FINAL REPORT

ENVIROKING LIQUID WASTE FACILITY

843 JOHN RENSHAW DRIVE, BLACK HILL

AIR QUALITY ASSESSMENT
RWDI # 2201045
October 17, 2022

SUBMITTED TO

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NOTE

WILKINSON MURRAY

In October 2020, Wilkinson Murray Pty Limited merged with RWDI Group, a leading international consulting firm. Wilkinson Murrays core practise areas of noise, acoustics, vibration, and air quality consulting built since 1962 servicing Australia and Asia-Pacific region will complement RWDI practise areas. Combined, RWDI+Wilkinson Murray is one of the largest teams globally specialising in the area of noise, acoustics, vibration, and air quality.

RWDI

RWDI is a team of highly specialised consulting engineers and scientists working to improve the built environment through three core areas of practice: building performance, climate engineering and environmental engineering. More information is available at www.rwdi.com.

QUALITY ASSURANCE

RWDI Australia Pty Ltd operates a Quality Management System which complies with the requirements of AS/NZS ISO 9001:2015. This management system has been externally certified by SAI Global and Licence No. QEC 13457 has been issued for the following scope: The provision of consultancy services in acoustic engineering and air quality; and the sale, service, support and installation of acoustic monitoring and related systems and technologies.

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1 INTRODUCTION

RWDI Australia (RWDI) has been engaged by DFP Planning Pty Ltd on behalf of Enviroking Investments to conduct an air quality impact assessment for the proposed modification application at Enviroking Waste Facility located at 843 John Renshaw Drive, Black Hill shown in **Figure 1-1**.

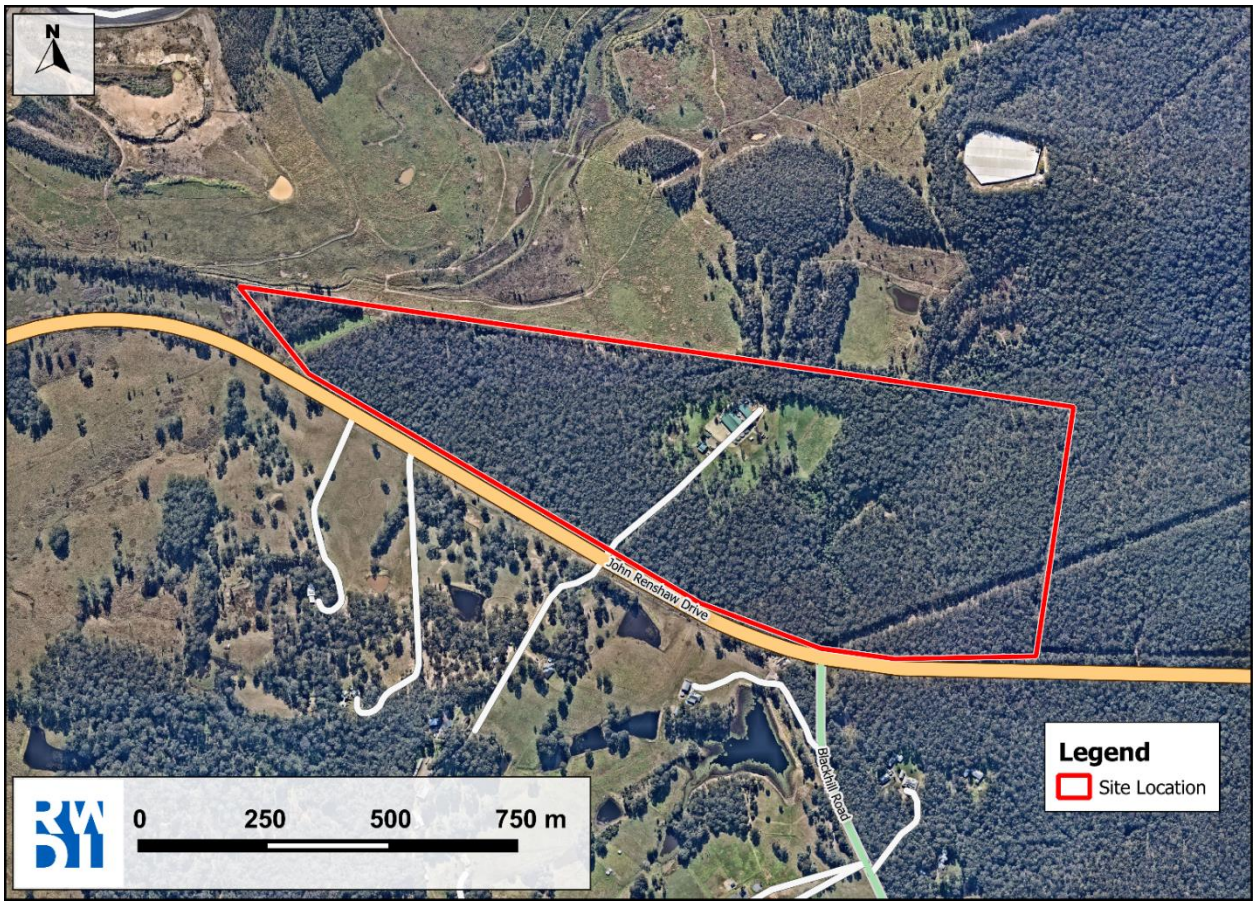

Figure 1-1 Site Location

This assessment is required as part of the submission for the proposed s4.55 Modification Application (**MP_07_0048-Mod-3**) to be approved by NSW Department of Planning and Environment (DPE).

Enviroking propose to modify Condition 6 of Schedule 2 of the Development Consent to increase the quantity of waste to be processed, treat, or handed at the facility from 20,000 tonnes to 30,000 tonnes per annum.

This AQIA presents the review of available information, past assessments and predict air quality impacts associated with the proposed increase in throughput. This preliminary assessment has been conducted in general accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2016).

1.1 Background

Currently the site operates as liquid waste facility at 843 John Renshaw Drive, Black Hill (the site) in the Cessnock local government area. The facility receives and treats oily or greasy waste waters from businesses including motor vehicle workshops, food premises and food processing facilities, which are not treatable by public sewage treatment plants (STP). The waste is collected from businesses using vacuum capable vehicles, generally during the evening and early morning. These vehicles deliver the waste to the site, where it is pumped into holding tanks prior to treatment in the processing plant.

The proposed modification relates to the "processing" limits of the existing facility and seeks to modify Condition 6 of Schedule 2 of the Development Consent to increase the quantity of waste to be processed, treated, or handled at the Site from 20,000 tonnes to 30,000 tonnes per annum.

2 PROJECT DESCRIPTION

2.1 Site Description

The Site is located within the Cessnock LGA, approximately 20 kilometres east of Cessnock and 21 kilometres north-west of Newcastle CBD. The Site is legally described as Lot 931 DP 816814, is known as 843 John Renshaw Drive, Black Hill and has an area of 60.21 hectares.

The Site is bounded by John Renshaw Drive to the south, Bloomfield Collieries Open Cut Mining operation to the north and Donaldson Mine to the east. Smaller rural holdings are located to the south of John Renshaw Drive. The closest residential receivers are approximately 550 metres to the south of the operational area of the site, on John Renshaw Drive and Black Hill Road. The site location and sensitive receptors are shown in **Figure 2-1**.

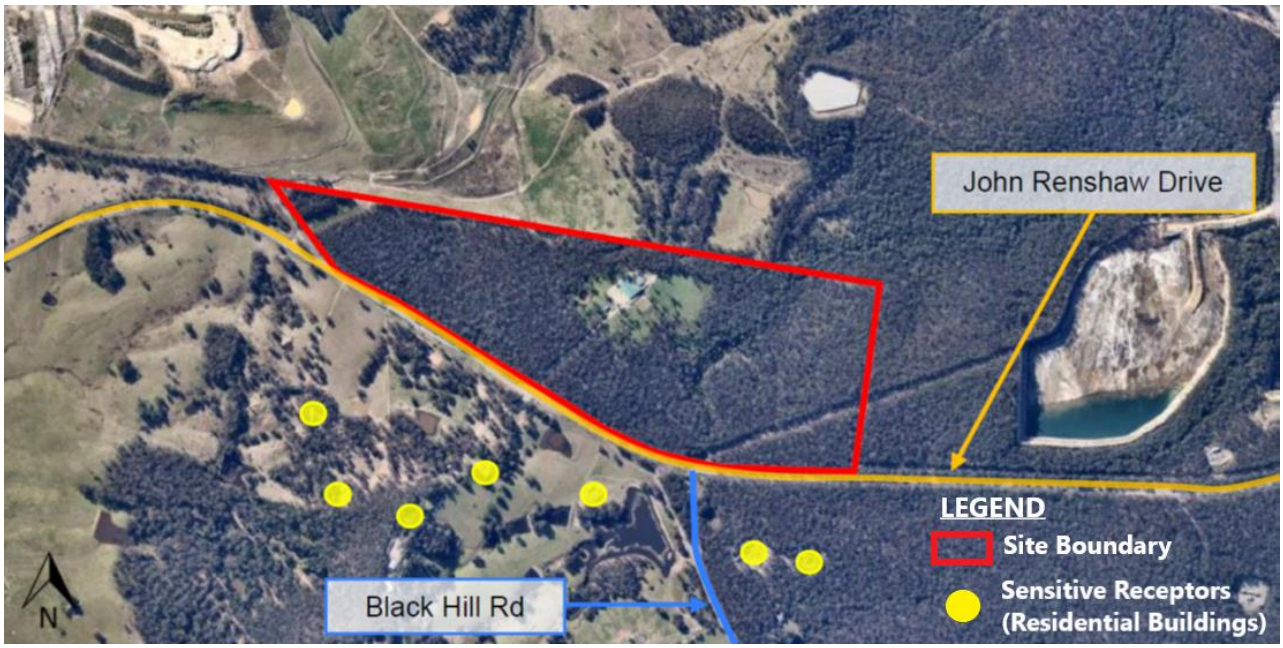

Figure 2-1: Site Plan and nearby Sensitive receptors

2.2 Project Overview

The site presently receives and treats oily or greasy waste waters from businesses such as motor vehicle workshops, restaurants, food halls, canteens, and food processing facilities, as these types of waste are not treatable by public sewage treatment plants (STPs).

The volume of liquid waste has been increased in recent years as a consequence of an increase in residential population in the Hunter Region and therefore, an increase in economic activity associated with liquid food waste, greasy waters from industry and also increased amounts of "drilling mud" from the increased use of

hydraulic boring for installation of services in urban and rural environments. Accordingly, the purpose of the proposed modification is to modify Condition 6 to increase the limit on processing, treating, or handling waste to a maximum of 30,000 tonnes per annum to accommodate some of the increased demand. The increase in throughput can be accommodated using the existing equipment and storage tanks on the Site and therefore, the proposal does not include any new buildings, alterations or additions to existing building or new plant/equipment.

2.2.1 Waste Volumes

Transport of both imported waste and despatched wastes and end-products is by road using predominantly 12 to 23 kilolitre (kL) capacity tankers. The Site proposes to increase the annual capacity of accepted waste from 20,000t to 30,000t.

2.2.2 Accepted Wastes

The waste accepted by the existing Enviroking facility is oily or greasy waste waters, generally considered as organic waste as these types of waste are not treatable by public sewage treatment plants (STPs). These organic wastes accepted by the facility generally would be obtained from grease trap wastes of as these types of waste are not treatable by public sewage treatment plants (STPs). These organic wastes would therefore fall into three broad categories, namely:

- grease trap waste;
- liquid food waste that can be dewatered; and
- liquid food waste that cannot be dewatered.

2.2.3 Treatment Process

The proposed increase in throughput at Enviroking facility can be accommodated using the existing equipment and storage tanks on the Site.

The waste is collected from businesses (mainly urban areas such as Newcastle), generally during the evening and early morning (i.e., outside of business peaks) using vacuum capable vehicles (i.e., trucks fitted with a pump and reservoir tank).

These vehicles then deliver the liquid waste streams to the Site where waste is decanted via gravity feed into holding tanks, prior to treatment in the processing plant. In some cases, after delivery to the site, unladen vehicles exit the Site for further waste collection. Initially, the liquid waste passes through a coarse solids filter (grit and trash basket) into a receiving tank. Then the liquid waste is pumped to a primary or secondary treatment tank where oily, aqueous, and solid phases are allowed to separate by gravity. Then the separated phases are pumped, either to storage for despatch as the organic end-product, or to recirculate through the process for further separation of each waste phase. Treated waste water is pumped into holding tanks.

Following the processing of each batch of accepted waste, the various end-products and residual wastes include:

- a viscous solid organic material for use as an organic fertiliser;
- an oily product that may be further processed (off-site) in the production of bunker fuel, pet food, stockfeed, margarine etc;
- separated waste oil for further refinement (off-site);
- waste water for discharge to sewer under a Trade Waste Agreement or for (off-site) irrigation
- an inert solid waste for placement in landfill.

These end-products and residual wastes are then loaded into tanker trucks for transportation off-site for application on agricultural land or land rehabilitation (e.g., mine sites). Industrial liquid wastes are dewatered and solidified for landfill. Both processes produce relatively clean waste water that is trucked for disposal at a public STP.

3 AIR QUALITY CRITERIA

3.1 Introduction

The NSW EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (the Approved Methods - August 2022) provides applicable impact assessment criteria for a number of air pollutants. Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to ambient air quality. The sections below identify the pollutants of interest in this study and the applicable impact assessment criteria.

3.2 Pollutants of Interest

Odour and particulate matter are the major air pollutants associated with the Proposal. Specifically, the following pollutants are identified:

- Nitrogen Dioxide (NO_2)
- Particulate matter ($PM_{2.5}$ and PM_{10}) and Total suspended particulates (TSP);

3.3 Impact Assessment Criteria

The EPA Approved Methods specifies air quality assessment criteria for assessing impacts from dust generating activities. The Approved Methods does not include any impact assessment criteria for odour assessment from oily grease liquid waste processing facility. Accordingly, goals from the Victorian Environmental Protection Agency (Vic EPA) and South Australian Environmental Protection Agency (SA EPA) have also been adopted for this study. **Table 3-1** summarises the air quality goals for dust and particulate matter that are relevant to this study. The air quality goals relate to the total concentrations of dust and particulate matter in the air and not just that from the Proposal. Therefore, some consideration of background levels needs to be made when using these goals to assess impacts.

Table 3-1:Impact Assessment Criteria

Pollutant	Averaging Period	Impact	Criteria
Particulate Matter ≤ 2.5 µm ($PM_{2.5}$)	24-hours	Total	25 µg/m^3
	Annual	Total	8 µg/m^3
Particulate Matter ≤ 10 µm (PM_{10})	24-hours	Total	50 µg/m^3
	Annual	Total	25 µg/m^3
Total Suspended Particulates (TSP)	Annual	Total	90 µg/m^3
Nitrogen Dioxide (NO_2)	1-hour	Total	246 µg/m^3
	Annual	Total	62 µg/m^3

3.4 Odour Assessment Criteria

Odours from the proposed increase throughput at the Enviroking facility, associated with liquid waste storage and processing exhaust have the potential to cause nuisance. In a regulatory context, odour needs to be considered in two ways, depending on the situation. NSW legislation prohibits emissions that cause offensive odour to occur at any off-site receptor.

Offensive odour is evaluated in the field by authorised officers, who are obliged to consider the odour in the context of its receiving environment, frequency, duration, character and so on and to determine whether the odour would unreasonably interfere with the comfort and repose of the normal person. In this context, the concept of offensive odour is applied to operational facilities and relates to actual emissions in the air.

However, in the approval and planning process for proposed new operations or modifications to existing projects, no actual odour exists, and it is necessary to consider hypothetical odour. In this context, odour concentrations are used and are defined in odour units. The number of odour units represents the number of times that the odour would need to be diluted to reach a level that is just detectable to the human nose. Thus, by definition, odour less than one odour unit (1 OU), would not be detectable to most people.

The range of a person's ability to detect odour varies greatly in the population, as does their sensitivity to the type of odour. Therefore, there can be a wide range of variability in the way odour response is interpreted.

It should be noted that odour refers to complex mixtures of odours, and not “pure" odour arising from a single chemical. Odour from a single, known chemical very rarely occurs (when it does, it is best to consider that specific chemical in terms of its concentration in the air). In most situations, odour will be comprised of a cocktail of many substances that is referred to as a complex mixture of odorous pollutants, or more simply odour.

For developments with potential for odour it may be necessary to predict the likely odour impact that may arise. This is done by using air dispersion modelling which can calculate the level of dilution of odours emitted from the source at the point that it reaches surrounding receptors. This approach allows the air dispersion model to produce results in terms of odour units. However, in the Local Government Air Quality Toolkit (DECC, 2007), the NSW EPA acknowledges that air dispersion modelling is often an expensive exercise, and that suitable odour mitigation can often be installed for comparable costs.

The NSW criteria for acceptable levels of odour range from 2 to 7 OU, with the more stringent 2 OU criteria applicable to densely populated urban areas and the 7 OU criteria applicable to sparsely populated rural areas, as outlined below.

Table 3-2 presents the relevant impact assessment criteria for complex mixtures of odorous pollutants.

Table 3-2: Impact assessment criteria – Complex Mixture of Odourous Pollutants

Population of affected community	Impact assessment criteria (OU)*
Urban (≥~2000) and/or schools and hospitals	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤ ~2)	7.0

Note: * 99th percentile nose-response time.

The Site is located in a rural area, therefore, in accordance with the criteria in **Table 3-2**, an impact assessment criterion would be 6.0 OU/m^3.

3.5 Odour Issues

The main odour issues associated with the operation of the facility include:

- fugitive release of odour during handling and storage of grease trap waste and oily waste, and
- controlled release, via a stack.

During tank-filling operations, foul air, displaced from the tanks, collects in piping, and is ducted to an external stack. In addition, the plant building includes two large exhaust fans and was designed to provide negative pressure, to control any fugitive release of odour during road tanker discharge and tank filling. In addition, road tankers are washed out, before filling with waste water for offsite disposal. Waste water from the washing out of road tankers flows into the emergency spill collection sump before being vacuum pumped into a treatment tank. The washing out of road tankers releases fugitive odours from residual grease trap waste.

4 EXISTING ENVIRONMENT

4.1 Local Meteorology

Meteorological conditions strongly influence air quality. Most significantly, wind speed, wind direction, temperature, relative humidity, and rainfall affect the dispersion of air pollutants.

Observations of wind speed and direction from the Office of Environment and Heritage (OEH) air quality monitoring station (AQMS) at Beresfield have been selected to represent typical wind patterns in the area surrounding the site. The Beresfield AQMS is located approximately 8 kilometres east-northeast from the centre of the site. The Beresfield air quality monitoring site is located in Francis Greenway High School, on Lawson Avenue, Beresfield. It is situated in a residential area to the north-west of Newcastle.

Figure 4-1 through **Figure 4-5** presents annual and seasonal "wind rose" plots for the Beresfield AQMS, for the period 2018 to 2021, respectively. As can be seen from the wind rose plots west to north-west and south-east to east octants are most common in all four seasons.

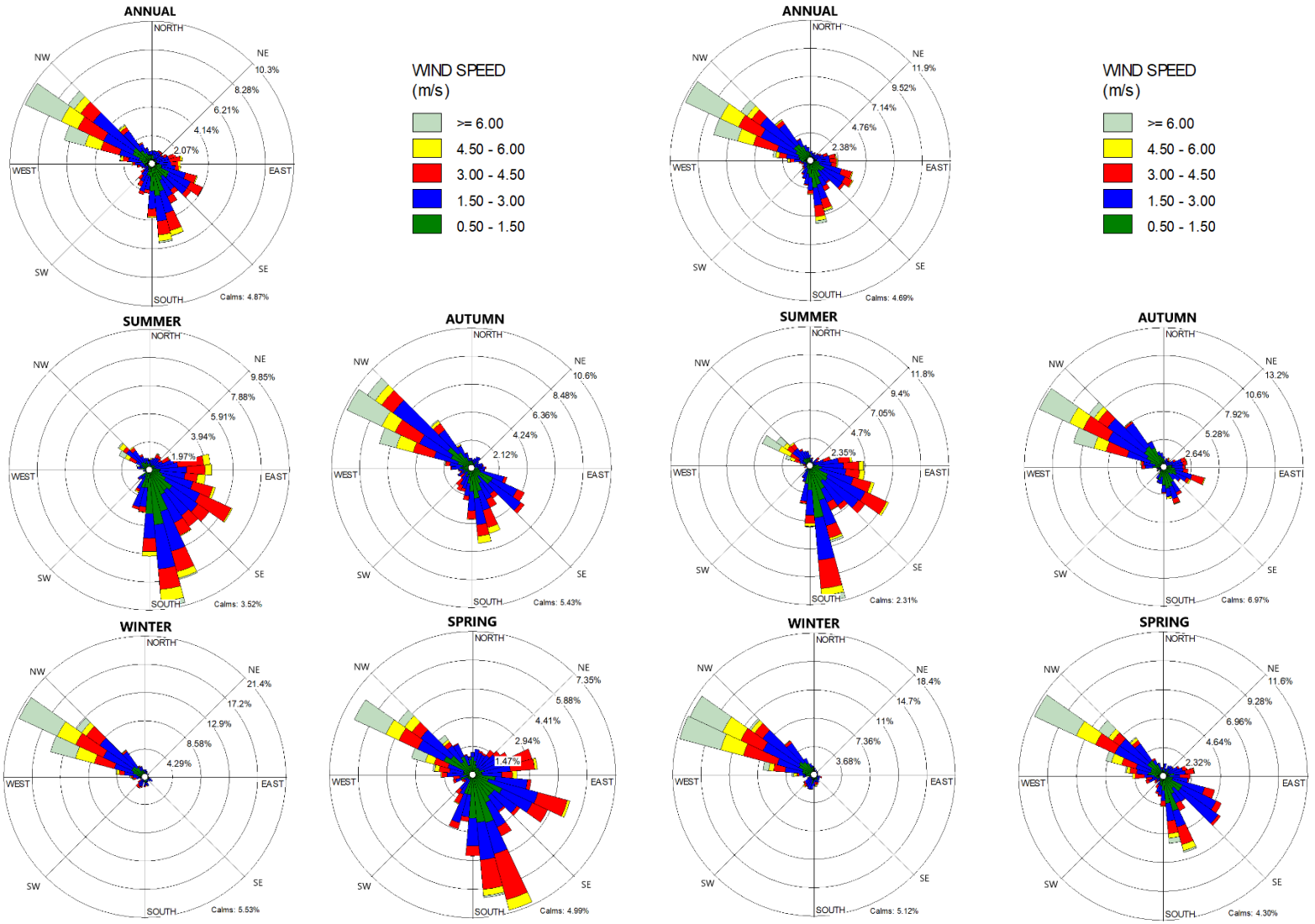

Figure 4-1: Beresfield AQMS Wind Roses, 2018

Figure 4-2: Beresfield AQMS Wind Roses, 2019

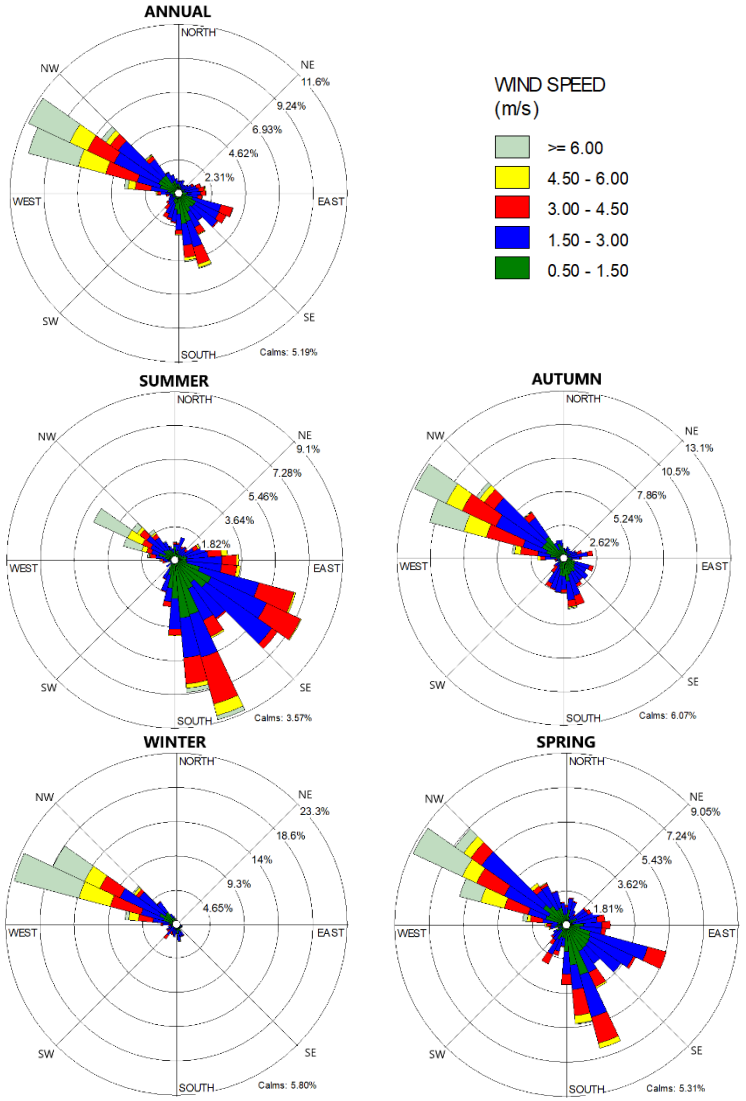

Figure 4-3: Beresfield AQMS Wind Roses, 2020

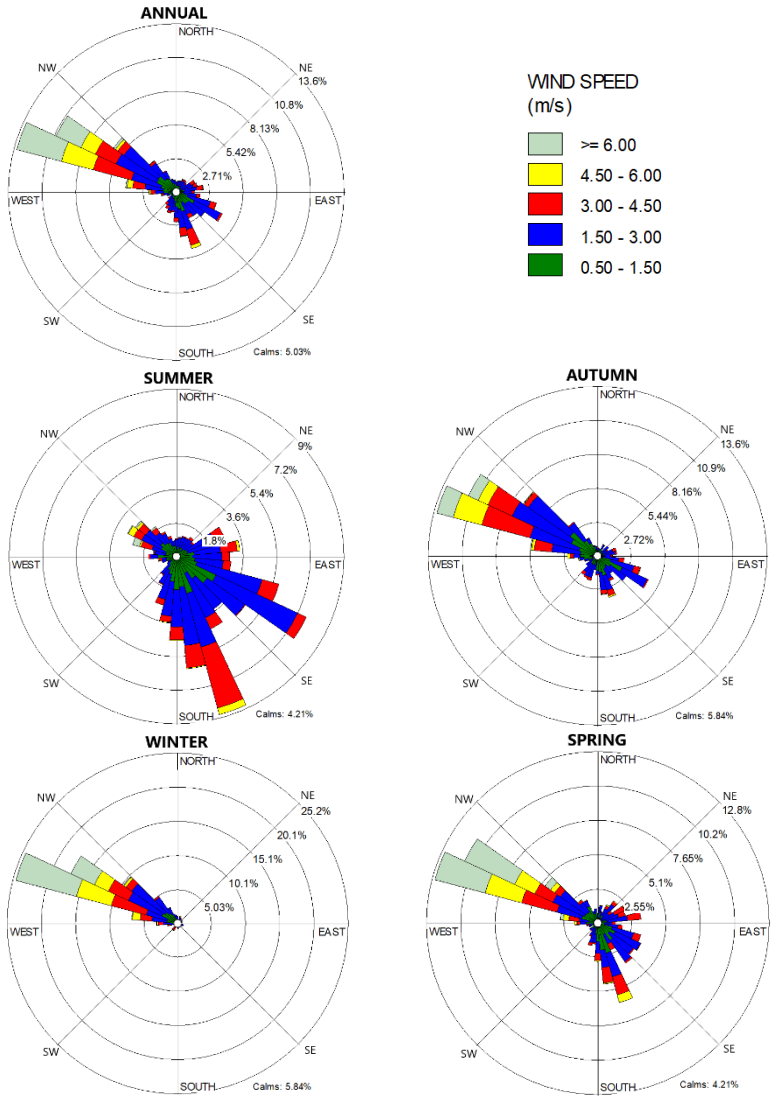

Figure 4-4: Beresfield AQMS Wind Roses, 2021

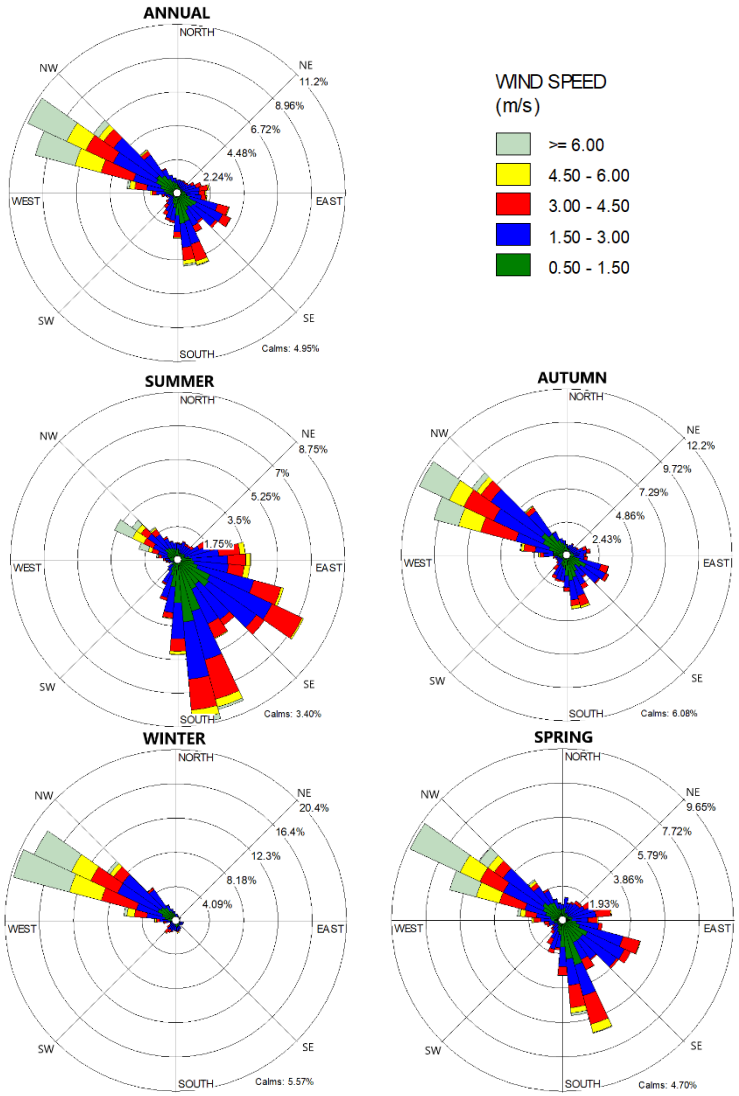

Figure 4-5: Beresfield AQMS Wind Roses, 2018 - 2021

4.2 Local Ambient Air Quality

No site-specific data are available to determine the existing concentrations of air pollutants at sensitive receptors near the site. Data on existing background pollution concentrations was obtained from the NSW Department of Planning and Environment (DPE) Air Quality Monitoring network. DPE operates a network of air quality monitoring stations (AQMS) across NSW. The nearest AQMS measuring the selected pollutants is located approximately 8 kilometres east-northeast of the Proposed site, at Beresfield AQMS.

A summary of the ambient air quality monitoring data collected over a five-year period 2017 – 2021 at Beresfield AQMS is presented in **Table 4-1**. It also presents the applicable air quality criteria for each pollutant of interest. Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality.

Table 4-1: Ambient air quality monitoring concentrations in proximity to the proposal site

Year	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	NO_2 (µg/m³)
2017	7.6	19.6	16.9
2018*	8.7	21.6	16.9
2019*	12.1	25.9	15.0
2020	7.7	18.5	13.2
2021	5.9	15.9	11.3
Average	8.4	20.3	14.7
Impact Criteria	8.0	25	28

a. Elevated levels due to bushfires and dust storms in NSW

The data in **Table 4-1** show annual average $PM_{2.5}$ and PM_{10} concentrations at Beresfield AQMS exceeded the goals of 8 µg/m³ and 25 µg/m³ on a number of occasions. These exceedances of the goals were due to bush fires.

There are no readily available site specific Total Suspended Particulates (TSP) and deposited dust monitoring data. The Beresfield monitoring site does not measure these components. Estimates of the annual average background TSP concentrations can be determined from a relationship between measured PM_{10} concentrations. This relationship assumes that 40% of the TSP is PM_{10} and was established as part of a review of ambient monitoring data collected by co-located TSP and PM_{10} monitors operated for reasonably long periods of time in the Hunter Valley (NSW Minerals Council, 2000).

Applying this relationship with the 5-year average PM_{10} concentration of 20.3 µg/m³ at the Beresfield AQMS yields an estimated annual average TSP concentration of 50.8 µg/m³.

It should be noted that elevated particulate levels were measured in 2018 and 2019 compared to the previous years. The elevated levels on the whole were due significant bushfires and dust storms in NSW from October to

December. However, to be conservative the 2019 data has been used to establish existing background levels. A review of the data from Beresfield AQMS and comparison to the impact criteria indicates the following:

PM_{10}

- Measured annual average has been steady between 21.6 and 15.9 µg/m^3 with the exception of a sharp rise to 25.9 µg/m^3 for the 2019 year. The 2019 data is impact by bushfires and local dust storms contributing to this sharp rise particulate levels.
- Considering this data period, the annual impact criteria of 25 µg/m^3 has not been exceeded and the arithmetic average of the period is calculated to be 20.3 µg/m^3 which is at 81% of the annual impact criteria.

$PM_{2.5}$

- Measured annual average has ranged between 5.9 and 12.1 µg/m^3. The higher 2018 and 2019 levels are due to bushfires and local dust storms.
- Considering this data period, the annual impact criteria of 8 µg/m^3 has been exceeded and the arithmetic average of the period is calculated to be 8.4 µg/m^3 which is at 105% of the annual impact criteria.

NO_2

- Measured annual average has been quite steady between 11.3 and 16.9 µg/m3.
- Considering this data period, the annual impact criteria of 28 µg/m3 has not been exceeded and the arithmetic average of the period is calculated to be 14.7 µg/m3 which is at 52% of the annual impact criteria.

5 AIR QUALITY IMPACT ASSESSMENT

5.1 Overview

This section provides the methods, and assessments of the odour impacts on residences and other sensitive locations surrounding the site, due to the proposed increase in capacity of the Enviroking liquid waste treatment facility.

The current site is located within the RU2 Rural Landscape under the Cessnock Local Environmental Plan 2011. Consequently, land use is predominantly rural. Bloomfield open cut mine, located in the north of the study area, is the main industry. Airborne particulate matter from the mine is the main source of air pollution in the area. There are no other major sources of air pollution or odour in the area. It should also be noted that no odour complaints had been made with respect to current operations.

5.2 Dust Impact Assessment

The main source of dust at the Enviroking facility is from vehicles, mainly road tankers crossing the site on the unsealed access road. Dust from this source is adequately managed at the moment with the road being watered as required to minimise dust emissions. This practice will continue with the increased operations and traffic into and out of the site.

In terms of air quality, the increase in through put for this facility will generate additional traffic movements that will travel along John Renshaw Drive. The emissions would be of a similar nature to those already emitted by road traffic along the nearby road network, although at a much lower level and is therefore considered a low risk to the nearby receivers.

5.3 Odour Impact Assessment

The methodology employed for assessing odour impacts from the liquid waste facility is based on the guidelines Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (NSW DEC 2022). For this study, a Level 1 Odour Impact assessment process based on simple calculations from Assessment and management of odour from stationary sources in NSW (November 2006) was used to determine whether the proposed management practices and odour emission control equipment, in combination with the distance to the nearest sensitive receptor (and likely future sensitive receptors), the topography and meteorology of the site, will result in offensive odour impacts.

The assessment is carried out to estimate potential compliance with odour assessment criteria (to minimise the likelihood of complaints). This simple technique can be used to estimate the maximum impingement concentrations of odour on nearby receptors to ensure that offensive odours are not likely to occur. This analysis will also provide the zone affected by offensive odour.

The Enviroking Liquid Waste Treatment Facility consists of a main plant shed or building that houses the filters, treatment tanks and holding tanks which comprise the waste processing system. Odours from the system include those collected via a ducted ventilation system and discharged from the stack, located at the middle of the north-east or rear wall of the plant building. Fugitive odour releases also occur from the open receiving

tanks during tanker discharge and tank filling, as well as when there is liquid waste in the in-ground emergency spill collection sump, which also receives runoff water from the truck washout area.

Three worst-case hourly odour emission sources (to outside air) were identified as follows:

- SOURCE #1. Odour emissions released by agitated liquid waste during the filling of the primary holding tanks.
- SOURCE #2. Fugitive odour emissions released by agitated liquid waste during the filling of the primary holding tanks and assumed to not be emitted from Stack.
- SOURCE #3. Fugitive odour emissions from undisturbed liquid waste the open-to-air sludge pits at ground level on right hand side and in front of existing plant building.

A summary of the odour concentrations used for Enviroking at Black Hill are provided in **Table 5-1**.

Table 5-1 : Waste Odour Concentrations

Parameter	Nominal worst-case odour concentration for Enviroking (OU/m^3) *
Undisturbed material	2,000 OU/m^3
Agitated material	10,000 OU/m^3

* - As per 2007 AQ Assessment Report

5.3.1 Discussion of Results

Discussion with Enviroking indicated that no odour complaints are received with respect to the waste management at the existing Enviroking site.

As mentioned above, for this study, a Level 1 Odour Impact assessment process based on simple calculations from Assessment and management of odour from stationary sources in NSW (November 2006) was used. Also, Victoria EPA (1518: Recommended Separation Distances for Industrial Residual Air Emissions – Guideline – 2013) provide the recommended separation distances between industrial land uses that emit odour or dust, and sensitive land uses. As per Table 1 of this guideline, for the industry type that stores, process and treats industrial waste like handling and storage of grease trap waste and oily waste, the recommended separation distance is 500 m. As noted above, the nearby sensitive receptors are more than 550m away and satisfies the Victorian EPA recommended separation distance criteria.

Similarly, South Australia EPA (Evaluation distances for effective air quality and noise management – 2017) provide recommended evaluation distances from polluting activities, within which potential adverse impacts on sensitive receptors need to be assessed. As per Appendix 1 of this guideline, for the industry type that handles and stores grease trap waste and oily waste (similar to petroleum storage), the recommended separation distance is 500 m. As noted above, the nearby sensitive receptors are more than 550m away and satisfies the South Australia EPA recommended separation distance criteria.

From the above EPA guidance, it can be evaluated that a more detailed Odour assessment (Level2) is not needed and Level 1 odour impact assessment procedure (Technical notes: assessment and management of odour from stationary sources in NSW), which determines the affected zone for increase in throughput of liquid waste from 20,000 to 30,000 tonnes/year is appropriate. The detailed Level 1 Odour Impact assessment and emission data were presented in the attached **Appendix A.**

As predicted from the assessment, there would be no real potential odour impact on the surrounding sensitive receivers. The recommended separation distance is approximately 333m. Therefore, offensive odour impacts from the proposal is minimised, as there are no sensitive receptors located within 333 m and the nearby sensitive receptors are more than 550m away from the Site (Residential Buildings are located in the area south of John Renshaw Drive).

6 RECOMMENDED MITIGATION AND MANAGEMENT

6.1 Odour Mitigation and Management

Given the small impact predicted beyond the consent area for the proposed expansion of operating capacity of the Enviroking facility, there would be no real potential for these to impact cumulatively with other local odour sources such that the amenity of surrounding sensitive receivers would decrease.

In terms of odour control, the current ventilation controls which include a hood system covering the most odorous areas of the plant building, should be working in proper condition along with the specified parameters.

7 CONCLUSION

RWDI Australia (RWDI) has been engaged by DFP Planning Pty Ltd on behalf of Enviroking Investments to conduct an air quality impact assessment (AQIA) for the increased capacity of oil and grease trap waste handling and processing the proposed at the Environing Waste Management Facility, located on John Renshaw Drive, Black Hill, near Cessnock. The nearest sensitive receivers were identified as residences located in the area south of John Renshaw Drive.

The assessment concludes:

- Potential dust impacts associated with the increase in truck movements of the proposed increased capacity will result in negligible impact.
- Odour Assessment was undertaken using procedures set out in NSW EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (the Approved Methods – August 2022). The project has determined the air quality impacts from the proposed increased capacity of the Enviroking Liquid Waste Treatment Facility, predicted for sensitive receivers in the surrounding area beyond the Enviroking site, are not likely to be significant, and will not compromise public health or amenity. The predicted air quality impacts are not likely to exceed criteria set out by the NSW DECC.

As identified in Section 6.1, the odour mitigation and management measures are identified, to further reduce air quality impacts associated with the operation of the site.

8 REFERENCES

NSW DECC, 2022. Approved Methods for the Modelling and Assessment of Air Pollutants in NSW(AMMAAP). NSW DECCW. https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/22p3963-approved-methods-for-modelling-and-assessment-of-air-pollutants.pdf?la=en&hash=79991C3AD2F7A1FAEC34EBAA857E7D0CCDDD1B24

SA EPA 2016. EPA Guidelines: Evaluation distances for effective air quality and noise management http://www.epa.sa.gov.au/files/12193_eval_distances.pdf

EPA Victoria, Publication 1992 June 2021, Guide to the Environment Reference Standard. EPA Victoria https://www.epa.vic.gov.au/-/media/epa/files/publications/1992.pdf

EPA Victoria, 1518: Recommended Separation Distances for Industrial Residual Air Emissions – Guideline https://www.epa.vic.gov.au/about-epa/publications/1518

NSW EPA 2006 - Technical Notes - Assessment and management of odour from stationary sources in NSW https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/20060441notes.pdf?la=en&hash=8C80E2169C89194E611AA4C68F4AAF4CB6275015

APPENDIX A

LEVEL 1 ODOUR IMPACT ASSESSMENT

Appendix A: Level 1 Odour Impact Assessment

Project #: 2201045

843 John Renshaw Drive, Black Hill, NSW

LEVEL 1 Odour Impact Assessment Procedure - Assessment and management of odour from stationary sources in NSW (2006)

https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/20060441notes.pdf?la=en&hash=8C80E2169C89194E611AA4C68F4AAF4CB6275015

ENVIROKING LIQUID WASTE WATER TREATMENT PLAN

Emissions Data - Stack Sources

Parameter	Value	Units	Comments
Odour Concentration (OU) - D	10,000	OU/m3	Worst Case Grease Trap as per previous AQ Assessment report in 2007
Source#1 - Odour Emissions released by agiatated liquid waste during filling of the primary holding tanks			
Sludge flow to Tanks	35	t/hr	For 30,000 tons/year
Material Density	1.0000	t/m3	assumed same as water
Volumetric air flow	35.0000	m3/hr	
Volumetric air flow	0.0097	m3/s	
Odour Emission Rate	97	OU/s	Maximum OER - Material input to tanks (34 t/hr; 10,000 OU/m3)
Peak-to-mean ratio (PMR)	6	---	Tall point src, SC:D,E,F, far-field (Manual, NSW DEC, 2005)
Odour Emission Rate - PMR1	583	OU/s	Source #1 - Primary Tank Filling
SOURCE #2 - Fugitive odour emissions released by agitated liquid waste during the filling of the primary holding tanks and assumed to not be emitted from Stack #1,			
Odour Emission Rate	97	OU/s	Maximum OER - Material input to tanks (34 t/hr; 10,000 OU/m3)
Peak-to-mean ratio (PMR)	6	---	Tall point src, SC:D,E,F, far-field (Manual, NSW DEC, 2005)
Odour Emission Rate - PMR2	583	OU/s	Source #2 - Fugitive emissions from Tank Filling
SOURCE #3 - Fugitive odour emissions from undisturbed liquid waste the open-to-air sludge pits at ground level on right hand side and in front of existing plant building			
Odour Emission Rate	1260	OU/s	As per previous AQ Assessment dated 11/07/2007, estimate from worst-case inputs
Peak-to-mean ratio (PMR)	6	---	Tall point src, SC:D,E,F, far-field (Manual, NSW DEC, 2005)
Odour Emission Rate - PMR2	7560	OU/s	Source #2 - Fugitive emissions from Tank Filling
Total Odour Emission Rate (Eou)	8727	OU/s	Total from Source #1, Source #2 and Source #3
Odour Assessment Criterion (oac)	6	OU	Table 7.5 - Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales

No Buildings other than main plant shed

Estimate the maximum impingement concentrations of odour on nearby receptors

$K = (35 \times Eou / (oac \times X^2))$

K impingement criterion (i.e. greater than 1 indicates that offensive odour impacts are likely), X distance from the stack in m

Since the nearest receptor is 550m, X = 550

$K = (35 \times 8727 / (6 \times 550^2))$

K = 0.2

Since K is less than 1, offensive odours should not occur at nearby senstive receptor (residential building)

Estimate the zone affected by offensive odour

$d = (11.0 \times Eou / oac)^{0.6}$

d radius of the affected zone in m

$d = (11.0 \times 8727 / 6)^{0.6}$

d = 333 m

From Level 1 odour impact assessment procedure (Technical notes: assessment and management of odour from stationary sources in NSW), the affected zone for increase in throughput of liquid waste from 20,000 to 30,000 tonnes/year would be approximately 333m. Therefore, to ensure offensive odour impacts are minimised, there should be no sensitive receptors (or likely future sensitive receptors) located within 333 m and the near by sensitive receptors are more than 550m away from the plant.