Application for licence amendment

Part V Division 3 of the Environmental Protection Act 1986

Licence number	L9184/2018/1
Licence nolder	SAMI Bitumen Technologies Pty Ltd
ACN	001 089 416
DWER file number	DER2018/001632
Premises	SAMI Bitumen Kwinana
	KWINANA BEACH WA 6167
Date of report	20 December 2023
Status of report	Final

1. Decision summary

Licence L9184/2018/1 is held by SAMI Bitumen Technologies Pty Ltd (licence holder) for SAMI Bitumen Kwinana (premises), located at 57 Port Road, Kwinana Beach.

This report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the premises. As a result of this assessment, revised licence L9184/2018/1 (L9184) has been granted.

The revised licence issued as a result of this amendment supersedes the existing licence previously granted in relation to the premises.

2. Scope of assessment

2.1 Regulatory framework

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 <u>DWER Regulatory documents</u>.

2.2 Application summary

On 8 September 2023 the Licence Holder submitted an application to the department to amend Licence L9184/2018/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Remove the requirement for vapour recovery and associated authorised emission points for the vapour recovery systems on bitumen tanks, tanker loading, final product tanks, and mixing vessels and replace with passive breathing (without treatment) as follows:
 - Headspace vapours from bitumen tanks and final product tanks (including oil, PMB, CRMB and bitumen products) to discharge via atmospheric breathing vents at the top of each tank (17 metres above ground level).
 - Extraction system at the loading gantries to be discharged via the existing A4 stack (11 metre above ground level).
 - Extraction system for mixing vessels in the manufacturing building to be discharged via a stack above the building roof (12 metres above ground level).

The amendment is limited to the scope described above and no change to the premises production capacity has been sought.

2.3 Background

L9184 authorises operation of, and associated emissions and discharges from, bitumen storage and processing activities undertaken on the premises. Condition 1 of the existing licence requires vapour recovery from the vents on the heated bitumen storage tanks, the bitumen tanker loading gantry, and the bitumen product tanks on the premises and condition 2 authorises volatile organic compound (VOC) emissions from the vapour recovery unit stacks.

On 15 July 2023 an explosion occurred in a bitumen storage tank at the premises. An investigation of the explosion found the root cause to be the accumulation of pyrophoric iron sulphides caused by the reaction of hydrogen sulfide (H_2S) and iron under low oxygen conditions. The pyrophoric iron sulphides ignited in the presence of air, and this initiated an explosion with the combustible gases inside the tank.

As part of the investigation, among other findings, it was recommended to relocate the atmospheric breather on the premises storage tanks to tank high points and to stop extracting

the headspace of the tanks to prevent such explosions occurring in the future. There are 15 tanks on the premises required to be converted from vapour recovery to passive breathing with atmospheric breather vents to be located at approximately 17 metres above ground level.

The decision was also made to cease vapour recovery at the loading gantries and instead move to passive discharge of extracted vapours via the existing stack and to also install a new stack on the manufacturing building for discharge of vapours from the mixing vessels contained within.

2.4 Odour and air emissions study

The licence holder submitted a report from OPAM Consulting titled SAMI Bitumen Technologies, Kwinana New vapour extraction network Odour and Air Emissions Risks Assessment. The report documents the emissions to air of the premises both for both the existing and proposed future configuration with vapour recovery replaced with passive breathing. The four infrastructure components that were considered in the assessment were:

- bitumen tanks;
- tanker loading at the gantry;
- final product tanks; and
- mixing vessel (Polymer modified bitumen (PMB) manufacture)

Emulsion tanks have low odour and emissions potential and are not proposed to be reconfigured for this amendment, therefore were not considered in the assessment.

The assessment indicates that during filling, the odour emission rates (OER) from the bitumen storage tanks passive vents are predicted to be 4-12 times lower than the combined OER from vapour recovery unit stacks 2 and 3 in the current configuration. Even if several tanks are filled at once, the total OER will be less than or similar to the lower level of emissions from the two stacks. Similarly, emission of VOCs is not expected to increase under the new configuration for passive breathing from the bitumen tanks.

The assessment also predicts that with the new configuration for extraction and discharge of vapours during loading, 84% of the time the OER from the loading gantry discharge point will remain similar or less than the current OER and 16% of the time the OER may be higher but is still expected to remain very low.

The final product tanks emit 470 odour units per cubic metre per second (ou/m³/s) from stack 4 during filling in the current configuration and under passive emissions the maximum OER is 370 ou/m³/s. The mixing vessel within the manufacturing building also discharges through stack 4 under the current configuration (470 ou/m³/s). Emissions from the new stack (A5) are expected to be around 35 ou/m³/s.

A screening analysis was also undertaken as part of the assessment for the major pollutants present in premises emissions including Benzene, Toluene, Ethyl Benzene, (BTEX) and n-hexane. The screening analysis found that screening concentrations are all less than 1% of ambient air quality guideline values in the Draft Guideline: Air Emissions (DWER 2019) for emissions from the bitumen tanks, loading gantry and the final product tanks.

Odour patrols were conducted as part of the odour assessment to establish the contour of the ground odour plume in the field. The patrols found that bitumen odour was intermittent at measuring points where it was detected. From the observations the odour could be recognised at an obvious level to around 200m to 250 metres from the premises and at a subtle level out to 400 to 450 metres from the premises.

The assessment concluded that the risk of odour and VOC impacts from the new configuration of discharge points is low. The current configuration has generated no odour complaints, and the new configuration is based on the odour and air emissions risk assessment considered likely to be similar or less in terms of odour emissions.

3. Risk assessment

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

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 1 below. Table 1 also details the control measures the licence holder has proposed to assist in controlling these emissions, where necessary.

٦	Table 1: Licence Holder controls						
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Emission	Sources	Potential pathways	Proposed controls
Odour			Passive release for tank vents will be 17 metres above ground level.
VOCs	Filling of tanks Loading of tanker vehicles Manufacturing building	Air/windborne pathway	Extraction fan and exhaust at 11 metres above ground level via the existing stack for tanker loading emissions and a discharge stack from the manufacturing building at 12 metres above ground level. Odour patrols conducted after the modified configuration for vapour discharge has been complete.

3.1.2 Receptors

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

Table 2 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (Guideline: Environmental siting (DWER 2020)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Residential area	3.3 km from east from boundary
Single residence café and liquor store	420 metres south from boundary
Environmental receptors	Distance from prescribed activity
Cockburn Sound marine environment	500 metres west
Underlying groundwater (non-potable purposes)	3.3 metres to groundwater maximum.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the Guideline: Risk Assessments (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the licence holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the delegated officer considers the licence holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

The revised licence L9184/2016/1 that accompanies this report authorises emissions associated with the operation of the premises. The conditions in the revised licence have been determined in accordance with Guidance Statement: Setting Conditions (DER 2015).

Table 3. Risk assessment of potentia	l emissions and discharges	from the Premises operation
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Risk Event			Risk rating ¹	Licence				
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls	C = consequence L = likelihood	Holder's controls sufficient?	Conditions of licence	Reasoning
Operation								
Manufacture of PMB and CRMB. Transfer of organic liquids both heated and ambient	Odour and VOCs	Air/windborne pathway causing impacts to health and amenity	Single residence 420m south and residential area 3,300 m east	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Conditions 1 and 2	Based on the odour assessment commissioned by the licence holder the venting of individual tanks at 17 metres in height, the loading gantry at 11 metres and manufacturing building at 12 metres is expected to result in similar or less odour emissions to the current configuration, which employs vapour recovery units to collect and treat vapours from the infrastructure. There have been no odour complaints under the current configuration. Given the above the delegated officer considered that the proposed change to the treatment and discharge of vapours from the premises tanks, gantries, and manufacturing shed is not expected to alter the risk of odourous emissions from the premises impacting the health or amenity of receptors. The infrastructure requirements and authorised discharge points were altered to reflect this replacement of vapour recovery with passive breathing

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

4. Consultation

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

Table 4: Consultation

Consultation method	Comments received	Department response
Local Government Authority advised of proposal 4 October 2023	City of Kwinana advised they had no comment 19 October 2023	NA
The Licence Holder was provided with draft amendment on 11 December 2023	Licence holder replied 13 December 2023 noting that due to a mistake in the original application the discharge height for tanks was actually 17 metres.	The delegated officer accepted these changes.
	Also remove reference to carbon filter on the manufacturing building.	

5. Decision

The delegated officer has assessed the proposal to remove the vapour recovery systems on the premises and replace these with passive breathing of VOC emissions from elevated vents or stacks and determined that it does not increase the risk of amenity impacts from the premises emissions or pose an unacceptable risk to the environment or public health. In coming to this conclusion, the delegated officer has considered the following points:

- The venting of premises storage tanks at 17 metres will result in a smaller odour emission rate than the current vapour recovery system venting through stacks 2 and 3.
- Odour emissions associated with extraction of vapours from the truck gantry during loading and discharging at via a stack 11 metres above ground level, remain low.
- Odour emissions associated with extraction of vapours from the manufacturing building and discharging at via a stack 12 metres above ground level, remain low.
- The existing conditions of the licence require the licence holder to record the details of any complaints and include these in an annual environmental report to the department. These records as well as the department's own complaint records can be referred to if complaints arise following the reconfiguration of vapour discharge on the premises.

The delegated officer also noted that the licence holder plans to undertake odour patrols following implementation of the amended vent configuration.

6. Conclusion

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

Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the revised licence as part of the amendment process.

Table 5: Summary of licence amendments

Condition no.	Proposed amendments
1	Removal of vapour recovery conditions from table one and replacement with vapours being vented from atmospheric breathers or stacks as appropriate.
2	Removed stack A2 and A3 as authorised emission points. Addition of tank vents, Manufacturing building stack as authorised emission points and revised stack A4 to receive emissions from the loading gantry as an authorised emission point.

References

- 1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
- 2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
- 3. DWER 2020, Guideline: Risk Assessments, Perth, Western Australia.
- 4. SAMI Bitumen Technologies 2023 Application for amendment Perth Western Australia
- 5. OPAM Consulting 2023 SAMI Bitumen Technologies, Kwinana New vapour extraction network Odour and Air Emissions Risk Assessment. Perth Western Australia