



Application for a works approval

Division 3, Part V *Environmental Protection Act 1986*

Works approval number	W6515/2021/1
Applicant	AWE Perth Pty Ltd
ACN	009 204 031
File number	DER2021/000104
Premises	Waitsia Gas Project Stage 2 Pye Rd YARDARINO WA 6525 Legal description – Lot 4 on Plan 13178, within Production Licence L1
Date of report	3 August 2021
Status of report	Final

1. Purpose and scope of assessment

AWE Perth Pty Ltd, a wholly owned subsidiary of Mitsui E&P Australia (the applicant), proposes to construct Stage 2 of the Waitsia Gas Project (Stage 2). An application for works approval was submitted under Division 3 Part V of the *Environmental Protection Act 1986* (EP Act) on 12 February 2021.

This report sets out the delegated officer's assessment of potential risk events arising from emissions and discharges during construction and operation of infrastructure relating to the prescribed activity.

In completing the assessment documented in this report, the department has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2. Application details

2.1 Background

The applicant proposes to further develop the Waitsia gas field, a free-flowing conventional natural gas reservoir in the onshore North Perth basin, about 16 km southeast of Dongara.

The applicant currently operates the Waitsia Gas Project Stage 1, which was commissioned in 2016 and has been producing from existing gas wells through the refurbished Xyris Production Facility (XPF). Stage 1 was initially developed for an extended production test of the Waitsia gas reservoir and included upgrades to existing assets that connected the Waitsia-01 and Senecio-03 gas wells to the XPF, which had been in care and maintenance since 2010.

The initial production capacity of XPF was about 11.5 terajoules (TJ) per day, however this was expanded to about 30 TJ per day following completion of the Stage 1 expansion project in September 2020. Gas processed through XPF was initially delivered through the Parmelia Gas Pipeline, however following the Stage 1 expansion, delivery has been through the Dampier to Bunbury Natural Gas Pipeline (DBNGP) for both domestic and industrial consumption.

Stage 1 was not assessed by the Environmental Protection Authority (EPA) as the impacts were not so significant that they warranted referral to the EPA. Stage 1 has been regulated by the department under Part V of the EP Act and by the Department of Mines, Industry Regulation and Safety (DMIRS) under the *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act) and the *Petroleum Pipelines Act 1969*.

Stage 2 is separate from Stage 1 and relates to new infrastructure required for a fully producing gas field. The Stage 2 proposal was assessed by the EPA at the level of assessment of Referral Information with additional information required, with a two-week public review (EPA Report 1687). The proposal was approved by Ministerial Statement 1164 in February 2021 (see section 3.1). Stage 2 is also subject to separate approvals under the PGER Act, with an Environment Plan approved by DMIRS in May 2021.

2.2 Overview

The application for Stage 2 comprises the construction of a new gas processing facility and additional gas gathering facilities, resulting in up to 8 production wells being connected to a new gas plant (Waitsia Gas Plant, WGP).

Key elements of the application include:

- construction and operation of a new gas plant, with a maximum export capacity of 250 TJ per day;
- installation of a gas gathering system comprising of flowlines and hubs to transfer the extracted gas to the gas plant and gas distribution network; and
- construction of evaporation pond(s) for storage of produced water (PW) and turkey's nest(s) for storage of other contaminants and hydrocarbons.

Gas extracted from new production wells will be conveyed to gas gathering stations, or hubs. Gas will then be directed via flowlines to the proposed WGP for processing, before being conveyed to the nearby DBNGP.

Table 1 describes the prescribed premises category that the application is subject, as defined in Schedule 1 of the Environmental Protection Regulations 1987.

Table 1: Prescribed premises category

Classification of premises	Assessed design capacity (as per application)
Category 10: Oil or gas production from wells: premises, whether on land or offshore, on which crude oil, natural gas or condensate is extracted from below the surface of the land or the seabed, as the case requires, and is treated or separated to produce stabilized crude oil, purified natural gas or liquefied hydrocarbon gases.	1,873,000 tonnes per year of natural gas 250 terajoules per day

2.3 Proposal details

The WGP is an industrial facility that will process gas produced from deep underground conventional free-flowing reservoirs. It will be a self-contained, stand-alone facility that will be operated from site, with remote monitoring capability.

The gas extracted from the wells will be treated with chemicals from dedicated injection packages located in the well site compounds before the treated reservoir fluids are conveyed via flowlines to centrally located gas gathering hubs. These reservoir fluids will then be directed via flowlines to the proposed gas plant for processing.

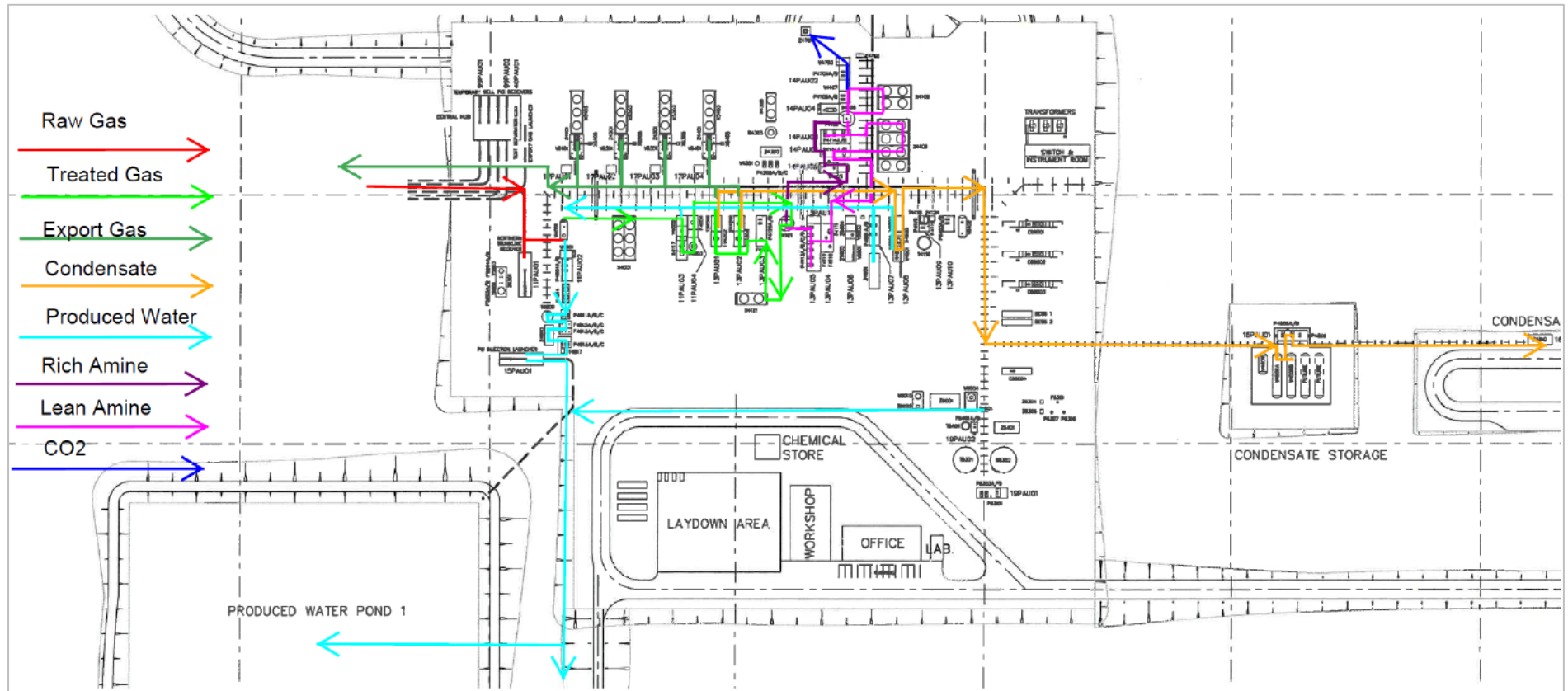
On arrival at the gas plant, the PW and condensate will be separated and removed. After gas 'sweetening' (i.e., removal of H₂S, CO₂ and mercaptans from the gas stream to make it suitable for transport and sale), water content control and hydrocarbon dewpointing, treated gas will be compressed and exported to the nearby DBNGP. The condensate will be stabilised, stored and loaded-out to road trains for off-site disposal. A process overview for the WGP is provided below as Figure 1.

The plant will be operated 24 hours per day, 365 days a year.

2.3.1 Infrastructure and equipment

The gas plant will comprise the following infrastructure and equipment

- slug catcher – provides the initial separation of free liquids from the gas stream and a buffer volume to prevent 'slugs' of liquid entering the gas plant;
- future inlet compression – for when the reservoir pressure declines, and additional compression is required for the cases where lower pressure will cause a loss of efficiency in the gas plant;
- inlet cooling – for cases where the raw gas arrival temperature may cause a loss of efficiency in the gas plant and/or loss of dewpoint control in the export pipelines;
- inlet separation – removes condensate liquid from the gas stream after inlet cooling;
- mercury removal – removes mercury from the product the meet environmental and DBNGP specification limits;
- gas sweetening – CO₂ removal to DBNGP specification limits;
- water content and hydrocarbon dewpoint control – reduction to levels that will satisfy the DBNGP specification limits;
- export compression and metering – treated gas from the dewpoint control equipment is routed to sales gas compressors to boost the gas pressure to allow export of the gas into the DBNGP;
- condensate treatment and storage – recovered condensate is stabilised and stored prior to off-site disposal;



▲ Figure 1: WGP gas process flow

- PW treatment, prior to conveyance to re-injection wells (future scope), with evaporation pond(s) as a contingency; and
- support utilities.

A summary of key WGP systems and infrastructure is detailed in Table 2.

Table 2: Key WGP systems and infrastructure

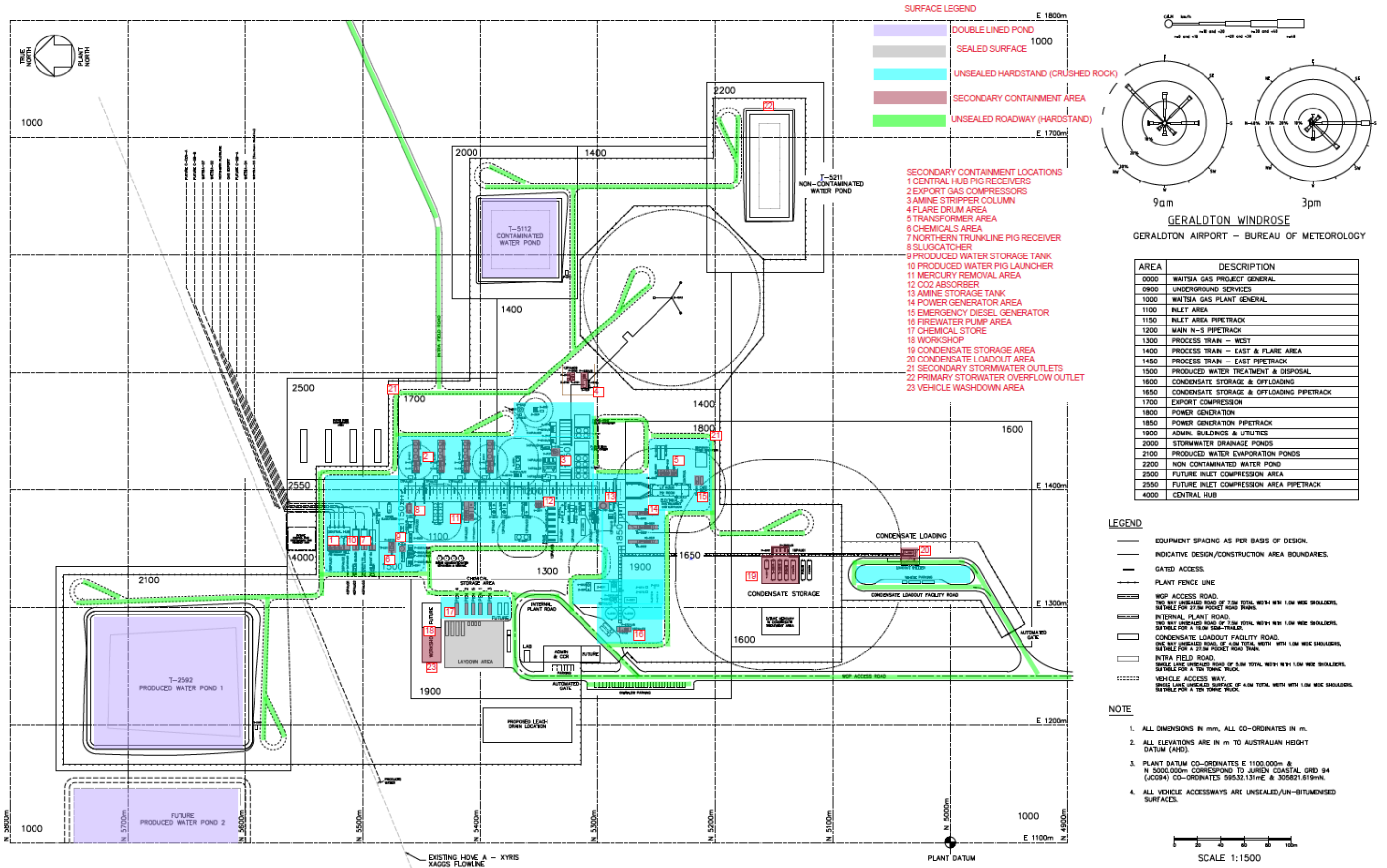
System / infrastructure	Description
Operational infrastructure	
Pig receivers	Located within a contained area to ensure an incidental release of liquid hydrocarbons during pig retrieval is contained.
Export compressors	4 export compressors will be used to facilitate the delivery of gas from the WGP to the DBNGP. These compress the export quality gas from the WGP to meet or exceed the DBNGP pressure, thereby moving the gas from the WGP to the DBNGP. Export compressors will be provided with double-block and bleed isolation from the upstream train, and at the suction and discharge of each individual compressor.
Amine system	A gas sweetening system used to remove CO ₂ from the reservoir gas to ensure it meets the specification required for export into the DBNGP. This is the key gas processing system where the amine chemical is diluted with water, and this mixture (lean amine) is then brought into contact with the hydrocarbon gas, where CO ₂ is stripped out of the gas. The amine-water-CO ₂ mixture (rich amine) is then regenerated, and the CO ₂ is then routed to the incinerator, resulting in the lean amine which in turn is recirculated back through the process.
Flare drum area system / stack	An emergency flare connected to the flare header and knock-out drum system will be installed to allow relief steam, blowdowns and vents to be directed to the atmosphere. The ignition system will comprise an automatic high-energy ignition with manual flame front generator backup. At least 3 installed thermocouple devices will be provided for flame-out detection. A flare drum will be installed to knockout any liquids from the gas to ensure liquids are not routed to the flare. The flare will operate with a pilot light under normal operation and gas will be re-routed to the flare under an emergency scenario. Pilots and flare purge will operate continuously. The flare will be shrouded to minimise light emissions during normal operations.
Transformer area	Comprises step down transformers that will convert 6.6 kV to 440 V.
Slug catcher	Provides initial separation of free liquids from the gas stream and provides a buffer volume to prevent slugs of liquid entering the WGP.
Produced water system	Includes PW storage tank and PW pig launcher. PW will primarily be separated within the slug catcher and feed knock out drum. The PW degasser will separate vapour from the liquids that will be directed to the acid gas knock out drum for disposal by the incinerator. PW from the degasser will then be pumped to the PW cooler which will reduce the fluid temperature to 50°C during normal PW rate of ~16 m ³ /hr. There are two paths of flow for the PW – treated and filtered prior to re-injection into depleted reservoirs (future scope), or diverted to evaporation ponds if the re-injection system is offline.
Mercury removal unit	A single non-regenerable bed type MRU will be used to remove elemental mercury from the reservoir fluids.

System / infrastructure	Description
	Mercury removal facilities are designed to meet the mercury sales gas specification of nil commercially detectable levels.
Generators	Primary power generation at the site will comprise 3 x 2.6 MW (6.6 kV) gas fired generator sets (operated at 50% capacity). A permanent 1,300 kW diesel generator will be used for black start of the facility and possibly during construction/commissioning/maintenance, and will be kept as a backup power source.
Containment infrastructure	
Condensate storage tanks	Condensate will be stored in 4 x horizontal storage tanks, each with a working capacity of 150 m ³ . Tanks will connect to the loading area for export by road tankers off-site. Bunding will be constructed in accordance with AS1940:2017.
Condensate loading area	Road tankers will be loaded with condensate for off-site disposal. Bunding will be constructed in accordance with AS1940:2017.
Amine storage tanks	Amine chemicals will be stored in 2 x horizontal storage tanks, each with a working capacity of at least 125 m ³ .
Chemical area	Storage of operational volumes of production chemicals used to supply the gathering system and the WGP. Bunding will be constructed in accordance with AS/NZS 3833, AS1940 and Dangerous Goods legislation.
Storage ponds	
Temporary construction turkey's nest	Provide storage of liquid wastes including RO brine, concrete batching plant wash-out, etc. during construction works. To be lined with single 0.75 mm HDPE liner.
PW evaporation ponds	Up to 2 x evaporation ponds to provide initial storage capacity of PW, and contingent storage capacity in the event that future re-injection of PW is interrupted. Design of each pond accounts for 1:25 year, 24-hour rainfall events, with a minimum surface area of 10,000 m ² . To be lined with double 1.5 mm HDPE liner with leak detection. Each pond will be operated with a minimum 500 mm operational freeboard.
Contaminated water pond	Provide containment of surface water runoff from bunded process plant areas. Estimated minimum storage capacity of 4,800 m ³ (excluding 500 mm freeboard). To be lined with double 1.5 mm HDPE liner with leak detection.

Secondary containment

Secondary containment is required for all tanks and storage area containing hazardous materials, including hydrocarbons, chemicals, and process fluids. An indicative layout showing areas with secondary containment is shown in Figure 2, with design requirements listed above in Table 2.

Secondary containment will comprise several different forms, including prefabricated concrete bunds, concrete bunds constructed on-site, built-in metal containment bunds (i.e., within a self-contained skid) and double-skinned tanks. All containment will meet the design principals of AS 1940.



▲ Figure 2: WGP – plant surfaces and secondary containment

Storage ponds

The applicant may construct a temporary turkey's nest to enable storage of liquid wastes during construction, such as reverse osmosis brine (from the RO plant) and concrete batching plant washout. The pond will comprise a single liner only due to its short duration, however other storage tanks may also be used for storing these liquid wastes.

Although two PW evaporation ponds are included in the site design, the applicant intends to only construct a single pond initially, with a second pond to be constructed in the future, if required.

The applicant advises one of the PW ponds or a temporary turkey's nest may initially be used to store construction water (e.g., potable water), and if so, will be constructed and lined with a single 0.75 mm HDPE temporary liner.

The design specifications of all storage ponds to be constructed is listed above in Table 2.

Site drainage

The proposed drainage system at the premises consists of:

- secondary containment that drains to a contaminated water collection system, the low points of the bunds are connected to the sump via piping with a lockable valve which will normally be closed;
- secondary containment that is not connected to a contaminated water collection system, will be connected to sumps designed with manual valves (normally closed) that will allow uncontaminated water to flow via the stormwater drainage system to grade, or emptied using a vacuum trailer; and
- drainage for the gas compressor packages, generator packages, flare knockout drum, transformers and condensate load-out bay will be connected to external sumps, which will be drained regularly using a vacuum trailer.

Hazardous materials storage

Several hazardous materials and chemicals are required to support on-site activities, with the largest being a 50,000 L self-bunded diesel tank. Several other hazardous materials and chemicals will be stored within 1,500 L intermediate bulk containers and 200 L drums, in bunded areas in accordance with the storage requirements contained in AS 1940.

2.4 Construction and commissioning

2.4.1 Construction schedule

The applicant proposes to commence construction activities in Q3 2021, with commissioning expected to commence in late 2022 and operations by early 2023. Activities proposed during construction include site preparations and civil works, installation of the temporary construction village (not covered by the scope of this application), and installation of the gas plant equipment and associated infrastructure.

To reduce on-site construction time, a large portion of the WGP systems and infrastructure will be transported to site in modular form. Most buildings associated with the WGP are also likely to be prefabricated and pre-fitted before transportation to site, however there will be some systems, infrastructure and buildings that will require on-site assembly.

2.4.2 Commissioning

Following completion of construction activities, commissioning will be undertaken over a period of about 6 months and will involve the following pre-commissioning works:

- first introduction of hydrocarbons, and hydrocarbon commissioning of all aspects of the works including testing and turning of the system;
- functional testing of all manual and actuated valves, including testing of actuated valves under nitrogen;

- low pressure air leak testing of piping, valve seats of critical valves and pressure equipment;
- cold loop testing, energising, and functional testing of all circuits;
- hot loop and motor bump checks; and
- other pre-commissioning checks necessary to enable the introduction of gas and initial pressurisation.

Commissioning activities will then include the following:

- transfer of the 'permit to work' system to the applicant from the point of introduction of hydrocarbons;
- purge of air from all process pipework and the introduction of a nitrogen blanket;
- initial pressurisation of all process (with hydrocarbons) and utility pipework, up to full available service pressure, in a progressive manner with repeated leak checks;
- wet calibration of the fuel gas system;
- start-up of the compressor package and commissioning of the compressor; and
- re-commissioning of all equipment and performance testing of the plant.

As agreed by the applicant, an environmental commissioning plan was not required to be submitted with the application, however a plan will be required to be submitted at least 3 months prior to the commencement of commissioning, as a condition of the works approval.

Emissions to air (commissioning)

The following emissions to air are expected to result from commissioning activities:

- functional testing of all manual and actuated valves, including testing of actuated valves under nitrogen;
- initial pressurisation of all process (with hydrocarbons) and utility pipework, up to full available service pressure, in a progressive manner with repeated leak checks;
- wet calibration of the fuel gas system; and
- initial energization and operation, through to performance testing of the WGP.

Emissions to air from commissioning activities are expected to be similar to the emissions produced during operations (see below).

Produced formation water (commissioning)

A flowline will be installed from the WGP to transport PW for storage within the PW pond, if re-injection for PW into the depleted reservoirs of identified existing wells is interrupted. The water line will be comprised of both HDPE and carbon steel (below ground and above ground, respectively) designed to AS 2885.1. During commissioning, the integrity of the flowline and reinjection well will be verified.

2.5 Operational aspects

Operation of the WGP will involve processing methane and the removal and subsequent release of CO₂ to meet gas pipeline requirements. Emissions of concern include oxides of nitrogen (NO_x), particulate matter including PM_{2.5}, VOCs (including benzene, toluene and xylene (BTX)), and mercury (Hg).

Point sources of air emissions will include:

- inlet compression – will be undertaken by 4 x 1,860 kW gas engine-driven compressors, operating on an n+1 basis and so only three compressors normally will be operating at any one time. Inlet compression will not be installed at the time of initial construction of the plant, but has been modelled to ensure the whole plant is considered. Emissions of concern are primarily NO_x;
- export compression – will be undertaken by 4 x 1,860 kW gas engine-driven compressors, operating on an n+1 basis and so only three compressors normally will be operating at any one time. Emissions of concern are primarily NO_x;

- gas engine alternator – power will be supplied by 3 x 2,600 kW generators, operating on an n+1 basis and so only two generators normally will be operating at any one time. Emissions of concern are primarily NO_x;
- emergency diesel engine generator – power will be supplied by one generator for black start of the facility and possibly during construction/commissioning/maintenance. Outside of these times, it is expected the generator will only be periodically started for maintenance. The generator will be rated at about 1,300 kW, with emissions of concern primarily NO_x;
- hot water fired heater – a 26,000 kW (duty) hot water fired heater will operate continuously. Emissions of concern are primarily NO_x;
- incinerator – will be used to incinerate acid gases removed during processing. Emissions of concern are primarily NO_x;
- flare – will operate with a pilot light under normal operations and gas will be re-routed to the flare under an emergency scenario. In the event the incinerator is not operational, the acid gas emissions will be redirected to the flare.

Expected air emissions

Expected emission rates during operation of the WGP are summarised in Table 4 and have been provided in terms of normal operations and emergency operations. Normal operations include emissions from the generators, the compressors, the flare with pilot flame, the heating medium boilers and the incinerator. Emergency operations include emissions from the plant when the flare is operating at peak flow conditions (all other sources would remain operational). The applicant expects that emergency operations would only occur for a small number of hours (less than 24 hours) and result in short-term impacts.

Emissions rates for each component have been derived from a number of sources, including manufacturer provided fuel consumption rates and emission factors, the National Pollutant Inventory (NPI) Combustion Sources Emissions Estimations Manual (NPI 2008) and the NPI Oil and Gas Emissions Estimations Manual (NPI 1999).

2.5.1 Produced water

During operations, the daily total PW (PW and condensed water) from the reservoir will initially be about 142 m³ and is expected to peak at about 381 m³ after about 4 years, before reducing back to 142 m³ over the subsequent 7 years. The total PW volume required to be disposed over the 20-year life of operation will be about 1,000,000 m³.

Although aquifer re-injection of PW is the applicant's preferred method of disposal, it plans to construct a PW pond, with a design and space for a second duplicate pond. The ponds will comprise a dual 1.5 mm HDPE geomembrane liner, with leak detection installed between the two layers. The ponds will store PW so that evaporation occurs over time, to avoid the requirement for potential additional water treatment.

The initial PW pond has been designed to provide a minimum evaporation area of 10,000 m², which will account for instantaneous rainfall events on a 25-year, 24-hour storm event. Each pond will be constructed with a minimum surface area of 10,000 m², excluding a minimum 500 mm operational freeboard.

The applicant plans to install a groundwater monitoring bore downgradient of the PW pond, to detect any potential leakage through the pond liner system.

Table 4: Source parameters and emission rates for the proposed WGP

Emission source	Gas engine generator	Diesel engine generator	Export gas compressor	Inlet gas compressor	Hot water fired heater	Incinerator	Flare (normal)	Flare (peak flow rate)
Installed units	3	1	4	4	1	1	1	1
Operating units	2	1	3	3	1	1	1	1
Stack height (m)	6.4	8.2	6.5	6.5	24.5	22.9	15.96 ¹	44.06
Stack internal diameter (m)	0.5	0.5	0.35	0.35	1.3	1.219	0.18 ¹	6.32 ¹
Exit velocity (m/s) [per unit]	43.8	20	46	46	15	22.3	20	20
Am ³ /s (actual @ stack temp)	8.6	3.95	4.43	4.43	19.91	26.03	0.51	627.41
Temperature (°C)	500	495	574	574	400	259	1,000	1,000
Mass emission rate (g/s)								
NO _x	0.803	3.59	0.297	0.297	0.880	4.94	0.00201	11.3
PM _{2.5}	0.000181	0.108	0.00686	0.00686	0.133	0.706	Negl	Negl
Benzene	0.00103	0.000881	0.0000429	0.0000429	0.00372	0.0141	Negl	Negl
Toluene	0.000956	0.000312	0.000472	0.000472	0.00591	0.0141	Negl	Negl
Xylene	0.000431	0.000217	0.000229	0.000229	Negl	0.0141	Negl	Negl
Hg	Negl	Negl	Negl	Negl	Negl	Negl	Negl	Negl

Note 1: Flare values presented are the effective release heights and diameters which are derived using expected net heat release rate.

2.6 Exclusions to this assessment

The following matters are out of the scope of this assessment and have not been considered within the technical risk assessment detailed in this report:

- gas gathering infrastructure and associated extraction activities;
- gas export pipelines and associated exporting activities;
- reinjection of PW – this aspect will be subject to a separate works approval application;
- electric power generation – proposed power generation is below the prescribed threshold;
- concrete batching, where batching is conducted on the premises;
- preparatory works, such as clearing, levelling and construction of access roads, carparks, laydown areas, office buildings, workshops, warehouse/storage, and construction of hardstands for use in construction works;
- construction and operation of the temporary worker's accommodation camp, including wastewater (sewage) and municipal waste disposal; and
- construction and operation of ponds for storage of potable water.

The works approval is related to category 10 activities only and does not offer the defence to offence provisions in the EP Act (see s.74, 74A and 74B) relating to emissions or environmental impacts arising from non-prescribed activities, including those listed above.

3. Other approvals

3.1 Part IV of the EP Act

3.1.1 Background

The Stage 2 proposal was referred to the EPA in August 2019 under section 38 of the EP Act. In October 2019, the EPA decided to assess the proposal and set the level of assessment at Referral Information with additional information required, with a two-week public review period.

The EPA advertised the referral information for the proposal for public comment in September 2019 and received 273 submissions, with most submissions requesting the proposal be assessed at the level of Public Environmental Review.

The additional referral information was released for public review from 23 April 2020 to 7 May 2020. A total of 43 public submissions and three agency comments were received, with the key issues relating to:

- uncertainty of the impacts to groundwater and surface water from abstraction, gas processing and wastewater reinjection;
- potential impacts on air quality;
- impacts to flora and vegetation;
- potential impacts from greenhouse gas (GHG) emissions;
- increase in seismic activity due to reinjection of wastewater;
- potential impacts on cultural heritage; and
- concern regarding future hydraulic fracturing as part of the proposal.

The EPA released its final report on the assessment (EPA Report 1687) in September 2020. The Minister for Environment (Minister) subsequently approved the project through the publishing of MS 1164 on 1 February 2021.

3.1.2 Ministerial Statement 1164 of 2021

The key environmental factors identified in EPA Report 1687 are generally related to the potential impacts from the proposal on flora and vegetation, inland waters, GHG emissions, air quality and social surroundings. Several recommendations were made, however none that were specific to emissions and discharges from the construction or operation of the gas plant.

The EPA also provided 'other advice' to the Minister with respect to emissions and discharges, noting that a works approval and licence are statutory requirements for the proposal and are the most appropriate regulatory instrument for regulating emissions and discharges from the proposal. The EPA notes DWER will assess emissions and discharges in more detail and expects management and monitoring conditions to be applied to the proposal.

MS 1164 contains several conditions that relate to ensuring there are no adverse impacts resulting from clearing native vegetation, groundwater abstraction and flaring, and that GHG emissions are offset.

Key findings:

The delegated officer notes that:

- 1) it is the EPA's view the proposal's air emissions can be adequately regulated through Part V of the EP Act, rather than a condition under Part IV of the EP Act, in addition to management of PW, noise impacts and visual amenity;
- 2) MS 1164 includes a control on the maximum capacity of the gas plant (set through the authorised extent in Schedule 1), to limit GHG emissions from the proposal; and
- 3) MS 1164 includes a condition requiring implementation of a greenhouse gas management plan, which requires the reporting of GHG emissions to DWER and the public to ensure emission reduction targets proposed by the applicant are being achieved.

3.2 Part V of the EP Act

3.2.1 Clearing of native vegetation

Clearing of native vegetation in Western Australia requires a clearing permit unless exemptions apply. Under Schedule 6 of the EP Act, clearing assessed under section 40 of the EP Act as part of a proposal referred under section 38 of Part IV of the EP Act does not require a clearing permit, providing the clearing is done in accordance with the Implementation Agreement or Decision.

The proposed site for the WGP is a cleared, agricultural paddock and there is no native vegetation clearing required.

Clearing of some native vegetation is however required for the flowlines and some wells that form the gathering system, which is outside the scope of the Part V application. The delegated officer notes this proposed clearing has been assessed by the EPA under Part IV of the EP Act, with the authorised extent of clearing limited to a maximum of 17 ha within the development envelope, as described and spatially defined in MS 1164.

3.3 Other relevant approvals

3.3.1 *Petroleum and Geothermal Energy Resources Act 1967*

In Western Australia, all onshore petroleum exploration and developments are subject to approval by DMIRS under the PGER Act and regulations, and *Petroleum Pipelines Act 1969* and regulations.

Aspects of the proposal that constitute a 'petroleum activity' are subject to the PGER Act and regulations that, among other things, will require the applicant to submit environment plans (EP) for petroleum activities that demonstrate how all environmental risks and impacts will be managed and carried out in a manner consistent with the principles of ecologically sustainable development.

Relevant EPs approved by DMIRS under the PGER Act and regulations include:

- Waitsia Gas Project Stage 2: Facilities and Temporary Construction Village Environment Plan (WGP-HSE-PLN-00001 Rev 2); and
- Waitsia Gas Project Stage 2: Flowlines and Hubs Construction Environment Plan (WGP-

HSE-PLN-00002; under assessment by DMIRS).

3.3.2 Rights in Water and Irrigation Act 1914

Groundwater is a key component of the production process and will be used mainly in the removal of acid gas from the produced gas stream, in addition to gas sweetening, dust suppression and other ancillary requirements.

The premises lies within the Eneabba Plains and Twin Hills sub-areas of the Arrowsmith groundwater area, in which mining, public water supply and agriculture are the major water uses. Available water in the Eneabba Plains sub-area is approaching the allocation limit for licensing, when considering the Yarragadee aquifer system.

Groundwater abstraction in gazetted areas is regulated by the department under section 5C of the *Rights in Water and Irrigation Act 1914* (RIWI Act). A section 5C Licence to Take Water has been issued from the Superficial aquifer (60,000 kL/yr) for water use for industrial purposes, dust suppression and firefighting (GWL 041290).

3.3.3 Federal legislation

Environment Protection and Biodiversity Conservation Act 1999 (Cth)

The proposal was referred to the federal Department of Agriculture, Water and Environment (DAWE) in March 2020 under the EPBC Act.

In July 2020, DAWE advised the proposed action was not a controlled action and did not require further assessment and approval under the EPBC Act.

4. Consultation

The application was referred to relevant public authorities and advertised for public comment on the department's website during February and March 2021.

4.1.1 Public authorities

Department of Mines, Industry Regulation and Safety

DMIRS advises in January 2021, the applicant submitted an Environment Plan (EP) for the proposal under the Petroleum and Geothermal Energy Resources (Environment) Regulations 2012, which initially did not meet the criteria for approval and had not been approved at the time. The applicant later provided a copy of the approved EP (WGP-HSE-PLN-001 Rev 2).

DMIRS noted the applicant has other approvals for the operation and maintenance of existing assets and infrastructure within Production Licences L1, L2, L4 and L5 and that petroleum activities within the prescribed premises may already be covered by those plans.

DMIRS advises the activities associated with the proposal are well understood and can be implemented acceptably through legislative approval processes administered by the respective departments. DMIRS administers a wide range of other licenses and regulatory approvals that may be required in relation to the proposal, which the applicant has been made aware of the relevant requirements.

Shire of Irwin

The Shire of Irwin has been referred the application but is yet to provide comment.

4.1.2 Public submissions

Several public submissions were received during the public comment period, in which concerns were raised about potential impacts to human health and the environment, particularly impacts to local air quality, surface and groundwaters and conservation significant flora and fauna.

In terms of impacts to local air quality, the following concerns were raised in submissions:

- the application identifies that substances that are harmful to human and environmental health, i.e. NO_x, SO₂, PM_{2.5}, PM₁₀ and VOCs, will be emitted, which should be limited to zero by the works approval;
- impacts to the health of fauna should also be determined and considered; and
- the commissioning phase will involve gas extraction and flaring of venting of gas – the commissioning phase needs to be clearly defined to avoid this flaring or venting to continue on an ongoing basis without proper emissions controls.

In terms of impacts to surface and groundwaters, the following concern was raised in submissions:

- the application lacks detail on sufficient protection from adverse impacts on groundwater (superficial and Yarragadee aquifers) and the Ejarno Spring, such as risks from well casing failure over time and potential contamination of culturally significant surface water systems.

In terms of impacts to flora and fauna, the following concern was raised in submissions:

- the application states that conservation significant species (including critically endangered species) will not be impacted by the proposal as it is limited to agricultural paddock, however, contradicts this by also stating that up to 8.34 ha of native vegetation will be cleared.

Other matters

The issue of GHG emissions was also a key matter raised in submissions.

The delegated officer notes GHG emissions was a key environmental factor identified by the EPA in its assessment of the proposal under Part IV of the EP Act and is subject to detailed conditions under MS 1164, including setting a control on the maximum capacity of the gas plant and the requirement to implement a GHG management plan that demonstrates the applicant's contribution to net zero carbon emissions by 2050.

In order to avoid regulatory duplication, the department will not assess or impose controls on emissions which are already regulated under Part IV of the EP Act. The delegated officer has therefore determined to exclude the assessment of GHG emissions from this application.

5. Environmental siting

5.1.1 Physiography

The premises is located in the State's coastal Wheatbelt region, about 16 km southeast of Dongara. It is located on the eastern side of the Eneabba Plain, about 3 km west of the Gingin Scarp, a prominent landform feature of the area. The Brand Highway, a major infrastructure route between the Mid West region and Perth, runs adjacent to the coast about 10 km to the west of the premises.

5.1.2 Land use and sensitive receptors

The premises is located in an area that has been largely cleared for agriculture, with extensive existing oil and gas field development. The local area is sparsely populated with limited settlement, transport and communications infrastructure. Subsurface gas pipelines traverse the area, with the DBNGP running adjacent in a north-south alignment to the proposed WGP site.

The proposed WGP site is 156 ha and located within a mostly cleared agricultural paddock. Access to the premises is via Pye Rd, which is a private road on freehold land. There are 3 farmhouses on rural properties within a 5 km radius of the proposed WGP site, with the closest being about 2.5 km west-southwest of the gas plant.

There are large tracts of almost undisturbed land immediately to the south of the premises, most of which is vested in the State Government.

The Yardanogo Nature Reserve (Class C) is located about 2.5 km south of the proposed WGP site, however gas gathering infrastructure associated with the proposal runs adjacent (Waitsia-03 well area) – potential impacts from clearing native vegetation for this part of the proposal has been considered by the EPA in its assessment.

Ejarno Spring is located about 500 m east of the proposed WGP site and contains known groundwater dependent ecosystems (GDEs). Potential impacts to these ecosystems from groundwater abstraction and drawdown has also been considered by the EPA in its assessment and will be regulated by the department under the RIWI Act.

5.1.3 Climate

The area has a Mediterranean to semi-arid climate, with a short mild wet winter and the remainder of the year being warm to hot, dry and windy. Moderate to strong south to south-westerly winds dominate the summer period and mild north-westerly winds occur in winter. The average annual rainfall is around 450 mm, with most rain falling during May to August. Annual evaporation and evapotranspiration sums are about 2,200 mm and 550 mm, respectively.

5.1.4 Surface water

The premises is located in a valley, between two ridges running in a north-northwest direction towards the Irwin River, the major surface water body in the local area, which flows at a distance of about 7.5 km north of the proposed WGP site. There are several recognised GDEs in the region including the Ejarno Spring and Yardanogo Nature Reserve.

The Ejarno Spring, also known as the 6 Mile Swamp, is a surface expression of groundwater and classified as a GDE. Similar features also occur further to the south of the WGP site, in a southbound continuation of the topographic depression that form part of the Beharra Spring consanguineous wetland suite. The hydrological connectivity between this wetland suite and the underlying superficial aquifer varies between unconfined to perched. The vegetation within and surrounding the wetland suite transitions from wetland to dryland vegetation and is considered to be partially dependent on groundwater, either as a perched water table or the superficial aquifer.

Other GDEs in the area include the Yardanogo Nature Reserve, Beekeepers Nature Reserve (10 km west of WGP site) along the coast, and Crown Reserves 27935 and 43543 along the Irwin River.

5.1.5 Groundwater

The premises is located within the northern Perth Basin. On a regional scale, the groundwater system comprises the predominantly unconfined Superficial formations, which include alluvium, Tamala Limestone, Bassendean Sand, lateritic weathering residues and colluvium, overlying the Yarragadee aquifer. These may be in direct hydraulic connection with the Yarragadee aquifer however some perched layers are known to exist in the area.

Standing water levels vary from 0 to 100 m below ground surface. The Yarragadee aquifer is typically fresh to marginal near the surface and increases in salinity with depth. Groundwater flow directions are generally towards the ocean, in a west-southwest direction.

Groundwater recharge into the Yarragadee aquifer occurs by direct rainfall and downward leakage from overlying aquifers in the Superficial formations. Localised siltstone and shale beds may support perched water table conditions in some areas, with low permeability lacustrine sediments present in topographic depressions and result in the ponding of water features such as the Ejarno Spring.

The standing water level at the Waitsia-02 well site, located adjacent to the WGP site, is about 9 m below ground level.

6. Modelling data

6.1 Air emissions assessment

6.1.1 Air dispersion model

The applicant engaged consultant Ramboll Australia to undertake air dispersion modelling for the project (Ramboll 2019), which was later updated to reflect changes to the plant design and incorporation of actual air quality data from a regional background monitoring campaign conducted by the applicant during 2019 and 2020 (Ramboll 2021a), and also to assess the impacts of a reduction of the flare height from 25 m to 15 m and revised flow rates (Ramboll 2021b).

Version 7 of the CALPUFF air dispersion model was used to assess the potential air quality impacts of atmospheric emissions from the project, comparing the ground level concentrations (GLCs) predicted at sensitive receptor locations against relevant ambient air quality criteria.

6.1.2 Results

The modelling indicates that cumulatively predicted GLCs for all compounds of concern are well below the corresponding ambient air quality and workplace exposure standard criteria at all nominated receptor locations:

- cumulative annual average concentration of PM_{2.5} most closely approached the criteria, however the applicant considers this to be a function of background concentrations with only a minor contribution from the WGP in all scenarios;
- cumulative short-term impacts from NO₂ were considered to be the main pollutant of concern, with predicted concentrations below the NEPM criteria for all scenarios at the nominated receptor locations, ranging from 65% to 74% of the criteria at the nearest receptor and significantly less than other receptors;
- cumulative short-term predicted concentrations were also below the proposed future changes to the NEPM criteria, with the highest predicted concentration of NO₂ (located at receptor 1 and associated with start-up operations) still 20% under the criteria; and
- predicted GLCs at sensitive receptor locations decreased slightly under normal operations and increased slightly under emergency operations, when comparing the predicted emissions from a reduced flare height of 15 m and revised flow rates.

6.1.3 DWER technical review

DWER's review of the air dispersion modelling (Ramboll 2021a) identified that:

- the air quality assessment was conducted in accordance with the Air Quality Modelling Guidance Notes (DoE 2006);
- the NEPM standards (NEPC 2021) for gaseous pollutants have been updated with more stringent criteria during the works approval assessment, with all modelled results below the identified assessment criteria for both NEPM (2015) and NEPM (2021); and
- it is noted the 1-hour NO₂ predicted maximum at start-up is around 80% of the NEPM (2021) standard, which may become important if future NO₂ emission sources are introduced into the local area.

6.2 Noise assessment

6.2.1 Noise model

The applicant engaged consultant Herring Storer Acoustics to undertake an environmental noise assessment (Herring Storer 2019), which was also later updated to reflect the final plant design and layout (Herring Storer 2021). The noise modelling software *SoundPLAN 7.2* was used to predict noise levels at nearby receptors from all noise sources (including the nearby XPF) operating at the same time under worst case meteorological conditions.

6.2.2 Results

The model predicts full compliance with the assigned levels under the Environmental Protection (Noise) Regulations 1997 (Noise Regulations), with the highest noise levels at the nearest sensitive receptor predicted to be 30 dB(A) from a combination of all noise sources and the highest night-time propagation weather conditions.

The model assumes that operational noise will not be tonal, due to the distance and noise levels approaching the existing background noise levels.

6.2.3 DWER technical review

The department has reviewed the Herring Storer (2021) report and is satisfied the assessment methodology and results present reliable conclusions on the predicted noise levels and compliance with the assigned levels at nearby sensitive receptors under worst case meteorological conditions.

7. Risk assessment

7.1.1 Determination of emission, pathway and receptor

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

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

7.1.2 Risk ratings

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

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

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

7.2 Risk assessment table

The table below describes the risk events associated with the proposal consistent with the *Guideline: Risk Assessments* (DWER 2020). The table identifies whether the risk events are acceptable and tolerated, or unacceptable and not tolerated, and the appropriate treatment and degree of regulatory control, where required.

Risk Event				Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
Construction works								
Construction and installation of the WGP and associated infrastructure, chemical containment area, ponds, internal roads, etc.	Noise and fugitive dust associated with construction civil excavation, earthworks, construction works, etc.	Unreasonable interference with the health, welfare, convenience, comfort or amenity of nearby sensitive receptors (3 dwellings within 5 km radius)	Adequate separation to nearby receptors (>2.6 km) Construction work predominantly limited to day light hours Conduct noise monitoring during higher noise emission activities, e.g. piling works	Minimal impacts to amenity on local scale Slight	Not likely to occur in most circumstances Unlikely	Low Acceptable, not subject to controls	The delegated officer considers there is sufficient separation in place (>2.5 km to nearest human receptor, >16 km to nearest town), and therefore does not reasonably foresee that noise and dust from construction works will impact on the amenity or health of off-site human receptors.	<u>Works approval controls:</u> None specified.
	Groundwater acidification associated with disturbance (oxidation) of ASS	Leaching from in-situ ASS material, causing acidification of shallow groundwater	Construction works not to extend below the natural water table	Low level on-site impacts, minimal off-site impacts on local scale Minor	May occur only in exceptional circumstances Rare	Low Acceptable, not subject to controls	Construction works will not extend below the standing water level (~9 mbgl). The delegated officer therefore considers the risk of disturbing ASS from civil works and excavations to be low.	<u>Works approval controls:</u> None specified.
Temporary construction & use of turkey's nest	Seepage/infiltration of contaminated water, stored within temporary turkey's nest	Seepage/infiltration causing contamination of shallow groundwater (dissolved solids, hydrocarbons and suspended solids), impacts to nearby GDEs (Ejarno Spring)	Turkey's nest constructed with single 0.75 mm HDPE liner	Mid-level on-site impacts, low-level off-site impacts Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	The applicant proposes to construct a temporary turkey's nest to manage batch plant washdown water, RO brine and vehicle and equipment washdown water during construction. To protect the underlying groundwater resource, the pond will be constructed with a single 0.75 mm HDPE geomembrane liner, which will be removed off-site following construction. The delegated officer considers this control will ensure the risk of groundwater contamination from the pond during construction is acceptable. As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the works approval as minimum infrastructure requirements.	<u>Works approval controls:</u> - Pond must be constructed as per design plans, and HDPE geomembrane properties and construction must comply with WQPN #26 (DoW 2013) requirements or equivalent
Commissioning and time limited operations/full operations								
Commissioning and operation of WGP and associated infrastructure	Exhaust emissions (NO _x , PM, VOCs) during normal operations from: - Gas engine generator - Export gas compressors - Inlet gas compressors - Incinerator - Emergency diesel generator	Unreasonable interference with the health and amenity of nearby sensitive receptors (3 dwellings within 5 km radius)	Generators and compressors are lean burn engines operating at reduced combustion temperature and pressure MRU outlet installed with particulate filter Elevated exhaust emission points to facilitate dispersion	Specific consequence criteria (for public health) likely to be met, low-level off-site impacts to amenity Minor	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	Air dispersion modelling (Ramboll 2021b) indicates predicted GLCs for most compounds in isolation and cumulatively are below the corresponding ambient air quality and workplace exposure standard criteria at nearby receptor locations, except for scenarios that consider annual average background concentrations of PM _{2.5} , which were already in exceedance of the guideline before consideration of other sources. Short term impacts from NO ₂ were predicted to be the main pollutant of concern from the WGP, although predicted concentrations were below the relevant guideline concentration.	<u>Works approval controls:</u> - Infrastructure design criteria specified, and pollution control infrastructure must be installed on selected items; - Submission of a commissioning plan within 3 months of commencing commissioning; - Implementation of the commissioning plan, including validation air emissions monitoring; - Submission of a commissioning report.
	Flaring under peak flow conditions (NO _x)		Flare will comprise an elevated stack facilitate dispersion (15 m) A constant pilot flame that will be enclosed such that no flame will be visible during normal operations A smokeless flame during normal operations Flare system will meet industry standards API 537 and API 521 Plant to operate to industry best practice of combustion	Specific consequence criteria (for public health) likely to be met, low-level off-site impacts to amenity Minor	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	To ensure an acceptable level of risk is maintained during operations, controls will be imposed on the works approval to require validation of emissions during commissioning, in addition to infrastructure design requirements and pollution control specified (such as minimum stack height), and routine air emissions monitoring during operations. Operational requirements for the flare to be specified on the licence during operations.	<u>Licence controls:</u> - Infrastructure design and operational requirements specified in infrastructure table; - Annual stack emissions testing; - Flare operational requirements specified.

Risk Event				Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
			or flaring instead of cold venting					
	Seepage/infiltration of PW, stored within evaporation ponds	Seepage/infiltration causing contamination of shallow groundwater (dissolved solids, hydrocarbons and suspended solids), impacts to nearby GDEs (Ejarno Spring)	Evaporation ponds constructed with dual 1.5 mm HDPE geomembrane liner with leak detection Visual inspections conducted Groundwater monitoring bore installed downgradient	Mid-level on-site impacts, low-level off-site impacts Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	To protect the underlying groundwater resource, the PW evaporation ponds will be constructed with a dual 1.5mm HDPE geomembrane liner with leak detection installed. A groundwater monitoring bore will also be constructed downgradient to confirm the ponds are not leaking. The delegated officer considers these controls will ensure the risk of groundwater contamination from the PW ponds is acceptable. As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the works approval, and required to be maintained on the licence as minimum infrastructure requirements.	<u>Works approval controls:</u> - PW ponds must be constructed as per design plans, and HDPE geomembrane properties and construction must comply with WQPN #26 (DoW 2013) requirements; - Groundwater monitoring bore to be installed <u>Licence controls:</u> - Infrastructure design and operational requirements specified in infrastructure table; - Requirement to conduct routine groundwater monitoring; - Requirement to conduct routine visual integrity and liner leak detection tests
		Overland runoff/direct discharge causing contamination of shallow groundwater, impacts to nearby GDEs (Ejarno Spring)	Evaporation ponds constructed with sufficient capacity to account for 1:25 year, 24 hour rainfall events	Mid-level on-site impacts, low-level off-site impacts Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	The proposed PW ponds have been designed with sufficient capacity to account for instantaneous rainfall events on a 25-year, 24-hour storm event, and will be operated with a minimum 500 mm freeboard at all times. The delegated officer considers these controls will ensure the risk of impacts from the ponds overtopping is acceptable. As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the works approval, and required to be maintained on the licence as minimum infrastructure requirements.	<u>Works approval controls:</u> - PW ponds must be constructed as per design plans (minimum storage capacity specified); - Minimum 500 mm operational freeboard must be maintained <u>Licence controls:</u> - Infrastructure design and operational requirements specified in infrastructure table; - Minimum 500 mm operational freeboard must be maintained.
	Spills and leaks of hazardous materials and hydrocarbons, contaminated surface water runoff from operational areas		Bulk hazardous and hydrocarbon storage within 1,500 L IBCs or 200 L drums in bunded areas in accordance with AS1940 (secondary containment) Controlled drainage area diverting surface water runoff from sealed operational areas to a contaminated evaporation pond Controlled drainage area diverting surface water runoff from unsealed areas to the non-contaminated water pond, or diverted away/to grade	Mid-level on-site impacts, low-level off-site impacts Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	The WGP is designed to comprise both sealed and unsealed areas, with surface water runoff from sealed hardstand surfaces designed to flow to a 'contaminated water pond' for evaporation, and non-process areas and roads to a 'non-contaminated water pond'. Sealed collection areas will comprise valves (normally shut) to enable sampling, prior to diversion to the contaminated water pond. Drainage from secondary containment bunds will be connected to external sumps that will be drained regularly using a vacuum trailer. The delegated officer considers these controls will ensure the risk of impacts from spills and leaks from bulk hazardous and hydrocarbon storage areas is acceptable. As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the works approval, and required to be maintained on the licence as minimum infrastructure requirements.	<u>Works approval controls:</u> - Ponds must be constructed as per design plans (minimum storage capacity specified); <u>Licence controls:</u> - Infrastructure design and operational requirements specified in infrastructure table; - Sealed surfaces must divert surface water runoff to the contaminated water pond; unsealed hardstand areas must divert surface water runoff to the non-contaminated water pond, or diverted away/to grade
	Noise associated with operation of fixed plant	Unreasonable interference with the health, welfare, convenience, comfort or amenity of nearby sensitive receptors (3 dwellings within 5 km radius)	Complaints management system – all complaints recorded and investigated, with actions taken reported in response to the complaint	Minimal impacts to amenity on local scale Slight	Not likely to occur in most circumstances Unlikely	Low Acceptable, not subject to controls	Noise modelling (Herring Storer 2021) indicates full compliance with the Noise Regulations when considering a combination of all noise sources and the highest night-time propagation weather conditions. The delegated officer therefore does not reasonably foresee off-site human receptors being impacted from noise during commissioning or time-limited or full operations.	<u>Works approval controls:</u> None specified. <u>Licence controls:</u> None specified.

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

8. Decision

The delegated officer has determined the proposal to construct and operate a new gas processing facility at the premises, with an assessed throughput of 1,873,000 tonnes per year of natural gas (250 terajoules per day), does not pose an unacceptable risk of impacts to on- and off-site receptors. This determination is based on the following:

- the location of the premises being within an area of extensive existing oil and gas field development, and being sparsely populated with sufficient separation to nearby (human) sensitive receptors;
- cumulative predicted GLCs for all compounds of concern (air emissions) being below the corresponding ambient air quality and workplace exposure standard criteria;
- noise levels at the nearest sensitive receptor predicted to comply with the Noise Regulations, when considering all noise sources and the highest night-time propagation weather conditions;
- lined containment ponds to be constructed for storage of PW, for evaporation; and
- secondary containment for all tanks and storage areas containing hazardous materials (including hydrocarbons, chemicals and process fluids).

In order to minimise the potential for environmental impacts, the applicant has proposed the following engineering controls, which will be imposed on the works approval as they are considered critical to maintaining an acceptable level of risk:

- WGP flare and all exhaust emission points must be elevated to facilitate air dispersion;
- generators and compressors must be specified to achieve ambient air quality and workplace exposure standard criteria;
- lined containment ponds must be constructed for PW storage, with a leak detection system installed;
- secondary containment must be constructed for all storage areas of hazardous materials, with bunding in accordance with AS 1940; and
- all operational areas must be constructed within a controlled drainage area, which diverts surface water runoff to a lined contaminated water pond.

The delegated officer is satisfied the above engineering controls lower the overall risk profile of the proposal, and adequately address the concerns raised in public submissions regarding the risk of impacts to human health from air emissions and impacts to the Ejarno Spring and its catchment.

8.1.1 Consideration of Part IV of the EP Act

The delegated officer has considered the EPA's view that air emissions, noise impacts, PW management and visual amenity can be regulated under Part V of the EP Act, and these aspects of the application have been included within the scope of this assessment.

The delegated officer has ensured there is no regulatory duplication with aspects of the application that are already regulated under MS 1164, such as GHG emissions.

It is noted that public submissions consider DWER to be a separate regulatory authority under the EP Act to the EPA and the Minister, and there is an expectation that DWER will consider GHG emissions in accordance with its role under the EP Act and retain oversight by imposing more specific requirements on Part V instruments. However, it should be noted both Parts IV and V of the EP Act are regulated by the same Minister, who ultimately has discretion relating to how an environmental factor should be regulated.

It is not uncommon for a proposal to be subject to both an assessment by the EPA under Part IV, and regulation under Part V of the EP Act through a works approval and licence. If an environmental factor is already regulated under Part IV of the EP Act, it is appropriate to avoid the duplication of conditions relating to that factor under Part V. It is also not the role of the delegated officer to reassess and determine the merits of an approval granted by the Minister

on the assessment by the EPA, or the enforceability or effectiveness of conditions within a Ministerial Statement.

8.1.2 Works approval and licence

Works Approval W6515/2021/1 that accompanies this report authorises construction, commissioning and time-limited operations only. The conditions in the issued works approval, as outlined in the above risk table have been determined in accordance with the *Guideline: Setting Conditions* (DWER 2020b).

The applicant will be required to prepare and submit to the CEO, an environmental commissioning plan at least 3 months prior to the commencement of commissioning.

An amendment to the Waitsia Gas Project Stage 1 licence (L7847/2003/7) is required to authorise emissions associated with the ongoing operation of the premises, i.e., gas processing activities. A risk assessment for the operational phase has been included in this report, however licence conditions will not be finalised until the department assesses the amendment application. Conditions will be imposed to ensure day-to-day operations do not pose an unacceptable risk of impacts to on- and off-site receptors, and to address the concerns raised in public submissions.

8.1.3 Applicant comments on draft decision

The applicant was provided with drafts of the works approval and this report on 8 July 2021. Several minor corrections and clarifications were sought with changes made where required, including a design change to the flare stack height following updated air dispersion modelling.

9. Conclusion

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

Caron Goodbourn
MANAGER, PROCESS INDUSTRIES
REGULATORY SERVICES

Delegated officer
under section 20 of the Environmental Protection Act 1986

10. References

1. Department of Environment (DoE) 2006, *Air Quality Modelling Guidance Notes*, Perth, Western Australia.
2. Department of Water (DoW) 2013, *Water Quality Protection Note 26: Liners for containing pollutants, using synthetic membranes*.
3. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Risk Assessments*, Perth, Western Australia.
4. DWER 2020b, *Guideline: Setting Conditions*, Perth, Western Australia.
5. Herring Storer Acoustics (Herring Storer) 2019, *Environmental Noise Assessment – Waitsia Gas Project Stage 2*. Report prepared for Ramboll, July 2019.
6. Herring Storer 2021, *Works Approval Environmental Noise Project – Waitsia Gas Project Stage 2*. Report prepared for Mitsui E&P Australia, January 2021.
7. Ramboll Australia Pty Ltd (Ramboll) 2019, *Waitsia Gas Project – Stage 2, Air Dispersion Modelling – Version 2*. Report prepared for Mitsui E&P Australia Group, July 2019.
8. Ramboll 2021a, *Waitsia Gas Project – Stage 2, Air Dispersion Modelling Assessment – Version 1, Rev B*. Report prepared for Mitsui E&P Australia Group, February 2021.
9. Ramboll 2021b, *Waitsia Gas Project – Stage 2, Air Dispersion Modelling Assessment – Version 2, Rev B*. Report prepared for Mitsui E&P Australia Group, July 2021.
10. *Variation to the National Environmental Protection (Ambient Air Quality) Measure 2015* (Cth). <https://www.legislation.gov.au/Details/F2016L00084>. (NEPC 2015).
11. *Variation to the National Environmental Protection (Ambient Air Quality) Measure 2021* (Cth). <https://www.legislation.gov.au/Details/F2021L00585>. (NEPC 2021).