerial Statement 745

A proposal to enhance the KPS was referred to the EPA on 11 April 2007, under Section 38 of the EP Act. The proposal related to the installation of a wet compression system and associated infrastructure within the existing KPS, and construction of evaporation ponds and a water pipeline to deliver water from an existing offtake located approximately 4 km to the east of the KPS. The EPA assessed the proposal, setting the level of assessment as ARI and publishing its Assessment Report (Bulletin No. 1258) on 28 May 2007. The KPS enhancement project was subsequently approved by the Minister for the Environment on 9 August 2007 via Ministerial Statement 745 (MS 745).

The wet compression system and associated infrastructure allow the KPS to generate additional power during periods of high ambient temperatures, such as 41°C, by eliminating the sensitivity of the installed gas turbines to ambient temperature.

There are no proposed changes or amendment to the wet compression system or associated MS 745 infrastructure. Therefore, MS 745 is not discussed further in this document.

2.5 Proposal justification and alternatives

2.5.1 Need for the Proposal

The SWIS is undergoing significant changes, including forecast increases in demand on the network, the increase of intermittent renewable electricity generation capacity, and the imminent closure of coal fired power plants in Western Australia (REF: 16).

The WEM Electricity Statement of Opportunities (ESOO) is published by AEMO annually. The publication includes a 10 year long term Projected Assessment of System Adequacy (PASA) for the SWIS. The primary purpose of the WEM ESOO is to identify required investment in generation, storage and demand side management needed to ensure a secure and reliable electricity supply for the SWIS over the following decade.

The 2023 WEM ESOO highlights the “urgency” of increasing generation due to planned closure of coal fired power stations and increasing demand on the SWIS (Ref: 2). The AEMO has highlighted the role of gas generation to support the transition to a majority-renewables system (Ref: 3).

In 2022 the WA State Government announced that Collie Power Station would be retired in late 2027, and Muja D in late 2029 (REF: 16). The closure of coal fired power plants will result in a decrease of available capacity on the SWIS of 193 MW from 2024-2025, an additional 317 MW from 2027-2028, and a further 422 MW from 2029-2030 (Ref: 1). Additionally, modelling undertaken by the AEMO assumes that the coal fired Bluewaters Power Station will also exit the WEM in 2030-2031, reducing available capacity on the SWIS by a further 434 MW (Ref: 2).

Coupled with the reduced forecast reserve capacity on the network, the 2023 WEM ESOO predicts significant growth in peak and average electricity demand on the SWIS (Ref: 2). Forecast growth in demand is supported by the findings of the SWIS Demand Assessment 2023 to 2042 (Ref: 31) and the Whole of System Plan report (Ref: 33). Key drivers for the forecast growth in demand include:

- electrification of established minerals and metals industries, particularly alumina
- electrification of businesses
- demand for renewable energy to support the production of renewable hydrogen
- uptake of electric vehicles (EVs) (influenced by Federal and State government policies)
- increased cooling loads (air conditioning)
- projected uptake of electrical appliances

The KPS has been operating as a peaking power plant on the SWIS since 2005. The Proposal will provide additional firming capacity, security and stability on the SWIS. Additionally, the Proposal will provide affordable pricing on the WEM, without the need for development of a new facility. The capacity will provide security and stability to the SWIS, and provide stable, affordable pricing on the WEM. The KPS would continue to operate as a peaking plant, however the additional operating capacity would allow it to meet the expected increasing peaks in demand, along with addressing the gap left by exiting coal power stations.

It is expected that while KPS operation will increase in the short to medium term, use of the facility will decrease in the medium to long term. The WA Government projects that by 2050, 96% of the energy consumed on the SWIS will come from renewable generation sources, compared to the current (2023) figure of 34% (Ref: 24). Reduced use of the KPS will be driven by the predicted significant increase in renewable generation capacity on the SWIS as the State works towards its commitment of net zero emissions by 2050.

2.5.2 Benefits of the Proposal

The Climate Change Bill (WA) was introduced to Parliament on 30 November 2023. The Bill proposes to establish a long-term target for the WA State Government of net zero emissions by 2050. The Bill introduces the States ambition to reduce government emissions by 80% below the 2020 level by 2030 and require emissions targets for the whole of WA to be set for 2035, 2040 and 2045.

The Proposal supports the decarbonisation of the SWIS as a whole, by providing required additional capacity in the short to medium term, at a significantly lower emissions intensity than the coal fired power stations that are set to come offline by 2030. Under the proposed amended operating capacity, the KPS would have an emissions intensity (calculated as the measure of GHG emission per MWh produced by a facility (tCO₂-e/MWh).) of 623 kg of kgCO₂-e/MWh, compared to the emissions intensity of coal fired power station on the SWIS, which range from 730 kgCO₂-e to 910 kgCO₂-e (Ref: 35).

2.5.3 Proposal alternatives

The option to 'do nothing' would further exacerbate the forecast shortfall in generation capacity on the SWIS in the short to medium term. The option to increase the KPS operating capacity at a reduced rate (less than 13,800 hours) was also considered. The direction of Synergy and the AEMO dictate KPS' hours of operation due to contracting arrangements and power generator market obligations. Generation is dependent on many factors including market conditions, electricity and frequency requirements of the SWIS, and the bidding strategies of Synergy and other market participants. As a result, it is difficult to predict annual hours of operation into the future, particularly in the context of the significant forecast growth in renewable generation capacity on the SWIS over the medium to long term (Ref: 31).

While RATCH is applying for an increase in approved operating capacity up to 13,800 hours per year, it does not expect that the KPS will reach this maximum every year, neither does it expect that operation will remain this high into the future. Historically, KPS' annual operating hours and associated GHG emissions have fallen well below the limits approved under MS 645, with the facility having averaged 65kt CO₂-e per year between FY13 and FY22, despite being approved up to 320kt CO₂-e in that period. Because of the nature of the electricity market, operation fluctuates from year to year, so RATCH is applying for the maximum expected operating hours, while expecting to operate at lower rates most years.

2.6 Local and regional context

2.6.1 Climate

The Kemerton area experiences a Mediterranean climate, characterised by hot dry summers and cool wet winters. The nearest Bureau of Meteorology (BoM) monitoring station, Bunbury³ (Station No. 9965), is located approximately 25 km southwest of the KPS.

Data from the Bunbury station (for the years 1995–2023) show an average annual rainfall of 730.4 mm, with the wettest month on average being July (145.5 mm) and the driest being February (8.4 mm). The mean maximum temperature ranges from 17.3°C (July) to 30°C (February), and the mean minimum temperature for ranges from 7.3°C (July) to 15.9°C (February) (Ref: 5). Climate data is shown in Figure 2-2.

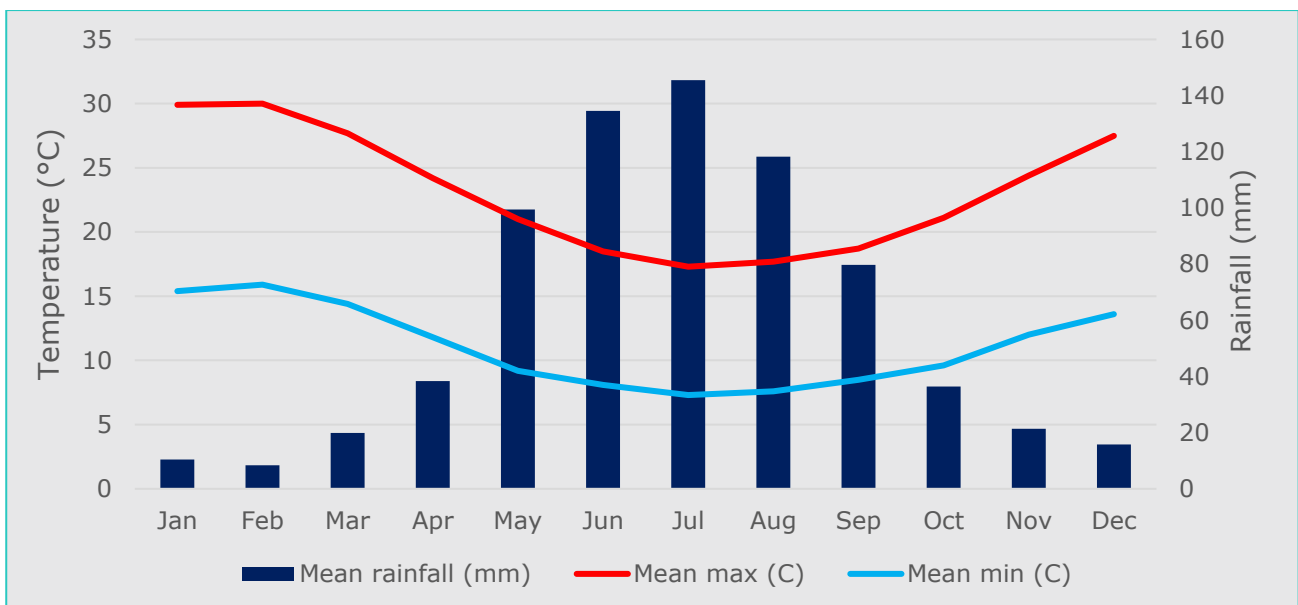


Figure 2-2: Bunbury (Station No. 9965) climate data

2.6.2 Topography, soils and geology

The KPS is located within a relatively flat, low lying area, at less than 15 m Australian Height Datum (AHD). The facility is located within the Bassendean System. Major soil types within the Bassendean System are Bassendean sands, which overlie the Guildford Formation.

Bassendean sands are typically fine to medium grained, well drained, grey to off-white in colour, and have low fertility and water holding capacity. Bassendean sands vary in thickness, reaching up to 15 m where rounded dune features are present, to a thin veneer of 2 – 5 m thick. The Guildford Formation is a more clay based sediment, formed of sandy and silty clays through to some clayey sands with semi-lithified laterised clay, and can become waterlogged in winter (Ref: 41).

³Wokalup (Station No. 9642) is located nearer to the KPS, however climate data records for the station are not available from 2000 onwards.

2.6.3 Surface hydrology

The KPS is located in an area mapped as an unnamed palusplain wetland in the Geomorphic Wetlands of the Swan Coastal Plain database (Ref: 7). Additionally, the broader KPS site (Development Envelope) intersects an unnamed wetland and an unnamed sumpland, however these are outside of the KPS footprint. The KPS and much of the broader local area is prone to seasonal inundation due to the low lying, flat nature of the area. The nearest Ramsar wetland (Peel-Yalgorup System) (Ref: 10) is located approximately 9 km northwest of the KPS, and the nearest wetland recorded in the Directory of Important Wetland in Western Australia (Benger Swamp) (Ref: 9) is located approximately 3.5 km to the east of the KPS.

2.6.4 Hydrogeology

The KSIA is underlain by an unconfined superficial aquifer. Depth to the water table throughout much of the area is less than 2 m and extensive areas of wetland (seasonal and permanent) occur in the eastern extent of the KSIA, in which the KSP is located (refer to Section 2.6.3). The aquifer is recharged by rainfall however a significant proportion of infiltration is lost due to wetland and shallow water table related evapotranspiration processes (Ref: 1). The superficial aquifer is approximately 28 m thick in the KPS area, and is further underlain by the following confined aquifers, listed by increasing depth:

- Leederville Formation – recharged mainly via downward leakage from the superficial aquifer. The main recharge area around Kemerton for the aquifer is between Wellesley River and Myalup Swamp, where there is a downward vertical gradient and the overlying superficial formation is primarily sand (Ref: 1).
- Cattamarra Coal Measure – a confined multilayered aquifer composed of siltstone and shale interbedded with sandstone. Groundwater salinity records indicate the formation is divided into two parts separated by a shale layer, with an upper sequence containing fresh groundwater and a lower sequence containing brackish groundwater (Ref: 1).

2.6.5 Flora, vegetation and fauna

Regional vegetation mapping shows the KPS is located within the Bassendean (1000) association, described as Woodland/low woodland/low forest or woodland (Ref: 40). Regional vegetation complex mapping shows the KPS is located within the Bassendean Complex-Central and South, which is characterised by woodland to low woodland and sedgeland (Ref: 7).

The KPS was constructed within a blue gum (*Eucalyptus globulus*) plantation. Parts of the blue gum plantation are still present within the southern extent of the KPS boundary. Surveys undertaken prior to construction recorded two Priority flora species, *Acacia semitrullata* (then P3, now P4) and *Jacksonia sparsa* ms (then P4, no longer listed) to the south of the proposed development extent (current KPS footprint), but did not record any conservation significant flora or fauna species/populations within the proposed development extent (Ref: 41).

2.6.6 Aboriginal and European heritage

Heritage surveys undertaken prior to the construction of the KPS did not identify any sites of significance within the power station extent (Ref: 41).

A search of the Department of Planning Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System (AHIS) undertaken in January 2024 identified eight Aboriginal heritage sites within 5 km of the KPS – none of these were Registered sites. Aboriginal heritage sites identified within 5 km of the KPS are shown in Table 2-6.

Name	Place ID	Status	Approximate distance and direction from Development Envelope
Harvey/Brunswick uncton 51	5803	Stored Data / Not a Site	4.8 km northwest
Harvey 52/Brunswick Jun Rd	5804	Lodged	3.8 km northwest
Harvey 53/Brunswick Jun Rd	5805	Stored Data / Not a Site	3.4 km northwest
Harvey 55/Brunswick Jun Rd	5807	Stored Data / Not a Site	0.8 km west
Brunswick Junction 56	5808	Stored Data / Not a Site	3.0 km southeast
Brunswick Junction 58	5810	Stored Data / Not a Site	2.5 km south
Wellesley River Waugal	33865	Lodged	1.2 km east
Harvey 54/Brunswick Jun Rd	5806	Lodged	3.5 km northwest

Table 2-6: Aboriginal heritage sites within 5km

The nearest European heritage sites, Runnymede and Florries Cottage Group (Binningup) and Benger Swamp are located approximately 3.5 km northwest and 3.5 km east of the KPS respectively (Ref: 15).

2.6.7 Zoning and tenure

The KPS is located on Lot 505 on Deposited Plan P 39528, an approximately 27 hectare site which is owned by the Proponent and is situated within the KSIA. The KSIA which comprises the following three specific areas:

- 2,025 ha Strategic Industry Zone
- 293 ha Ancillary Industry Zone
- 5,437 ha Industry Zone Buffer, intended to ensure that industries located in the Strategic Industry Zone do not adversely impact on receptors outside of the KSIA's boundary

The KPS is located within the Strategic Industry Zone, an area zoned as Industrial under the Shire of Harvey District Planning Scheme No. 1 and the Greater Bunbury Region Scheme.

In addition to the RATCH owned KPS, companies currently operating in the KSIA include Albermale Lithium (lithium hydroxide processing), Kemerton Silica Sand (silica sand production), Simcoe Operations (silica production), Cristal (titanium dioxide production), Nufarm Coogee Pty Ltd (chlor-alkali production), BOC Limited (oxygen and nitrogen production) and Tesla (peaking power plant).

3. Legislative context

3.1 Environmental impact assessment

3.1.1 Environmental Protection Act 1986

The EP Act is the primary environmental legislation that governs environmental protection and Environmental Impact Assessment (EIA) in Western Australia. Part IV, Division 1 of the EP Act, provides for the referral and assessment of proposals that may result in significant impacts to the environment. The Part IV process is administered by the Environmental Protection Authority Services Unit of the DWER.

The Proposal represents a significant amendment (as defined under Section 3 of the EP Act) to an approved proposal - MS 645. As such, the Proposal is being referred to the EPA by RATCH under Section 38 of the EP Act.

This Referral Supporting Information Document is intended to provide sufficient information to the EPA to enable EIA of the Proposal, and has been prepared in accordance with the relevant EPA instructions and guidance, including:

- Instruction and template – How to identify the content of a Proposal (Ref: 25)
- How to prepare an Environmental Review Document – Instruction (Ref: 23)
- Statement of environmental principles, factors and objectives and aims of EIA (Ref: 27)
- Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual (Ref: 26)

The Proposal relates only to increasing the KPS hours of operation approved under MS 645. There is no clearing, construction, development or amendment to existing equipment or infrastructure associated with the Proposal.

3.1.2 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the referral and assessment of proposals which, if implemented, may have a significant impact on Matters of National Environmental Significance (MNES).

A search of the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) was undertaken in March 2024, using the KPS Development Envelope as the search extent (Appendix A). As the Proposal does not involve any clearing or amendment to the existing KPS footprint and facility, it was determined that it would not result in any significant impacts to MNES and therefore is not being referred under the EPBC Act.

3.2 National Greenhouse and Energy Reporting Act 2007

The *National Greenhouse and Energy Reporting Act 2007* (NGER Act) establishes the NGER scheme whereby those who meet a facility or company GHG emissions threshold are required to report on the amount of GHG emissions on an annual basis. The objectives of the NGER scheme are to:

- Inform government policy and the Australian public
- Help meet Australia’s international reporting obligations
- Assist Commonwealth, state, and territory government programs and activities
- Avoid duplicating reporting requirements in the states and territories

The methods and criteria for calculating GHG emissions are described in the National Greenhouse and Energy Reporting (Measurement) Determination (Ref: 11). KPS meets the NGER threshold, and reports annually to the NGER scheme. RATCH tracks KPS’ GHG emissions as part of this reporting.

3.2.1 Safeguard mechanism

Under the NGER Act, the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Safeguard Mechanism) commenced in 2016 and was updated in 2023, with reforms coming into effect on 1 July 2023. The Safeguard Mechanism is the Australian Government’s policy for reducing emissions in line with the United Nations Framework Convention on Climate Change and its subordinate document, the Paris Agreement.

With regards to Safeguard Mechanism, grid-connected electricity generators such as the KPS fall under a sectoral baseline, which means that the entire sector cannot emit above 198 million t CO₂ e annually. KPS falls under this baseline and does not need a facility standard baseline under the Safeguard Mechanism.

3.3 Prescribed Premises Licence L8026/2006/6

The KPS currently operates under Prescribed Premises Licence L8026/2006/6, under Part V of the EP Act. The licence applies to electric power generation, as presented in Table 3-1.

Category number	Category description	Category production or design capacity	Premises production or design capacity
52	Electric power generation: premises (other than premises within category 53 or an emergency or standby power generating plant) on which electric power is generated using a fuel.	20 megawatts or more in aggregate (using natural gas) or 10 megawatts or more in aggregate (using a fuel other than natural gas)	320 MWe

Table 3-1: L8026/2006/6 prescribed premises category

The Proposal (increasing the KPS hours of operation from 2,000 hours/annum to 13,800 hours/annum) will not require any new licence categories to be added to the existing licence and no amendment to L8026/2006/6 is anticipated to be required.

3.4 Other approvals and regulation

A summary of regulatory approvals that are currently held by/relevant to the KPS, along with identification of any requirement to amend existing approvals or obtain new approvals for the Proposal is shown in Table 3-2.

Decision-making authority	Legislation or Agreement regulating the activity	Approval required (and specify which proposal element the approval is related to)
DWER	EP Act – Part V	Prescribed Premises Licence Licence covers the monitoring and reporting of emissions and discharges, including monitoring of point source emissions to air (Air Quality). KPS currently operates under Prescribed Premises Licence L8026/2004/6 – refer to Section 3.3
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	<i>Dangerous Goods Safety Act 2004</i>	Dangerous Goods Site Licence The KPS currently operates under a Dangerous Goods Site Licence. The licence authorises the holder to store and handle dangerous goods. The Proposal does not result in any changes to the currently approved dangerous good storage quantities and therefore does not trigger any requirement to amend the licence.
Economic Regulation Authority (ERA)	Economic Regulation Authority (Licencing Fund) Regulations 2014	Electrical Generation Licence KPS currently operates under an Electricity Generation Licence. The proposal does not trigger any requirement to amend the existing licence

Table 3-2: Other decision-making authorities

4. Stakeholder consultation

Stakeholder consultation relating to the construction and operation of the KPS was undertaken at the time the facility was referred to the EPA in 2003. The following information relates specifically to the Proposal.

4.1 Key stakeholders

Key stakeholders identified during consultation on the Proposal to date include:

- Kemerton Industrial Park (KIP) Coordinating and Community Committees
- DWER
- AEMO
- Synergy
- Economic Regulation Authority
- Shire of Harvey

Communications with the broader community may be further considered based on regulator and customer feedback

4.2 Stakeholder engagement process

RATCH has an ongoing commitment to keeping its stakeholders and the community informed of its activities at its sites. In the context of the Proposal, this has been demonstrated through the following actions:

- Maintenance of a relevant and current website
- Provision of information via the Kemerton Industry Reference Group
- Distribution of media statements as appropriate
- Direct consultation with local stakeholders
- RATCH developed a Community and Stakeholder Engagement Plan (CSEP) to guide consultation about changes to the operations of KPS with key stakeholders in relation to the Proposal

4.3 Stakeholder consultation outcomes

A summary of key relevant stakeholder consultation undertaken to date is presented in Table 4-1. RATCH will continue stakeholder consultation during the implementation of the Proposal to ensure awareness, understanding of concerns, and ongoing positive, effective two-way communication is maintained.

Table 4-1: Stakeholder consultation summary

Stakeholder	Date	Topic/Concern raised	Proponent response/ outcome
EPA / DWER	8 March 2023	Initial discussion of MS 645 capacity limits	Guidance provided on the options to amend generation capacity
Synergy	January 2023 – February 2024	Several meetings to discuss the proposed changes and impact to the site operations.	Consultation undertaken to provide information only
EPA / DWER	26 June 2023	Follow up discussion on MS 645 capacity limits	Further direction provided by the EPA
AEMO	4 July 2023	Discussion on proposed changes and impact to the site operations	Consultation undertaken to provide information only
EPA	7 Nov 2023	Meeting to discuss S40AA approvals pathway and required information	Pathway agreed to present and submit the proposal
Local stakeholder	2 December 2023	Conversation with the local stakeholder to discuss proposed increased operation	No concerns raised
KIP Coordination and Community Committees*	14 February 2024	Proposed changes to the operation of KPS was presented to the group which covered all Stakeholders in the KIP.	No feedback or concerns raised.
EPA	27 February 2024	Meeting to discuss the Proposal scope and timing of submission	Further direction provided by EPA

***KIP members include:** Albermale, Tronox, Simcoa, Coogee Chemicals, Cockburn Cement, Kemerton Silica Sand, Tesla Corporation, South West Development Commission (SWDC), Shire of Harey, Southern Ports Authority, Bunbury Geographic Economic Alliance, Department of Jobs, Tourism, Science and Innovation (JTSI), DevelopmentWA, Public Transport Authority, Main Roads WA, Water Corporation, Department of Transport, Department of Planning, Lands and Heritage, Department of biodiversity, Conservation and Attractions, Energy policy WA.

5. Objectives and Principles of the EP Act

Section 4A of the EP Act states that the objective of the Act is to protect the environment of the State, having regard to the five principles listed in Table 5-1. RATCH has considered each of the five principles in the context of the Proposal, as presented in Table 5-1.

EPA Principle	Consideration in the Proposal
<p>1. The precautionary principle</p> <p>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</p> <p>In the application of the precautionary principle, decision should be guided by:</p> <ul style="list-style-type: none"> a. Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and b. an assessment of the risk-weighted consequences of various options. 	<p>Appropriate studies for determining the extent of environmental impacts for the construction and operation of the KPS were undertaken at the time it was referred to the EPA in 2003.</p> <p>Additional scientific studies have been undertaken to ensure that potential environmental impacts associated with the Proposal are understood. Results of studies are outlined in this document and associated reports are attached as appendices.</p> <p>Where appropriate, management and mitigation measures have been adopted in order to minimise the significance of impacts to the environment associated with the Proposal.</p> <p>Operation of the KPS is well understood, with the facility having been operating since 2005. The Proposal will not deviate from the approved method of operation of the KPS and represents only an increase in the facility's operational capacity.</p>
<p>2. The principle of intergenerational equity</p> <p>The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.</p>	<p>By increasing the operating capacity of an existing facility, the Proposal negates the need to develop a new generation sources on the SWIS and the associated environmental impacts that would come with doing so (clearing of vegetation, direct impacts to biodiversity).</p> <p>The Proposal will produce electricity at a lower emissions intensity than alternative hydrocarbon based power stations on the SWIS. The Proposal supports efforts to reduce GHG emissions for the electricity generation sector and the state of WA as a whole, through providing additional required capacity to the network in the short to medium term, during the period between the present day and the point at which sufficient renewable generation capacity is added.</p>
<p>3. The principle of the conservation of biological diversity and ecological integrity</p> <p>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</p>	<p>The Proposal is to increase the operational capacity of the existing KPS facility. It does not involve any clearing of vegetation, nor any construction or changes to existing equipment/infrastructure.</p> <p>By increasing the operating capacity of the existing KPS facility, the Proposal negates the impacts to biological diversity that would be likely to occur should a new facility be developed in order to meet forecast shortfalls in available capacity on the SWIS.</p> <p>As such, it is not anticipated to result in any significant impacts to biological diversity and/or ecological integrity.</p>
<p>4. Principles relating to improved valuation, pricing and incentive mechanisms</p> <ul style="list-style-type: none"> a. Environmental factors should be included in the valuation of assets and services; and b. The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement. 	<p>Increasing the operating capacity of an existing facility – KPS, enables environmental impacts associated with constructing and developing a new facility to be avoided.</p> <p>Annual fees associated with Prescribed Premises Licence L8026/2006/6 will continue to be paid for the discharge of atmospheric emissions from the operation of KPS.</p> <p>A Greenhouse Gas Management Plan (GHGMP) for the Proposal has been developed and will be implemented.</p>

EPA Principle	Consideration in the Proposal
<p>c. The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.</p> <p>d. Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.</p>	
<p>5. The principle of waste minimisation All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</p>	<p>The KPS was constructed and operates in line with waste procedures that were developed in consideration of the waste hierarchy. The Proposal will not result in any increase in waste generated at the KPS.</p>

Table 5-1: Environmental protection principles

6. Environmental factors and objectives

The EPA uses environmental factors, defined in the EPA Administrative Procedure Manual (Ref: 26), as a systematic approach to organising environmental information for the purpose of EIA. The EPA identify 14 environmental factors which are organised into five themes; Sea, Land, Water, Air and People (Ref: 27). An EPA defined objective is also identified for each environmental factor. The EPA assesses the significance of the environmental impacts of a proposal on each of the environmental factors and their respective objectives.

6.1 Identification of environmental factors

Environmental factors and objectives are listed in Table 6-1, along with a summary of how each has been considered in the context of the Proposal. Additionally, one the following classifications have been applied to each factor based on consideration of Proposal related impacts:

- Key environmental factor – the Proposal may cause a significant impact to the environmental factor
- Other environmental factor – the Proposal has the potential to interact with the environmental factor but is not anticipated to result in significant impacts
- Not relevant – the Proposal is not anticipated to result in any impacts to the environmental factor

Theme	Factor and objective	Consideration
Sea	Benthic Communities and Habitats - To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. Proposal is located approximately 8.5 km inland.
	Coastal Processes - To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. Proposal is located approximately 8.5 km inland.
	Marine Environmental Quality - To maintain the quality of water, sediment and biota so that environmental values are protected.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. Proposal is located approximately 8.5 km inland.
	Marine Fauna - To protect marine fauna so that biological diversity and ecological integrity are maintained.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. Proposal is located approximately 8.5 km inland.
Land	Flora and Vegetation - To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. No clearing, construction or development to occur.
	Landforms - To maintain the variety and integrity of significant physical landforms so that environmental values are protected.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. No clearing, construction or development to occur.
	Subterranean Fauna - To protect subterranean fauna so that biological diversity and ecological integrity are maintained.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. No clearing, construction or development to occur.
	Terrestrial Environmental Quality - To maintain the quality of land and soils so that environmental values are protected.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. No clearing, construction or development to occur.

Theme	Factor and objective	Consideration
	Terrestrial Fauna - To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. No clearing, construction or development to occur.
Water	Inland Waters - To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	Not relevant – Proposal relates only to increasing approved operating hours for existing KPS. No clearing, construction or development to occur.
Air	Air Quality - To maintain air quality and minimise emissions so that environmental values are protected.	Other environmental factor – the Proposal (increased operation of the KPS) has the potential to produce air emissions which may impact on air quality. Air quality is addressed as an other environmental factor in Section 8.2.
	Greenhouse Gas Emissions – To reduce greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change.	Key environmental factor – the Proposal will result in an increase in GHGs being emitted to the environment. GHG emissions are addressed as a key environmental factor in Section 7.
People	Social Surroundings - To protect social surroundings from significant harm.	Other environmental factor – the Proposal has the potential to result in noise emissions which may impact on social surroundings. Social surroundings is addressed as an other environmental factor in Section 8.1.
	Human Health – To protect human health from significant harm.	Not relevant – the Proposal has the potential to impact on human health through atmospheric emissions and noise emissions. These factors are assessed under air quality (Section 8.2) and social surroundings (Section 8) respectively.

Table 6-1: Consideration of environmental factors and objectives

6.2 Summary of key and other factors

Based on the consideration of the Proposals impacts on environmental factors presented in Table 6-1:

- GHG Emissions is identified as a key environmental factor (Section 7)
- Social Surroundings and Air Quality are identified as other environmental factors (Section 8.1 and Section 8.2 respectively)
- All remaining factors identified as not relevant are not discussed further in this document.

7. Greenhouse gas emissions

GHG Emissions are addressed in the following format, consistent with the EPA Instructions on how to prepare and Environmental Review Document (Ref: 23):

- Statement of EPA objective
- Identification of relevant policy and guidance
- Description of receiving environment, as relevant to the respective factor
- Identification of potential environmental impacts, both direct and indirect
- Description of mitigation measures, including application of the mitigation hierarchy
- Assessment of the significance of residual impacts to the respective factor
- Description of predicted environmental outcome as assessed against the EPA objective for the respective environmental factor

7.1 EPA objective

To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable (Ref: 20).

7.2 Policy and guidance

The relevant policy and guidance relating to GHG emissions include the following:

- Environmental Protection Act 1986 (WA)
- Environmental Factor Guideline – Greenhouse Gas Emissions (Ref: 20)
- Western Australian Climate Policy (WA, 2020)
- Greenhouse Gas Emissions Policy for Major Projects (WA, 2019)
- National Greenhouse and Energy Reporting Act 2007 (Cth) (NGER Act)
- National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Cth)
- National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015
- Climate Change Bill 2023 (WA)

In accordance with the EPA Factor Guideline for GHG emissions (Ref: 20), proposals that are likely to exceed a threshold of 100,000 tonnes of CO₂-e per annum of Scope 1 or Scope 2 GHG emissions will be assessed under part IV of the EP Act. Forecast Scope 1 GHG emissions from the Proposal exceed the 100,000 tCO₂-e per annum significant impact threshold.

The 2020 Western Australian Climate Policy supports the State Government's goal to achieve net zero GHG emissions by 2050. The Policy determines actions taken by the Government to enhance climate resilience and support the low-carbon transition.

The Greenhouse Gas Emissions Policy for Major Project (WA, 2019) (GHG Policy for Major Projects) states a commitment to working with all sectors of the WA economy towards achieving net zero GHG emissions by 2050. In accordance with the policy, the Minister for Environment will consider the characteristics of each project and the advice and

recommendations of the EPA. The Government may then consider whether it is appropriate to apply a condition that sets out the requirements for a plan detailing a proponent's contribution towards achieving the WA State government's aspiration of net zero emissions by 2050. The Policy is applicable to new proposals that meet the Safeguard threshold (>100,000 tCO₂-e per year of Scope 1 emissions).

The National Greenhouse and Energy Reporting Act 2007 (NGER Act) establishes the NGER scheme whereby those who meet a facility or company GHG emissions threshold are required to report on the amount of GHG emissions on an annual basis. The KPS meets the NGER threshold and GHG emissions from the facility are reported annually under the NGER scheme. Methods and criteria for calculating GHG emissions are detailed in the National Greenhouse and Energy Reporting (Measurement) Determination (Ref: 11).

Under the NGER Act, the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Safeguard Mechanism) commenced in 2016 and was updated in 2023, with reforms coming into effect on 1 July 2023.

The Safeguard Mechanism is the Australian Government's policy for reducing emissions in line with the United Nations Framework Convention on Climate Change and its subordinate document, the Paris Agreement. Under Article 4.2 of the Paris Agreement, Australia is obliged to set a Nationally Determined Contribution (NDC) for pursuing domestic mitigation measures. Australia has set a goal to reduce emissions by 26 – 28% below 2005 levels by 2030. In the updated NDC (2022), Australia is increasing the ambition of its 2030 commitment, committing to reduce greenhouse gas emissions 43% below 2005 levels by 2030.

The Safeguard Mechanism sets three types of baselines. Grid-connected electricity generators such as the KPS fall under a sectoral baseline, where the entire electricity generation sector cannot emit above 198 million t CO₂ e annually. The KPS falls under this baseline and does not need a facility standard baseline under the Safeguard Mechanism.

The Climate Change Bill (WA, 2023) was introduced to Parliament on 30 November 2023. The Bill proposes to establish a long-term target for the WA State Government of net zero emissions by 2050. The Bill introduces the States ambition to reduce government emissions by 80% below the 2020 level by 2030 and require emissions targets for the whole of WA to be set for 2035, 2040 and 2045.

7.3 Receiving environment

Along with many other regions around the world, both Australia and Western Australia are experiencing rapid changing climate. The 2022 State of the Climate Report, published by CSIRO and the Bureau of Meteorology (BoM) (Ref: 6), outlines the following climate change related impacts in that are relevant in the context of Western Australia:

- Australia's climate has warmed by an average of $1.47 \pm 0.24^{\circ}\text{C}$ since national records began in 1910
- Sea surface temperatures have increased by an average of 1.05°C since 1900, which has led to an increased frequency of extreme heat events over both land and sea

- Rainfall in the southwest of Australia has declined around 15% in the months April – October since 1970, while May – July rainfall in the same region has seen a decrease of around 19% since 1970
- There has been an increase in extreme fire weather and a longer fire season across large part of Australia since the 1950s
- There has been a decrease in tropical cyclones in the Australian region
- Oceans around Australia have become more acidic, with changes occurring at a faster rate in recent years
- Sea levels are rising around Australia, with more frequent extreme events increasing the risk of inundation and damage to coastal infrastructure and communities

Over the coming decades, the trends outlined above are expected to continue to impact Australia (Ref: 6).

7.4 Potential environmental impacts

7.4.1 Estimated GHG emissions

The Proposal does not involve any construction or commissioning, therefore GHG emissions relate only to the operation of KPS. The Proposal will result in the generation of Scope 1, Scope 2 and Scope 3 GHG emissions.

Scope 1 GHG emissions are those that are produced directly from operations. At KPS, the majority of Scope 1 emissions stem from the combustion of natural gas used to produce electricity for the SWIS. Scope 1 emission estimates were calculated using the emissions factors provided by the 2023 Australian National Greenhouse Accounts (NGA) Factors (Ref: 11).

Scope 2 GHG emissions are those from the indirect consumption of an energy product by a facility (Ref: 35). The only source of Scope 2 emissions for KPS are from the use of purchased electricity. The consumption of purchased electricity is not expected to increase with the proposed increase in operating hours, neither is electricity consumption expected to change significantly over time. Scope 2 emissions were calculated using the location-based accounting method, using the projected emissions factors for the Western Australian SWIS electricity grid (Ref: 12).

Scope 3 GHG emissions are indirect emissions other than Scope 2 emissions that occur as a consequence of the activities of a facility, but from sources not owned or controlled by that facility's business (Ref: 35). The majority of the KPS' Scope 3 emissions are expected to be the upstream emissions associated with extracting, processing, and transporting natural gas. Scope 3 emissions will also be generated from diesel consumption, both for energy generation and vehicle use. However, the level of diesel consumption is not expected to increase under the proposed amended hours of operation. Scope 3 emission estimates were calculating using the emissions factors provided by the 2023 Australian NGA Factors (Ref: 11).

Based on the maximum proposed operating capacity of 13,800 hours per year, predicted annual Scope 1, 2 and 3 emissions on an annual basis, and over the life of the Proposal are presented in Table 7-1.

GHG emissions scope	Annual GHG emissions (kt CO ₂ -e)	Lifetime GHG emissions (kt CO ₂ -e)
Scope 1	1,345	30,938
Scope 2	1	14
Scope 3	102	2,347

Table 7-1: Proposal GHG emissions estimates

It should be noted that the KPS has consistently operated at lower levels (operating hours and associated GHG emissions) than authorised under MS 645, including the 2022-23 financial year (FY23), when it obtained temporary approval to operate at higher rates due to market circumstances (refer to Section 2.4.1). On average, KPS has produced 101 kt CO₂-e Scope 1 emissions per year over the last 10 years, peaking in FY23 at 462 kt CO₂-e Scope 1 emissions in FY23. Historical Scope 1 emissions per year are presented in Figure 7-1, along with a comparison against the total allowable GHG emissions for the respective time period.

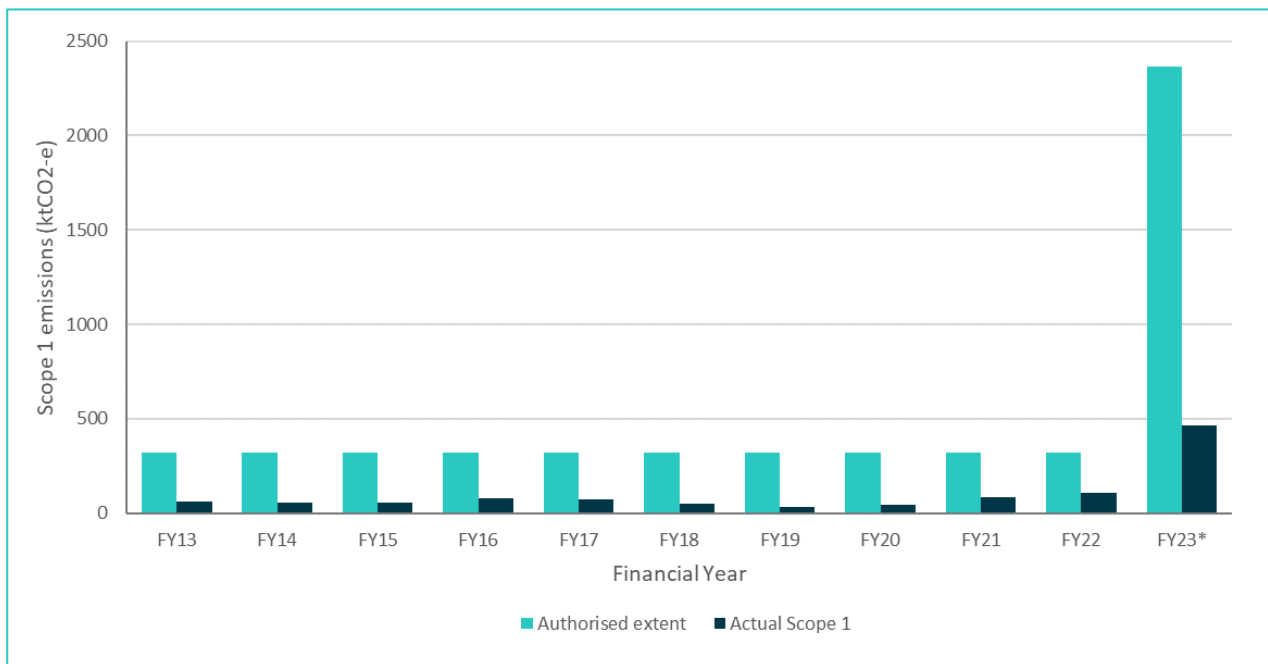


Figure 7-1: Historic Scope 1 emissions the KPS. *The authorised extent for FY23 is on a November to October basis, whereas the Actual Scope 1 emissions are using NGER July to June.

7.4.2 Contribution to state and national emissions

Based on the State and Territory Greenhouse Gas Inventory, Western Australia emitted a total of 80.23 million tonnes of CO₂ equivalent (mtCO₂-e) in 2021 (the most recent year for which reporting data is available) (Ref: 13). Under the maximum proposed operating extent, the KPS would emit up to 1.345 mtCO₂-e of Scope 1 emissions, which would represent 1.68% of the 2021 state total. Australian national emissions for the year 2021 were 464.77 mtCO₂-e, the maximum proposed operating extent of 1.388 mtCO₂-e of Scope 1 emissions would represent 0.29% of the 2021 national total.

As outlined in Section 7.4.1, actual emissions from the KPS have historically fallen significantly below the volume approved under MS 645. This trend is expected to continue into the future. While the KPS' operating hours are anticipated to increase in the short to medium term, use of the facility is expected to decrease in the medium to long term in line with additional renewable capacity becoming available on the SWIS (refer to Section 2.5).

7.4.3 Emissions intensity and benchmarking

Emissions intensity is calculated as the measure of GHG emission per MWh produced by a facility (tCO₂-e/MWh).

The emissions intensity of the Proposal has been calculated as 0.62 tCO₂-e/MWh. This value was benchmarked against other similar facilities (grid connected gas generators) to determine where the facility sits comparatively. Results of the benchmarking exercise are presented in Figure 7-2. The KPS is depicted in three separate columns which represent:

- Emissions intensity of the Proposal (blue) - 0.62 tCO₂-e /MWh
- Emissions intensity from FY22 (MS 645 Amendment 7) (red) – 0.63 tCO₂-e /MWh
- Emissions intensity under the current approved extent (MS 645 Schedule 1, Amendment 6) (green) - 0.64 tCO₂-e /MWh

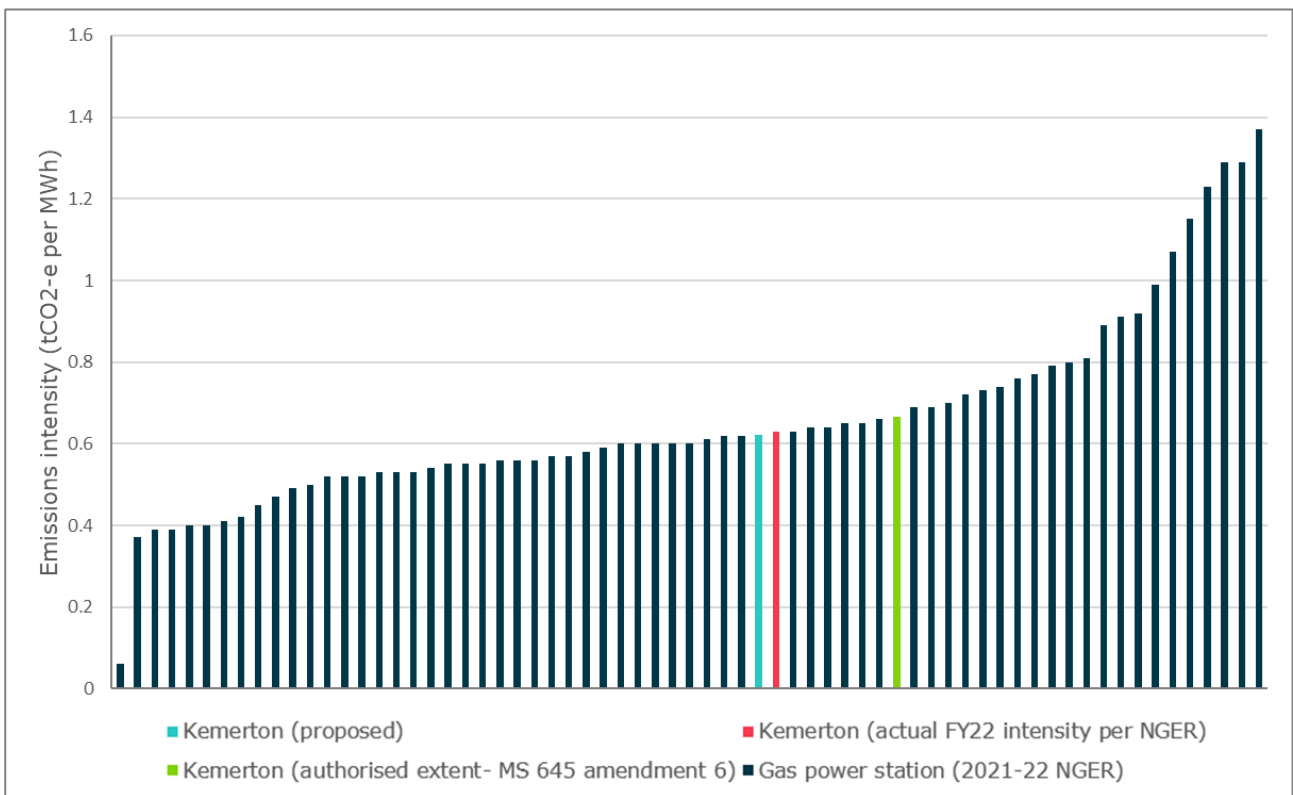


Figure 7-2: Benchmarking of the KPS emissions intensity against other grid connected gas generation facilities in Australia

7.5 Mitigation measures

The key GHG emissions mitigation for the Proposal is the reduced operation of the KPS over time. This factor is outside of the control of RATCH, however as outlined in Section 2.5, renewable generation capacity on the SWIS is anticipated to increase significantly between the present day and 2040.

The proposed increased operating capacity of the KPS will support the long term transition of the SWIS to a predominantly renewables based grid as conventional coal plants cease operations by 2030 and availability on the SWIS over the short to medium term is stretched (Section 2.5). In this way, the proposed increase in KPS operating capacity supports the decarbonisation of the SWIS as a whole.

The KPS is an existing facility and therefore options for mitigating GHG emissions based on the design of the facility are limited. However, a range of mitigation measures are assessed in the Greenhouse Gas Management Plan (GHGMP) (refer to Section 7.6.1) prepared for the Proposal. Mitigation measures that have been adopted are detailed in Table 7-2.

Mitigation measure	Mitigation type	Mitigation detail
Minimising run-up and run-down times	Reduce	KPS has reduced its cooldown sequence from 15 hours to 30 minutes. This abates a combination of internally generated and purchased electricity (dependent on availability) which are required for cooldown processes.
Wet compression system	Reduce	Implementing a wet compression system has increased the energy efficiency of the power station by reducing heat within the compressor. Hot ambient temperatures reduce the efficiency of the turbines, and result in less electricity per unit of gas being combusted. Wet compression mitigates these losses.
Avoiding generation using diesel	Avoid	Generation of electricity using diesel is avoided as far as possible, with diesel only used for generation when KPS is faced with gas supply issues. Diesel is more emissions intensive than gas, and while this proposal continues to allow for up to 200 hours of operation on liquid fuel (diesel) as back-up, the ongoing intent is to avoid this unless necessary. This has been the case for several years, and diesel was not used for generating electricity at KPS in FY20, FY22 and FY23
Electric vehicles	Avoid	Two electric vehicles and one electric buggy are already used on site to reduce diesel consumption and its associated emissions. RATCH is also considering switching the three remaining diesel vehicles on the KPS site to electric alternatives.
Offsets	Offset	RATCH has embarked on afforestation, forest rehabilitation and conservation projects, to maintain and create natural carbon capture storage, and is planning to develop carbon offsetting schemes based on the projects' carbon credits. These projects are underway for carbon credits assessment.

Table 7-2: Adopted mitigation measures

7.6 Assessment of significance of residual impacts

Under the maximum operating capacity of 13,800 hours, the Proposal is forecast to produce 1,345 ktCO₂-e per year, which would represent 1.68% of Western Australia's annual GHG emissions (based on the 2021 reporting year). The forecast Scope 1 GHG emissions from the Proposal exceed the 100,000 tCO₂-e per annum significant impact threshold. Accordingly, a GHGMP for the Proposal has been prepared (Section 7.6.1).

Actual emissions are anticipated to fall below 1,345 ktCO₂-e, however due to the variable factors that drive the operation of the KPS, a conservative figure of 13,800 hours has been used to determine maximum potential GHG emissions. The Proposal will support the WA Governments work towards net zero emissions by 2050, and the transition of the SWIS to a predominantly renewables based system.

7.6.1 Greenhouse Gas Management Plan

A Greenhouse Gas Management Plan (GHGMP) was prepared for the Proposal (Appendix B). The GHGMP was prepared in consideration of the EPA Factor Guideline for GHG Emissions (Ref: 20) and the EPA Template - Greenhouse Gas Environmental Management Plan (Ref: 22).

7.7 Environmental outcome

The EPA objective for GHG emissions is "*To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable*" (Ref: 20). While the Proposal will result in increased GHG emissions from the KPS, it will provide required electricity to the SWIS at a lower emissions intensity than the coal fired power plants that are scheduled to come offline by 2030, as required to support the WA State Governments ambition of achieving net zero emissions by 2050. The Proposal will facilitate the transition of the SWIS to a predominantly renewables network, with operating hours and associated GHG emissions reducing over time in line with new renewable capacity being added to the network.

No significant residual impacts have been identified and it is considered that the EPA's objective for GHG emissions will be met.

8. Other environmental factors

8.1 Social Surroundings

8.1.1 EPA objective

To protect social surroundings from significant harm (Ref: 21).

8.1.2 Policy and guidance

The relevant policy and guidance relating to the noise aspect of social surroundings include the following:

- *Environmental Protection Act 1986 (WA)*
- *Environmental Factor Guideline – Social Surroundings (Ref: 21)*
- *Environmental Protection (Noise) Regulations 1997 (Ref: 19) (Noise Regulations)*

The Noise Regulations provide allowable noise levels to be received at a premises from an external source. Assigned noise levels relating to 'noise sensitive premises: highly sensitive area' are the most stringent to assess against. The applicable noise levels are shown in Table 8-1.

Type of premises receiving noise	Time of day	L _{A10} (dB(A))	L _{A1} (dB(A))	L _{Amax} (dB(A))
Noise sensitive premises: highly sensitive area	7:00 am to 7:00 pm Monday to Saturday	45 + influencing factor	55 + influencing factor	65 + influencing factor
	9:00 am to 7:00 pm Sunday and public holidays	40 + influencing factor	50 + influencing factor	65 + influencing factor
	7:00 pm to 10:00 pm all days	40 + influencing factor	50 + influencing factor	55 + influencing factor
	10:00 pm to 7:00 am Monday to Saturday and 10:00 pm to 9:00 am Sunday and public holidays	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premise other than those in the Kwinana Industrial area	All hours	65	80	90
Note: <ul style="list-style-type: none"> • dB(A) is A-weighted decibels • L_{A1} is not to be exceeded for more than 1% of the time • L_{A10} is not to be exceeded for more than 10% of the time • L_{Amax} is not to be exceeded at any time 				

Table 8-1: Assigned noise levels for highly sensitive areas

An influencing factor is determined for each noise sensitive premises based on proximity to industrial land use, commercial premises, and main roads. Under the Noise Regulations, noise emissions for the KIP have an adjustment of +5 dB(A) to the influencing factor (Ref: 19). Therefore, the assigned noise levels relevant to this assessment are shown in Table 8-2.

Type of premises receiving noise	Time of day	L _{A10} (dB(A))	L _{A1} (dB(A))	L _{Amax} (dB(A))
Noise sensitive premises: highly sensitive area	7:00 am to 7:00 pm Monday to Saturday	50	60	70
	9:00 am to 7:00 pm Sunday and public holidays	45	55	70
	7:00 pm to 10:00 pm all days	45	55	60
	10:00 pm to 7:00 am Monday to Saturday and 10:00 pm to 9:00 am Sunday and public holidays	40	50	60

Table 8-2: Assigned noise levels for highly sensitive areas, including influencing factor

Further, noise emissions from KPS would be considered as not “significantly contributing” to any exceedance of the assigned noise levels if the noise received at the premises is 5 dB(A) below the assigned noise level (Ref: 19). Therefore, in order to comply with the most stringent

Noise Regulation, the L_{A10} value of noise received at the nearest sensitive receptor would need to be 35 dB(A) or below.

Additionally, noise emitted from any premises that exhibits certain characteristics (as defined in Item 9 of Part 2 of the Noise Regulations; Ref: 19) is subject to an adjustment as follows:

- Tonality receives an adjustment of +5 dB to the noise emitted.
- Impulsiveness receives an adjustment of +10 dB to the noise emitted.
- Modulation receives an adjustment of +5 dB to the noise emitted.
- The above adjustments are cumulative to a maximum of 15 dB.

8.1.3 Receiving environment

8.1.3.1 Sensitive receptors

KPS is located in a regional area, with the nearest built-up area, Harvey, located approximately 14 km to the northeast.

A sensitive receptor can be considered any place where a person is expected to work or reside "including a dwelling, school, hospital, office or public recreational area" (Ref: 38). A desktop assessment was undertaken to identify nearby sensitive receptors in line with this definition. Aerial imagery (Ref: 29) was reviewed within a radius of 10 km from KPS and buildings/infrastructure were marked as a sensitive receptor if they appeared to be a residence or facility where people are likely to work or spend a significant amount of time. Where the building use could not be determined, it was conservatively marked a sensitive receptor.

Identified sensitive receptors within a 10 km radius of KPS are shown in Figure 8-1, with the nearest sensitive receptors include possible residential dwellings approximately 2 km west of the Proposal.

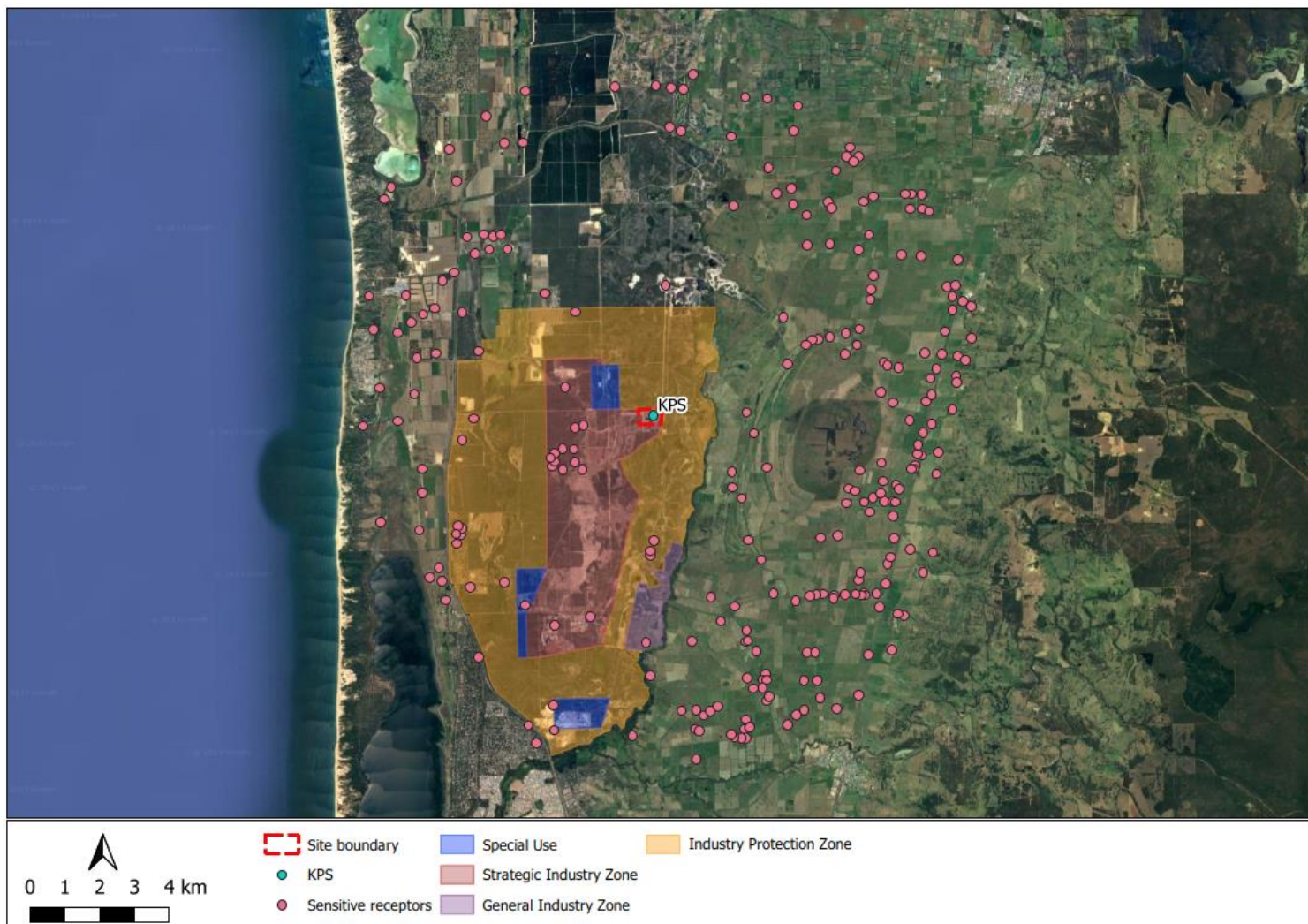


Figure 8-1: Sensitive receptors

8.1.3.2 Existing noise levels

The Proposal is largely isolated from other noise sources, with the nearest industry, Kemerton Silica Sand, located approximately 3.4 km to the northeast. The most significant extraneous noise sources would be vehicle noise from the surrounding roads and sounds of nature (birds, wind in trees etc.).

8.1.4 Potential environmental impacts

Noise emissions from the Proposal, specifically those from operation of the gas turbines (GT11 and GT12), have the potential to impact on social surroundings via impacts to nearby sensitive receptors. The greatest impact is likely to occur when the gas turbines are operating overnight when background noise levels are low, and a temperature inversion occurs with wind blowing towards the nearest sensitive receptors (Ref: 1).

A Noise Impact Assessment was undertaken by Worley Consulting (2024) (Appendix D) in order to determine the likely impacts of the Proposal on the local noise environment, refer to Section 8.1.4.1.

8.1.4.1 Noise Impact Assessment

A screening level noise assessment was undertaken in line with the *Draft Guideline: Assessment of Environmental Noise Emissions* (Ref: 16), which determined a detailed noise assessment was required based on the nature of the plant and the proximity of the KPS to the nearest sensitive receptors.

A detailed noise assessment for KPS was previously carried out by Herring Storer in 2003 (Ref: 33) which predicted noise emissions associated with KPS would not significantly impact the local noise environment. However, due to the age of the Herring Storer assessment, an updated model was undertaken to verify the results.

Noise monitoring was undertaken at the KPS site to be used as input into the updated noise model. The SoundPLAN v7.4 noise modelling software package was used to predict sound pressure levels at the nearest KSIA boundary, to compare results with the 2004 Herring Storer assessment.

Modelling scenarios included:

1. GT11 and GT12 operating simultaneously at 81 megawatts (MW) each (simulated as a singular noise source)
2. GT11 and GT12 operating simultaneously at 110 MW each (simulated as two noise sources)
3. GT11 operating in isolation at 110 MW
4. GT12 operating in isolation at 110 MW

Results of the noise modelling showed that for all investigated scenarios, the predicted sound pressure levels at the closest KSIA boundary were below 35 dB(A) for both day and night environmental conditions, which verified the results of the 2003 Herring Storer noise assessment.



Predicted noise contours for the night time results (which pertain to the most conservative environmental conditions) are shown for Scenario 2 in Figure 8-2.

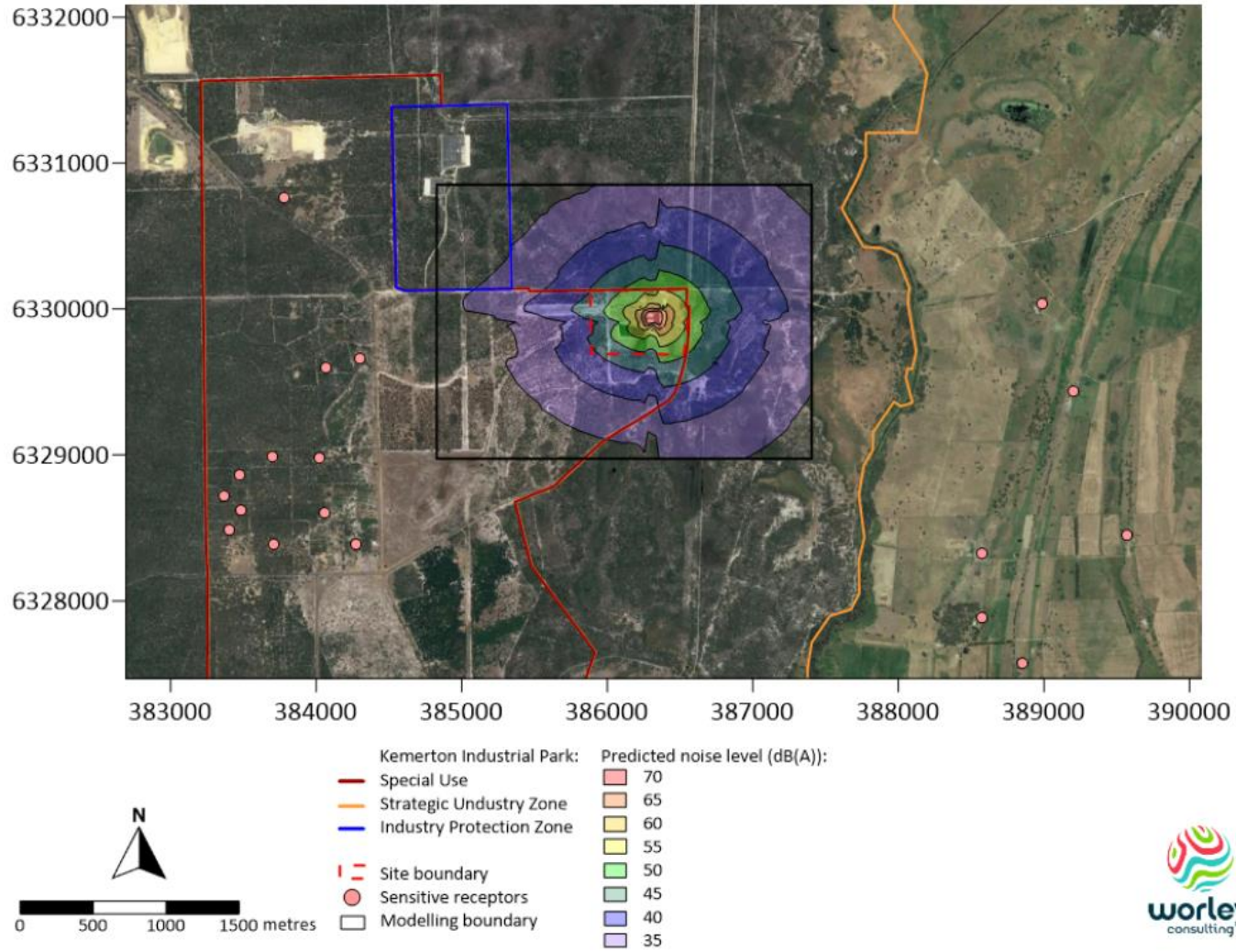


Figure 8-2: Predicted noise levels for Scenario 2 (Night)

8.1.4.2 Mitigation measures

Modelling confirmed that predicted sound power levels at the closest KSIA boundary were below 35 dB(A) for both day and night environmental condition, therefore no noise emissions related mitigation measures are proposed.

8.1.5 Environmental outcome

Results of the noise modelling showed that for all investigated scenarios, the predicted sound pressure levels at the closest KSIA boundary were below 35 dB(A) for both day and night environmental conditions, which verified the results of the 2003 Herring Storer noise assessment. As such, noise emissions associated with the Proposal are unlikely to have a significant effect on the local noise environment, and it is expected that the EPA's objective in relation to social surroundings, specifically noise, will be met.

8.2 Air quality

8.2.1 EPA Objective

To maintain air quality and minimise emissions so that environmental values are protected (Ref: 25).

8.2.2 Policy and guidance

The relevant policy and guidance relating to the air environment include the following:

- *Environmental Protection Act 1986 (WA)*
- *National Environment Protection (Ambient Air Quality) Measure (Ref: 37) referred to as the Air NEPM*
- *National Environment Protection (Air Toxics) Measure (Ref: 36) referred to as the Air Toxics NEPM*

The Air NEPM was developed to ensure all Australians have protection from the potential health effects of air pollution and have been developed for a number of criteria pollutants.

The Air Toxics NEPM provides a framework for monitoring, assessing, and reporting on ambient levels of five air toxics to facilitate the collection of information for the future development of air quality standards for these pollutants.

Relevant assessment criteria as taken from the Air NEPM and the Air Toxics NEPM are presented in Table 8-3.

Pollutant	Averaging period	Criteria ($\mu\text{g}/\text{m}^3$)	Source
NO ₂	1-hour	247	Air NEPM
	Annual	62	Air NEPM
SO ₂	1-hour	572	Air NEPM
	24-hour	229	Air NEPM
	Annual	57	Air NEPM

Pollutant	Averaging period	Criteria ($\mu\text{g}/\text{m}^3$)	Source
CO	8-hour	11,354	Air NEPM
PM _{2.5}	24-hour	25	Air NEPM
	Annual	8	Air NEPM
Benzene (a NMVOC)	Annual	11	Air Toxics NEPM
Formaldehyde (a NMVOC)	24-hour	54	Air Toxics NEPM
Toluene (a NMVOC)	24-hour	4,114	Air Toxics NEPM
	Annual	411	Air Toxics NEPM
Xylenes (as total of ortho, meta and para isomers) (a NMVOC)	24-hour	1,183	Air Toxics NEPM
	Annual	946	Air Toxics NEPM
Benzo(a)pyrene as a marker for PAH	Annual	0.3 ng/m ³	Air Toxics NEPM
Note: $\mu\text{g}/\text{m}^3$ is microgram per square meter			

Table 8-3: Adopted air quality assessment criteria

8.2.3 Receiving environment

8.2.3.1 Sensitive receptors

For the purposes of an air quality assessment, a sensitive receptor is generally accepted as any place where a person is expected to work or reside "including a dwelling, school, hospital, office or public recreational area" (Ref: 38). A desktop assessment was undertaken to identify nearby sensitive receptors in line with this definition, as discussed in Section 8.1.3.1.

Identified sensitive receptors within a 10 km radius of the Proposal are shown in Figure 8-1, with the nearest sensitive receptors include possible residential dwellings approximately 2 km west of the Proposal.

8.2.3.2 Existing ambient air quality

The local airshed receives pollutants from industry within the KSIA.

Due to the lack of air quality monitoring stations in the vicinity of the Proposal, modelled air quality data from the KIP⁴ Expansion Air Quality Assessment (Ref: 18) were reviewed to inform the overall state of existing air quality at the Proposal and beyond the KSIA area.

The purpose of the assessment (Ref: 18) was to update air quality modelling for a suite of industries located within the KSIA, to predict zones of impact from gaseous emissions from a mix of generic sources located within the KSIA. The assessment focused on NO₂ and SO₂, and included the following three scenarios:

- Existing industry (at the time of writing – 2010)
- Existing industry and approved future industry

⁴ KSIA referred to as the Kwinana Industrial Park in report.

- Existing industry, approved future industry and numerous hypothetical future industries representing a 'mature' industrial estate.

The results of the assessment are presented in Table 8-4.

Scenario	Maximum predicted 1-hour NO ₂ concentration outside the buffer (µg/m ³)	Maximum predicted 1-hour SO ₂ concentration outside the buffer (µg/m ³)
Criteria (µg/m ³)	247	572
1. Existing industry	59	55
2. Existing and approved future industry	65	72
3. Existing, approved, and hypothetical industry	71	169

Table 8-4: Results for the KIP expansion air quality assessment (Ref: 1)

It is assumed Scenario 3 is the most representative scenario of the likely local air quality associated with current industrial facilities within the KSIA. The maximum predicted 1-hour concentrations of NO₂ and SO₂ beyond the KSIA buffer are 29% and 30% of the criteria respectively. Therefore, the current local air quality is considered good and provides room for sustainable industrial growth within the KSIA.

8.2.4 Potential environmental impacts

The Proposal will result in increased atmospheric emissions from the KPS which has the potential to cause a reduction in ambient air quality.

Key emissions associated with the operation of the Proposal include nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO), particulate matter (PM_{2.5}), polycyclic aromatic hydrocarbons (PAH) and non-methane volatile organic compounds (NMVOC). Key atmospheric emission sources from the Proposal are the gas turbines (GT11 and GT12).

An Air Quality Impact Assessment was undertaken by Worley Consulting (2024) (Appendix E) was undertaken to determine the likely the impacts of the Proposal on local air quality, refer to Section 8.2.4.1.

8.2.4.1 Air quality Impact Assessment

The regulatory dispersion model, AERMOD, was used to predict the dispersion of relevant pollutants from the Proposal. Modelling was undertaken for three operational scenarios, with emission rates based on stack testing and MS 645 maximum allowable operations:

- Scenario 1a: Low operational load case with gas as a fuel source (emission rates taken from stack testing results)
- Scenario 1b: Low operational load case with diesel as a fuel source (emission rates taken from stack testing results)
- Scenario 2a: High operational load case with gas as a fuel source (emission rates taken from stack testing results)

- Scenario 3a: MS 645 maximum allowable operating conditions with gas as a fuel source (emission rates taken from MS 645)
- Scenario 3b: MS 645 maximum allowable operating conditions with diesel as a fuel source (emission rates taken from MS 645)

Prognostic three-dimensional (3D) meteorological data was used as input into the model. The meteorological data was generated using the Weather Research and Forecasting Model (WRF) in line with the United States Environmental Protection Agency's *Guidance on the Use of the Mesoscale Modelling Interface Program (MMIF) for AERMOD Applications* (Ref: 8).

The two gas turbines were included as point (stack) sources and the main buildings were included to capture any building downwash/wake effect.

Modelling results focused on the maximum predicted concentrations at the sensitive receptor locations (as discussed in Section 8.2.3.1) for each modelling scenario; and were compared to the respective assessment criteria (provided in Table 8-3). For all modelling scenarios and all pollutants of interest (NO₂, SO₂, CO, PM_{2.5}, PAHs and NMVOC) the predicted ground-level concentrations were well below the respective criteria. The absolute maximum predicted concentration with respect to the criteria, occurred for the maximum predicted 1-hour NO₂ concentration under Scenario 1b, at 5% of the Air NEPM criterion.

The maximum predicted concentration for each pollutant and relative averaging period are shown in Table 8-5.

Contours of the predicted 1-hour dispersion of NO₂ for Scenario 1b are shown in Figure 8-3.

Pollutant	Averaging Period	Assessment Criteria	Maximum predicted ground level concentration at the sensitive receptors		Percentage of criterion	Scenario
NO₂	1-hour	247 µg/m ³		12 µg/m ³	5%	1b
	Annual	62 µg/m ³		0.2 µg/m ³	0.3%	1b
SO₂	1-hour	572 µg/m ³		2.2 µg/m ³	0.3%	1b
	24-hour	229 µg/m ³		0.29 µg/m ³	0.1%	1a
	Annual	57 µg/m ³		0.02 µg/m ³	0.04%	1a
CO	8-hour	11,354 µg/m ³	2.2 µg/m ³	0.02%		3a
PM_{2.5}	24-hour	25 µg/m ³	0.3 µg/m ³	1%		3b
	Annual	8 µg/m ³	0.03 µg/m ³	0.3%		3b
PAHs	Annual	0.003 µg/m ³	5.00E-05 µg/m	2%		3b
NMVOC	24-hour	54 µg/m ³	0.04 µg/m ³	0.1%		3b
	Annual	11 µg/m ³	0.003 µg/m ³	0.03%		3b

Table 8-5: Maximum predicted concentrations from the Air Quality Impact Assessment

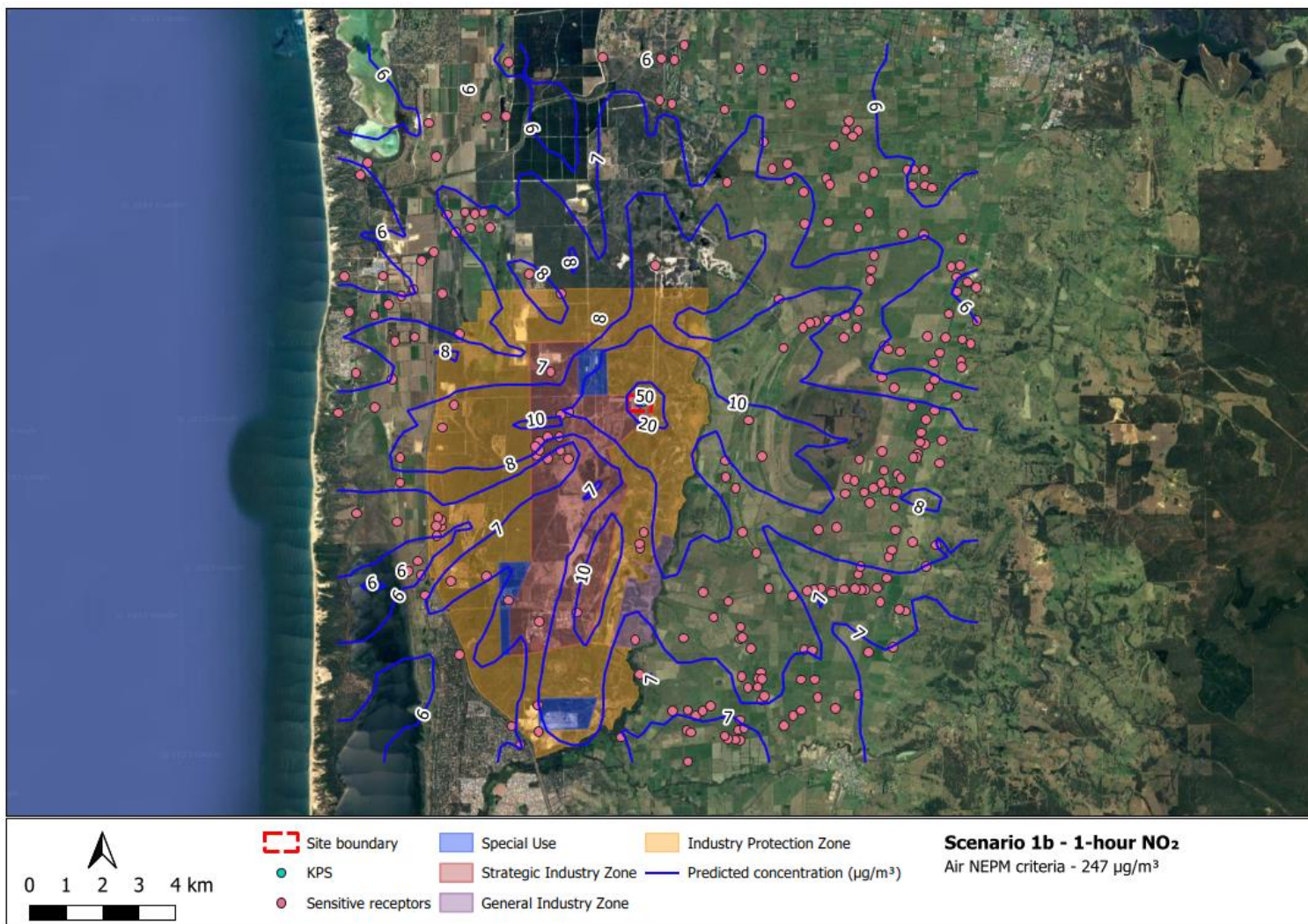


Figure 8-3: Scenario 1b – 1-hour NO₂

8.2.4.2 Mitigation measures

Based on the results of the Air Quality Impact Assessment, predicted ground level impacts are within the applicable standards; therefore, no further mitigation measures are proposed for emissions from the Proposal.

Monitoring of point source emissions to air from the KPS is managed under the current Prescribed Premises Licence (L8026/2006/6) - emissions to air will continue to be monitored under the Prescribed Premises Licence.

8.2.5 Environmental outcome

Based on the Air Quality Impact Assessment (Ref: 44, Appendix X) emissions associated with the Proposal are likely to have a negligible impact on the air quality in the local area of the KPS. Therefore, it is expected that the EPA's objective for air quality will be met.

9. Holistic impact assessment

As outlined in the EPA Instruction on how to prepare and Environmental Review Document (Ref: 23), a holistic impact assessment should be undertaken where 'the combination of the environmental effect of two or more environmental factors or values has the potential to result in a significant impact'. As determined in this document, the Proposal is only anticipated to result in significant impacts to a single environmental factor - GHG emissions, therefore there is no requirement for a holistic impact assessment to be undertaken.

10. Cumulative impact assessment

The EPA defines cumulative environmental impacts as 'the successive, incremental and interactive impacts on the environment of a proposal with one or more past, present and reasonably foreseeable future activities' (Ref: 23).

As outlined in Section 7.4.2, GHG emissions from the Proposal (under the maximum proposed operating capacity) would contribute an additional 1.68% to WAs, and 0.29% to Australia's total emissions. As also outlined in Section 7.4.2, KPS GHG emissions have historically fallen significantly below the volume approved under MS 645 and this trend is anticipated to occur.

Noise and air quality assessments determined that the Proposal is unlikely to result in significant impacts to Social Surroundings or Air Quality. As the Proposal is situated in isolation from other anthropogenic sources of noise, no cumulative noise impacts are anticipated. Air quality monitoring data was not available for the Proposal site, so background concentrations are unknown, however all modelling results predicted pollutant concentration well below the respective assessment criteria. Therefore, no cumulative impacts relating to air quality are anticipated.

11. References

1. Aquaterra, 2002. Kemerton Water Study Phase 2. Report prepared for Landcorp April 2002. Unpublished.
2. Australian Energy Market Operator Limited (AEMO) 2023a. 2023 Wholesale Electricity Market Electricity Statement of Opportunities. Available at: https://aemo.com.au/-/media/files/electricity/wem/planning_and_forecasting/esoo/2023/2023-wholesale-electricity-market-electricity-statement-of-opportunities-wem-esoo.pdf?la=en. Accessed December 2023.
3. Australian Energy Market Operator Limited (AEMO) 2023b. 2023 Western Australia Gas Statement of Opportunities. Available at: https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/wa_gsoo/2023/2023-wa-gas-statement-of-opportunities-wa-gsoo.pdf?la=en&hash=71B9040F2097FF4552429FF8F61C62A4. Accessed December 2023.
4. Bies, D., and Hansen, C 2009. *Engineering Noise Control Theory and Practice*, Fourth Edition. Eds. Spon Press. Abingdon England. 2009.
5. Bureau of Meteorology (BoM), 2023. Monthly climate statistics – Bunbury (Site number 009965). Available at http://www.bom.gov.au/climate/averages/tables/cw_009965.shtml. Accessed December 2023.
6. Commonwealth Scientific and Industrial Research (CSIRO) and the Bureau of Meteorology (BoM), 2022. State of the Climate 2022. Report prepared in collaboration with the Bureau of Meteorology. Available from: <https://www.csiro.au/en/research/environmental-impacts/climate-change/State-of-the-Climate>. Accessed February 2024.
7. Department of Biodiversity, Conservation and Attractions (DBCA), 2023. Geomorphic Wetlands, Swan Coastal Plain. DBCA-019. GIS dataset.
8. Department of Biodiversity, Conservation and Attractions (DBCA), 2018a. Vegetation Complexes – Swan Coastal Plain. DBCA-046. GIS dataset.
9. Department of Biodiversity, Conservation and Attractions (DBCA), 2018b. Directory of Important Wetlands in Australia – Western Australia. DBCA-045. GIS dataset.
10. Department of Biodiversity, Conservation and Attractions (DBCA), 2017. Ramsar Sites. DBCA-010. GIS dataset.
11. Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2023a. National Greenhouse and Energy Reporting (Measurement) Determination 2008. Available from: <https://legislation.gov.au/F2008L02309/latest/versions>. Accessed January 2024.
12. Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2023b. Australia’s emissions projections 2023. Available from: <https://www.dcceew.gov.au/climate-change/publications/australias-emissions-projections-2023>. Accessed January 2024. Available from: <https://www.dcceew.gov.au/climate-change/publications/australias-emissions-projections-2023>. Accessed January 2024.
13. Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2023c. Emissions by State and Territory. Available from: <https://greenhouseaccounts.climatechange.gov.au/>. Accessed January 2024.
14. Department of Jobs, Tourism, Science and Innovation (DJTSI) 2023. Kemerton Strategic Industrial Area. March 2023. Available at: <https://developmentwa.com.au/projects/industrial-and-commercial/kemerton-sia/overview>. Accessed December 2023.
15. Department of Planning, Lands and Heritage (DPLH), 2024. Heritage Council WA – Local

Heritage Survey. DPLH-008. GIS dataset.

16. Department of the Premier and Cabinet (DPC) (WA) 2022. State-owned coal power stations to be retired 2030 with move towards renewable energy. Available at: <https://www.wa.gov.au/government/announcements/state-owned-coal-power-stations-be-retired-2030-move-towards-renewable-energy>.
17. DWER (Department of Water and Environmental Regulation) 2021. *Draft Guideline: Assessment of Environmental Noise Emissions*. Joondalup, Western Australia. May 2021. Available from: <https://www.wa.gov.au/system/files/2022-03/Draft%20Guideline%20Assessment%20of%20environmental%20noise%20emissions.pdf>.
18. EA (Environmental Alliances) 2010. *Air Quality Modelling for the Expansion of the Kemerton Industrial Estate*, Report prepared by Air Assessments for EA. November 2010. Available from: <https://www.harvey.wa.gov.au/documents-and-forms/plans-and-strategies/2022/february/kemerton-industrial-area-appendix-i-air-quality-mo>. Accessed November 2023.
19. *Environmental Protection (Noise) Regulations 1997*. Issued under the *Environmental Protection Act 1986*, Western Australia. January 2017. Available from: [https://www.legislation.wa.gov.au/legislation/prod/filestore.nsf/FileURL/mrdoc_29715.pdf/\\$FILE/Environmental%20Protection%20\(Noise\)%20Regulations%201997%20-%20%5B02-c0-01%5D.pdf?OpenElement](https://www.legislation.wa.gov.au/legislation/prod/filestore.nsf/FileURL/mrdoc_29715.pdf/$FILE/Environmental%20Protection%20(Noise)%20Regulations%201997%20-%20%5B02-c0-01%5D.pdf?OpenElement).
20. Environmental Protection Authority (EPA) 2023a. *Environmental Factor Guideline – Greenhouse Gas Emissions*. April 2023. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Guideline-GHG-Emissions%20-%20April%202023.pdf. Accessed December 2023.
21. Environmental Protection Authority (EPA) 2023b. *Environmental Factor Guideline – Social Surroundings*. November 2023. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Environmental%20Factor%20Guideline%20-%20Social%20Surroundings%20%28Nov2023%29.pdf. Accessed December 2023.
22. Environmental Protection Authority (EPA) 2023c. Template: Greenhouse Gas Environmental Management Plan April 2023. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/GHG%20EMP%20TEMPLATE%20APRIL%202023.pdf. Accessed December 2023.
23. Environmental Protection Authority (EPA) 2021a. *How to prepare and Environmental Review Document - Instructions*. October 2021. Available from: https://www.epa.wa.gov.au/sites/default/files/Forms_and_Templates/Instructions-%20How%20to%20prepare%20an%20Environmental%20Review%20Document_0.pdf. Accessed December 2023.
24. Environmental Protection Authority (EPA) 2021b. *Instructions – Referral of a proposal under section 38 of the Environmental Protection Act 1986*. October 2021. Available from: https://www.epa.wa.gov.au/sites/default/files/Forms_and_Templates/Instructions_Request_to_amend_proposal_an_or_conditions_under_s.45C.pdf. Accessed December 2023.
25. Environmental Protection Authority (EPA) 2021c. *Instruction and template – How to identify the content of a proposal*. October 2021. Available from: https://www.epa.wa.gov.au/sites/default/files/Forms_and_Templates/Instruction-%20How%20to%20identify%20the%20content%20of%20a%20proposal_0.pdf. Accessed December 2023.
26. Environmental Protection Authority (EPA) 2021d. *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual – Requirements under the Environmental Protection Act 1986*. October 2021. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EIA%20%28Part%2

- 0IV%20Divisions%201%20and%202%29%20Procedures%20Manual 1.pdf. Accessed December 2023.
27. Environmental Protection Authority (EPA) 2021e. *Statement of environmental principles, factors, objectives and aims of EIA*. October 2021. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Statement%20of%20environmental%20principles%2C%20factors%2C%20objectives%20and%20aims%20of%20EIA.pdf. Accessed December 2023.
 28. Environmental Protection Authority (EPA) 2020. *Environmental Factor Guideline – Air Quality*. April 2020. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20Air%20Quality%20-%202003.04.2020.pdf. Accessed December 2023.
 29. Google Maps 2023, Google satellite imagery of the Kemerton Power Station and surrounds in World Geodetic System 1984, <https://www.google.cn/maps/vt?lyrs=s@189&gl=cn&x=%7Bx%7D&y=%7By%7D&z=%7Bz%7D>.
 30. Government of Western Australia, 2023a. Sectoral emissions reduction strategy for Western Australia – Pathways and priority actions for the state’s transition to new zero emissions. December 2023. Available from: <https://www.wa.gov.au/system/files/2023-12/sectoral-emissions-reduction-strategy-western-australia.pdf>. Accessed January 2023.
 31. Government of Western Australia, 2023b. SWIS Demand Assessment 2023 to 2042. May 2023. Available from: https://www.wa.gov.au/system/files/2023-05/swisda_report.pdf. Accessed December 2023.
 32. Government of Western Australia, 2020. Western Australian Climate Change Policy. Available from: https://www.wa.gov.au/system/files/2020-12/Western_Australian_Climate_Policy.pdf. Accessed December 2023.
 33. Government of Western Australia, 2020. Whole of System Plan. Energy Transformation Taskforce. Available from: https://www.wa.gov.au/system/files/2020-11/Whole%20of%20System%20Plan_Report.pdf. Accessed December 2023.
 34. Herring Storer 2003. *Proposed Power Station Kemerton, Western Australia, Environmental Acoustic Assessment*, November 2003.
 35. National Greenhouse and Energy Reporting (NGER), 2023. Greenhouse gases and energy. Available at: <https://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/electricity-sector-emissions-and-generation-data/electricity-sector-emissions-and-generation-data-2021%E2%80%9322>. Accessed February 2024.
 36. NEPC (National Environment Protection Council) 2011. *National Environment Protection (Air Toxics) Measure*. Australian Government. September 2011. Available from: <https://www.legislation.gov.au/Details/F2011C00855>. Accessed November 2023.
 37. NEPC (National Environment Protection Council) 2021. *National Environment Protection (Ambient Air Quality) Measure*. Australian Government. May 2021. Available from: <https://www.legislation.gov.au/Details/F2021C00475>. Accessed November 2023.
 38. NSW EPA (New South Wales Environmental Protection Authority) 2017, *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*, State of New South Wales, January 2017, Accessed 3 November from: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/approved-methods-for-modelling-and-assessment-of-air-pollutants-in-nsw-160666.pdf>.
 39. Office of the Environmental Protection Authority 2014. Kemerton Power Station Desktop Audit Report. File Number CA01-2013-0017. May 2014.

40. Shepherd, D.P., Beeston, G.R and Hopkins, A.J., 2002. Native vegetation in Western Australia: extent, type and status. Department of Primary Industries and Regional Development. Perth, Western Australia. Report 249.
41. Transfield Services Kemerton, 2003. Kemerton Power Station Referral Supporting Document Volume I and Volume II. Report No: 2003/179. Referral prepared by ATA Environmental.
42. US EPA (United States Environmental Protection Agency) 2023, *Guidance on the Use of the Mesoscale Model Interface Program (MMIF) for AERMOD Applications*, EPA-454/B-23-006, Office of Air Quality Planning and Standards, North Carolina, October 2023, https://gaftp.epa.gov/Air/aqmg/SCRAM/models/related/mmif/MMIF_Guidance.pdf.
43. World Bank Group, 2007, *Environmental, Health, and Safety General Guidelines*, April 2007, <https://www.ifc.org/content/dam/ifc/doc/2023/ifc-general-ehs-guidelines.pdf>.
44. Worley Consulting 2023a. *Kemerton Power Station - MS 645 Amendment Air Quality Impact Assessment*. December 2023.
45. Worley Consulting 2023b. *Kemerton Power Station - MS 645 Amendment Noise Impact Assessment*. December 2023.

Appendix A. PMST Report



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 13-Mar-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	31
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	8
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Peel-yalgorup system	Within 10km of Ramsar site

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
Zanda baudinii listed as Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black- Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding likely to occur within area
Zanda latirostris listed as Calyptorhynchus latirostris Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area
FISH		
Galaxiella nigrostriata Blackstriped Dwarf Galaxias, Black- stripe Minnow [88677]	Endangered	Species or species habitat may occur within area

MAMMAL

Scientific Name	Threatened Category	Presence Text
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area
PLANT		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Austrostipa bronweniae listed as Austrostipa bronwenae [92773]	Endangered	Species or species habitat may occur within area
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area
Caladenia procera Carbunup King Spider Orchid [68679]	Critically Endangered	Species or species habitat likely to occur within area
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat known to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat known to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leafed Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat known to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Morelotia australiensis listed as Tetraria australiensis Southern Tetraria [92784]	Vulnerable	Species or species habitat may occur within area
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area
Synaphea sp. Serpentine (G.R.Brand 103) [86879]	Critically Endangered	Species or species habitat may occur within area
Synaphea stenoloba Dwellingup Synaphea [66311]	Endangered	Species or species habitat may occur within area

SHARK

Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area
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Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Migratory Marine Species

Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area
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Migratory Terrestrial Species

Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
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Migratory Wetlands Species

Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State
Gwalia	Nature Reserve	WA

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Leeuwin Offshore Wind Farm	2022/9160	Controlled Action	Assessment Approach
Silica Sand Mine Expansion	2002/910	Controlled Action	Post-Approval
WA Offshore Windfarm	2021/8961	Controlled Action	Assessment Approach
Yarragadee Water Supply Development	2005/2073	Controlled Action	Completed
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Kemerton Lateral Gas Pipeline Project	2005/2388	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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Appendix B. Greenhouse Gas Management Plan



Appendix C. GHGMP External Review



Appendix D. Noise Impact Assessment



Appendix E. Air Quality Impact Assessment