



Application for Works Approval

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

Works Approval Number W6727/2022/1

Applicant Strike South West Pty Ltd

ACN 118 251 497

File number DER2022/000328

Premises Walyering Processing Facility
Brand Highway
CATABY WA 6507

Legal description
Part of Petroleum Production Licence L23
As defined by the premises map and coordinates in the issued works approval

Date of report 21 February 2023

Proposed Decision Works approval granted

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the Walyering Conventional Gas Development, a gas extraction and processing facility. As a result of this assessment, works approval W6727/2022/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Application summary

On 18 July 2022, Strike South West Pty Ltd (Strike SW, the applicant) submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction works relating to the establishment the Walyering Conventional Gas Development, a gas extraction and processing facility on part of Production Licence L23, Brand Highway, Cataby (the premises, defined by the coordinates in the works approval), for the supply of natural gas to the Parmelia Gas Pipeline located adjacent to the premises. The premises is approximately 21 km south-west of the town of Dandaragan and 5.5 km north-west of Cataby in the Shire of Dandaragan.

The premises relates to category 10 oil or gas production from wells and an assessed production capacity of 250,000 tonnes annum or 30 terajoules (TJ) per day under Schedule 1 of the Environmental Protection Regulations 1987 (EP Regulations), which are defined in works approval W6727/2022/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W6727/2022/1.

2.3 Premises overview

The applicant proposes to construct the Walyering Conventional Gas Development within an area previously cleared for agriculture in the Shire of Dandaragan. The premises will comprise two free-flowing, conventional gas wells (Walyering 5 and Walyering 6), a gathering system of flowlines, a production facility, and a tie in point to the third-party-operated Parmelia Gas Pipeline. The applicant advised that no hydraulic fracture stimulation is proposed on the premises as the Walyering Gas Field is free-flowing. The production facility is proposed to have a maximum export capacity of approximately 30 TJ of natural gas per day (annualized) and is expected to have an operational life of approximately ten years following commissioning of the infrastructure.

The production facility will comprise -slug catcher, gas-gas heat exchanger, export gas filter, low temperature two phase separator, condensate flash vessel, condensate storage tanks, cold vent for emergency or maintenance blow down and condensate stabilisation, vent knock out drum, chemical injection skids (methanol and corrosion inhibitor), produced water treatment system and storage tanks, solar array and battery storage for power supply with a diesel generator back-up, storage shed/chemical store and a support utility containing switchgear and control system servers. The facility will be unmanned, being operated via a local Programmable Logic Controller remotely from an operations centre located in Perth.

Wet natural gas will be extracted from the two extraction wells and transferred via flowlines to the production facility. The gas will undergo two-phase separation into process gas and free fluids at a slug catcher. The separated process gas will be directed to a gas-gas heat exchanger where the temperature is reduced, the pressure of the pre-cooled gas is then reduced across the Joule-Thompson control valve, and the cooled gas is then transferred to a low temperature separator (LTS). Remaining liquids will be condensed and separated from the gas in the LTS and directed to the condensate flash vessel. Gas from the gas-gas exchanger is directed to an export gas coalescer filter for removal of any remaining impurities (liquids and dust) prior to discharge into the Walyering Gas Pipeline via a royalty flow meter. The Walyering Gas Pipeline will then transfer the sales gas to the Parmelia Gas Pipeline.

Free liquids will be directed from the slug catcher to a condensate flash vessel where they will undergo further separation into condensate, water, and vapour. Separated condensate will be directed to the condensate storage tanks. Separated water will be directed to storage tanks (a water treatment package may be installed prior to the tanks if required although the majority of hydrocarbons are expected to be removed by the processing facility). The lightest gaseous fraction will be discharged via a continuous purge to the cold vent.

Inputs to the process include corrosion inhibitor, and methanol to prevent hydrate formation during processing. The plant will be powered by a battery system charged by a solar array supported by a 50kVa diesel generator as a back-up power supply in event of insufficient solar generation or maintenance requirements.

The production facility includes cold venting of process gas to maintain the stability and safety of the system. Cold venting will result in discharge of methane, carbon dioxide (CO₂), volatile organic compounds (VOCs), sulfur compounds and gas impurities to the atmosphere. The applicant advised cold venting will be limited to the following scenarios:

- discharge via the cold vent of a minor continuous volume from the condensate flash vessel to maintain positive backpressure and keep air out of the vent system;
- discharge via the cold vent of the production facility inventory when it is required to be shut-down due to maintenance or emergency; and
- discharge via any of the pressure safety valves of a small amount of process gas in event of a high pressure reading.

The applicant proposes to undertake environmental commissioning of the premises over a nominal six day period. Infrastructure will be hydrotested and nitrogen purged prior to commissioning commencing. During environmental commissioning hydrocarbon gas will be introduced into the production facility and will be vented via the cold vent until objectives and key performance indicators for export to the Parmelia Gas Pipeline are met. The commissioning activities will include:

- Hydrocarbon pressurisation/evacuation of N₂ system leak checks
- Complete system leak checks (no venting)
- Flow Walyering-05 well and Walyering-06 well (separate activities) to achieve operating temperatures and flowrates
- Full facility operational checks followed by blowdown testing
- Pressurisation, restart and flow check prior to export

Based on expected duration and venting rates for the above activities the applicant estimates commissioning of the facility will require approximately seven hours of venting, and result in discharge of approximately 73 tonnes of gas via the cold vent.

2.4 Exclusions

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:

- disposal of wastes - including municipal waste, construction wastes and produced water at locations outside the premises boundary;
- power supply – power will be provided by a battery system primarily charged by a solar array, with a small (50 kVA) diesel generator for continued power supply during solar power down time (due to inspection and maintenance of the solar battery system or extended periods of limited sunlight). Solar power generation is not a prescribed activity and the diesel generator is sufficiently small (similar fuel consumption to a large 4-wheel drive vehicle) that emissions are not so significant as to warrant regulatory control, and it is well below the design capacity threshold of relevant prescribed premises categories;
- concrete batching - where batching is conducted on the premises for use on the premises the premises is not subject to Part V of the EP Act however the requirements of the Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998 apply to the activity;
- preparatory works, such as clearing, levelling and construction of access roads, carparks, laydown areas, office buildings, and construction of hardstands for use in construction works; and
- fire response infrastructure including tanks and pumps.

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

The delegated officer noted that the premises is predicted to generate up to 18,000 t CO₂e per year of Scope 1 GHG emissions (JBS&G 2022c). The delegated officer did not further consider GHG emissions as they are beyond the current scope of the department's published risk-based regulatory framework for assessment and regulation under Part V of the EP Act and below the 100,000 t CO₂-e per year significance threshold specified in the EPA's Environmental Factor Guideline – Greenhouse Gas Emissions.

2.5 Other approvals

2.5.1 *Rights in Water and Irrigation Act 1901 (RIWI Act)*

Strike Energy has a 5C extraction licence GWL206081 for an existing extraction bore located on the Walyering 5 extraction well drill pad. Water for hydrotesting of the infrastructure will be sourced from this bore. The applicant advised that the extraction licence will be updated as needed to incorporate this activity.

2.5.2 *Part IV of the EP Act*

The proposal to construct and operate the Walyering Conventional Gas Development was referred to the EPA under Part IV of the EP Act on 4 April 2022. The EPA examined the referral and conducted preliminary investigations and inquires including public consultation. On 6 July 2022 the EPA determined that the proposal would not be assessed under Part IV of the EP Act. In its determination, the EPA considered that the likely environmental effects of the project were not so significant as to warrant formal assessment due to it being within a previously disturbed area, there being no requirement for clearing of native vegetation, and Scope 1 and 2 GHG well below 100,000 CO₂-e per annum (predicted to be ≤18,000 tonnes and ≤11,000 tonnes CO₂-e respectively per annum).

The EPA concluded that the project can be adequately assessed and regulated through Part V of the EP Act, the *Petroleum Pipelines Act 1969* (PP Act), *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act), *Work Health and Safety Act 2022* (WHS Act), and the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007. The application is considered to be generally consistent with the proposal referred to the EPA under Part IV of the EP Act other than the inclusion of a solar/battery array for power supply to the production facility in place of the referred proposal which indicated the facility would be connected to the grid. The premises Scope 2 GHG emissions are likely to be reduced from those considered by the EPA as a result of this change.

2.5.3 Department of Mines, Industry Regulation and Safety (DMIRS)

In Western Australia, all onshore petroleum exploration and development activities are subject to approval by DMIRS. Gas gathering (extraction wells), and gas transfer and export activities (pipelines) are subject to approval requirements under the following legislation administered by DMIRS:

- *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act);
- Petroleum and Geothermal Energy Resources (Environment) Regulations 2012 (PGER Regulations);
- *Petroleum Pipelines Act 1969* (Pipelines Act); and
- Petroleum Pipelines (Environment) Regulations 1969 (Pipeline Regulations).

In accordance with this legislation, oil and gas operators must obtain Petroleum Pipeline and Petroleum Production licences and submit an Environment Plan (EP) to DMIRS for approval. An EP is a management document designed to demonstrate that all environmental risks and impacts associated with a petroleum activity are reduced to As Low As Reasonably Practicable (ALARP), and at all times carried out in a manner consistent with the principles of ecologically sustainable development.

DMIRS reviewed the application and provided the following comments.

- At the time of responding the applicant had applied for Petroleum Production and Petroleum Pipeline licenses and had submitted an EP for construction and pre-commissioning activities (nitrogen purging and hydrotesting) for the gas gathering and transfer infrastructure which was under assessment. The applicant advised DWER on 11 January 2023 that the Petroleum Production Licence had been granted.
- The introduction of hydrocarbons (commissioning), operation and maintenance of the infrastructure would be covered under a separate EP to be submitted at a future date.
- The premises will also require other approvals and approved plans under legislation administered by DMIRS including but not limited to Field and Well Management Plans, a Safety Case and a Dangerous Goods Site Storage Licence.
- The application is broadly consistent with good practice requirements for the petroleum industry with the exception of the proposed use of a single HDPE lined drilling sump for produced water evaporation as evaporation ponds should be constructed consistent with best practice (i.e. double HDPE lined with leak detection).
- The environmental risks associated with the construction, commissioning and operation of the extraction wells and flowlines can be appropriately managed under DMIRS administered legislation and assessment processes.

NOTE: In accordance with the department's published regulatory framework the delegated officer has considered the legislative context of the Walyering Conventional Gas Development and determined that DMIRS is the lead agency responsible for the regulation of activities associated with gas extraction and transport.

In order to avoid regulatory duplication, the delegated officer determined not to undertake detailed assessment of public health and environmental risks associated with the construction, commissioning and operation of the gas gathering and transfer infrastructure (i.e. extraction wells and flowlines) as it is considered that risks will be adequately assessed and regulated through the DMIRS administered legislation and assessment processes described.

3. Air emissions

Cold venting of process gas will occur primarily via the cold vent stack with minor amounts also vented from pressure safety valves during commissioning and operation of the Walyering Production Facility (refer to section 2.3 for further details). The applicant provided details of the expected composition of emissions based on compositional analysis of flashed gas from the Walyering 5 well, as well as details of the cold vent design criteria, expected venting rates and timeframes for commissioning, emergency shut-down (blowdown) and operational scenarios. The compositional analysis indicated that the gas is primarily comprised of methane, ethane and propane with a minor amount of VOCs (predominantly comprising benzene, toluene, ethylbenzene and xylenes (BTEX)). Based on the compositional analysis provided mercury is not expected to be present within the gas.

The applicant undertook a screening analysis for air emissions in accordance with the department's draft *Guideline: Air emissions* (DWER 2019) to determine the significance of air emissions from the production facility. Given there is no combustion occurring within the plant, the primary emission is VOCs. The screening assessment was conducted for benzene as it has the most conservative ambient air quality guideline value (AGV) of the VOCs (1-hour 29 µg/m³ and annual 9.6 µg/m³). Screening analysis is a conservative assessment of potential worst case ground level concentrations (GLC) and does not take into account distance to receptors. The applicant's screening analysis indicated that air emissions are not insignificant. The department reviewed the screening analysis outcomes and advised the applicant further assessment of air emission impacts was required.

The applicant subsequently undertook a more detailed screening assessment of the operational cold venting emissions scenario using the SCREEN3 model, a single source Gaussian plume screening model maintained by the United States Environmental Protection Agency (USEPA). The SCREEN3 model can be used to conservatively predict worst case GLC for pollutants at specified distances from the source. The department also ran the model for the commissioning and emergency shut-down scenarios to consider potential impact to receptors associated with these scenarios. The worst case GLC predicted by the model, based on cold vent design criteria and expected benzene emissions, are included in Table 1 for distances of 3.5 km and 4 km from the gas plant (based on nearest receptor distance) with comparison made to benzene AGV.

Table 1: Walyering Production Facility SCREEN3 worst case predicted GLC for benzene at approximate receptor locations

Emission scenario	Emission rate (g/s)	Averaging time	AGV $\mu\text{g}/\text{m}^3$	GLC at 3.5 km $\mu\text{g}/\text{m}^3$	% of AGV	GLC at 4 km $\mu\text{g}/\text{m}^3$	% of AGV
Operation – Cold venting (continuous)	0.08	1 hour	29	8.116	28%	6.782	23%
		Annual ¹	9.6	3.84	40%	NA	
Commissioning (estimated 7 hours duration)	4.19	1 hour	29	425.1	1466%	355.2	1225%
Operation – emergency/ maintenance shut down and blowdown (15 minutes duration)	3.05	1 hour	29	309.4	1067%	258.5	891%

NOTE 1: Annual results are from the initial screening assessment conducted in accordance with the department's draft *Guideline: Air emissions* as SCREEN3 is configured for short-term assessment. They represent the maximum predicted GLC and do not provide an indication of where this occurs.

Noting that the SCREEN3 model results indicate there is potential for worst case GLCs to exceed the benzene AGV during commissioning venting and emergency or maintenance shut-down blowdown, but that the model does not consider the distribution of wind directions and speeds that will inform the frequency of potential impacts at receptors, the applicant considered the risk of exceedance of the AGV with regard to meteorological records (wind speed and direction) relevant to the premises.

Five years of wind speed and direction data from the Bureau of Meteorology (BoM) Badgingarra Research Station (Site No. 009037) was analysed to determine frequencies of light winds (up to 2 m/s) toward the closest receptors to the east and south-east. Only light wind conditions were considered as pollutants are not as readily able to disperse under such conditions typically resulting in higher GLCs. Monthly and annual wind roses (Figure 1) and tabulated data for the period indicated that winds ≤ 2 m/s occur for 0.97% of a year in an arc of 250-290° (towards the eastern receptor) and 0.86% of the year toward the southeast receptor in an arc of 295-335°. Based on total expected venting during commissioning of seven hours, that applicant calculated the frequency of venting is 0.0008, and the combined probabilities of light winds toward the eastern and south eastern receptors during commissioning are 0.0000078 (0.97% of 0.0008) and 0.0000069 (0.86% of 0.0008) indicating there is a low likelihood conditions more likely to be conducive of high GLC (and even lower likelihood during a shut-down or maintenance blowdown which are predicted to occur once per year).

Annual (2017-2021)

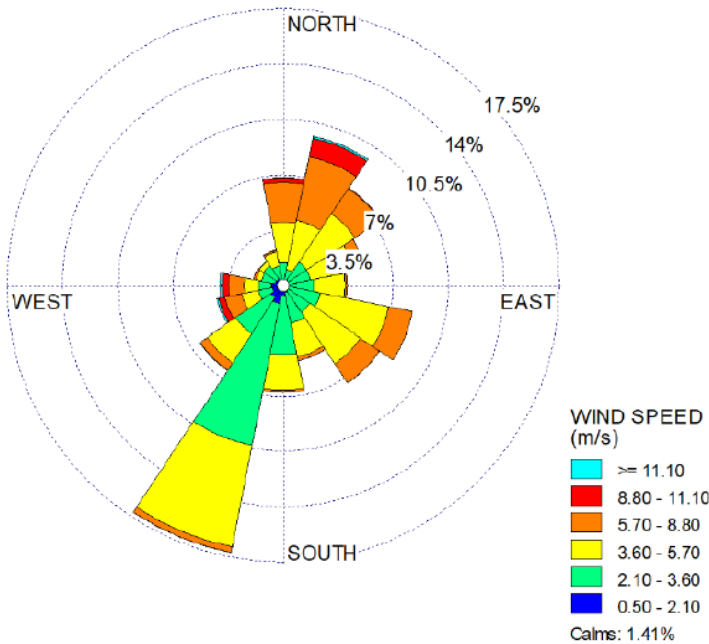


Figure 1: Badgingarra Research Station (Site No. 009037) Wind Rose 2017-2021 (BOM 2023, supplied by Strike Energy)

The delegated officer reviewed the results of the two screening assessments undertaken and determined that given screening assessments are designed to be conservative and worst case predicted GLC are $\leq 40\%$ of relevant AGV, emissions during normal operation of the facility (i.e. continuous cold venting) are unlikely to give rise to GLC of benzene which exceed AGV at the nearest receptors, particularly given the low frequency meteorological conditions more likely to give rise to higher GLC.

The delegated officer noted the presence of a northern receptor (Billinue Aboriginal Community) located a similar distance to the processing facility as receptors considered by the applicant. The frequency of worst-case meteorological conditions for this receptor were therefore determined with reference to the 5-year wind rose for Badgingarra Research Station (WillyWeather 2023) for consideration in this assessment. The station data indicated light southerly winds (0.3 to 3.5 m/s) have been recorded 2.95% of the time. With reference to the commissioning and emergency blowdown scenarios, the delegated officer reviewed the SCREEN3 outcomes and relevant meteorological data and concluded that while the screening assessments indicate GLC of benzene at the closest receptors could potentially exceed the 1-hour AGV during commissioning or blowdown events, the assessments are conservative, the events are of short duration and there is a low likelihood of worst-case meteorological conditions for the closest receptors coinciding with these scenarios.

4. Risk assessment

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

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

4.1 Source-pathways and receptors

4.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this decision report are detailed in Table 2 below. Table 2 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 2: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Installation of the Walyering production facility infrastructure and associated vehicle movements	Air / windborne pathway	<ul style="list-style-type: none"> • Use of water carts during construction for dust suppression. • Site speed limits and vehicle access restricted to designated roads and tracks. • Visual monitoring of dust.
Noise			<ul style="list-style-type: none"> • Construction activities are expected to occur over an eight week period and will predominantly be limited to daytime hours.
Hydrotesting water	Hydrotesting of Walyering production facility	Direct discharge	<ul style="list-style-type: none"> • Potable water will be sourced for hydrotesting and will be disposed in the existing lined pond (0.75 mm HDPE) at Walyering-06 for evaporation. • Hydrotesting will be conducted prior to the introduction of hydrocarbons into the system therefore is not expected to contain contaminants.
Commissioning and Operation			
Noise	Commissioning and operation of the Walyering production facility	Air / windborne pathway	<ul style="list-style-type: none"> • Processing equipment will have negligible noise emissions, with the exception of the JT valve on the low temperature separator, diesel generator, and condensate transfer pumps. • Condensate transfer pumps will be located >20 m from the closest fenceline, are designed for quiet operation and will typically be operated for 90 minutes per day during daylight hours. • Boundary noise monitoring will be carried out on commencement of operations.

<p>Volatile organic compounds (BTEX),</p>	<p>Commissioning and operation of the Walyering production facility</p>	<p>Air / windborne pathway</p>	<p><u>Commissioning</u></p> <ul style="list-style-type: none"> • Infrastructure will be hydrotested (water and nitrogen) prior to commissioning to confirm integrity prior to the introduction of hydrocarbons into the system. • Commissioning is expected to occur for a short-duration of approximately six days and is expected to require seven hours of venting over this period. • A commissioning procedure will be in place to improve the efficiency of venting. • Commissioning gases will be discharged via a cold vent stack that will be approximately 5 m in height and 20 cm diameter. • Blowdown is not automatic and must be initiated manually, therefore will be a planned event. • Commissioning will be undertaken in accordance with a Commissioning and Operations Environment Plan, subject to review and approval by DMIRS • Commissioning of the facility will be a manned activity. <p><u>Operation</u></p> <ul style="list-style-type: none"> • The processing facility has been designed for maximum hydrocarbon recovery and minimised down time for maintenance/start-up/shut-down through incorporation of simple equipment and no rotating parts. • A programmable logic controller (PLC) will be installed on the premises for operation and monitoring of the production facility. • The PLC will be programmed to respond to command and emergency shut-down signals locally from the plant as well from an operations centre located in Perth. • A local emergency shut-down button will be installed to provide shut-down capability separate from the PLC. • Emergency shut-down will be initiated in the event of process upsets based on pre-defined limits for pressure, flow-level and temperature. • Pressure vessels (i.e. the low temperature separator) are fitted with a Pressure Safety Valve (PSV) to protect against overpressure (explosion risk). Small amounts of process gas will be discharged/cold vented from the PSV in event of high pressure readings. • To prevent air ingress into the system (which presents an explosion risk) a continuous low volume purge will be discharged via a cold vent stack as per the minimum purge gas flow requirement described in <i>American Petroleum Institute (API) Standard 521 Pressure-Relieving and Depressurizing Systems</i>. The cold vent stack will be approximately 5 m in height and 20 cm diameter. • The plant will have shut down valves to enable the inventory to be held until it is blown down during an emergency shut-down or for maintenance, or the facility is re-started. The maximum blown down emissions will equate to the facility capacity of 9.265 m³.
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Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> • Blowdown is not automatic and must be initiated manually, therefore will be a planned event. • The plant design includes multiple shut down valves and performance criteria to minimise the inventory needing to be blown down during emergency shut-downs. • Only major maintenance activities (as opposed to routine maintenance) and emergency shut-down will require a full inventory blow down which is only expected to occur once per year for a predicted duration of 15 minutes. • Inventory blow-down will be discharged via the cold vent stack.
Hazardous substances including process chemicals (methanol and corrosion inhibitor) and condensate	Commissioning and operation of the Walyering production facility	Direct discharge	<ul style="list-style-type: none"> • The premises will have a Dangerous Goods Site Storage Licence under the <i>Dangerous Goods Act 2004</i> and the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007 and storage of dangerous goods will be in accordance with the licence. • Process chemical skids will be bunded in accordance with <i>AS 1940-2004 The storage and handling of flammable and combustible liquids (AS1940-2004)</i>. • Chemical skids at the Walyering 5 extraction well will be contained within a bund. • Condensate storage tanks will be self-bunded and located within a HDPE and concrete lined earthen bund that meets the requirements of <i>AS 1940-2004 and the premises Dangerous Goods Storage Licence</i>. • Condensate storage tanks will be fitted with high and high-high level sensors to trigger automatic shut-off valves to prevent overfilling. • The condensate tanker transfer point will have an automatic cut-off valve.
Potentially contaminated stormwater water (hydrocarbons)		Direct discharge	<ul style="list-style-type: none"> • Liquid vessels within the Walyering Processing Facility will be located within concrete bundareas and the condensate storage tanks will be bunded as described above. • Concrete bunds will have at least one lockable drain valve. • Stormwater accumulated within concrete bunds will be disposed in accordance with Strike's Stormwater Management Procedure during routine facility inspections. • This will involve visual inspection for signs of contamination (i.e. sheen/colouring) and discharge to grade in the event there is no evidence of contamination.
Produced water (contains hydrocarbons)		Direct discharge	<ul style="list-style-type: none"> • Separated produced water will be stored in two 70 m³ enclosed tanks prior to being removed for offsite disposal via a suitably licensed waste contractor.. • The treated water tanks will be self-bunded or located within an appropriately sized bund. • If larger volumes of water are recovered during early production a produced water treatment system, located within an appropriately sized bund, may be installed. • The water tanker transfer point will have dry break couplings.

4.1.2 Receptors

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

Table 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DER 2020)).

Separation distances are specified from the gas production facility as the risk assessment will not consider the extraction wells and pipelines which will be assessed and regulated by DMIRS (as per section 2.5.3).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from gas production facility
Rural residence	~3.6 km and ~4.3 km south east
Rural residence	~4.1 km south south-east
Rural residence	~4.6 km east
Billinue Aboriginal Community	~4.2 km north
Cataby townsite	~6.5 km south-east
Environmental receptors	Distance from gas production facility
TECs – Banksia dominated woodlands of the Swan Coastal Plain	~1 km northwest
Conservation significant fauna	A number of conservation significant birds may be present within the surrounding area.
Nature Reserve	~3.2 km west
Surface water - Minyulo Brook, a minor non-perennial watercourse. Regionally significant as it supports a high proportion of water dependant flora and flushes the associated wetland.	~1.7 km west and 3 km east
Surface water - Caro Swamp, catchment for several minor non-perennial water courses in the area including the Caro Brook, Eneminga Brook and Minyulo Brook. Likely to be seasonally inundated.	~2 km south
Groundwater – Gingin groundwater area	Located within the designated Gingin groundwater area. Groundwater is understood to be relatively shallow, with a depth of 5-10 mbgl, and the groundwater quality in the broader regional area is understood to be marginal, with a salinity of 500 to 1000 mg/L.
Registered Aboriginal heritage sites	300 south-west of the closest extraction well (Minyulo Brook heritage site)

4.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and take into account potential source-pathway and receptor linkages as identified in Section 4.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 4.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

Works approval W6727/2022/1 that accompanies this decision report authorises construction, commissioning and time-limited operations. The conditions in the issued works approval, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

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

Table 4: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of works approval	Reasoning
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Construction								
Installation of Walyering production facility and associated vehicle movements	Dust	Air / windborne pathway causing impacts to health and amenity	Rural residences 3.6 km south east, 4.6 km east and 4.2 km north	Refer to Table 2	C = Slight , minimal impact to amenity at a local scale L = Unlikely , will probably not occur in most circumstances Low Risk	Y	None	The delegated officer considers that given the works will occur at a separation distance of over 2 km to the nearest public receptor, there is a low risk of noise and dust emissions impacting the health or amenity of the public.
	Noise					NA		
	Potentially contaminated hydrotesting water	Direct discharge to land resulting in land contamination	Immediate surrounding area (farmland)			Y		The delegated officer considers that given the applicant has proposed to contain hydrotesting water in an appropriately sized and HDPE lined pond and that the water is unlikely to contain significant contaminants, there is a low risk of impact to surrounding farmland and specific controls relating to management of the water are not required in the works approval.
Commissioning								
Commissioning of the Walyering production facility (anticipated duration of six days)	Noise	Air/windborne pathway causing impacts to health and amenity	Rural residences 3.6 km south east, 4.6 km east and 4.2 km north	Refer to Table 2	C = Slight , minimal impact to amenity at a local scale L = Unlikely , will probably not occur in most circumstances Low Risk	NA	None	Delegated Officer considers that given the premises is located in an area surrounded by farmland and there is a separation distance of over 2 km to the nearest public receptor, there is a low risk of commissioning noise impacting the amenity of the public therefore specific controls relating to noise are not required. The applicant is required to comply with relevant provisions in the Noise Regulations.
	Methane, carbon dioxide, volatile organic compounds, sulphur compounds and gas impurities (approximately seven hours of cold venting of gas planned)					N		
Operation								

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of works approval	Reasoning
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Operation of the Walyering production facility	Methane, carbon dioxide, volatile organic compounds, sulphur compounds and gas impurities (continuous cold venting of gas)	Air/windborne pathway causing impacts to health and amenity	Rural residences 3.6 km south east, 4.6 km east and 4.2 km north	Refer to Table 2	C = Minor, Specific Consequence Criteria (for public health) are likely to be met L = Unlikely, will probably not occur in most circumstances Medium Risk	Y	Conditions 1, 16, 17, 18	<p>The delegated officer queried why the premises was designed with a cold vent rather than a flare to combust VOCs. The applicant advised that disruption was caused to the local community during well test flaring as the flare was visible from the highway resulting in a paddock fire (false alarm) being reported to the landholder, local council and emergency services, and associated disruption to these community members. A flare with a suitable design rating for the premises was also unable to be sourced. The delegated officer took this into consideration in determining cold venting to be appropriate for the premises.</p> <p>Based on the expected composition of extracted gas, VOCs (notably benzene) are considered the most significant pollutant with the potential to impact public health within continuous cold vent emissions. The delegated officer had regard to the screening assessment for benzene in determining the continuous cold vent emissions are likely to comply with both the short and long term AGVs at the nearest receptors, therefore are acceptable.</p> <p>The delegated officer determined it appropriate to include a requirement to install a system to continuously measure cold venting rates, to allow for confirmation they align with predicted emission rates on which the screening assessment was based. The applicant advised a measuring device has been incorporated into the design (at the condensate flash vessel outlet) which is capable of continuously measuring cold vent rates during normal operations</p>
	Methane, carbon dioxide, volatile organic compounds, sulphur compounds and gas impurities (inventory blowdown)				C = Major, Specific Consequence Criteria (for public health) are exceeded L = Rare, may only occur in exceptional circumstances Medium Risk	N		<p>Inventory blowdown events will occur infrequently associated with emergency or maintenance shut-down, will be limited to a total volume of less than 10 m³ (based on the capacity the facility) and will be of limited duration. While results of the screening assessments conducted indicate it is possible for the GLC of benzene at the nearest receptors to exceed the short-term AGV during these events, worst case meteorological conditions more likely to give rise to this have a low probability of occurring in conjunction with a blowdown event. The applicant advised that as blowdown must be manually initiated, it can be initiated during favorable weather conditions to facilitate dispersion away from receptors. Based on this the delegated officer determined it appropriate to require continued weather monitoring (wind speed and direction) and recording, and restrict initiation of blowdown events to when wind conditions facilitate dispersion away from the receptors (times other than when wind direction is from 160-200° and 250 to 335°). The applicant will also be required to record the duration of blowdown events to confirm the duration and frequency align with that proposed in the application.</p> <p>The delegated officer also included the applicant's facility monitoring and shut-down controls as construction and operational requirements in the works approval as these minimise the likelihood of unplanned venting from the facility.</p>

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of works approval	Reasoning
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
	Noise	Air/windborne pathway causing impacts to amenity	Rural residences 3.6 km south east, 4.6 km east and 4.2 km north		C= Slight , minimal impact to amenity at a local scale L= Unlikely , will probably not occur in most circumstances Low Risk	NA	NA	Given the distance to the nearest public receptors the delegated officer considers that the noise associated with the operation of the premises is unlikely to be distinguishable at the nearest receptors, therefore presents a low risk of impacting public amenity.
	Produced water (contains hydrocarbons) due to loss of containment	Direct discharge to land from containment infrastructure potentially resulting in land contamination and potential seepage to groundwater causing contamination	Immediate surrounding area (farmland) Groundwater (5-10 mbgl)		C = Minor , Low level onsite impact, minimal local offsite impacts L = Unlikely , will probably not occur in most circumstances Medium Risk	Y	Conditions 1 and 16	Based on the applicant's expected production rate of 10,000 L / day the proposed available storage volume (140 m ³) is considered adequate. The delegated officer considered the applicant's proposed controls to store the water in bunded tanks prior to disposal will appropriately mitigate the risk of contamination as a result of containment loss. These have therefore been imposed as construction and operational requirements in the works approval. The application indicated treated produced water may also be disposed to an evaporation pond but did not include specific construction details for this infrastructure. With reference to the requirements of Water Quality Protection Note 26 (DOW 2013), the existing drilling sumps on the premises are considered unsuitable for long term use as evaporation ponds therefore have not been authorised for such use within the conditions of the works approval. The applicant advised further approval would be sought if on site discharge of the water is required in the future. Noting that, dependent on production rates during early production a treatment system may also be installed, conditions allowing for this have also been included in the works approval.
	Condensate due to loss of containment	Direct discharge to land from containment infrastructure potentially resulting in land contamination and potential seepage to groundwater causing contamination	Immediate surrounding area (farmland) Groundwater (5-10 mbgl)		C = Moderate mid level onsite impacts and low level offsite impacts at a local scale L = Rare , may only occur in exceptional circumstances Medium Risk	Y	Conditions 1 and 16	The delegated officer considered the applicant's proposed controls to contain condensate within self bunded tanks located within a bund, with level monitoring and automatic shut off will sufficiently mitigate the risk of land contamination due to containment loss therefore imposed the applicant's controls as construction and operational requirements in the works approval.
	Contaminated stormwater or hazardous materials such as hydrocarbons or chemicals (corrosion inhibitor, methanol)	Direct discharge to land from containment infrastructure potentially resulting in land contamination and potential seepage to groundwater causing contamination	Immediate surrounding area (farmland) Groundwater (5-10 mbgl)		C = Minor , Low level onsite impact, minimal local offsite impacts L = Unlikely , will probably not occur in most circumstances Medium Risk	Y	Conditions 1 and 16	The delegated officer considered the applicant's proposed controls to locate chemicals and processing liquids vessels within suitable bunding sufficiently mitigate against stormwater contamination and loss of containment events and the associated impacts of these therefore imposed the applicant's controls as construction and operational requirements in the works approval. Environmental Protection (Unauthorised Discharges) Regulations 2004 and the general provisions of the EP Act apply in relation to causing pollution, should contaminated water be discharged to the environment from containment bunding.

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

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

Note 3: Conditions **2-7, 11-15 and 19 to 23** are all department imposed conditions required for compliance reporting, authorising environmental commissioning and time limited operation and associated emissions, and general complaint and record keeping requirements

5. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
<p>Application advertised on the department's website on 13 September 2022 for a period of 21 days, and in the West Australian Newspaper on the 19 September 2022.</p>	<p>The department received a submission from one party in response to the advertisements. The matters raised included:</p> <ol style="list-style-type: none"> 1. The proximity of the premises to surface waters and groundwater systems and inadequate consideration of risks to these receptors. 2. The cumulative impact of the greenhouse gas (GHG) emissions from the project will contribute to WA's GHG emissions and cannot be considered in isolation. The submission raised that the application is linked to a larger gas development project which they estimate will produce 758,000 t CO₂-e). 3. Potential for impact on species of conservation significance which requires referral to the Commonwealth for assessment under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>. 	<ol style="list-style-type: none"> 1. The department has considered the risk to groundwater associated with the gas processing activity Table 4 and determined there was a medium risk of impact to this receptor. Conditions have been applied to the works approval consistent with the applicant's proposed controls to ensure the risk is sufficiently mitigated. Surface water features are in proximity to the extraction wells which the delegated officer has determined will be regulated by DMIRS. 2. As detailed in section 2.4, the delegated officer excluded GHG emissions from the assessment on the basis that GHG emissions are beyond the current scope of the department's Part V of the EP Act published risk-based regulatory framework and will be well below the 100,000 t CO₂-e per year significance threshold specified in the EPA's <i>Environmental Factor Guideline – Greenhouse Gas Emissions</i>. 3. Activities may be deemed a controlled action under the EPBC Act if they will or are likely to have a significant impact Matters of National Environmental Significance (MNES). The EPA considered the Walyering Conventional Gas Development and determined the likely environmental effects of the proposal are not so significant as to warrant formal assessment and can be adequately assessed and managed within the regulatory framework administered by DWER and DMIRS. Significant impacts to MNES were not identified as occurring or likely to occur in the risk assessment.
<p>Local Government Authority advised of the application on 13 September 2022 and invited to provide comment</p>	<p>No comments were received from the LGA.</p>	<p>NA</p>

Consultation method	Comments received	Department response
DMIRS advised of the application 13 September 2022 and asked to provide advice	DMIRS responded to the request for advice on 4 November 2022. The advice provided is referred to in section 2.5.3.	The delegated officer noted the advice and as per section 2.5.3 determined that DMIRS is the lead agency responsible for the regulation of activities associated with gas extraction and transport therefore did not undertake detailed risk assessment or regulation of these activities within the works approval.
Applicant was provided with draft documents on 16 January 2023	The applicant submitted a response to drafts on 1 February 2023. A summary of their comments and the department's response is provided in Appendix 1	The department's response to the matters raised is provided in Appendix 1.

6. Decision

Based on the assessment in this decision report, the Delegated Officer has determined that the proposal to establish the Walyering Conventional Gas Development, will not pose an unacceptable risk to public health or the environment. This determination is based on:

- the small scale of the production facility (total capacity of <math><10\text{m}^3</math>), and the limited population within the surrounding areas, with adequate separation distance to the nearest human receptors;
- the short duration of commissioning (planned for six days with seven hours of venting) and infrequent limited duration shut-down and maintenance blowdown requirements.
- adequate secondary containment infrastructure for all potentially hazardous materials being included in the premises design; and
- continuous monitoring of the facility via a programmable logic controller.

The applicant's containment and monitoring controls are considered critical to maintaining an acceptable level of risk of environmental impacts, and in accordance with the *Guidance Statement: Setting Conditions* (DER 2015) have been imposed on the works approval as infrastructure controls for construction, and operational controls for commissioning and time limited operation.

The delegated officer determined to apply some additional controls in the works approval to mitigate the risk of ambient air quality impacts associated with blowdown events during commissioning and time limited operations. These include:

- establishment of a weather station for continuous meteorological monitoring (wind conditions); and
- blowdown events restricted to periods when meteorological conditions are least likely to impact air quality at sensitive receptor locations.

The delegated officer considered the legislative context relevant to the premises and determined not to assess the environmental and public health risks associated with construction and operation of gas gathering infrastructure as these risks are considered adequately regulated through DMIRS administered legislation (refer to section 2.5.3). The infrastructure is therefore included within the premises boundary but the works approval does not specify any regulatory controls relating to the construction or operation of the infrastructure.

A licence will be required to authorise ongoing operation of the constructed infrastructure. Licence conditions will not be finalised until the department assesses the licence application. The department will consider information reported in the Environmental Compliance Report, and if available the Time Limited Operation report, in assessing the 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.

Works Approval W6727/2022/1 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: Risk Assessment* (DWER 2020b).

7. Conclusion

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

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia
2. Department of Water (DOW) 2013, *Water Quality Protection Note 26 - Liners for containing pollutants, using synthetic membranes*, Perth, Western Australia
3. Department of Water and Environmental Regulation (DWER) 2019a, *Guideline: Industry Regulation Guide to Licensing*, Perth, Western Australia
4. DWER 2019b, *Guideline: Air emissions (DRAFT)*, Perth, Western Australia
5. DWER 2020a, *Guideline: Environmental Siting*, Perth, Western Australia
6. DWER 2020b, *Guideline: Risk Assessments*, Perth, Western Australia
7. Environmental Protection Authority (EPA) 2022, *Public record pursuant to s. 39 of the Environmental Protection Act 1986 for The Walyering Conventional Gas Development*, Perth, Western Australia
8. Strike South West Pty Ltd (Strike Energy) 2022, *Application for a Works Approval under the Environmental Protection Act 1986 dated ,18 July 2022*, Perth, Western Australia
9. Strike Energy 2023, *Email Response to W6727/2022/1 Walyering Processing Facility Request for Further Information Air Emissions received 3 January 2023*, Perth Western Australia.
10. JBS&G Australia Pty Ltd (JBS&G) 2022a, *Strike South West Pty Ltd Part V, Division 3 Environmental Protection Act 1986 Application for Works Approval Walyering Processing Facility Shire of Dandaragan Western Australia 6507 62390/145,612 Rev 1* Perth, Western Australia
11. JBS&G 2022b, *Response to Request for Information (including attachments) dated 25 August 2022*, Perth, Western Australia
12. JBS&G 2022c, *Strike South West Pty Ltd Walyering Conventional Gas Development Environmental Protection Act 1986 Part IV Section 38 Referral WAY-HSE-REP-004 Rev 2* Perth, Western Australia
13. JBS&G 2022d, *Email Response to W6727/2022/1 Walyering Processing Facility Clarification Request for Air Emissions received 6 December 2022*, Perth Western Australia.
14. WillyWeather 2023, *Weather Stations - Badgingarra Research Station*. Accessed January 2023 at <https://www.willyweather.com.au/climate/weather-stations/wa/wheatbelt/badgingarra-research-station.html?superGraph=plots:temperature,grain:yearly,startDate:1965-01-01,endDate:2023-01-13&climateRecords=period:all-time&longTermGraph=plots:temperature,period:all-time,month:all&windRose=period:5-year,month:all-months>.

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

Condition	Summary of applicant's comment	Department's response
<p>Decision Report – 2.3</p> <p>Works approval conditions 1, Table 1 and 8 Table 3</p>	<p>Requested updates to some references to premises infrastructure due to minor changes to infrastructure or inaccurate descriptions in the draft document.</p> <p>Advised that installation of a Produced Water Treatment System is dependant on water volumes produced therefore may not be included or may be added following early production. The processing facility is expected to remove the majority of hydrocarbons so may not require further treatment and will be disposed via a licensed waste disposal contractor. The water will only be stored in the produced water tanks and no discharge to existing drilling sumps is now planned, or a future approval will be sought if on-site discharge will be required in the future.</p>	<p>The delegated officer made the requested updates and changes as they do not alter the risk assessment.</p> <p>Works approval conditions were altered to enable the produced water treatment system to be constructed under the works approval at a later stage if required.</p>
<p>Decision Report – Table 2</p> <p>Works approval conditions 1, Table 1, 8 Table 3 and 9 Table 4.</p>	<p>Confirmed commissioning would be a manned activity and that potable water would be used for hydrotesting and is not expected to contain contaminants (due to use prior to the introduction of gas into the system) therefore will be discharged into an existing HDPE lined pond.</p> <p>Advised enclosures are not proposed for the condensate transfer pumps as they are designed for quiet operation.</p> <p>Advised the self-bunded condensate tank bund would be HDPE and concrete lined and provided accompanying design. Clarified that only the liquid vessels within the processing facility would be located within concrete bunds and detailed how accumulated stormwater in bunds would be disposed. Clarified details for bunding relating to the chemical store and process chemical skids.</p> <p>Advised the continuous measurement system for venting had been included in the design on the condensate flash vessel outlets and was suitable for the continuous stream during normal operations but not for blow-down events due to the significant difference in the discharge rates. Cold vent flow rates during purging/blow-down scenarios will be calculated based on actual flow rate measures at the individual wells via wellhead flow metres.</p>	<p>The delegated officer made the requested updates and changes as they do not alter the risk assessment.</p>

Condition	Summary of applicant's comment	Department's response
Decision Report – Table 4 Works approval conditions 1, Table 1, 8 Table 3 and 10 Table 5.	Advised a fit for purpose weather station had been purchased (VantagePro 2) but it is not recognised as an Australian Standard instrument. Advised the monitoring mast would be installed at a suitable height with clear sky angles that are clear of obstacles in accordance with AS 3580.14.	The specifications of the proposed weather station and were reviewed and it was determined to be appropriate for the intended purpose. Requirements for the installation location were added to the works approval aligned with the requirements of AS 3580.14 and a maintenance/calibration requirement for the station was also included.
Decision Report – Table 4 Works approval conditions 8 Table 3 and 10 Table 5.	Requested that the restriction on initiation of blowdown is based on when wind direction is from 160-200° or 250 to 335° AND when the wind speed is less than 2 m/s (i.e., calm conditions).	As per Table 4, the justification to restrict the initiation of blowdown events to when wind direction facilitates dispersion away from the nearest receptors was based upon screening assessments indicating there is a risk of AGVs being exceeded at the nearest receptor. While light wind conditions are more likely to give rise to higher GLCs, the applicant has not provided information demonstrating that the risk of exceeding AGVs at receptors during other/higher wind conditions is sufficiently low, therefore the Delegated Officer has retained the restriction on blowdown events such that they can only be initiated during wind conditions which facilitate dispersion away from the receptors.
Schedule 1	A revised plan for the premises layout was provided in response to the draft decision report and works approval.	The premises layout plan was replaced with the revised plan and infrastructure references in the works approval were updated accordingly.