HORSLEY LOGISTICS PARK

Lot 201 - Warehouse 1
Air Quality Impact Assessment

Prepared for:

Jalco Group Pty Ltd
c\- ESR
Level 29
20 Bond Street
Sydney NSW 2000

SLR

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Jalco Group Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.19360-R04-v4.0	26 May 2022	D Dsouza, A Naghizadeh	G Starke	A Naghizadeh
610.19360-R04-v3.0	25 February 2022	D Dsouza	F Rahaman, A Naghizadeh	A Naghizadeh
610.19360-R04-v2.0	02 November 2021	D Dsouza	F Rahaman, A Naghizadeh	A Naghizadeh
610.19360-R04-v1.0	15 September 2021	D Dsouza	F Rahaman	D Dsouza

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1 Introduction

ESR has commissioned SLR Consulting Australia Pty Ltd (SLR) on behalf of Jalco Group (Jalco) to prepare an Air Quality Impact Assessment (AQIA) report for the proposed operation at Warehouse 1 of Lot 201 located at 327-355 Burley Road, Horsley Park (The Project). The proposed operation includes manufacturing and packaging of liquid household cleaning and laundry products as well as storage and distribution of raw material and finished goods.

This AQIA has been prepared in accordance with the NSW EPA document '*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*' (NSW EPA, 2017), hereafter referred to as 'The Approved Methods'. The assessment methodology includes the modelling of local meteorology and the dispersion of potential emissions from the proposed operations to predict potential air quality impacts on surrounding environment. The sections of this report where the requirements of the Approved Methods are met are as follows:

- Description of the Project including layout of site clearly showing unit operations, all emission sources clearly identified, plant boundary, sensitive receptor locations and local topographic features (**Section 2** and **Section 4**).
- Establishment of air quality assessment criteria for the proposed operation. (**Section 3.2**).
- A detailed discussion of the methodology used to calculate the expected pollutant emission rates for each source, including detailed calculations (**Section 5** and **Appendix A**).
- A description of the techniques used to prepare the meteorological data into a format for use in the dispersion modelling (**Sections 6.3**).
- A detailed discussion of the prevailing dispersion meteorology at the Site. The report should typically include wind rose diagrams, an analysis of wind speed, wind direction, stability class, ambient temperature and mixing height; and joint frequency distributions of wind speed and wind direction as a function of stability class (**Sections 6.4**).
- A detailed discussion of the methodology used to calculate the background concentrations for each pollutant including tables summarising the ambient monitoring data (**Section 4.4**).
- A detailed discussion of air quality impacts for all relevant pollutants, based on predicted ground-level concentrations at all sensitive receptors, including risk isopleths (contours) and tables summarising the predicted concentrations of all relevant pollutants at sensitive receptors (**Section 7**).

SLR issued an AQIA report (610.19360-R04-v2.0) for the Project, on 2 November 2021. The submissions submitted during the SSDA exhibition stage included a number of matters in relation to air quality impacts that were further clarified in an updated AQIA (610.19360-R04-v3.0 issued on 25 February 2025). Following the submission of the updated AQIA, ESR received additional comments in relation to the AQIA on 11 March 2022 and 25 March 2022 from Western Sydney Airport and the NSW EPA respectively. This revised AQIA incorporates responses to these comments.

Table 1 presents a list of comments relating to air quality impacts from the Project together with responses and reference to sections within this report where these matters have been addressed.

Table 1 Response to EPA and Western Sydney Airport Comments

Comment	SLR Response
Fairfield City Council	
The proposal shall demonstrate it will not cause any significant release of odorous and toxic VOCs. *The consultant identified dichloromethane to be the only chemical that contain toxic or odours VOC's. The anticipated dichloromethane consumption is based on a monthly usage. Impact assessment criteria for principal toxic air pollutants in the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW is based on hourly usage. The consultant shall anticipate VOC's consumption based on hourly usage or alternatively that consultant shall provide a clear statement advising that the anticipated VOC's emissions will comply with Impact Assessment Criteria present within the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.*	As very small quantities of dichloromethane are used, exceedances of the impact assessment criteria are highly unlikely. If it is assumed that: 1) Dichloromethane is used at a rate of 0.5 litres per hour 2) 50% of all dichloromethane used is evaporated 3) All dichloromethane is used within the dispensary which is ventilated at a rate of 4.5 m^3/s 4) The carbon filtration system adsorbs dichloromethane at 90% efficiency The in-stack concentration of dichloromethane is estimated to be 2.05 mg/m^3, which is well below the criterion of 3.19 mg/m^3. Given the height and exhaust velocity of the stack serving the dispensary, and as shown by result of the odour modelling, emissions from the stack will be diluted several thousand times (>4,000) prior to emissions from the stack reaching the nearest receptor. This would effectively reduce ground level concentrations to a fraction of the impact assessment criteria.

Comment	SLR Response
Table 11 Predicted Odour concentration at Residential Receptor and Figure 14 Odour Impacts, present within the report demonstrates the predicted odour impact that identified receivers are to experience. The Table displays that the odour concentration predicted at all surrounding residential receptors are below the relevant odour criteria of 2ou. It is then further indicated that all commercial receptors are predicted to experience odour concentrations (average across the entire commercial site) below the 2ou criterion with the exception of receptor C1 which is predicted to experience an exceedance of 2.8 ou which the consultant considers marginal. *A revised dispersion modelling assessment must include various pollution control strategies until compliance is achieved in accordance with the NSW EPA Approved Methods for Modelling and Assessment of Air Pollutant Guidelines.*	The adopted pollution control system design (see **Section 2.3**) is predicted to achieve compliance with the adopted odour impact assessment criteria at all locations with the exception of one carpark receptor where the predicted odour concentration is 2.0 odour units (see **Section 7**). It is noted that the adopted odour impact assessment criterion is conservative. Based on previous discussions with the NSW EPA, the odour impact assessment criterion is recommended to be determined through identifying the area within the two-odour unit isopleth and multiplying this area by the relevant average population density obtained from the Australian Bureau of Statistics. Conservatively adopting a population density of 500 people per square kilometre for the Site, the affected population for the worst case sensitivity scenario modelled would be less than 30, which means an odour impact assessment criterion of 5 ou may be appropriate.
The consultant has stated that the WWTP is identified to be a relatively large odour source, with a 28% contribution to total odour emissions from the site. A ground level impact contribution analysis was performed and revealed that the impacts from the WWTP ranged from <0.1ou to 0.4ou at the modelled residential receptors. There is no mention of the odour modelling impact of the WWTP undertaken on the identified commercial receptors. *The consultant shall also undertake an odour modelling impact contribution analysis and present the ground level concentration contribution of the WWTP will have on modelled commercial receptors.*	See **Section 7** for source contribution for all receptors
An odour control strategy for the WWTP has been provided by the consultant which demonstrates an approximate 50-90 per cent reduction in odour impacts at residential receivers. The consultant shall demonstrate how much odour reduction will occur at commercial receptors as a result of the odour control strategy.	Given the proximity of the WWTP to the worst impacted commercial receptors, higher odour reductions are predicted for these commercial receptors compared to residential receptors. Refer **Section 7**

Comment	SLR Response
Western Sydney Airport	
The data provided at Table 6 / Section 5.2 of the Air Quality Assessment needs to assess impact on air emissions at the Obstacle Limitation Surface (OLS). This would include confirmation of any impact of air emissions from the emission point at the OLS height. The current data only identifies the impact of emissions at the source of emission.	SLR understands that in line with CASA requirements, Jalco have submitted CASA Form 1247 *Operational Assessment of a proposed plume rise* to CASA to determine if a risk to the safety of aircraft operations is a matter that would require further assessment. As outlined in Form 1247, "It is for CASA to determine such an outcome given all considered input which is to be assessed whether it may create a risk to the safety of aircraft operation". It is noted that Form 1247 deals with the impact of plume velocity at the OLS. Air quality impacts at OLS are not considered to be likely and are not routinely addressed for transient receptors such as an airplane passing through the area at velocities greater than 67 m/s (aircraft landing speeds).

Comment	SLR Response
Environmental Protection Authority	
The EPA recommends that the proponent provides information on the expected control design and performance of air emission and pollution control equipment, and that additional assessment is undertaken to demonstrate compliance with EPA's impact assessment criterion. The EPA recommends the proponent provides:	
1. a description of all aspects of the air emission control system, including fugitive emission capture, treatment, and discharge systems.	See **Section 2.3, Appendix B and Appendix C**
2. plans, process flow diagrams and descriptions that clearly identify and explain all pollution control equipment and expected emission performance.	See **Section 2.3, Appendix B , Appendix C and Appendix H**
3. manufacturers guarantee or similar, to confirm the expected emission performance of the scrubber systems.	See **Section 2.3 and Appendix B**
4. additional assessment to demonstrate the project complies with EPA's impact assessment criterion.	See **Section 7**
5. a sensitivity analysis that explores the contributions the uncontrolled building vents have on potential offsite impacts.	See **Section 8**

2 Overview of Proposed Activities

2.1 Proposal Site Location

The Project is to be located at 8 Johnston Crescent, Horsley Park and is comprised of Warehouse 1 at Lot 201 (the Site). The site is located approximately 36 kilometres (km) west of the Sydney CBD. Location and boundary of the Site are illustrated in **Figure 1**.

Figure 1 Project Location

2.2 Description of Proposed Activities

The Project is proposed to operate on a 24/7 basis with a proposed maximum annual average product throughput of 208,100 tonnes per annum (tpa) and 57 heavy vehicle and 317 light vehicle movements per day over 3 shifts . The key activities at the Site includes:

- Delivery of raw materials ;
- Storage of raw materials;
- Manufacturing of liquid products;
- Storage of finished products; and
- Transport of finished products offsite via trucks.

As shown in **Figure 2**, the proposed facility will include a Liquid Packaging Area (LPA), Warehouse Area and Bottle Storage Area. Each of these areas will be separated internally to minimise any air exchange between the different zones.

The LPA will operate under negative pressure and will comprise of automated packing operations with one High Speed Fill Line (HSFL), six Low Speed Fill Lines (LSFLs) and one Bleach Fill Line (BFL).

Wastewater generated during operations will be treated onsite using a Dissolved Air Flotation (DAF) unit. In addition to the DAF unit, the wastewater treatment plant is proposed to consist of a sludge storage tank, a balance tank and an intermediate tank. The balance tank and sludge storage tank are aerated, under positive pressure and vent to the atmosphere via dedicated vents with vertical discharge. The intermediate tank is understood to be subject to gentle mechanical mixing rather than aeration, not under positive pressure, mostly sealed with breathing kept to a minimum to maintain equilibrium and is considered not to be a source of odour emissions. These operations are proposed to be located in the northwest corner of the Site (refer to **Figure 2** for Site Layout and Appendix B for detailed WWTP drawings).

Additionally, the warehousing area will be used for delivery and storage of packaged raw materials while the bottle storage area will be used for delivery and storage of empty bottles. These areas will be accessed externally via roller shutter doors (RSDs).

Provisions for a laboratory have also been made for testing of products and raw materials.

2.3 Revisions to Proposed Pollution Control Equipment

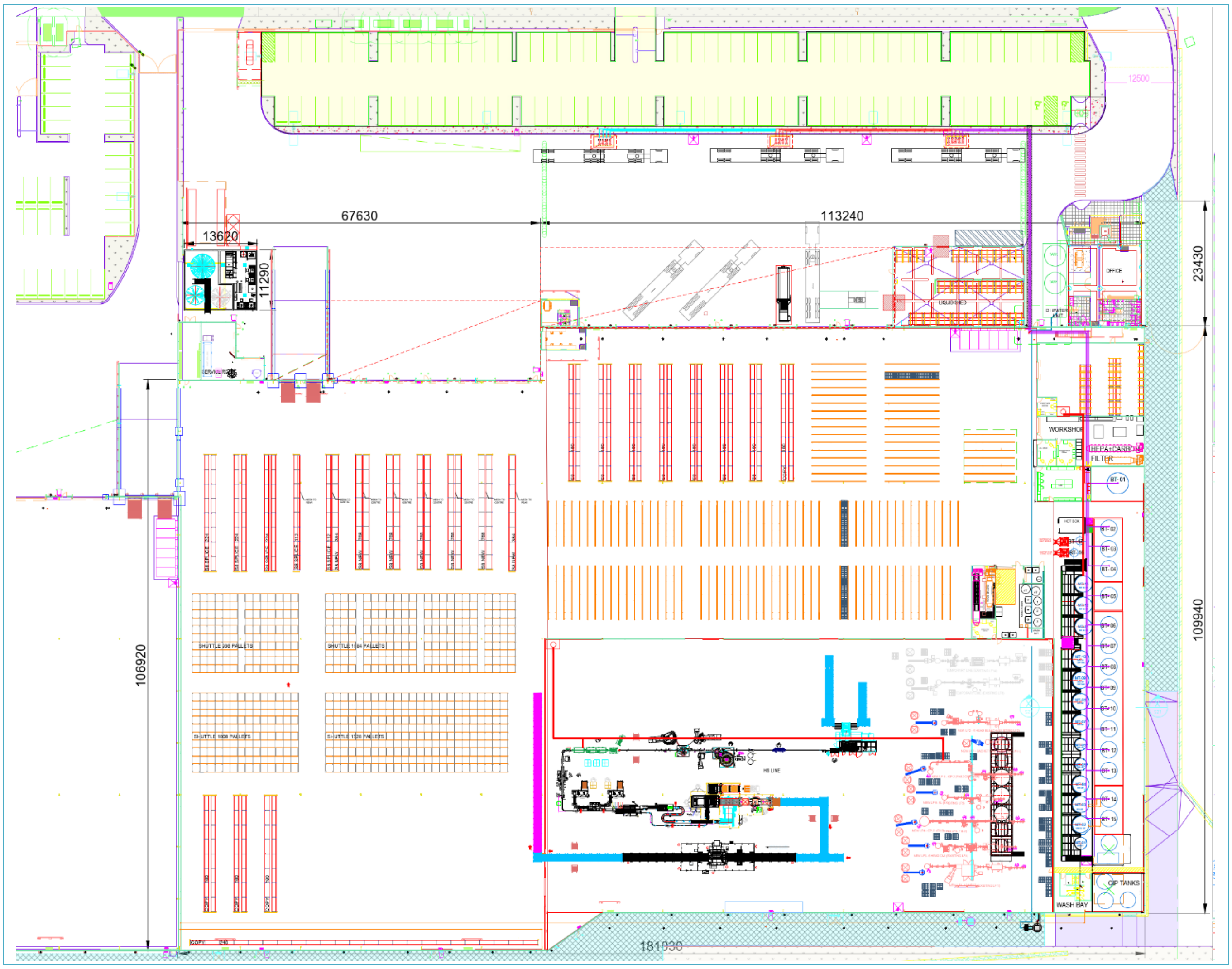
Since the Original AQIA was prepared, the design of the pollution control systems proposed to be installed at the Site have been further refined. Jalco engaged Polex Environmental Engineering (Polex) to design a pollution control system to serve the bulk storage tanks, mixing tanks, liquid filling lines and laboratory/dispensary whilst Integra Water was engaged for the detailed design of the wastewater treatment plant and associated extraction systems.

Full details of the pollution control system proposed by Polex are presented in Appendix C. Detailed drawings of the wastewater treatment plant are presented in Appendix B. In summary, proposed pollution control systems are proposed to comprise:

- Point extraction of odorous air is to be provided at all potential sources of odour emissions to minimise fugitive emissions into the warehouse. Polex anticipates that with proper coverage on the top of the filling machines, a maximum of 10% fugitive emissions from the filling machines into the surrounding workspace is achievable.
- A standalone system serving the liquid filling lines and the Enzyme room. Filtration is proposed to be through 2 stages: HEPA filtration for the enzymes, and CARBON filtration for the odours. The filter system also incorporates pre-filters to remove of any airborne particulates protecting both the HEPA and activated carbon filters.
- A second standalone system will be installed for the extraction and filtration of emissions from bulk tanks, mixing tanks, hopper for citric acid area, hopper for salt mixing and the dispensary area. Filtration is through activated carbon. The filter system also incorporates pre-filters for the removal of any airborne particulates, which protects the carbon filters.
- The carbon filters on both systems are designed to allow for sufficient contact time to provide effective adsorption to achieve 90%-95% adsorption of odorous compounds.
- The proposed HEPA/Carbon filters are modular systems that enable the entire filter assembly to be extended in the event that additional HEPA and/or CARBON filtration is required. The area within the factory selected to house the filtration systems facilitates the extension of the filter system if required.
- Exhaust emissions from each system is proposed to be released to atmosphere through a 16 m high stack at a velocity of at least 20 m/s and ambient temperature. It is noted that the original design modelled assumed four stacks would be installed (rather than two). The two stacks closest to the nearest residential neighbour have been removed as part of the refinement of the pollution control system design.
- To enhance the dispersion of emissions from the WWTP, emissions from the balance tank and sludge storage tank are proposed to be mechanically extracted and released to atmosphere via 8 m high vents at a velocity of 16 m/s.

It is noted that the LPA mechanical ventilation system originally proposed would remain in place. This would ensure that any fugitive emissions from the filling lines and material storage tanks would be released to atmosphere vertically through the proposed roof vents.

Figure 2 Site Layout



2.4 Identified Emission Sources and Pollutants of Concern

Based on the description of activities provided in **Section 2.2**, the following air emissions sources and pollutants have been identified.

2.4.1 Products of Combustion from Onsite Vehicle Operations

Transport of raw materials/products to and from the Site, trucks idling at the loading docks during loading/unloading activities and staff commuting to and from the Site will give rise to products of fossil fuel combustion including nitrogen oxides (NOx), sulphur dioxide (SO_2), carbon monoxide (CO) and Volatile Organic Compounds (VOCs). However, these emissions will be managed by logistics planning to minimise idling times, and installing signage to turn off engines while loading/unloading etc. Given this and considering the potential emissions associated with surrounding road networks, potential incremental impacts for emissions associated with fossil fuel combustion can be considered to be minimal and therefore have not been considered any further in this assessment.

2.4.2 VOCs and Odours from Manufacturing and Storage of Raw-Material/Finished Products

Based on the Project description provided to SLR, the key air emissions associated with the manufacturing operations are presented in the following sections.

2.4.2.1 VOCs

VOCs are likely to be generated from use of chemical as well as onsite vehicle movements/idling. Impacts from VOCs emissions associated with onsite vehicle movements/idling have been outlined in **Section 2.4.1**.

Jalco provided Material Safety Data Sheets (MSDS) for all chemicals proposed to be handled at the Site. SLR performed a review of these MSDS' to identify material which contain toxic or odorous organic compounds (as defined by Section 7.2.1 and Section 7.4.1 of the Approved Methods). This was done through a global CAS Registry Number search.

The material identified containing toxic or odorous VOCs and constituting chemicals are presented in **Table 2** along with the anticipated usage rate at the Site. Based on this information it is noted that the quantity of these VOCs to be used during proposed operations are considered to be negligible. A full list of all chemicals reviewed are provided in **Appendix F**.

Additionally, the handling of chemicals in **Table 2** would be restricted to the Site dispensary from which the air is extracted and diverted to the proposed Carbon filter to treat the extracted gas stream prior to release to atmosphere.

Table 2 Anticipated VOC consumption

Chemical Name	VOCs Identified	VOC Content by Weight (%)	Chemical Usage
Dichloromethane	Dichloromethane	100	~2.5 litres/month
Rowe Scientific Dichloromethane	Dichloromethane	>99	~2.5 litres/month

Given above, the Project is unlikely to cause any significant release of odorous and toxic VOC (as defined by the Approved Methods) and as such VOC emissions have not been considered further in this study.

2.4.2.2 Odours

The key odour emission sources associated with the proposed manufacturing operations are identified as follows –

- Stack serving the liquid filling lines and the Enzyme room HEPA/Carbon filtration system
- Stack serving the bulk tanks, mixing tanks and dispensary Carbon filtration system
- Vent serving the WWTP sludge storage tank
- Vent serving the WWTP balance tank
- WWTP DAF unit
- Fugitive odours associated with manufacturing of liquid detergent:
  - Five LPA roof vents; and
  - Leaks from RSD.

3 Regulatory Framework

3.1 Relevant Legislation, Policy and Guidance

The following Air Quality Policy and Guidance documents have been referenced within this assessment and have been used to identify the relevant air quality criteria (see **Section 3.2**).

3.1.1 Protection of the Environment Operations (POEO) Act 1997 & Amendment Act 2011

The POEO Act (and Amendment Act 2011) is a key piece of environment protection legislation administered by the NSW Department of Planning, Industry and Environment's Environment, Energy and Science (EES) group which enables the Government to establish instruments for setting environmental standards, goals, protocols and guidelines.

The following sections of the POEO Act are of general relevance to the Site:

- Section 124 and 125 of the POEO Act states that any plant located at a premise (e.g. the incinerator) should be maintained in an efficient condition and operated in a proper and efficient manner to reduce the potential for air pollution.
- Section 126 of the POEO Act requires that materials are managed in a proper and efficient manner to prevent air pollution (e.g. odour).
- Section 128 of the POEO Act states:
    1. The occupier of a premises must not carry out any activity or operate any plant in or on the premises in such a manner to cause or permit the emission at any point specified in or determined in accordance with the regulation of air impurities in excess of [the standard of concentration and/or the rate] prescribed by the regulations in respect of any such activity or any such plant.
    2. Where neither such a standard nor rate has been so prescribed, the occupier of any premises must carry on activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.

3.1.2 NSW Environment Protection Authority Air Quality Policy and Guidance

The EPA is the NSW regulatory authority responsible for air quality regulation and associated activities.

NSW Environment Protection Authority document *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (hereafter 'the Approved Methods') (EPA 2017), lists the statutory methods for modelling and assessing air pollutants from stationary sources and specifies criteria which reflect the environmental outcomes adopted by the EPA. The Approved Methods are referred to in the POEO (Clean Air) Regulation 2010 for assessment of impacts of air pollutants. The relevant odour criteria set out in the Approved Methods have been reproduced and discussed in **Section 3.2**.

The EPA's *Assessment and Management of Odour from Stationary Sources in NSW (Technical Framework and Technical Notes)* publications provide a policy framework for assessing and managing activities that emit odour and offer guidance on dealing with odour issues. These documents are required to be referenced when assessing any odour issue in NSW.

3.2 Relevant Odour Criteria

The equation used by the NSW EPA to determine the appropriate impact assessment criteria for complex mixtures of odorous air pollutants, as specified in the document '*Technical framework: assessment and management of odour from stationary sources in NSW*' (hereafter the Odour Framework [DEC 2006a]), is expressed as follows:

$$\text{Impact assessment criterion (ou)} = (\log_{10}(\text{population})-4.5)/-0.6$$

A summary of the impact assessment criteria given for various population densities, as drawn from the Odour Framework, is given in **Table 3**. Based on a conservative approach, a criterion of 2 ou has been selected for this study.

It is noted that based on previous discussions with the NSW EPA, the odour impact assessment criterion should be determined by identifying the area within the two-odour unit isopleth and multiplying this area by the relevant average population density obtained from the Australian Bureau of Statistics. Conservatively assuming a population density of 500 ppl/km^2, this would result in an affected population of less than 30 (for the worst case scenario refer **Section 8**), which equates to an odour impact assessment criteria of 5 ou.

Table 3 NSW EPA Impact Assessment Criteria for Complex Mixtures of Odorous Air Pollutants

Population of Affected Community	Impact Assessment Criteria for Complex Mixtures of Odours (ou) (nose-response-time average, 99th percentile)
Urban area (≥ 2000)	2.0
~300	3.0
~125	4.0
~30	5.0
~10	6.0
Single residence (≤ 2)	7.0

Source: DEC 2006

3.2.1 Peak to Mean Ratios

It is a common practice to use dispersion models to determine compliance with odour goals. This introduces a complication because dispersion models are typically restricted by the meteorological data inputs to predicting concentrations over an averaging period of 1-hour or greater. The human nose, however, can respond to odours over periods of the order of one second. During longer periods, odour levels can fluctuate significantly above and below the mean depending on the nature of the source.

To determine the ratio between the 1-second peak concentrations and longer period average concentrations (referred to as the peak to mean ratio) that might be predicted by a dispersion model, the EPA commissioned a study by Katestone Scientific Pty Ltd [(Katestone Scientific, 1998), (Katestone Scientific, 1995)]. This study recommended peak to mean ratios for a range of circumstances. The findings of these studies have been adopted in the Approved Methods and Technical Framework.

For area sources, the peak to mean ratio is dependent on atmospheric stability and the distance from the source. Given the separation distance and topographical features between the odour sources at the Site and the nearest sensitive receptors, a Peak-to-Mean Ratio (P/M60) of 2.5 for stability classes A, B, C and D and 2.3 for stability classes E and F applies. A P/M60 ration of 2.3 has also been applied to all wake-affected point sources and volume sources.

The estimated odour emission rates used in the modelling study have accounted for the above peak to mean ratio to enable direct comparison of the results against the goals shown in **Section 3.2**, which are based on nose-response time.

4 Existing Environment

4.1 Sensitive Receptors

Sensitive receptors are locations where the general population can be adversely impacted by exposure to pollution from the atmospheric emissions. The Approved Methods defines 'sensitive receptors' as '*a location where people are likely to work or reside*'. These locations include hospitals, schools, day care facilities and residential housing.

The Site is located in a semi-rural environment surrounded by low density residential areas and industrial areas. A list of existing and proposed sensitive receptors identified in the vicinity of the Site are presented in **Table 4**, along with the respective distances of each of these receptor points to the nearest Site boundary and receptor type (eg residence, industrial, etc.). **Figure 3** illustrates the location of these surrounding receptors relative to the Project location.

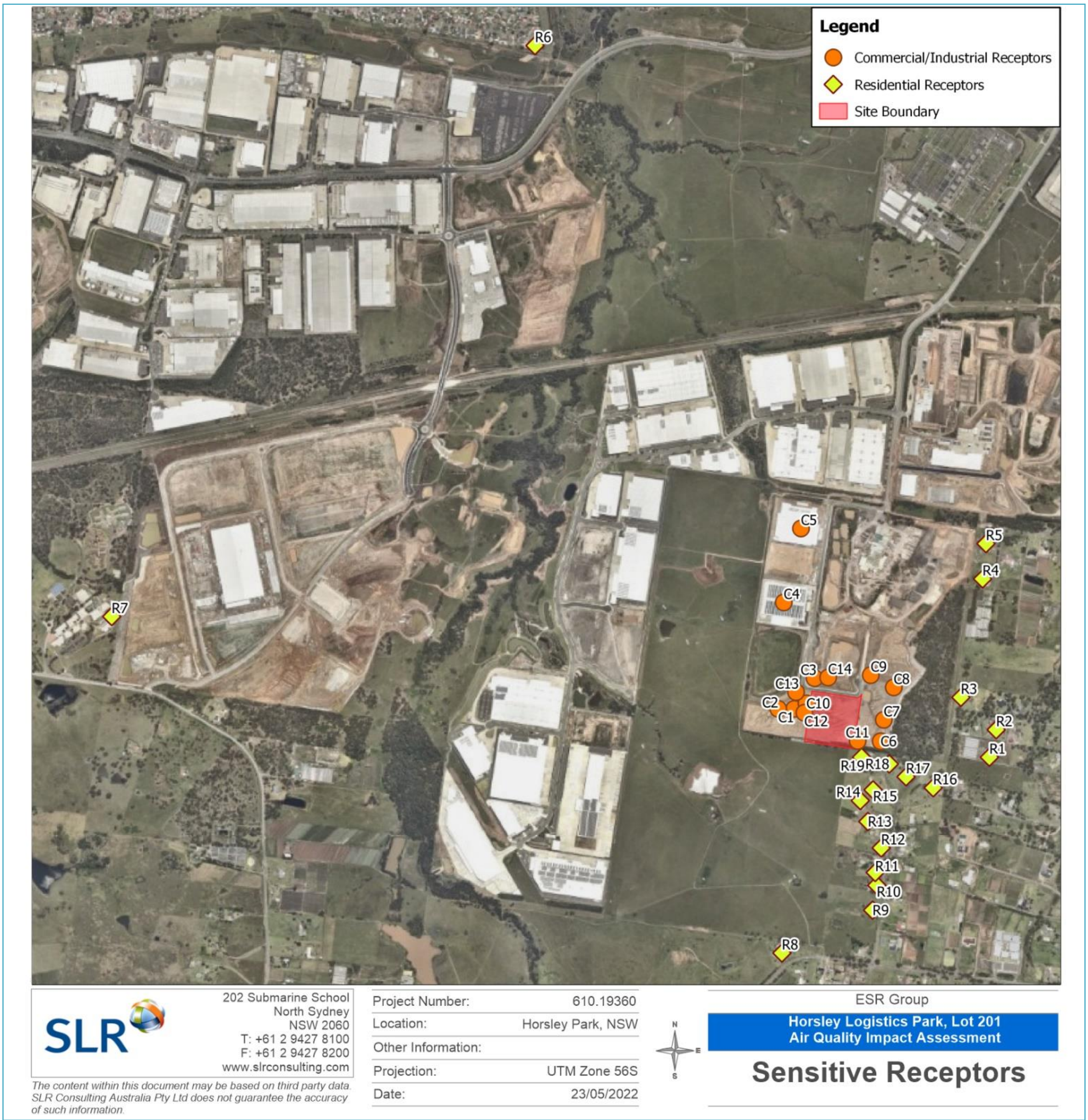
It is noted that the Site and neighbouring area are located within the 20 and 25 Australian Noise Exposure Concept Contour as per the *State Environmental Planning Policy, Western Sydney Aerotropolis* (NSW, 2020) which requires that no further sensitive development (including residences) can be located within this area.

Table 4 Details of Identified Receptors

ID	Location (m, UTM)		Receptor Type	Distance from Nearest Site boundary (m)
	Easting	Northing		
R1	299,140	6,253,875	Residential	520
R2	299,166	6,253,980	Residential	530
R3	299,031	6,254,104	Residential	380
R4	299,114	6,254,557	Residential	640
R5	299,127	6,254,692	Residential	750
R6	297,401	6,256,597	Residential	2,690
R7	295,781	6,254,413	Residential	2,690
R8	298,346	6,253,126	Residential	810
R9	298,693	6,253,290	Residential	620
R10	298,709	6,253,385	Residential	530
R11	298,703	6,253,434	Residential	480
R12	298,726	6,253,528	Residential	390

ID	Location (m, UTM)		Receptor Type	Distance from Nearest Site boundary (m)
	Easting	Northing		
R13	298,675	6,253,629	Residential	280
R14	298,646	6,253,709	Residential	200
R15	298,695	6,253,750	Residential	170
R16	298,925	6,253,758	Residential	340
R17	298,821	6,253,800	Residential	230
R18	298,757	6,253,849	Residential	150
R19	298,651	6,253,875	Residential	45
C1	298,393	6,254,060	Industrial	60
C2	298,332	6,254,060	Industrial	120
C3	298,471	6,254,177	Industrial	50
C4	298,353	6,254,467	Industrial	355
C5	298,419	6,254,750	Industrial	620
C6	298,724	6,253,936	Industrial	100
C7	298,736	6,254,018	Industrial	100
C8	298,774	6,254,142	Industrial	125
C9	298,686	6,254,189	Industrial	80
C10	298,440	6,254,081	Industrial	10
C11	298,636	6,253,937	Industrial	480
C12	298,432	6,254,045	Industrial	15
C13	298,400	6,254,124	Industrial	60
C14	298,523	6,254,180	Industrial	60

Figure 3 Locations of Receptors

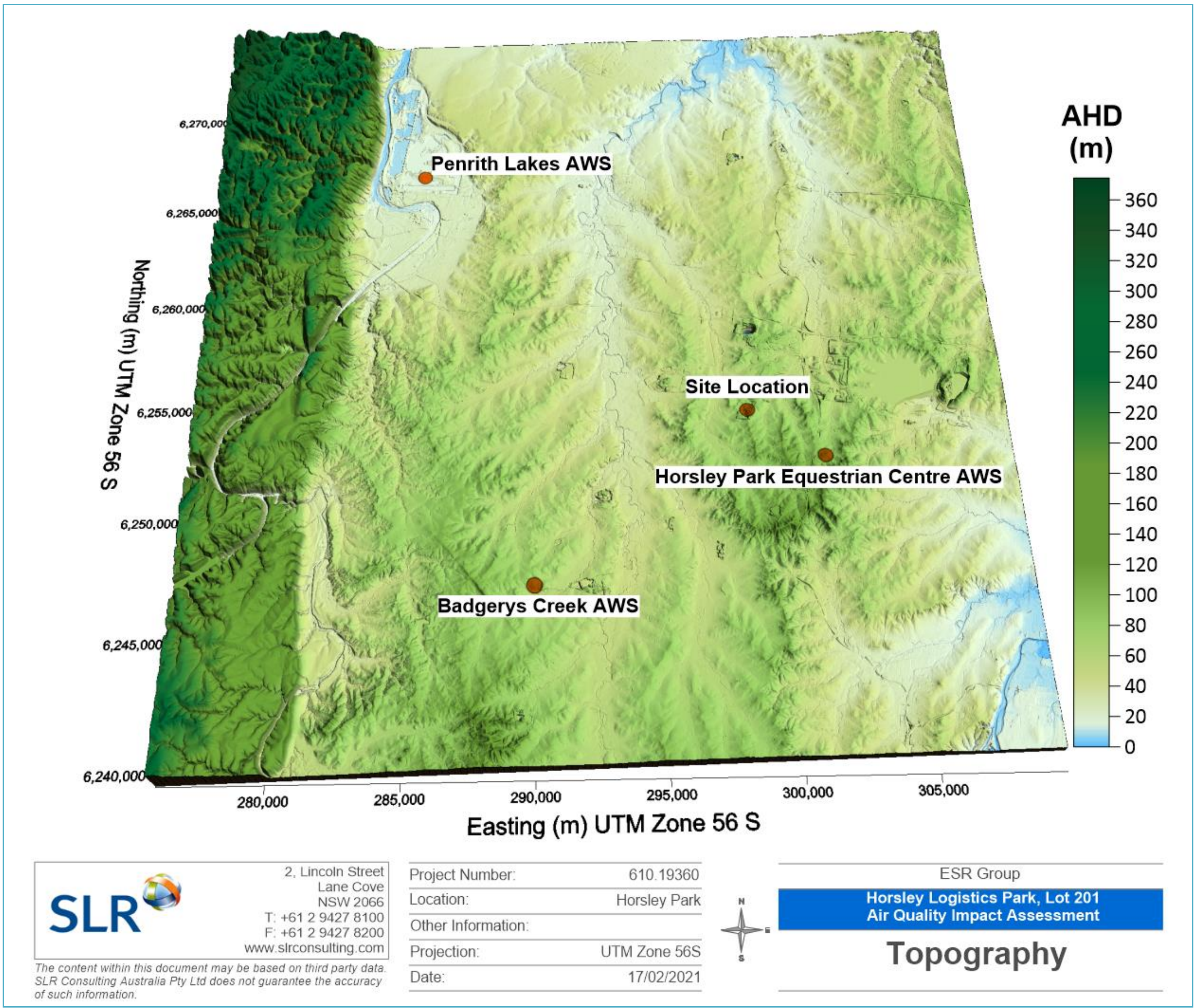


4.2 Surrounding Topography

Topography is important in air quality studies as local atmospheric dispersion can be influenced by night-time katabatic (downhill) drainage flows from elevated terrain or channelling effects in valleys or gullies around the quarry.

A three-dimensional representation of the area is shown in **Figure 4**. The topography of the local area ranges from approximately 0 m to 360 m Australian Height Datum (AHD). The Site is located on slightly elevated terrain, with potential for light air drainage flows from higher to lower elevations, under calm conditions.

Figure 4 Local Topography Surrounding the quarry



Note: Vertical exaggeration applied

4.3 Climate and Meteorology

The nearest meteorological monitoring station to the Site operated by the Bureau of Meteorology (BoM) is the Horsley Park Equestrian Centre automatic weather station (AWS), located approximately 4 km to the southeast. This station (Station ID 067119) was commissioned in 1997 and has long term (1997-2020) meteorological data for the following parameters:

- Temperature (°C)
- Rainfall (mm)

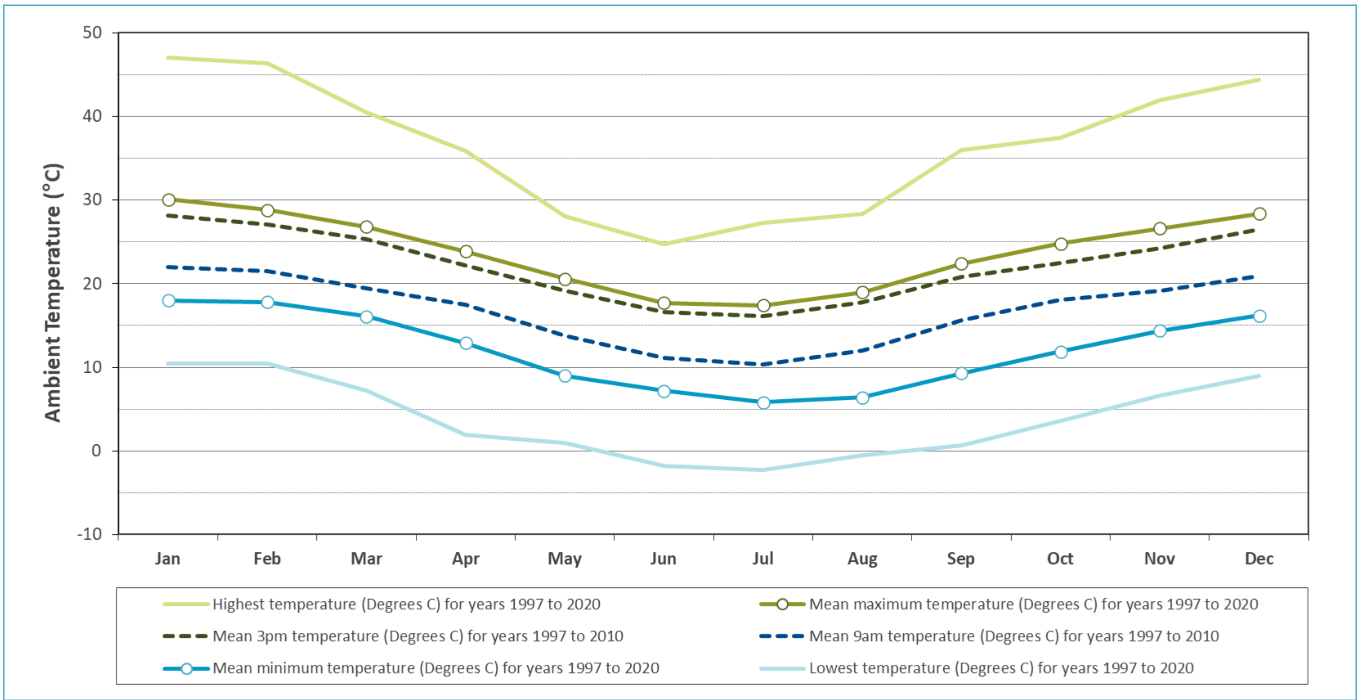
- Solar radiation (MJ/m2)
- Relative humidity (%)
- Wind speed (m/s) and wind direction (degrees).

A review of the long-term data collected is provided in the following sections.

4.3.1 Temperature

Long-term temperature statistics are summarised in **Figure 5**. Mean maximum temperatures range from 17.4°C in winter to 30.1°C in summer, while mean minimum temperatures range from 5.8°C in winter to 18°C in summer. Maximum temperatures above 45°C and minimum temperatures less than 0°C have been recorded.

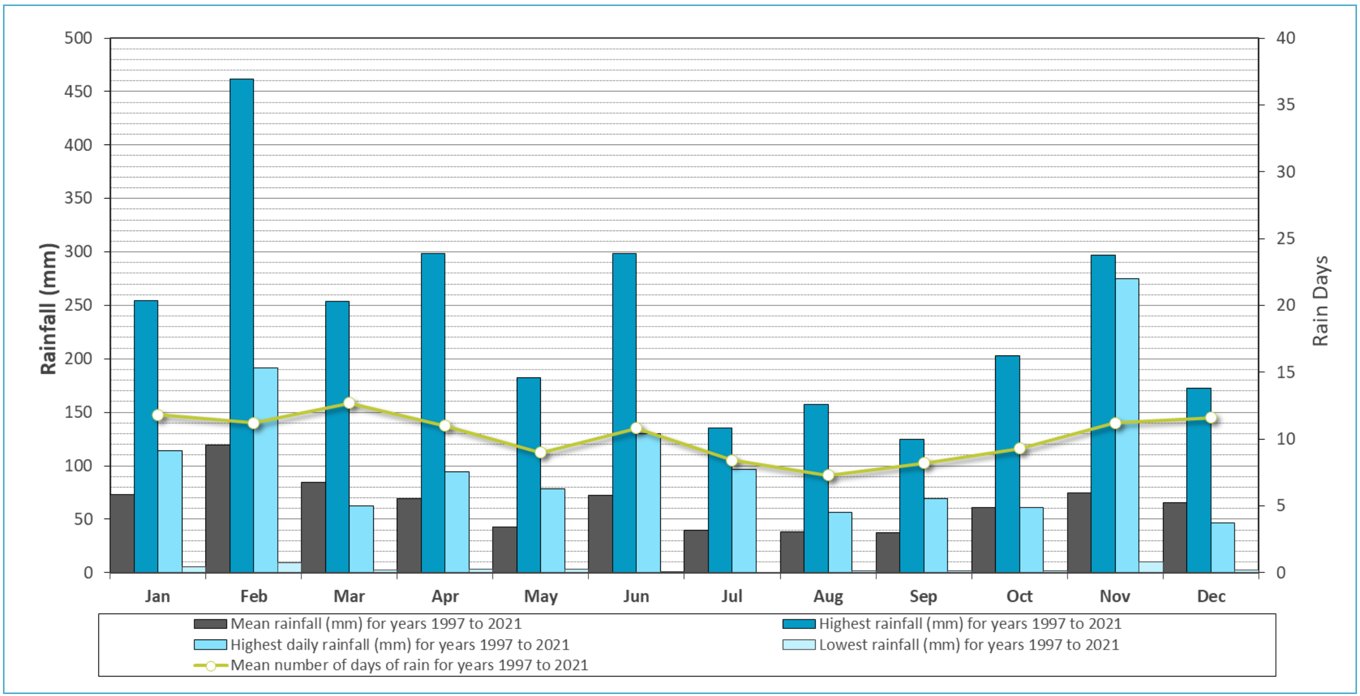
Figure 5 Long Term Temperature Data – Horsley Park Equestrian Centre AWS



4.3.2 Rainfall

Long-term rainfall statistics reported for Horsley Park Equestrian Centre AWS are summarised in **Figure 6.** Rainfall is relatively high in summer, reducing over autumn into winter, with the lowest average of 37.1 mm recorded during September. The minimum number of rain days recorded by the AWS was approximately seven days for the month of August. Peak rainfall events occur during summer, with the highest rainfall in February. The highest monthly rainfall recorded over the time period examined was 461.8 mm recorded in February 2020.

Figure 6 Long Term Rainfall Data - Horsley Park Equestrian Centre AWS



4.3.3 Wind Speed and Direction

Long term wind data (9 am and 3 pm) reported for Horsley Park Equestrian Centre AWS are presented as wind roses in **Figure 7**. The wind roses show that winds from the southwest are predominant in the morning while winds from the southeast are predominant during the afternoon.

4.3.4 Solar Radiation

As would be expected, the mean daily solar exposure levels (see **Figure 8**) are highest in summer (peaking at 22.7 MJ/m^2 in December) and lower in winter (dropping to 8.7 MJ/m^2 in June).

4.3.5 Relative Humidity

Long-term humidity statistics (9 am and 3 pm monthly averages) are summarised in **Figure 9**. Morning humidity levels range from an average of around 61% in early winter to around 81% in early autumn. Afternoon humidity levels are lower, at around 55% in winter and 42% in spring.

Figure 7 Wind Roses – Horsley Park Equestrian Centre

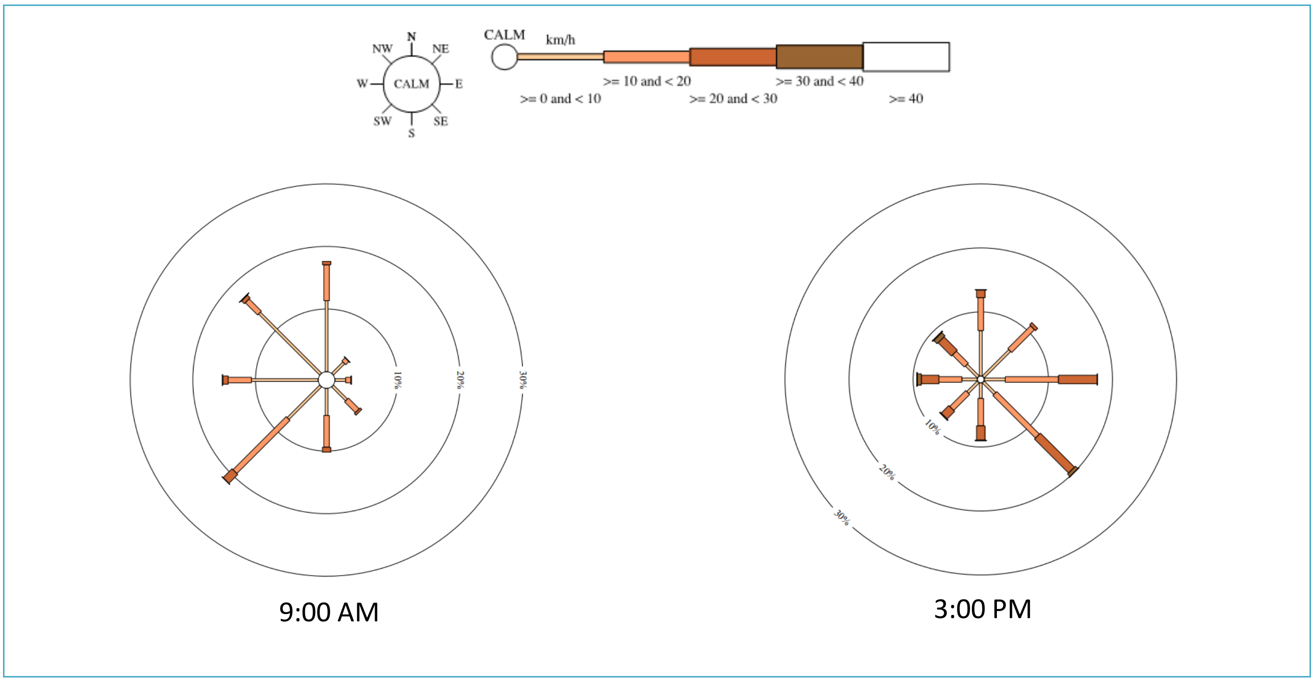


Figure 8 Solar Radiation Data – Horsley Park Equestrian Centre

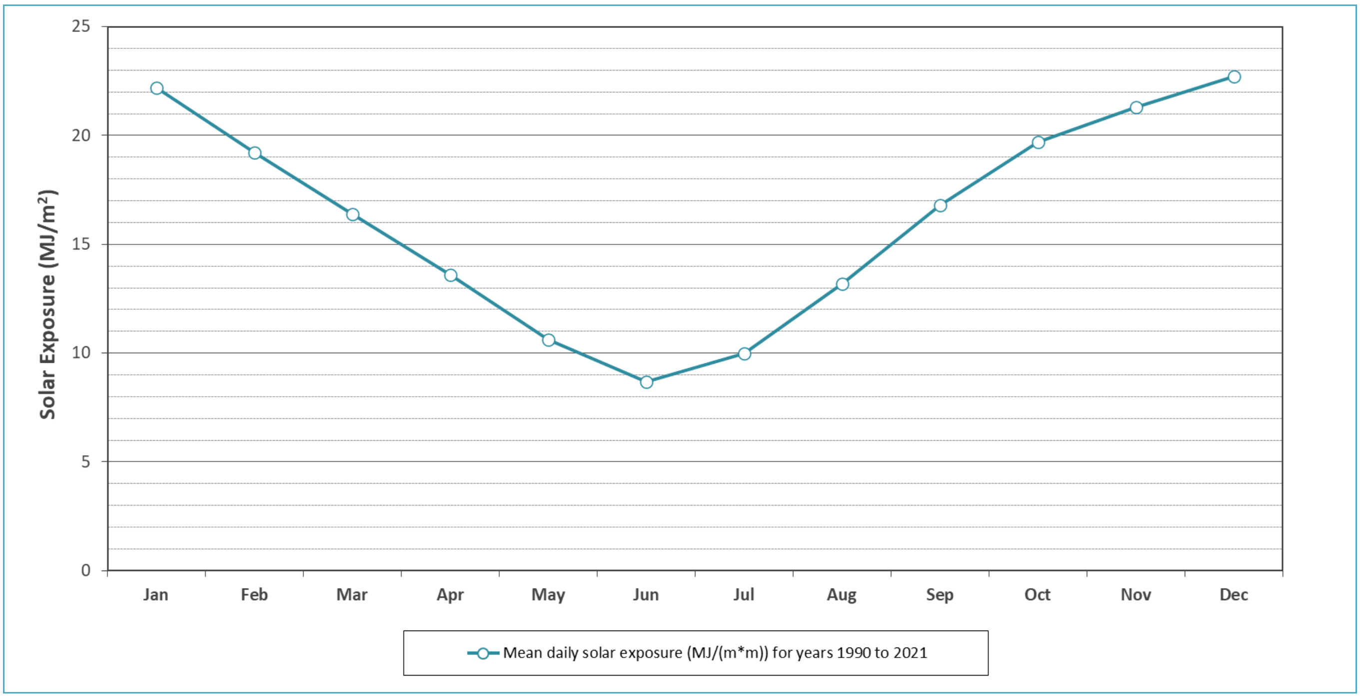
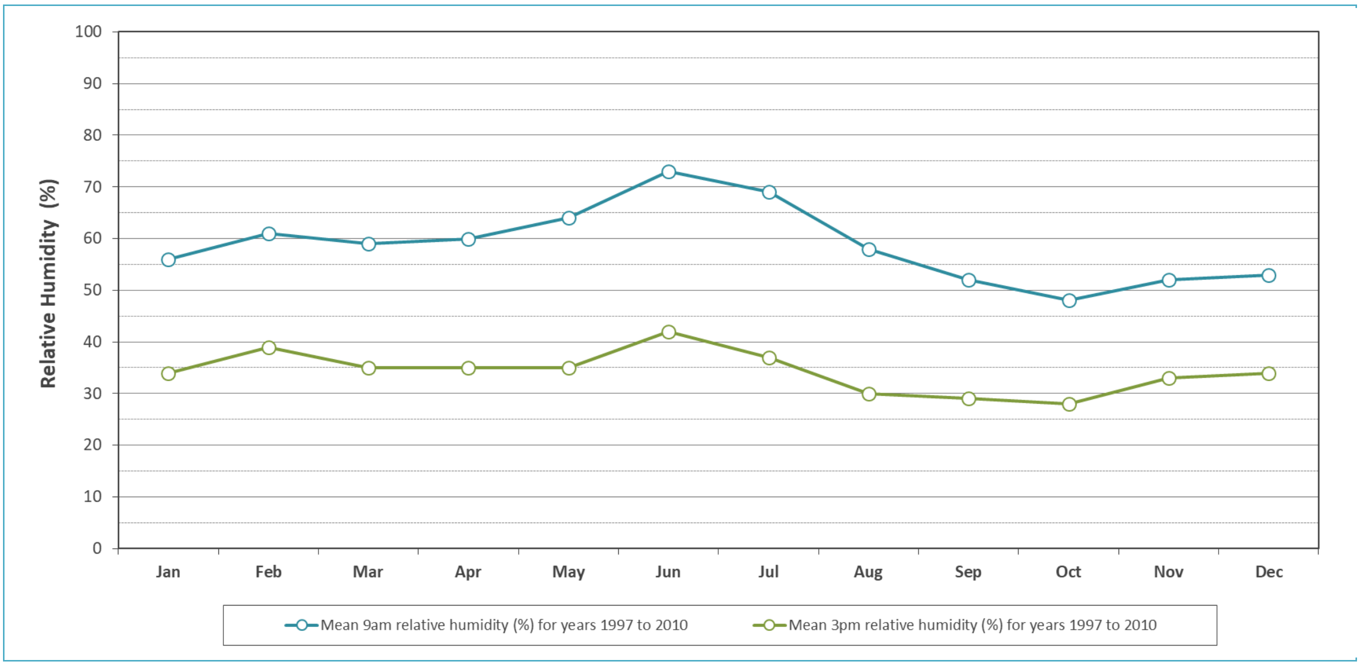


Figure 9 Humidity Data - Horsley Park Equestrian Centre



4.4 Existing Odour Environment

For the purposes of assessing potential cumulative off-site odour levels, the odour sources in local area (within 2 km radius of the Site) have been identified using publicly available information from Environment Protection Licences (EPLs) and the National Pollutant Inventory (NPI) database.

EPLs are issued under the Protection of the Environment Operations Act 1997 (POEO Act) and regulated by the NSW EPA. EPLs stipulate emission limits to water, land and/or air and provide operational protocols to ensure emissions/operations comply with relevant standards. General requirements of EPLs relating to air quality include:

- Plant and equipment are to be maintained and operated in a proper and efficient manner.
- Emissions of dust and odour are to be minimised/prevented from the premises.

The NPI database provides details on industrial emissions of over 4,000 facilities across Australia. The requirement to return emissions estimates to the NPI is determined by the activities/processes being undertaken at the facility, and also whether those processes exceed process-specific thresholds in terms of activity rates (i.e. throughput and/or consumption).

A search of the NSW EPA public register and NPI database for operations within a 2 km radius of the Site identified the following odour sources –

- PGH Bricks and Pavers Horsley Park, approximately 1.4 km north; and
- George Borg Piggery Horsley Park, approximately 1.8 km northeast;

Both these operations are unlikely to emit odours that would have similar characteristics of that to be emitted from the proposed operations.

Given above, background odour levels at the site and surrounding areas are considered to be negligible for this study.

5 Estimation of Air Emissions

5.1 Emission Estimation Methodology

SLR conducted odour emission monitoring at Jalco's existing Smithfield operations at 277-303 Woodpark Rd, Smithfield. These operations include powder and liquid detergent manufacturing and warehousing facility and have an average throughput of 66,000 tpa.

For the Normal Operations Scenario assessment, SLR has assumed:

- Odour concentrations for the bleach and detergent filling lines and blending tanks at the Site will be equal to the corresponding concentrations measured at Smithfield. These concentrations were multiplied by the flow rates provided by Polex to estimate odour emission rates. As Polex have adopted high flow rates to ensure fugitive emissions from the extraction points are minimised, this method may overestimate actual odour emissions from these sources.
- Odour concentrations inside the proposed enzyme room are equal to the highest odour concentration measured inside the Smithfield facility near roof vents and roller shutter doors (ie 220 ou). This concentration was multiplied by the air extraction rate provided by Polex to estimate odour emission rates. It is noted that the use of this odour concentration is likely to lead to overestimation of emissions at the Site as samples collected at the Smithfield site are impacted by spillages due to manual dosing of blending tanks, fugitive emissions from unsealed tanks and residual emissions from uncontrolled filling lines, all of which contribute to the fugitive odour samples collected from the Smithfield plant.
- The specific odour emission rate (SOER) for the various WWTP components (DAF, sludge storage tank and balance tank) are equal to that measured at Smithfield. The SOER was multiplied by the surface area of the WWTP components to estimate odour emission rates.
- Fugitive odour emissions released through the roof vents and RSDs are equal to 10% of all emissions estimated for activities inside the warehouse.
- At the time of the site visit conducted by SLR staff, powder product manufacturing and packaging areas were observed to be significantly odorous than the liquid product manufacturing and packaging areas; and
- Odour emissions sampled to represent the proposed liquid manufacturing operations were collected primarily from liquid manufacturing and packaging areas of the Smithfield plant;

Table 5 present a summary of odour concentrations and emission rates measured at the Smithfield facility. A detailed emission test report including sampling methodology and monitoring results are provided in **Appendix A.**

Table 5 Measured Odour Emission Parameters

Odour	Stack Diameter	Average Stack Temperature	Gas Flowrate	Average Stack Velocity	Odour Concentration	Mass Odour Emission Rate
Units	m	ºC	m^3/min	m/s	OU	ou.m^3/s
Blending Tanks Wet Scrubber - Inlet	0.38	21	0.22	2.2	940	210
Blending Tanks Wet Scrubber - Outlet	0.38	20	0.23	2.2	180	42
Bleach Line Wet Scrubber - Inlet	0.24	25	0.30	7.3	99	30
Bleach Line Wet Scrubber - Outlet	0.38	25	0.42	4.1	83	35
Filling Line 3 Hood	0.15	28	0.25	16	200	50
Roller Shutter Door Air Curtain - Inside	4.6 x 4	12	7.3	0.4	120	870
Roller Shutter Door Air Curtain - Outside	4.6 x 4	12	1.8	0.1	54	99
Mezzanine Floor near Blending Tanks	NA	17		NA	59	NA
Wastewater Storage Tank	0.54	13	0.01	0.03	25,000	170 (SOER: 15 ou.m^3/s)
Whirlybird Before Operations	0.88	17	0.83	1.4	110	91
Whirlybird During Operations	0.88	21	0.77	1.3	220	170

5.2 Estimated Emissions

Estimated odour emission rates (OER) and other relevant parameters used in the air dispersion modelling are presented in **Table 6.** It is noted that emission rates presented in **Table 6** were scaled using Peak to Mean Ratios presented in **Section 3.2.1.**

It is noted that all point sources were modelled using hourly varying temperatures to represent ambient conditions.

Table 6 Estimated Odour Emission Rates

Odour Emission Source	Source type	Height Above Ground (m)	Diameter (m)	Exit Velocity (m/s)	Area (m^2)	Temperature	OER ($ou.m^3/s$)[1]
WWTP - DAF	Area	1	-	-	10.5	-	158 [a]
WWTP - Sludge Storage	Point	7.6	0.2	16	10.2	Ambient	153 [a]
WWTP - Balance Tank	Point	8.2	0.2	16	16.6	Ambient	250 [a]
Stack 1 - Mixing Tanks and bulk tanks	Point	16	0.45	20	-	Ambient	298[b]
Stack 2 - Filling lines and dispensary	Point	16	0.70	20	-	Ambient	169[c]
Roof - Vents 1 (fugitive odours)	Point	15.7	0.86 [d]	8.5[e]	-	Ambient	84[f]
Roof - Vents 2 (fugitive odours)	Point	15.7	0.86 [d]	8.5 [e]	-	Ambient	84 [f]
Roof - Vents 3 (fugitive odours)	Point	15.7	0.86 [d]	8.5 [e]	-	Ambient	84 [f]
Roof - Vents 4 (fugitive odours)	Point	15.7	0.86 [d]	8.5 [e]	-	Ambient	84 [f]
Roof - Vents 5 (fugitive odours)	Point	15.7	0.86[d]	8.5 [e]	-	Ambient	84 [f]
RSD set 1 (LHS) - Storage 1	Volume	0	-	-	-	-	12 [f]
RSD set 1 (LHS) - Storage 2	Volume	0	-	-	-	-	12 [f]
RSD set 2 (RHS) - Processing 1	Volume	0	-	-	-	-	12 [f]
RSD set 2 (RHS) - Processing 2	Volume	0	-	-	-	-	12 [f]

1-Excludes peak to mean ratio

a-Estimated using provided area and SOER of 15 $ou.m^3/s$ (see **Table 5**)

b-Calculated using total flow of 3.2 m^3/s provided by Polex (See Appendix C), concentration of 940 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

c-Calculated using the following parameters:

Proposed HSFL emissions: total flow of 0.5 m^3/s provided by Polex (See Appendix C), concentration of 200 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

Proposed fill line emissions: total flow of 2.8 m^3/s provided by Polex (See Appendix C), concentration of 200 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

Proposed bleach line emissions: total flow of 0.5 m^3/s provided by Polex (See Appendix C), concentration of 99 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

Proposed Enzyme Room: total flow of 4.5 m^3/s provided by Polex (See Appendix C), concentration of 220 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

d-Diameter based on effective area for a square vent.

e-Actual operational velocity is likely to be approximately 8.5m/s. However, a conservative velocity of 2 m/s was modelled to present worst case impacts

f-Calculated assuming 10% fugitive emissions from sources within the warehouse (prior to treatment in carbon filters), 90% extraction through roof vents and 10% escape through RSDs

6 Atmospheric Dispersion Modelling Methodology

6.1 Model Selection

Emissions from the proposed operations have been modelled using a combination of the TAPM, CALMET and CALPUFF models. CALPUFF is a transport and dispersion model that ejects “puffs” of material emitted from modelled sources, simulating dispersion and transformation processes along the way. In doing so it typically uses the fields generated by a meteorological pre-processor CALMET, discussed further below. Temporal and spatial variations in the meteorological fields selected are explicitly incorporated in the resulting distribution of puffs throughout a simulation period. The primary output files from CALPUFF contain either hourly concentration or hourly deposition fluxes evaluated at selected receptor locations. The CALPOST post-processor is then used to process these files, producing tabulations that summarise results of the simulation for user-selected averaging periods. It is noted that building wake affect were also included in the model.

6.2 Building Wake Effects

Building Wake Effects were incorporated into the CALPUFF model using the Building Profile Input Program (BPIP) and simulated using the PRIME methodology. The location and dimensions of the proposed Jalco warehouse and other proposed and existing buildings in the vicinity of the Site were included in the model based on a screening criterion of buildings within a distance of 5L (where L is the lesser of the height or width of the building) from each release point for buildings with a height greater than 0.4 times the stack height

6.3 Meteorological Modelling

6.3.1 Selection of Representative Year for Meteorological Modelling

In order to determine a representative meteorological year, five years of meteorological data (2016-2020) from the nearest BoM station (Horsley Park Equestrian Centre AWS, Station ID 67119) located approximately 4 km southeast of Site location were reviewed and analysed. Specifically, the following parameters were analysed:

- Frequency and distribution of the predominant wind directions;
- Wind speed;
- Temperature; and
- Relative humidity.

Based on this analysis, 2019 calendar year was selected as a representative year for this study.

6.3.2 TAPM

The TAPM prognostic model, developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) was used to generate the upper air data required for CALMET modelling.

TAPM predicts wind speed and direction, temperature, pressure, water vapour, cloud, rain water and turbulence. The program allows the user to generate synthetic observations by referencing databases (covering terrain, vegetation and soil type, sea surface temperature and synoptic scale meteorological analyses) which are subsequently used in the model input to generate one full year of hourly meteorological observations at user-defined levels within the atmosphere.

Additionally, the TAPM model may assimilate actual local wind observations so that they can optionally be included in a model solution. The wind speed and direction observations are used to realign the predicted solution towards the observation values. In this study, data from the BoM's Horsley Park Equestrian Centre AWS, Badgerys Creek AWS and Penrith Lakes AWS has been used to nudge (ie influence) the TAPM predictions. **Table 7** details the parameters used in the TAPM meteorological modelling for this assessment.

Table 7 Meteorological Parameters Used for this Study - TAPM

TAPM (v 4.0)	
Number of grids (spacing)	4 (30 km, 10 km, 3 km and 1 km)
Number of grid points	35 x 35 x 35
Year of analysis	2019
Centre of analysis	290,980 m E 6,255,878 m S
Data assimilation	Horsley Park Equestrian Centre AWS, Badgerys Creek AWS and Penrith Lakes AWS

6.3.3 CALMET

In the simplest terms, CALMET is a meteorological model that develops hourly wind and other meteorological fields on a three-dimensional gridded modelling domain that are required as inputs to the CALPUFF dispersion model. Associated two dimensional fields such as mixing height, surface characteristics and dispersion properties are also included in the file produced by CALMET. The interpolated wind field is then modified within the model to account for the influences of topography, sea breeze, as well as differential heating and surface roughness associated with different land uses across the modelling domain. These modifications are applied to the winds at each grid point to develop a final wind field. The final hourly varying wind field thus reflects the influences of local topography and land uses.

CALMET modelling was conducted using the nested CALMET approach, where the final results from a coarse-grid run were used as the initial guess of a fine-grid run. This has the advantage that off-domain terrain features including slope flows and blocking effect can be allowed to take effect and the larger-scale wind flow provides a better start in the fine-grid run.

The outer domain was modelled with a resolution of 250 m. The TAPM-generated three-dimensional meteorological data were used as the 'initial-guess wind' field and local topography and land use information were used to refine the wind field predetermined by the TAPM.

The output from the outer domain CALMET modelling was then used as the 'initial-guess' field for the mid and inner domain CALMET modelling. A horizontal grid spacing of 50 m was used in the inner domain to adequately represent local terrain features and land use. The inner grid resolution was refined to a 50 m resolution to ensure adequate number of cells between source and receptors to enhance the reliability of the model predictions. Use of lower resolution (>100m) would likely to have the source and receptors in the same or neighbouring cells that may cause unrealistic model predictions at the ground and elevated receptors. Fine scale local topography and land use information and predetermined by the coarse CALMET runs.

Table 8 details the parameters used in the meteorological modelling to drive the CALMET model.

Table 8 Meteorological Modelling Parameters – CALMET

Parameter	Outer Domain	Inner Domain
Meteorological grid	12.5 km × 12.5 km	5 km × 5 km
Meteorological grid resolution	250 m	50 m
Initial guess filed	3D output from TAPM model	3D output from mid domain modelling

6.4 Meteorological Data Used in Modelling

To provide a summary of the meteorological conditions predicted at the site using the methodology described in **Section 6.3**, a single-point, ground-level meteorological dataset was 'extracted' from the 3-dimensional dataset at the Site and is presented in this section.

6.4.1 Wind Speed and Direction

A summary of the annual wind behaviour predicted by CALMET for 2019 is presented as a wind speed distribution plot in **Figure 10** and wind roses in **Figure 11**.

The wind roses show the frequency of occurrence of winds by direction and strength. The bars correspond to the 16 compass points (degrees from north). The direction of the bar shows the direction from which the wind is blowing. The length of the bar represents the frequency of occurrence of winds from that direction, and the widths of the bar sections correspond to wind speed categories, the narrowest representing the lightest winds. Thus, it is possible to visualise how often winds of a certain direction and strength occur over a long period, either for all hours of the day, or for particular periods during the day. There are times when the wind is calm (defined as being from zero to 0.5 metres/second), and the percentage of the time that winds are calm are shown as a note on the wind rose. The 'Beaufort Wind Scale' (consistent with terminology used by the BoM) was used to describe the wind speeds experienced at the Proposal Site, outlined in **Table 9**.

Table 9 Beaufort Wind Scale

Beaufort Scale #	Description	m/s	Description on land
0	Calm	0-0.5	Smoke rises vertically
1	Light air	0.5-1.5	Smoke drift indicates wind direction
2-3	Light/gentle breeze	1.5-5.3	Wind felt on face, leaves rustle, light flags extended, ordinary vanes moved by wind
4	Moderate winds	5.3-8.0	Raises dust and loose paper, small branches are moved
5	Fresh winds	8.0-10.8	Small trees in leaf begin to sway, crested wavelets form on inland waters
6	Strong winds	>10.8	Large branches in motion, whistling heard in telephone wires; umbrellas used with difficulty

Source: http://www.bom.gov.au/lam/glossary/beaufort.shtml

Figure 11 indicates that winds experienced in the study area are predominantly light (between 1.5 m/s and 5.3 m/s). Calm wind (<0.5 m/s) conditions were predicted to occur approximately 11% of the time throughout the modelling period.

The seasonal wind roses indicate that typically:

- In summer, light winds are predicted to blow predominantly from the eastern quadrant. Very low frequency of winds are predicted to blow from the western directions. Calm winds are predicted to occur approximately 11% of the time during summer.
- In autumn, predominantly light winds are predicted to blow from the southwest and northeast quadrants with minimal winds blowing from the northwest quadrant. Calm winds are predicted to occur approximately 14% of the time during autumn.
- In winter, predominant light to moderate winds from the southwest quadrant are predicted with relatively lower frequency of winds from the other directions. Calm winds are predicted to occur approximately 14% of the time during winter.
- In spring, light winds are predicted to blow from all directions with the exception for northerly and southerly winds. Calm winds are predicted to occur approximately 9% of the time during spring.

Figure 10 Annual Wind Speed Frequencies at the Proposal Site (CALMET Predictions, 2019)

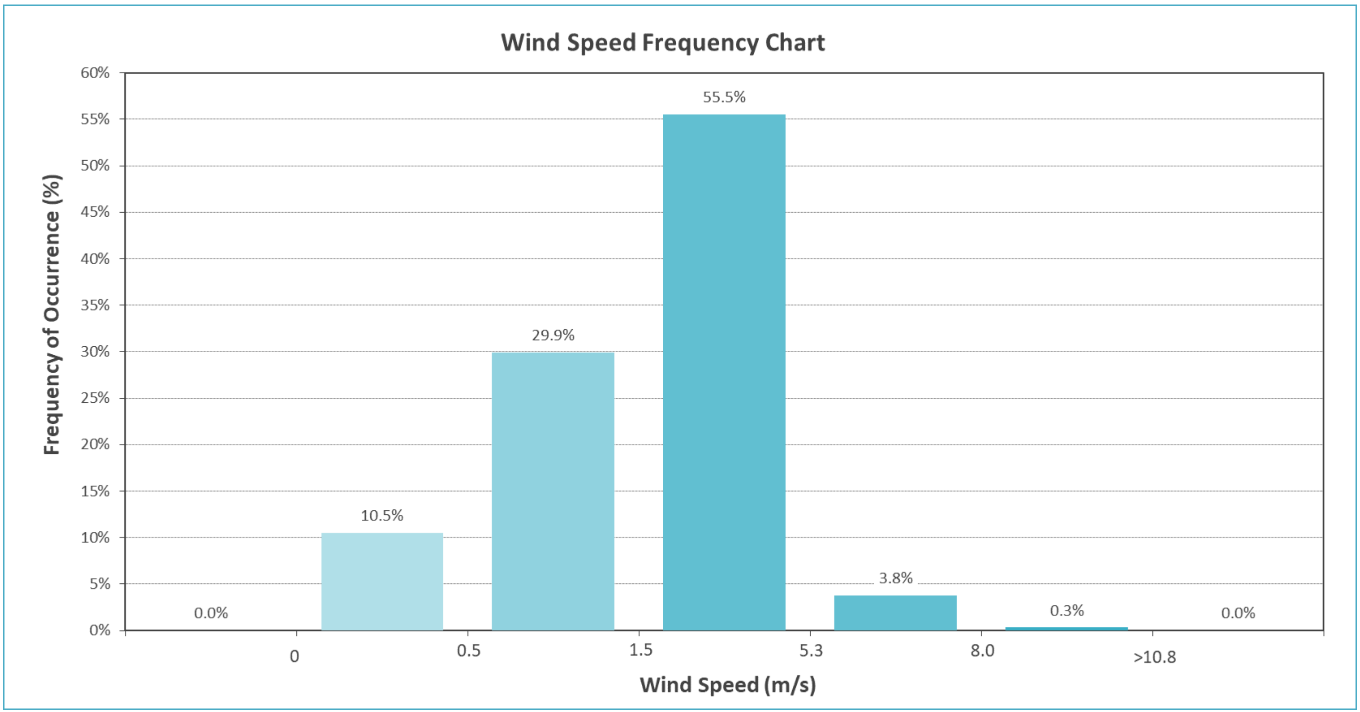
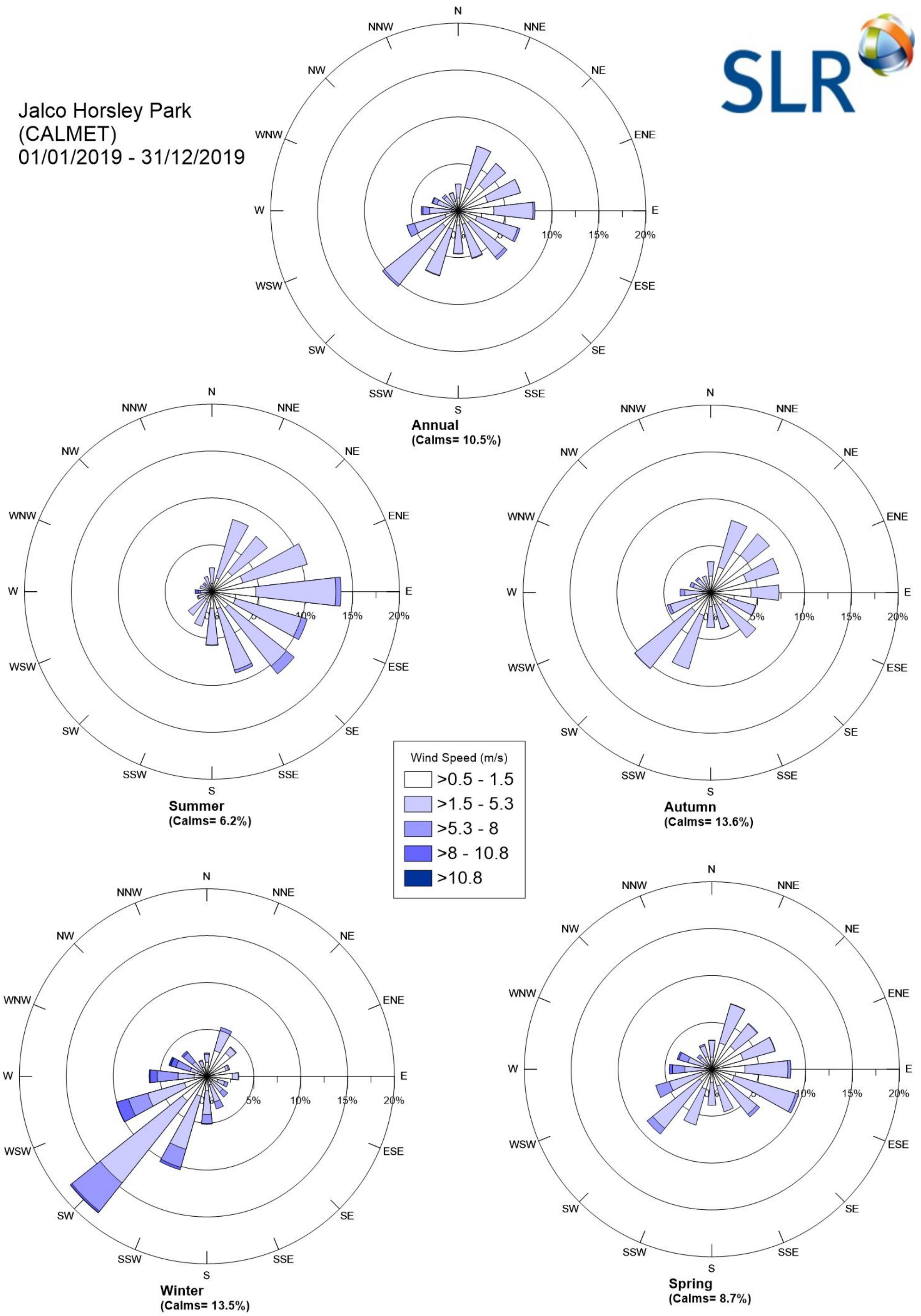


Figure 11 CALMET-Predicted Seasonal Wind Roses for the Proposal Site– 2019



6.4.2 Atmospheric Stability

Atmospheric stability refers to the tendency of the atmosphere to resist or enhance vertical motion. The Pasquill-Gifford-Turner (PGT) assignment scheme identifies six stability classes, A to F, to categorise the degree of atmospheric stability as follows:

- A = Extremely unstable conditions
- B = Moderately unstable conditions
- C = Slightly unstable conditions
- D = Neutral conditions
- E = Slightly stable conditions
- F = Moderately stable conditions

The meteorological conditions defining each PGT stability class are shown in **Table 10**.

Table 10 Meteorological Conditions Defining PGT Stability Classes

Surface Wind Speed (m/s)	Daytime Insolation			Night-Time Conditions	
	Strong	Moderate	Slight	Thin overcast or > 4/8 low cloud	<= 4/8 cloudiness
< 2	A	A - B	B	E	F
2 - 3	A - B	B	C	E	F
3 - 5	B	B - C	C	D	E
5 - 6	C	C - D	D	D	D
> 6	C	D	D	D	D

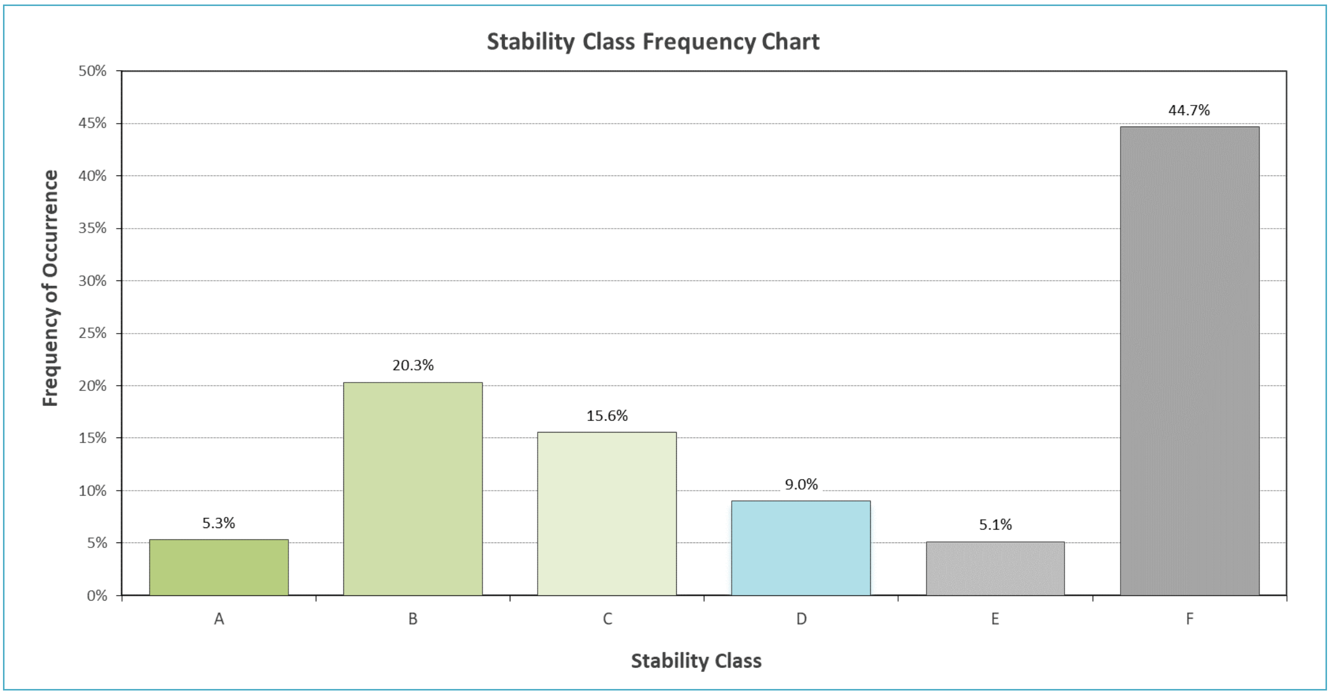
Source: (NOAA, 2018)

Notes:

1. Strong insolation corresponds to sunny midday in midsummer in England; slight insolation to similar conditions in midwinter.
2. Night refers to the period from 1 hour before sunset to 1 hour after sunrise.
3. The neutral category D should also be used, regardless of wind speed, for overcast conditions during day or night and for any sky conditions during the hour preceding or following night as defined above.

The frequency of each stability class predicted by CALMET, extracted at the Site, during the modelling period is presented in **Figure 12**. The results indicate a high frequency of conditions typical to Stability Class F. Stability Class F is associated with the relatively high frequency of low wind speed conditions at night-time, giving rise to stable atmospheric conditions.

Figure 12 Predicted Stability Class Frequencies at the Proposal Site (CALMET predictions, 2019)

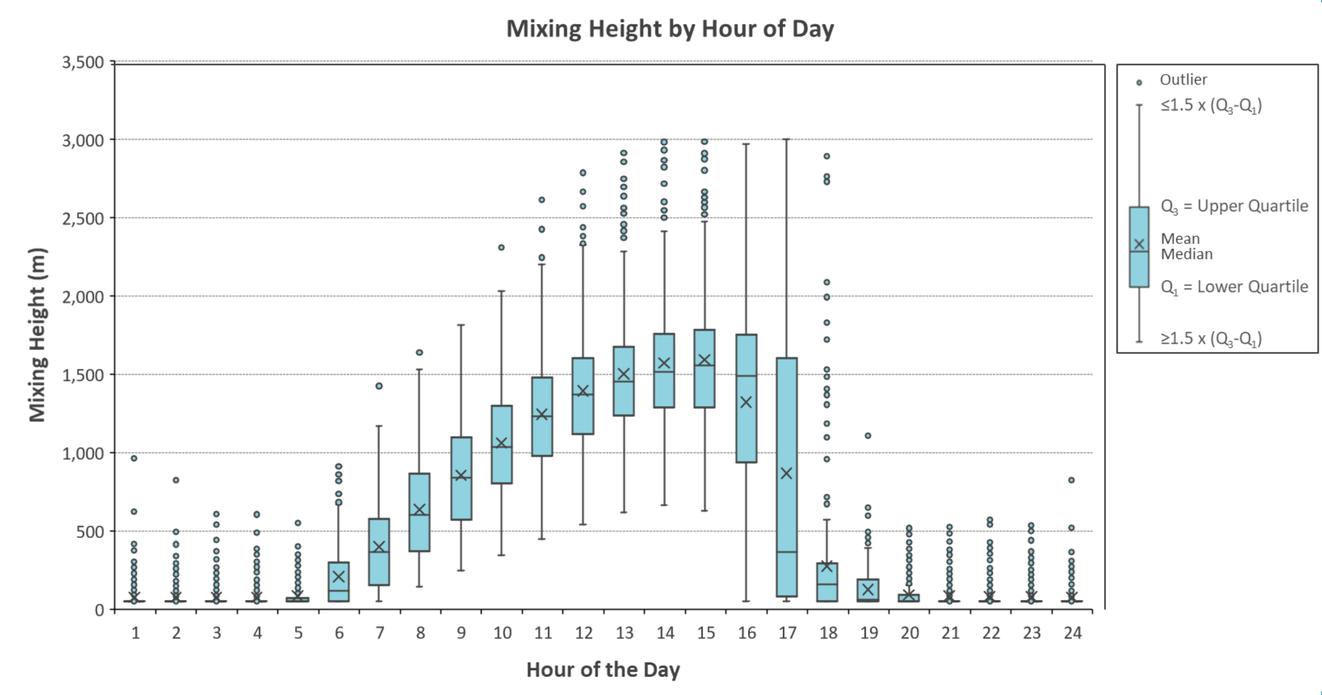


6.4.3 Mixing Heights

Diurnal variations in maximum and average mixing heights predicted by CALMET at the Proposal Site during the 2019 modelling period are illustrated in **Figure 13**.

As would be expected, an increase in mixing depth during the morning is apparent, arising due to the onset of vertical mixing following sunrise. Maximum mixing heights occur in the mid to late afternoon, due to the dissipation of ground based temperature inversions and growth of the convective mixing layer.

Figure 13 Predicted Mixing Heights at the Proposal Site(CALMET predictions, 2019)



7 Dispersion Modelling Results

Table 11 presents predicted ground level odour concentrations (99th percentile, nose response averaging period) at the modelled sensitive receptor locations. A contour plot presenting the isopleth of predicted odour concentrations across the modelling domain is presented in **Figure 14**.

Table 11 shows that the odour concentrations predicted at all surrounding residential receptors are well below the relevant odour criterion of 2 ou with the nearest residential receptor predicted to experience a maximum odour concentration of less than 0.5 ou (99th percentile, nose response averaging period).

Additionally, **Table 11** shows that all commercial receptors are predicted to experience odour concentrations below the 2 ou criterion with the exception of receptor C10 which is predicted to experience a 99th percentile concentration of 2 ou. It is noted that C10 is located in the carpark of the neighbouring facility. The slightly elevated odour concentrations at C10 are not expected to cause any odour nuisance[1].

Table 11 further shows that in terms of source contribution, the WWTP has the highest contribution of ground level impacts. Considering the level of pollution control proposed for the manufacturing component of the proposed facility (described in **Section 2.3**), this is to be expected. However, it is noted that there is insignificant impact at the modelled residential receptors due to the operation of the WWTP and that the refined design of the WWTP and adopted control measures (mechanical ventilation of tanks). These measures have led to reductions in the predicted 99th percentile concentrations ranging between 29% to 51% at the modelled residential receptors and more than 70% at the nearest commercial receptors.

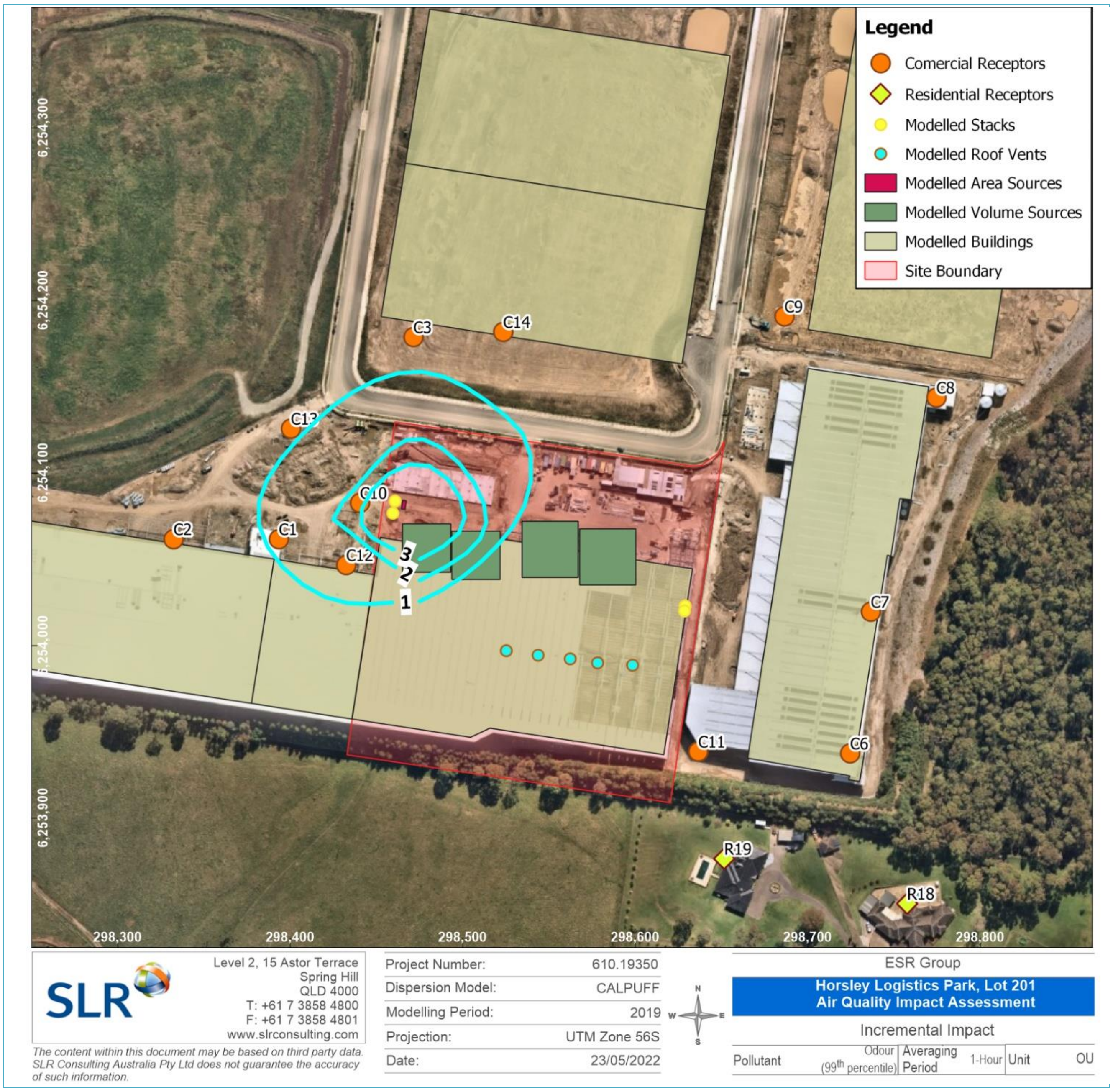
Based on the results of the modelling, it is concluded that proposed operation is unlikely to cause any significant odour nuisance at surrounding sensitive receptors. As outlined in **Section 3.2**, given the predicted area of impact (area within the 2 ou isopleth, most of which is contained within the site boundary), the adopted 2 ou criteria is deemed to be conservative.

[1] Consideration should also be given to the highly conservative use of the 2.0 ou assessment criterion for this impact assessment and the applicability to commercial receptors. Given the population density under the 2.0 ou contour a criterion of 5.0 ou would be more appropriate to this receptor particularly as people would only be transiting through this receptor rather than residing for any period of time.

Table 11 Predicted Odour Concentrations at Residential Receptors

Receptor ID	Receptor Type	Predicted Odour Concentration (99th Percentile Nose Response Average)				
		WWTP	Stack 1 Mixing Tanks and Bulk Tanks	Stack 2 Filling Lines and Dispensary	Fugitives RSDs and Roof Vents	Cumulative
R1	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R2	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R3	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R4	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R5	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R6	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R7	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R8	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R9	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R10	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R11	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R12	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R13	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R14	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R15	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R16	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R17	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R18	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
R19	Residential	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C1	Commercial	0.7	< 0.5	< 0.5	< 0.5	0.8
C2	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C3	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	0.5
C4	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C5	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C6	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C7	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C8	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C9	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C10	Commercial	1.7	< 0.5	< 0.5	< 0.5	2.0
C11	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C12	Commercial	1.4	< 0.5	< 0.5	< 0.5	1.6
C13	Commercial	0.6	< 0.5	< 0.5	< 0.5	0.7
C14	Commercial	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Criterion						**2.0**

Figure 14 Odour Impacts – Proposed Operations



8 Sensitivity Analysis

The dispersion modelling presented in **Section 7** adopts a number of conservative assumptions including the following:

- Emission rates used for the assessment were based on samples collected from the existing Jalco facility at Smithfield facility where:
  - Dosing of blending tanks is performed manually leading to spillages and fugitive emissions. The operations at the Site are proposed to be predominantly automated (no manual dosing of products) which would significantly reduce the potential for spillages.
  - Blending tanks are not sealed, leading to fugitive emissions. The blending tanks at the proposed facility are fully sealed with no potential for fugitive emissions.
  - With the exception of the bleach line, odorous air from filling lines are not extracted and treated. All filling lines at the Site are proposed to be equipped with air extraction and odour control systems.
  - Powder products, which are deemed to have a relatively high contribution to the site's fugitive odour emissions are also produced. Production of powder products is not proposed at the Site.
- The estimated emission rates for the WWTP have been calculated using peak flow rates measured at the Smithfield facility when the storage tanks were being filled. This leads to an overestimation of the odour emission rates from these sources as filling of the balance and storage tanks only occurs intermittently and hourly average air flow rates from the storage tanks are likely significantly lower than the peak flows measured over a 5 minute periods. SLR understands that wastewater is directed to the WWTP once every three hours (after completion of a batch) and is typically completed over a 10-30 minute timeframe. Moreover, the continuous low pressure aeration of the wastewater rather than manual aeration using high pressure air (which is performed at Smithfield) is expected to increase oxidation of volatile compounds and reduce scouring and release of volatile compounds present in the wastewater.
- A highly conservative exit velocity of 2 m/s was modelled for the vent stacks as opposed to actual operational velocity of 8.5 m/s however, the estimated odour emission rates were left unchanged (**Table 5**). Since all other meteorological parameters that may impact the dilution rate are constant, the lower velocity will lead to less effective dispersion of the plume and higher impacts at the receptor.

However, the modelling also assumes that the proposed pollution control systems operate as per the specifications provided by the equipment suppliers (refer **Section 2.3**). Additional dispersion modelling was performed in order to predict ground level odour concentrations in the event that

- The proposed carbon filtration system is less efficient than anticipated
- Fugitive odour capture rate is less than anticipated
- Odour emission rates from modelled source are higher than anticipated.

Three additional scenarios were modelled:

- **Sensitivity Testing Scenario 1 (ST1) –** This scenario assumes that fugitive emissions from the manufacturing facility (filling lines, bulk tanks, mixing tanks and dispensary) are double what Polex considers the maximum fugitive emissions would be. All other parameters are the same as those adopted for the normal operations scenario presented in **Section 5.**

- **Sensitivity Testing Scenario 2 (ST2) –** This scenario assumes that fugitive emissions from the manufacturing facility (filling lines, bulk tanks, mixing tanks and dispensary) are quadruple what Polex considers the maximum fugitive emissions would be and that the odour removal efficient of the proposed carbon filtration systems are only 80% rather than the guaranteed 90%-95% adsorption. All other parameters are the same as those adopted for the normal operations scenario presented in **Section 5.**
- **Sensitivity Testing Scenario 3 (ST3) –** This scenario is similar to Sensitivity Testing Scenario 2, however, it assumes that odour concentrations from all sources (including wastewater treatment plant) are 50% higher than the concentrations adopted for that Scenario.

Estimated OERs and other relevant parameters used in the air dispersion modelling for these scenarios are presented in **Table 12**. It is noted that emission rates presented in **Table 12** were scaled using Peak to Mean Ratios presented in **Section 3.2.1.**

Table 13 presents predicted ground level odour concentrations (99th percentile, nose response averaging period) at the modelled sensitive receptor locations for the three sensitivity testing scenarios. A contour plot presenting the isopleth of predicted odour concentrations across the modelling domain for these three scenarios is presented in **Figure 16**.

As shown in **Table 13**, odour concentrations predicted at all surrounding residential receptors are well below the relevant odour criterion of 2 ou for all three sensitivity testing scenarios modelled. The nearest residential receptor is predicted to be impacted by <0.5 ou, 0.7 ou and 1.1 ou for ST1, ST2 and ST3 respectively.

Additionally, **Table 13** shows that all commercial receptors are predicted to experience odour concentrations below the 2 ou criterion with the exception of receptors located immediately to the west of the Site. For ST1, only minor exceedances of the adopted odour criteria are predicted within the carpark of the neighbouring facility (C10). For ST2, minor exceedances are also predicted at the nearest roller shutter doors (C12) and for ST3 concentrations at these locations are further elevated and a 99th percentile concentration of 2.0 ou is predicted at C1. No exceedances of the adopted criteria are predicted at the proposed (yet to be approved) Café (C13). It is understood that the commercial facility to the west of the Site (C1, C2, C12) is temperature controlled and as such all doors would remain closed except when receiving deliveries.

While warehousing activities in the neighbouring industrial facility is understood to be a 24/7 operation, SLR understands that activities within the office building would predominantly be during office hours and the proposed café's operations would be limited to7.00 am to 7.00 pm Monday to Saturday and 9.00 am to 6.00 pm on a Sunday or a public holidays. A review of the timeseries model output shows that as expected (due to increased mixing heights, etc.) the predicted concentrations are significantly lower from early morning to early afternoon. **Figure 15** illustrates hourly variation in 99th percentile timeseries results for ST3 at C1 (office) and C13 (proposed café).

Based on the results of the sensitivity analysis, it is concluded that even a 50% increase in WWTP emissions, a twofold increase in stack emissions and a fivefold increase in fugitive warehouse emissions would not lead to any exceedances at the proposed residential receptors. While such an increase in odour emission rates would result in elevated odour concentrations at a number of modelled commercial receptors, significant odour nuisance at these receptors is deemed unlikely. As outlined in **Section 3.2**, the 2 ou criteria adopted for this assessment is conservative. Considering the extend of the 2 ou isopleth for the worst case scenario modelled (ST3 illustrated in **Figure 16**), a 5 ou criteria may be more appropriate for the industrial zoned land.

Regardless of the above, it is recommended that a detailed odour audit is be conducted post commissioning to verify that all odour emission rates and parameters meet ST3 parameters outlined in **Table 12** as a minimum.

Figure 15 Odour Impacts by Hour of Day at Neighbouring Office Location and Proposed Cafe (ST3)

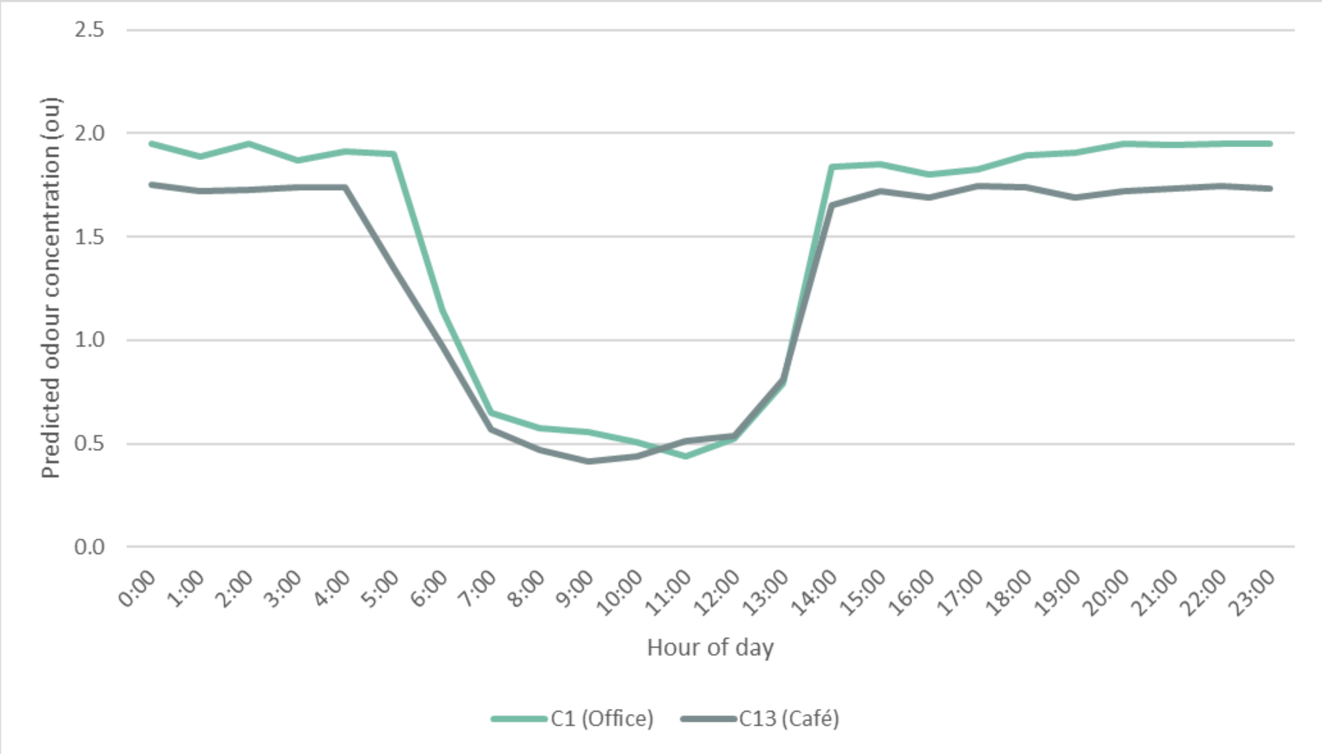


Table 12 Estimated Odour Emission Rates – Sensitivity Testing Scenarios

Odour Emission Source	Source type	Height Above Ground (m)	Diameter (m)	Exit Velocity (m/s)	Area (m^2)	Temperature	ST1 OER ($ou.m^3/s$)[1]	ST2 OER ($ou.m^3/s$)[1]	ST 3 OER ($ou.m^3/s$)[1]
WWTP - DAF	Area	1	-	-	10.5	-	158 [a]	158 [a]	237[i]
WWTP - Sludge Storage	Point	7.6	0.2	16	10.2	Ambient	153 [a]	153 [a]	230 [i]
WWTP - Balance Tank	Point	8.2	0.2	16	16.6	Ambient	250 [a]	250 [a]	375 [i]
Stack 1 - Mixing Tanks and bulk tanks	Point	16	0.45	20	-	Ambient	298 [b]	595 [g]	893 [i]
Stack 2 - Filling lines and dispensary	Point	16	0.70	20	-	Ambient	169 [c]	339 [h]	508 [i]
Roof - Vents 1 (fugitive odours)	Point	15.7	0.86 [d]	8.5[e]	-	Ambient	168 [f]	336 [f]	505 [i]
Roof - Vents 2 (fugitive odours)	Point	15.7	0.86 [d]	8.5 [e]	-	Ambient	168 [f]	336 [f]	505 [i]
Roof - Vents 3 (fugitive odours)	Point	15.7	0.86 [d]	8.5 [e]	-	Ambient	168 [f]	336 [f]	505 [i]
Roof - Vents 4 (fugitive odours)	Point	15.7	0.86 [d]	8.5 [e]	-	Ambient	168 [f]	336 [f]	505 [i]
Roof - Vents 5 (fugitive odours)	Point	15.7	0.86[d]	8.5 [e]	-	Ambient	168 [f]	336 [f]	505 [i]
RSD set 1 (LHS) - Storage 1	Volume	0	-	-	-	-	23 [f]	47 [f]	70 [i]
RSD set 1 (LHS) - Storage 2	Volume	0	-	-	-	-	23 [f]	47 [f]	70 [i]
RSD set 2 (RHS) - Processing 1	Volume	0	-	-	-	-	23 [f]	47 [f]	70 [i]
RSD set 2 (RHS) - Processing 2	Volume	0	-	-	-	-	23 [f]	47 [f]	70 [i]

grey cell indicates no change as compared to original normal operations scenario presented in **Section 5**

1-Excludes peak to mean ratio

a-Estimated using provided area and SOER of 15 $ou.m^3/s$ (see **Table 5**)

b-Calculated using total flow of 3.2 m^3/s provided by Polex (See Appendix C), concentration of 940 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

c-Calculated using the following parameters:

Proposed HSFL emissions: total flow of 0.5 m^3/s provided by Polex (See Appendix C), concentration of 200 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

Proposed fill line emissions: total flow of 2.8 m^3/s provided by Polex (See Appendix C), concentration of 200 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

Proposed bleach line emissions: total flow of 0.5 m^3/s provided by Polex (See Appendix C), concentration of 99 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

Proposed Enzyme Room: total flow of 4.5 m^3/s provided by Polex (See Appendix C), concentration of 220 ou (see **Table 5**) and odour removal efficiency of 90% (refer **Section 2.3**)

d-Diameter based on effective area for a square vent.

e-Actual operational velocity is likely to be approximately 8.5m/s. However, a conservative velocity of 2 m/s was modelled to present worst case impacts

f-Calculated assuming 20% fugitive emissions from sources within the warehouse (prior to treatment in carbon filters), 90% extraction through roof vents and 10% escape through RSDs

g-Calculated using total flow of 3.2 m^3/s provided by Polex (See Appendix C), concentration of 940 ou (see **Table 5**) and odour removal efficiency of 80%

h-Calculated using the following parameters:

Proposed HSFL emissions: total flow of 0.5 m^3/s provided by Polex (See Appendix C), concentration of 200 ou (see **Table 5**) and odour removal efficiency of 80%

Proposed fill line emissions: total flow of 2.8 m^3/s provided by Polex (See Appendix C), concentration of 200 ou (see **Table 5**) and odour removal efficiency of 80%

Proposed bleach line emissions: total flow of 0.5 m^3/s provided by Polex (See Appendix C), concentration of 99 ou (see **Table 5**) and odour removal efficiency of 80%

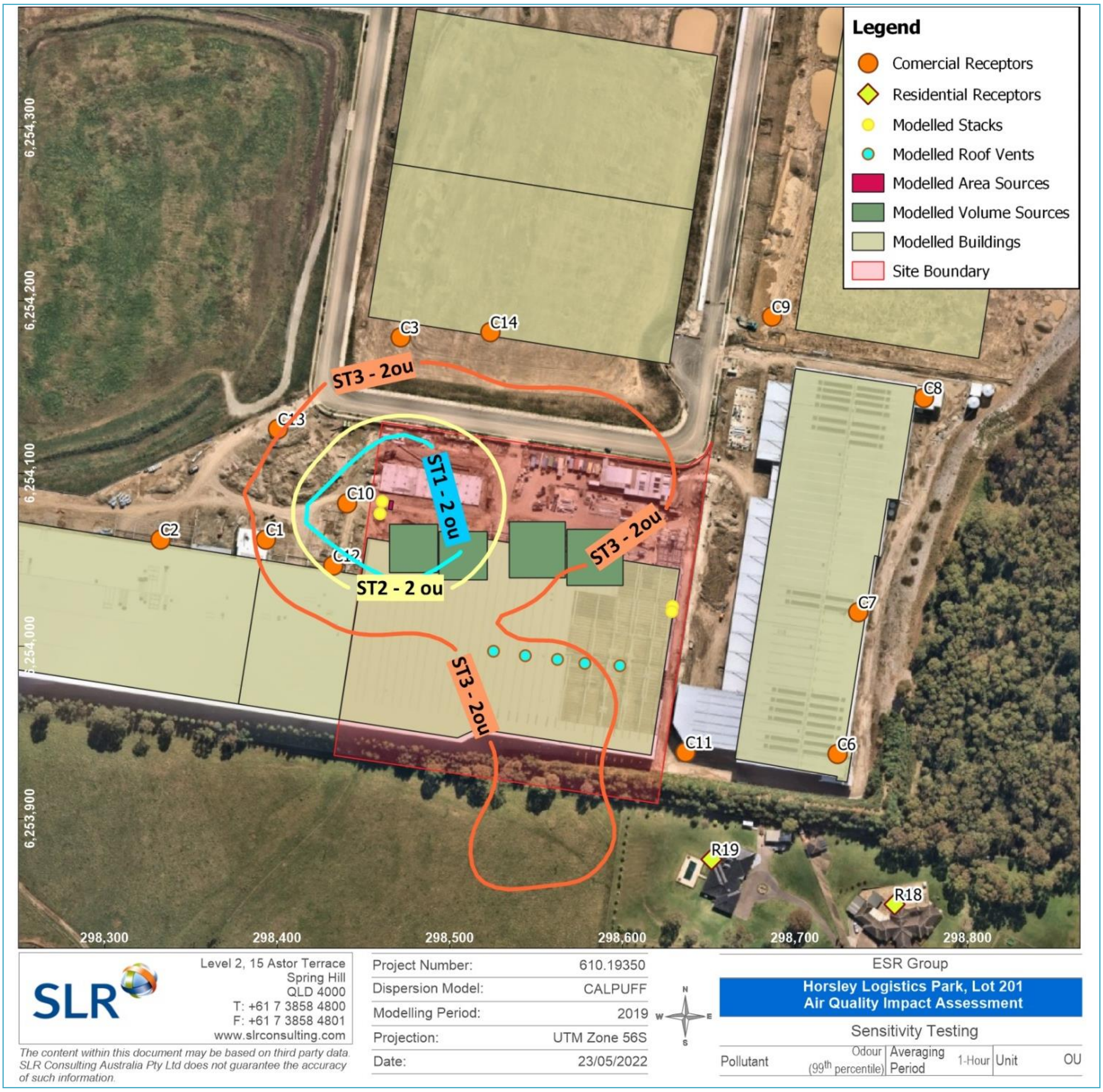
Proposed Enzyme Room: total flow of 4.5 m^3/s provided by Polex (See Appendix C), concentration of 220 ou (see **Table 5**) and odour removal efficiency of 80%

i-Calculated using odour concentrations 50% higher than those adopted by all other scenarios and all other assumptions adopted by Sensitivity Testing Scenario 2

Table 13 Predicted Odour Concentrations – Sensitivity Testing Scenarios

Receptor ID	Receptor Type	Predicted Odour Concentration (99th Percentile Nose Response Average)		
		ST1	ST2	ST3
R1	Residential	< 0.5	< 0.5	< 0.5
R2	Residential	< 0.5	< 0.5	< 0.5
R3	Residential	< 0.5	< 0.5	< 0.5
R4	Residential	< 0.5	< 0.5	< 0.5
R5	Residential	< 0.5	< 0.5	< 0.5
R6	Residential	< 0.5	< 0.5	< 0.5
R7	Residential	< 0.5	< 0.5	< 0.5
R8	Residential	< 0.5	< 0.5	< 0.5
R9	Residential	< 0.5	< 0.5	< 0.5
R10	Residential	< 0.5	< 0.5	< 0.5
R11	Residential	< 0.5	< 0.5	< 0.5
R12	Residential	< 0.5	< 0.5	< 0.5
R13	Residential	< 0.5	< 0.5	< 0.5
R14	Residential	< 0.5	< 0.5	< 0.5
R15	Residential	< 0.5	< 0.5	< 0.5
R16	Residential	< 0.5	< 0.5	< 0.5
R17	Residential	< 0.5	< 0.5	< 0.5
R18	Residential	< 0.5	< 0.5	< 0.5
R19	Residential	< 0.5	0.7	1.1
C1	Commercial	1	1.3	2.0
C2	Commercial	0.5	0.8	1.2
C3	Commercial	0.6	1	1.5
C4	Commercial	< 0.5	< 0.5	< 0.5
C5	Commercial	< 0.5	< 0.5	< 0.5
C6	Commercial	< 0.5	< 0.5	0.6
C7	Commercial	< 0.5	< 0.5	0.7
C8	Commercial	< 0.5	< 0.5	0.6
C9	Commercial	< 0.5	< 0.5	0.6
C10	Commercial	2.2	2.7	4.1
C11	Commercial	0.5	1	1.5
C12	Commercial	1.8	2.2	3.2
C13	Commercial	0.9	1.2	1.8
C14	Commercial	0.5	1	1.5
Criterion				**2**

Figure 16 Odour Impacts – Sensitivity Testing



9 Changes to the Modelled Design

The air quality impact assessment presented above was completed based on dedicated vents on the WWTP Sludge Tank and Balance Tank releasing emissions to atmosphere at a velocity of 16 m/s.. However, since completion of the dispersion modelling additional refinements have been made to the design of the WWTP vent. The updated design includes a common stack serving the two tanks releasing emissions to the atmosphere at a velocity of 32 m/s. The common stack is proposed to be 8.4 m high and located approximately 7 m further from the site boundary than the modelled design.

Given the above, it is expected that the off-site odour impacts associated with the updated WWTP design will be lower than that of the modelled design at the highest impacted residential and commercial receptors.

10 Equipment Design and Mitigation Measures

10.1 Equipment Design Considerations

As outlined in **Section 2.3, s**ince the Original AQIA was prepared, the design of the pollution control systems proposed to be installed at the Site have been further refined. Jalco engaged Polex Environmental Engineering (Polex) to design a pollution control system to serve the bulk storage tanks, mixing tanks, liquid filling lines and laboratory/dispensary with Integra Water engaged for the detailed design of the wastewater treatment plant and associated emission control systems.

Full details of the pollution control system proposed by Polex are presented in Appendix C. Detailed drawings of the wastewater treatment plant are presented in Appendix B. It is noted that the proposed odour control filters are modular systems that enable the entire filter assembly to be extended in the event that additional HEPA and/or CARBON filtration is required. The area within the factory selected to house the filtration systems facilitates the extension of the filter system if required.

Jalco commits to engage an independent specialist to conduct a detailed odour audit of the facility post commissioning to verify that all odour control equipment meet the minimum requirements listed below –

- All pollution control systems are to be designed and operated to meet the specifications outlined in **Section 2.3.** Odour emission rates should not exceed those of ST3 presented in **Table 12**.
- The installed odour control system are to be modular and capable of being expanded to further reduce any potential for odour emissions if required.
- All stacks are to be designed with appropriate sampling ports in compliance with Australian Standard (AS) 4323.1 – Stationary Source Emissions to allow for emission testing.
- All components of the WWTP are to be designed to meet ST3 OERs presented in **Table 12** as a minimum.
- Ensure the building will be designed to incorporate necessary sealing requirements described in **Appendix G.**

10.2 Recommended Mitigation Measures

As discussed in **Section 7** and **Section 8**, the predicted 99th percentile odour concentrations at all nearby residential and commercial receptors are predicted to be well below the adopted odour impact criterion of 2 ou (nose response time) with the exception of commercial receptors C1, C10 and C12 which are predicted to experience higher odour concentrations. The pollution control systems described in **Section 2.3** is expected to significantly reduce the likelihood of significant odour nuisance at nearby residential and commercial receptors. The following additional measures are recommended to further reduce the risk of odour nuisance and air quality impacts:

- Signage should be displayed to remind drivers to turn off vehicle engines when stationary to minimise exhaust emissions.
- General environmental awareness training should be provided to relevant staff and contractors, including:

    - Potential air quality and odour impacts that may be caused by activity during normal and abnormal circumstances;
    - Prevention of accidental air emissions and actions to be taken when accidental emissions occur;
    - Efficient and appropriate use and maintenance of equipment used at the marina (where relevant to their role); and
    - Procedures for complaint handling.
- All staff and contractors should be instructed to report any undue pollutant release (including odour) and visible emissions from the exhaust vents to the site manager.
- The site should be inspected daily and good housekeeping practices employed (e.g. ensuring the timely clean-up of any spills, identifying and rectifying any leaks that could contribute to fugitive emissions, etc.).

In addition to the above, complaints monitoring could be a very useful tool in assessing whether nuisance is being caused. It is therefore recommended that any complaint is investigated as soon as possible so that effective appraisal of the complaint can be carried out by subjective assessment. Where odour complaints are verified, engineering, operational or other odour reduction measures may be implemented.

11 Conclusion

SLR was commissioned by ESR to prepare an AQIA in order to assess the air quality impacts associated with the proposed operations at Warehouse 1 of Lot 201 located at 327-355 Burley Road, Horsley Park. The proposed operations will be conducted by Jalco and include manufacturing and packaging of liquid household cleaning and laundry products as well as warehousing operations for relevant raw material and finished goods.

This AQIA has been prepared in accordance with the Approved Method (NSW EPA, 2017). The assessment methodology includes the modelling of local meteorology and the dispersion of potential emissions from the proposed operations to predict the level of impact that may be experienced in the surrounding environment.

The relevant odour emission rates at the Site were estimated using odour samples collected at a similar facility currently operated by Jalco at Smithfield. The odour emission rates and other modelling parameter were calculated to represent conservative operational conditions at the Site and were modelled using the CALMET/CALPUFF modelling to predict the potential odour impacts at the surrounding identified sensitive receptor locations.

The dispersion modelling study predicted that the off-site odour impacts (99th percentile, nose response averaging period) would be below the odour criterion of 2 ou at all neighbouring residential and commercial receptors (average across the entire commercial site) with the exception of a commercial receptor C10 (located within the carpark of the neighbouring commercial lot to the west) for which a 99th percentile odour concentration of 2 ou[2] was predicted.

While the modelling adopted a number of conservative assumptions, additional sensitivity analysis was performed in order to predict ground level odour concentrations in the event that

- The proposed carbon filtration system is less efficient than anticipated
- Fugitive odour capture rate is less than anticipated
- Odour emission rates from modelled source are higher than anticipated.

Based on the results of the sensitivity analysis, it is concluded that even a 50% increase in WWTP emissions, a twofold increase in stack emissions and a fivefold increase in fugitive warehouse emissions would not lead to any exceedances at the proposed residential receptors. While such an increase in odour emission rates would result in elevated odour concentrations at a number of modelled commercial receptors, significant odour nuisance at these receptors is deemed unlikely as the 2 ou criteria adopted for this assessment is conservative considering the extend of the 2 ou isopleth. It is noted that the commercial receptor which is predicted to experience higher concentration of odours is temperature controlled and door are only opened to receive deliveries. As such, nuisance impacts within the proposed buildings is highly unlikely.

Further, as outlined in **Section 9**, refinements of the WWTP design post completion of the air quality dispersion modelling would likely result in lower odour impact at all modelled receptors compared with those presented in this report.

Other air emissions including product of combustion and VOC emissions associated with the proposed operation are likely to be minimal and unlikely to cause any notable increase in existing pollutant levels at surrounding area.

[2] Consideration should be given to the highly conservative use of the 2.0 ou assessment criterion for this impact assessment and the applicability to commercial receptors. Given the population density under the 2.0 ou contour a criterion of 5.0 ou would be more appropriate to this receptor particularly as people would only be transiting through this receptor rather than residing for any period of time

Based on the findings of this assessment, it is concluded that the proposed operation is unlikely to cause any adverse impacts at the surrounding sensitive receptors and would comply with the relevant ambient air quality and odour guidelines.

12 References

Environment Australia. (2012). *National Pollutant Inventory, Emission Estimation Technique Manual for Mining.*

Katestone Scientific. (1995). *The Evaluation of Peak-to-Mean Ratios for Odour Assessments, volumes I and II.* Katestone Scientific Pty Ltd.

Katestone Scientific. (1998). *Peak-to-Mean Concentration Ratios for Odour Assessments.* Katestone Scientific Pty Ltd.

NOAA. (2018, February 14). *Air Resources Laboratory*. Retrieved February 20, 2018, from National Oceannic and Atmospheric Association: https://www.ready.noaa.gov/READYpgclass.php

NSW. (2020). State Environmental Planning Policy (Western Sydney Aerotropolis).

NSW EPA. (2017, January). Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales. Prepared by NSW Environment Protection Authority, which is part of the NSW Office of Environment and Heritage (OEH). Retrieved from http://www.environment.nsw.gov.au/resources/air/ammodelling05361.pdf

APPENDIX A

Odour Test Report

JALCO SMITHFIELD

Odour Emission Monitoring Test Report

Prepared for:

Jalco Group Ptd Ltd
c/- ESR
Level 29, 20 Bond St
Sydney NSW 2000

Signatory

Issue Date: 15 September 2021

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September 2021

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Jalco Group Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.19360-TR01R00	24 August 2021	J Shepherd	G Starke	G Starke

CONTENTS

DOCUMENT REFERENCES

TABLES

APPENDICES

1 NOMENCLATURE

o	degrees	l/min	litres per minute
>	greater than	Max	maximum
≥	greater than or equal to	m	metres
<	less than	m/s	metres per second
≤	less than or equal to	m^2	square metres
%	percentage	m^3	cubic metres
#	denotes reporting conditions not specified in EPL and therefore adopted from POEO Schedule 5 Test methods, averaging periods and reference conditions for scheduled premises – Group 5	m^3/s	cubic metres of air per second
§	denotes concentration limit not specified in EPL and therefore adopted from POEO Schedule 4 Standards of concentration for scheduled premises: general activities and plant – Group 5	$\mu g/m^3$	micrograms per cubic metre of air
^	denotes Special Condition in EPL No. 10000 Condition L3.4 - Oxygen correction is not required for Nitrogen Oxides for emission Points 12 and 13	mg/m^3	milligrams per cubic metre of air
AESTD	Australian Eastern Standard Time Daylight Savings	Min	minimum
AEST	Australian Eastern Standard Time	min	minutes
ALS	Australian Laboratory Services	NA	not applicable
AM	ambient method	NATA	National Association of Testing Authorities
Am^3/s	actual cubic metres of air per second	NSW	New South Wales
Avg	average	NM	not measured
AS	Australian Standard	No.	number
AS/NZS	Australian Standards/New Zealand Standards	NO_x	oxides of nitrogen
CO^2	carbon dioxide	OEH	Office of Environment and Heritage
CO	carbon monoxide	OM	other method
CSC	certified span concentration	O_2	oxygen
Conc.	concentration	PM_{10}	particulate matter less than 10 microns
ºC	degrees Celsius	$PM_{2.5}$	particulate matter less than 2.5 microns
D	duct diameter	Ppb	parts per billion
EPA	Environment Protection Agency / Environment Protection Authority	ppm	parts per million
EPL	Environment Protection Licence	POEO	Protection of the Environment and Operations (Clean Air) Regulations 2010
F	fluoride	Qld	Queensland
g/g mole	grams per gram mole	SLR	SLR Consulting Australia Pty Ltd
GC/MS	Gas Chromatography/Mass Spectrometry	SO_2	sulphur dioxide
HCl	hydrogen chloride	SO_3/H_2SO_4	sulphur trioxide / sulphuric acid mist
hr	Hours	TM	Test Method
ID	identification	TSP	total suspended particulate
K	kelvin	UNSW	University of New South Wales
kg/m^3	kilograms per cubic metre	USEPA M	United States Environment Protection Agency Method
kPa	kilopascals	UTM	Universal Transverse Mercator
LOR	limit of reporting		

2 Introduction

SLR Consulting Australia Pty Ltd (SLR Consulting) was commissioned by Jalco to undertake odour emission monitoring at their located at 277-303 Woodpark Rd, Smithfield (the Site).

The objective of the testing was to obtain data to be used as input to the air quality impact assessment for the site.

The following scope of work was performed on 22 June 2021:

- A single odour sample collected from:
  - inlet and outlet of the wet scrubber serving the blending tanks
  - inlet and outlet of the wet scrubber serving the bleach filling line
  - filling Line 3 fan
  - inside and outside of the shed near the roller shutter door air curtain
  - mezzanine floor near the blending tanks
  - wastewater storage tank
  - whirlybird (from between liquid and powder lines) before operations start at 7:00 am
  - whirlybird (from between liquid and powder lines) during operations
- Where appropriate, monitor airflow, temperature and moisture and calculate mass odour emission rates.

This letter report outlines the sampling methodologies, the odour monitoring results, and includes the calculations of odour emission rates for each source, where appropriate.

2.1 Operating Conditions

On the day of testing, the plant operating procedures and production rates were considered normal by Site personnel.

3 Process Emissions Monitoring

3.1 Test Methods and Analysis References

All sampling and monitoring was performed by SLR unless otherwise specified. The following sections outline for each parameter requested to be tested, a brief description of the relevant test method for sampling and analysis and the NATA Accredited Laboratory that completed the analysis.

3.1.1 Flow and Temperature Sampling and Analysis

Flow and temperature sampling and analysis was performed in accordance with NSW OEH TM-1 and TM-2 (USEPA M2 *Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*). Where possible, a velocity profile was obtained across the stack utilising an S-Type pitot tube and manometer. Where practicable, each sampling plane complied with AS4323.1-1995 "*Stationary source emissions Selection of sampling positions*".

Temperatures were measured using a digital thermometer connected to a Type K chromel/alumel thermocouple probe.

3.1.2 Odour Sampling and Analysis

All Odour sampling and analysis was performed in accordance with NSW OEH OM-7 (AS/NZS 4323.3-2001 "*Stationary source emissions Part 3: Determination of odour concentration by dynamic olfactometry"*).

Odorous gas was drawn through a clean Teflon (PTFE) sample probe connected to a single use, odour-free Nalophan sampling bag. The sampling pump was connected to the airtight plastic container to provide a sample gas flow-rate of approximately 2 l/min. After the required volume has been sampled, the pump was stopped and the bag was sealed.

All collected samples were labelled with reference number, location, sampling date and times, kept under dark conditions. Samples were handled in accordance with SLR's QA/QC procedures and delivered to The Odour Unit, NATA accreditation number 14974, for analysis in accordance with AS/NZS 4323.3.

As required by the Australian Standard, all samples were analysed within 30 hours of sampling using dynamic olfactometry. Laboratory certificates of analysis are presented in **Appendix B.**

3.2 Deviations from Test Methods

There were deviations to the specified test reference methodologies, and these are specified below:

Sample Location – NSW TM-1, AS/NZS 4323.1:

- Blending Tanks Wet Scrubber Inlet - the sample location was deemed *non-compliant* with AS/NZS 4323.1. The sample plane did not meet the minimum distance required for distance from downstream disturbance and distance from upstream disturbance.
- Blending Tanks Wet Scrubber Outlet - the sample location did not meet ideal sampling plane criteria for both distance from upstream and downstream disturbance requirements.
- Bleach Line Wet Scrubber Inlet - the sample location did not meet ideal sampling plane criteria for distance from downstream disturbance.
- Bleach Line Wet Scrubber Outlet - the sample location did not meet ideal sampling plane criteria for distance from upstream disturbance.
- Whirlybird - the sample location was deemed *non-compliant* with AS/NZS 4323.1. SLR adopted additional sampling points in accordance with AS/NZS 4323.1 to improve the accuracy of the measurement. However, the location does not meet the minimum criteria set out in AS/NZS 4323.1.

3.3 Reference Conditions

Reference conditions for all reported concentrations and flow rates are at standard temperature and pressure (0°C, 101.3 kPa) and as measured moisture and oxygen concentration.

4 Results

SLR Consulting completed all the sampling as per the relevant standards, methods and analysis of flow and temperature. Results are presented in the following tables.

Table 1 Emissions Monitoring: Blending Tanks Wet Scrubber Inlet

Test Details			
Sample date	22 June 2021		
Conditions	Normal		
Sampling plane description	One 35 mm access port located on bend.		
Sample plane compliance	Not compliant with the dimensional requirements of Australian Standard AS4323.1. When the criteria in Table 1 of AS/NZS 4323.1 cannot be met, a greater number of sampling points shall be used in order to retain as much accuracy as is practicable.		
Additional Notes	None.		
Testing officer(s)	Danny Echeverri and Ali Naghizadeh		
Source Conditions			
Stack dimensions (m)	0.38 m (diameter)		
Av. stack gas temperature (°C)	21		
Barometric pressure (kPa)	103.1		
Duct static pressure (kPa)	0.001		
Average velocity (m/sec)	2.2		
Actual gas flowrate (m^3/min)	14		
Gas flow rate at S.T.P. (Nm^3/min)	13		
Dry gas flow rate (Nm^3/min)	Not assessed		
% H2O v/v	Not assessed		
AS 4323.1 compliance			
Requirements	**Criteria**	**Sampling plane**	**Compliance**
Distance from downstream disturbance	2 D min	0 D (bend)	No
Distance from upstream disturbance	6 D min	0 D (bend)	No
Flow direction at all points	Same direction	Same direction	Yes
Velocity at all points	> 3 m/s	< 3 m/s at all points	No
Cyclonic component	< 15°	< 15°	Yes
Difference between points	< 10% absolute temperature	< 10% absolute temperature	Yes
Difference between mean and points	< 10% absolute temperature	< 10% absolute temperature	Yes
Highest to lowest pitot pressure	< 9 : 1	< 9 : 1	Yes
Highest to lowest gas velocity	< 3 : 1	< 3 : 1	Yes
Gas temperature	> dew point	> dew point	Yes
Overall classification			**Non compliant ***

* Non-compliant sampling position: If the measurement near a bend is unavoidable, the sampling position shall be greater than one duct diameter upstream of the bend or greater than two duct diameters downstream of the bend.

Table 1 Emissions Monitoring: Blending Tanks Wet Scrubber Inlet continued

Test Results	
Odour	
Run No.	1
SLR Sample ID No.	11245
Sample Period (hrs)	0922 – 0940
Odour Concentration (OU)	940
Mass Odour Emission Rate (OU.m³/s)	210

Table 2 Emissions Monitoring: Blending Tanks Wet Scrubber Outlet

Test Details	
Sample date	22 June 2021
Conditions	Normal
Sampling plane description	One 35 mm access port located , 1.1 hydraulic diameters downstream from a bend, and 2.7 hydraulic diameters upstream from the exit.
Sample plane compliance	Not compliant with the dimensional requirements of Australian Standard AS4323.1. When the criteria in Table 1 of AS/NZS 4323.1 cannot be met, a greater number of sampling points shall be used in order to retain as much accuracy as is practicable.
Additional Notes	None.
Testing officer(s)	Danny Echeverri and Ali Naghizadeh

Source Conditions	
Stack dimensions (m)	0.38 m (diameter)
Av. stack gas temperature (°C)	20
Barometric pressure (kPa)	103.3
Duct static pressure (kPa)	0.001
Average velocity (m/sec)	2.2
Actual gas flowrate (m^3/min)	15
Gas flow rate at S.T.P. (Nm^3/min)	14
Dry gas flow rate (Nm^3/min)	Not assessed
% H2O v/v	Not assessed

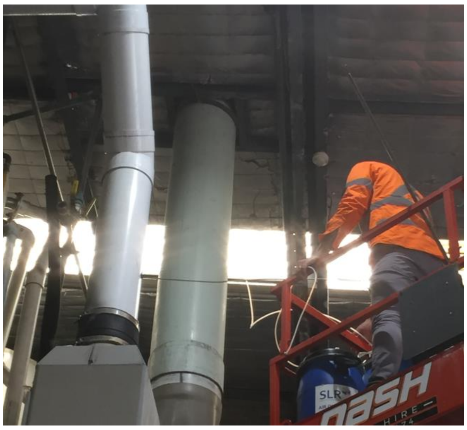
AS 4323.1 compliance			
Requirements	**Criteria**	**Sampling plane**	**Compliance**
Distance from downstream disturbance	2 D min	1.1 D (exit)	No
Distance from upstream disturbance	6 D min	2.7 D (inlet)	No
Flow direction at all points	Same direction	Same direction	Yes
Velocity at all points	> 3 m/s	< 3 m/s at all points	No
Cyclonic component	< 15°	< 15°	Yes
Difference between points	< 10% absolute temperature	< 10% absolute temperature	Yes
Difference between mean and points	< 10% absolute temperature	< 10% absolute temperature	Yes
Highest to lowest pitot pressure	< 9 : 1	< 9 : 1	Yes
Highest to lowest gas velocity	< 3 : 1	< 3 : 1	Yes
Gas temperature	> dew point	> dew point	Yes
Overall classification			**Non ideal ***

* Non ideal sampling position: If the measurement near a bend is unavoidable, the sampling position shall be greater than one duct diameter upstream of the bend or greater than two duct diameters downstream of the bend. When the criteria in Table 1 of AS/NZS 4323.1 cannot be met, a greater number of sampling points shall be used in order to retain as much accuracy as is practicable.

Table 2 Emissions Monitoring: Blending Tanks Wet Scrubber Outlet continued

Test Results	
Odour	
Run No.	1
SLR Sample ID No.	11246
Sample Period (hrs)	0940 – 0949
Odour Concentration (OU)	180
Mass Odour Emission Rate (OU.m^3/s)	42

Table 3 Emissions Monitoring: Bleach Line Wet Scrubber Inlet

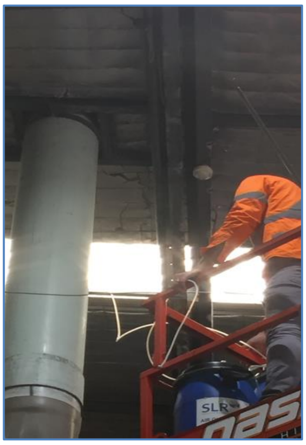
Test Details			
Sample date	22 June 2021		
Conditions	Normal		
Sampling plane description	One 35 mm access port located 1.8 hydraulic diameters downstream from a bend, and 2.9 hydraulic diameters upstream from the exit.		
Sample plane compliance	Not compliant with the dimensional requirements of Australian Standard AS4323.1. When the criteria in Table 1 of AS/NZS 4323.1 cannot be met, a greater number of sampling points shall be used in order to retain as much accuracy as is practicable.		
Additional Notes	None.		
Testing officer(s)	Danny Echeverri and Ali Naghizadeh		
Source Conditions			
Stack dimensions (m)	0.24 m (diameter)		
Av. stack gas temperature (°C)	25		
Barometric pressure (kPa)	103.5		
Duct static pressure (kPa)	0.200		
Average velocity (m/sec)	7.3		
Actual gas flowrate (m^3/min)	20		
Gas flow rate at S.T.P. (Nm^3/min)	18		
Dry gas flow rate (Nm^3/min)	Not assessed		
% H2O v/v	Not assessed		
AS 4323.1 compliance			
Requirements	**Criteria**	**Sampling plane**	**Compliance**
Distance from downstream disturbance	2 D min	1.8 D (exit)	No
Distance from upstream disturbance	6 D min	2.9 D (bend)	No
Flow direction at all points	Same direction	Same direction	Yes
Velocity at all points	> 3 m/s	> 3 m/s at all points	Yes
Cyclonic component	< 15°	< 15°	Yes
Difference between points	< 10% absolute temperature	< 10% absolute temperature	Yes
Difference between mean and points	< 10% absolute temperature	< 10% absolute temperature	Yes
Highest to lowest pitot pressure	< 9 : 1	< 9 : 1	Yes
Highest to lowest gas velocity	< 3 : 1	< 3 : 1	Yes
Gas temperature	> dew point	> dew point	Yes
Overall classification			**Non ideal ***

* Non ideal sampling position: If the measurement near a bend is unavoidable, the sampling position shall be greater than one duct diameter upstream of the bend or greater than two duct diameters downstream of the bend. When the criteria in Table 1 of AS/NZS 4323.1 cannot be met, a greater number of sampling points shall be used in order to retain as much accuracy as is practicable.

Table 3 Emissions Monitoring: Bleach Line Wet Scrubber Inlet continued

Test Results	
Odour	
Run No.	1
SLR Sample ID No.	11248
Sample Period (hrs)	1100-1115
Odour Concentration (OU)	99
Mass Odour Emission Rate ($OU.m^3/s$)	30

Table 4 Emissions Monitoring: Bleach Line Wet Scrubber Outlet

Test Details			
Sample date	22 June 2021		
Conditions	Normal		
Sampling plane description	One 35 mm access port located 2.7 hydraulic diameters downstream from a bend, and 4 hydraulic diameters upstream from the exit.		
Sample plane compliance	Not compliant with the dimensional requirements of Australian Standard AS4323.1. When the criteria in Table 1 of AS/NZS 4323.1 cannot be met, a greater number of sampling points shall be used in order to retain as much accuracy as is practicable.		
Additional Notes	None.		
Testing officer(s)	Danny Echeverri and Ali Naghizadeh		
Source Conditions			
Stack dimensions (m)	0.38 m (diameter)		
Av. stack gas temperature (°C)	25		
Barometric pressure (kPa)	103.3		
Duct static pressure (kPa)	0.023		
Average velocity (m/sec)	4.1		
Actual gas flowrate (m^3/min)	27		
Gas flow rate at S.T.P. (Nm^3/min)	25		
Dry gas flow rate (Nm^3/min)	Not assessed		
% H2O v/v	Not assessed		
AS 4323.1 compliance			
Requirements	**Criteria**	**Sampling plane**	**Compliance**
Distance from downstream disturbance	2 D min	2.7 D (exit)	Yes
Distance from upstream disturbance	6 D min	4 D (bend)	No
Flow direction at all points	Same direction	Same direction	Yes
Velocity at all points	> 3 m/s	> 3 m/s at all points	Yes
Cyclonic component	< 15°	< 15°	Yes
Difference between points	< 10% absolute temperature	< 10% absolute temperature	Yes
Difference between mean and points	< 10% absolute temperature	< 10% absolute temperature	Yes
Highest to lowest pitot pressure	< 9 : 1	< 9 : 1	Yes
Highest to lowest gas velocity	< 3 : 1	< 3 : 1	Yes
Gas temperature	> dew point	> dew point	Yes
Overall classification			**Non ideal ***

* Non ideal sampling position: If the measurement near a bend is unavoidable, the sampling position shall be greater than one duct diameter upstream of the bend or greater than two duct diameters downstream of the bend. When the criteria in Table 1 of AS/NZS 4323.1 cannot be met, a greater number of sampling points shall be used in order to retain as much accuracy as is practicable.

Table 4 Emissions Monitoring: Bleach Line Wet Scrubber Outlet continued

Test Results	
Odour	
Run No.	1
SLR Sample ID No.	11249
Sample Period (hrs)	1115-1139
Odour Concentration (OU)	83
Mass Odour Emission Rate (OU.m^3/s)	35

Table 5 Emissions Monitoring: Filling Line 3 Fan

Test Details		
Sample date	22 June 2021	
Conditions	Normal	
Sampling plane description	Face of fan	
Sample plane compliance	NA	
Additional Notes	None.	
Testing officer(s)	Danny Echeverri and Ali Naghizadeh	
Source Conditions		
Opening dimensions (m)	0.15 m (diameter)	
Av. stack gas temperature (°C)	28	
Barometric pressure (kPa)	103.3	
Duct static pressure (kPa)	NA	
Average velocity (m/sec)	16	
Actual gas flowrate (m^3/min)	16	
Gas flow rate at S.T.P. (Nm^3/min)	14	
Dry gas flow rate (Nm^3/min)	Not assessed	
% H_2O v/v	Not assessed	
Odour		
Run No.	1	
SLR Sample ID No.	11243	
Sample Period (hrs)	1034-1046	
Odour Concentration (OU)	200	
Mass Odour Emission Rate (OU.m^3/s)	50	

Table 6 Emissions Monitoring: Roller Shutter Door Air Curtain - Inside

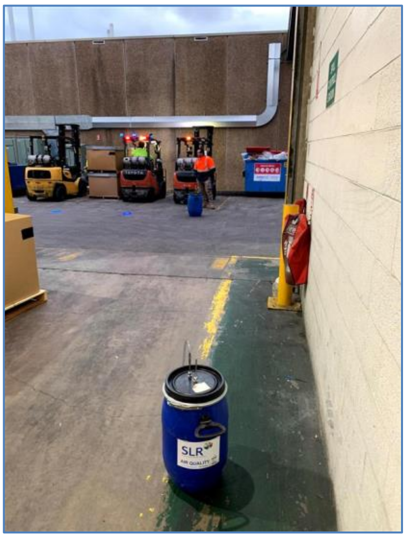
Test Details		
Sample date	22 June 2021	
Conditions	Normal	
Sampling plane description	Inside face of roller shutter door (before air curtain)	
Sample plane compliance	NA	
Additional Notes	None.	
Testing officer(s)	Danny Echeverri and Ali Naghizadeh	
Source Conditions		
Opening dimensions (m)	4.6 m x 4 m	
Av. stack gas temperature (°C)	12	
Barometric pressure (kPa)	103.3	
Duct static pressure (kPa)	NA	
Average velocity (m/sec)	0.40	
Actual gas flowrate (m^3/min)	440	
Gas flow rate at S.T.P. (Nm^3/min)	430	
Dry gas flow rate (Nm^3/min)	Not assessed	
% H2O v/v	Not assessed	
Odour		
Run No.	1	
SLR Sample ID No.	11242	
Sample Period (hrs)	0708-0720	
Odour Concentration (OU)	120	
Mass Odour Emission Rate (OU.m^3/s)	870	

Table 7 Emissions Monitoring: Roller Shutter Door Air Curtain - Outside

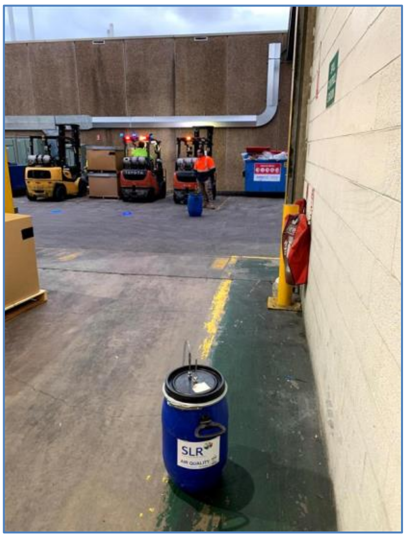
Test Details		
Sample date	22 June 2021	
Conditions	Normal	
Sampling plane description	Outside face of roller shutter door	
Sample plane compliance	NA	
Additional Notes	None.	
Testing officer(s)	Danny Echeverri and Ali Naghizadeh	
Source Conditions		
Opening dimensions (m)	4.6 m x 4 m	
Av. stack gas temperature (°C)	12	
Barometric pressure (kPa)	103.3	
Duct static pressure (kPa)	NA	
Average velocity (m/sec)	0.10	
Actual gas flowrate (m^3/min)	110	
Gas flow rate at S.T.P. (Nm^3/min)	110	
Dry gas flow rate (Nm^3/min)	Not assessed	
% H2O v/v	Not assessed	
Odour		
Run No.	1	
SLR Sample ID No.	11241	
Sample Period (hrs)	0708-0720	
Odour Concentration (OU)	54	
Mass Odour Emission Rate (OU.m^3/s)	99	

Table 8 Ambient Monitoring: Mezzanine Floor near Blending Tanks

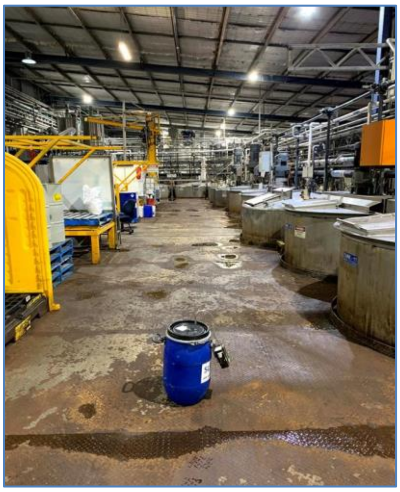
Test Details		
Sample date	22 June 2021	
Conditions	Normal	
Sampling plane description	NA	
Sample plane compliance	NA	
Additional Notes	Ambient monitoring	
Testing officer(s)	Danny Echeverri and Ali Naghizadeh	
Source Conditions		
Opening dimensions (m)	NA	
Av. stack gas temperature (°C)	17	
Barometric pressure (kPa)	103.3	
Duct static pressure (kPa)	NA	
Average velocity (m/sec)	NA	
Actual gas flowrate (m^3/min)	NA	
Gas flow rate at S.T.P. (Nm^3/min)	NA	
Dry gas flow rate (Nm^3/min)	Not assessed	
% H2O v/v	Not assessed	
Odour		
Run No.	1	
SLR Sample ID No.	11239	
Sample Period (hrs)	0524-0533	
Odour Concentration (OU)	59	

Table 9 Emissions Monitoring: Wastewater Storage Tank

Test Details	
Sample date	22 June 2021
Conditions	Normal
Sampling plane description	Open face of water storage tank hatch
Sample plane compliance	NA
Additional Notes	None.
Testing officer(s)	Danny Echeverri and Ali Naghizadeh
Source Conditions	
Opening dimensions (m)	0.54 m (diameter)
Av. stack gas temperature (°C)	13
Barometric pressure (kPa)	103.3
Duct static pressure (kPa)	NA
Average velocity (m/sec)	0.03
Actual gas flowrate (m^3/min)	0.01
Gas flow rate at S.T.P. (Nm^3/min)	0.01
Dry gas flow rate (Nm^3/min)	Not assessed
% H2O v/v	Not assessed
Odour	
Run No.	1
SLR Sample ID No.	11244
Sample Period (hrs)	0809-0821
Odour Concentration (OU)	25,000
Mass Odour Emission Rate (OU.m^3/s)	170

Table 10 Emissions Monitoring: Whirlybird Before Operations

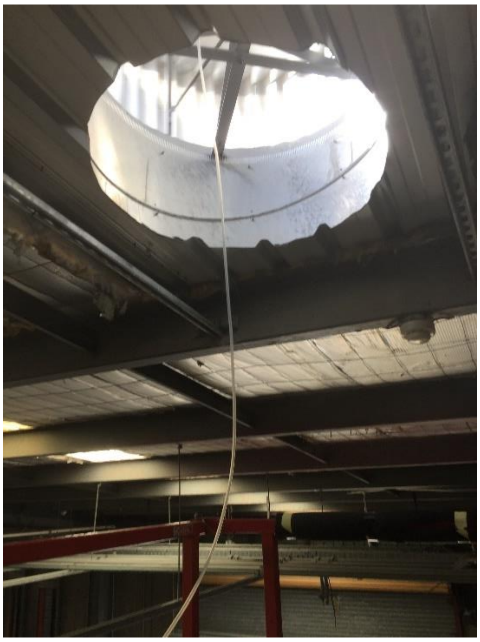
Test Details		
Sample date	22 June 2021	
Conditions	Normal	
Sampling plane description	One 88 cm diameter opening located directly below the whirlybird.	
Sample plane compliance	NA	
Additional Notes	None.	
Testing officer(s)	Danny Echeverri and Ali Naghizadeh	
Source Conditions		
Opening dimensions (m)	0.88 m (diameter)	
Av. stack gas temperature (°C)	17	
Barometric pressure (kPa)	103.3	
Duct static pressure (kPa)	NA	
Average velocity (m/sec)	1.4	
Actual gas flowrate (m^3/min)	50	
Gas flow rate at S.T.P. (Nm^3/min)	49	
Dry gas flow rate (Nm^3/min)	Not assessed	
% H2O v/v	Not assessed	
Odour		
Run No.	1	
SLR Sample ID No.	11240	
Sample Period (hrs)	0525-0535	
Odour Concentration (OU)	110	
Mass Odour Emission Rate (OU.m^3/s)	91	

Table 11 Emissions Monitoring: Whirlybird During Operations

Test Details		
Sample date	22 June 2021	
Conditions	Normal	
Sampling plane description	One 88 cm diameter opening located directly below the whirlybird.	
Sample plane compliance	NA	
Additional Notes	None.	
Testing officer(s)	Danny Echeverri and Ali Naghizadeh	
Source Conditions		
Opening dimensions (m)	0.88 m (diameter)	
Av. stack gas temperature (°C)	21	
Barometric pressure (kPa)	103.3	
Duct static pressure (kPa)	NA	
Average velocity (m/sec)	1.3	
Actual gas flowrate (m^3/min)	47	
Gas flow rate at S.T.P. (Nm^3/min)	44	
Dry gas flow rate (Nm^3/min)	Not assessed	
% H_2O v/v	Not assessed	
Odour		
Run No.	1	
SLR Sample ID No.	11247	
Sample Period (hrs)	1015-1027	
Odour Concentration (OU)	220	
Mass Odour Emission Rate (OU.m^3/s)	170	

4.1 Results Summary

A summary of the emission test results as required for an air quality impact assessment is presented in **Table 12**. All volumes and concentrations are reported at standard temperature and pressure (0^{o}C and 101.3 kPa), and at stack oxygen concentration unless otherwise stated.

Table 12 Summary of Emission Testing Results

Odour	Units	Blending Tanks Wet Scrubber Inlet	Blending Tanks Wet Scrubber Outlet	Bleach Line Wet Scrubber Inlet	Bleach Line Wet Scrubber Outlet	Filling Line 3 Fan	Roller Shutter Door Air Curtain - Inside	Roller Shutter Door Air Curtain - Outside	Mezzanine Floor near Blending Tanks	Wastewater Storage Tank	Whirlybird Before Operations	Whirlybird During Operations
Stack Diameter	m	0.38	0.38	0.24	0.38	0.15	4.6 x 4	4.6 x 4	NA	0.54	0.88	0.88
Average Stack Temperature	ºC	21	20	25	25	28	12	12	17	13	17	21
Average Stack Pressure	kPa	0.001	0.001	0.20	0.023	NA	NA	NA	NA	NA	NA	NA
Average Stack Velocity	m/s	2.2	2.2	7.3	4.1	16	0.40	0.10	NA	0.03	1.4	1.3
Odour Concentration	OU	940	180	99	83	200	120	54	59	25,000	110	220
Mass Odour Emission Rate	ou.m^3/s	210	42	30	35	50	870	99	NA	170	91	170

5 Monitoring Instrument Calibration

Details of the most recent calibration of each instrument used to take the measurements are provided in **Table 13**.

Table 13 Equipment Calibration Details

Asset Number	Name	Next Calibration / Due Date
2003	Pump	19-05-2022
2453	Thermocouple	12-02-2022
2454	Digitemp	07-06-2022
183541	Drycal	19-02-2022

6 Measurement Uncertainty

The estimated measurement uncertainty associated with the monitoring methods are provided in **Table 14.**

Table 14 Measurement Uncertainty

Parameter	Associated Test Method	Uncertainty
Velocity	TM-2, AS 4323.1, USEPA M2A, 2C	±5%
Temperature	TM-2, USEPA M2C	±2°C
Odour	OM-7, AS4323.3	± 50 - 124% (based upon a single determination)

7 References

AS. (1995). *4323.1:1995 - Stationary Source Emissions - Selection of Sampling Positions.*

AS/NZS. (n.d.). *4323.3:2001 - Stationary source emissions Part 3: Determination of odour concentration by dynamic olfactometry.*

NSW DEC. (2007). *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.*

USEPA. (2017). *Method 2 - Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube).*

USEPA. (2017a). *Method 2C - Determination Of Gas Velocity And Volumetric Flow Rate In Small Stacks Or Ducts (Standard Pitot Tube).*

APPENDIX A

Laboratory Analysis Reports

THE ODOUR UNIT PTY LTD

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Phone: +61 2 9209 4420
Email: info@odourunit.com.au
Internet: www.odourunit.com.au
ABN: 53 091 163 061

Accreditation Number:
14974

Odour Concentration Measurement Report

The measurement was commissioned by:

Organisation	SLR Consulting	Telephone	+61 2 9424 2210
Contact	D. Echeverri	Facsimile	--
Sampling Site	Not disclosed	Email	decheverri@slrconsulting.com
Sampling Method	Not disclosed	Sampling Team	SLR Consulting

Order details:

Order requested by	D. Echeverri	Order accepted by	A. Schulz
Date of order	Refer to correspondence	TOU Project #	N1869R
Order number	Refer to correspondence	Project Manager	A. Schulz
Signed by	D. Echeverri	Panel Operator	A. Schulz

Investigated Item	Odour concentration in odour units 'ou', determined by sensory odour concentration measurements, of an odour sample supplied in a sampling bag.
Identification	The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification), sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required.
Method	The odour concentration measurements were performed using dynamic olfactometry according to the Australian/New Zealand Standard: Stationary source emissions – *Part 3*: '*Determination of odour concentration by dynamic olfactometry* (AS/NZS4323.3). The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for butanol calibration. Any deviation from the Australian standard is recorded in the 'Comments' section of this report.
Measuring Range	The measuring range of the olfactometer is $2^2 \leq \chi \leq 2^{18}$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted. The machine is not calibrated beyond dilution setting 2^{17}. This is specifically mentioned with the results.
Environment	The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained at 22 ºC ±3 ºC.
Measuring Dates	The date of each measurement is specified with the results.
Instrument Used	The olfactometer used during this testing session was: TOU-OLF-001.
Instrumental Precision	The precision of this instrument (expressed as repeatability) for a sensory calibration must be $r \leq 0.477$ in accordance with the AS/NZS 4323.3. r = 0.280 (October 2019) Compliance – Yes
Instrumental Accuracy	The accuracy of this instrument for a sensory calibration must be $A \leq 0.217$ in accordance with the AS/NZS 4323.3. A = 0.076 (October 2019) Compliance – Yes
Lower Detection Limit (LDL)	The LDL for the olfactometer has been determined to be 16 ou, which is 4 times the lowest dilution setting.
Traceability	The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. The assessors are individually selected to comply with fixed criteria and are monitored in time to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen. Note Disclaimers on last page of this document.

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This report shall not be reproduced, except in full.

Date: Tuesday, 29 June 2021

Panel Roster Number: SYD20210623_064

A. Schulz
Authorised Signatory

THE ODOUR UNIT PTY LTD

THE ODOUR UNIT

NATA

Accreditation Number: 14974

Odour Sample Measurement Results
Panel Roster Number: SYD20210623_064

Sample Location	TOU Sample ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Nominal Sample Dilution	Actual Sample Dilution (Adjusted for Temperature)	Dilution Equipment ID	Sample Odour Concentration (as received, in the bag) (ou)	Sample Odour Concentration (Final, allowing for dilution) (ou)
11240: WB1 Run 1	SC21449	22.06.2021 0535 hrs	23.06.2021 1008 hrs	4	8	--	--	--	108	108
11239: Platform Run 1	SC21450	22.06.2021 0533 hrs	23.06.2021 1034 hrs	4	8	--	--	--	59	59
11241: RSD – O Run	SC21451	22.06.2021 0720 hrs	23.06.2021 1057 hrs	4	8	--	--	--	54	54
11242: RSD – I Run 1	SC21452	22.06.2021 0720 hrs	23.06.2021 1119 hrs	4	8	--	--	--	118	118
11244: DAF – 5	SC21453	22.06.2021 0821 hrs	23.06.2021 1153 hrs	4	8	--	--	--	25,300	25,300
11245: BT Scrubber – In	SC21454	22.06.2021 0935 hrs	23.06.2021 1319 hrs	4	8	--	--	--	939	939

Samples Received in Laboratory – From: SLR Consulting Date: 22.06.2021 Time: 1500 hrs

Note: The following are not covered by the NATA Accreditation issued to The Odour Unit Pty Ltd:

1. The collection of samples by the methods of AS/NZS 4323.4 and the calculation of Specific Odour Emission Rate (**SOER**).
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit Pty Ltd have performed the dilution of samples.

THE ODOUR UNIT PTY LTD

Accreditation Number:
14974

Odour Sample Measurement Results
Panel Roster Number: SYD20210623_064

Sample Location	TOU Sample ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Nominal Sample Dilution	Actual Sample Dilution (Adjusted for Temperature)	Dilution Equipment ID	Sample Odour Concentration (as received, in the bag) (ou)	Sample Odour Concentration (Final, allowing for dilution) (ou)
11246: BT Scrubber – Out Run 1	SC21455	22.06.2021 0935 hrs	23.06.2021 1412 hrs	4	8	--	--	--	181	181
11247: WB – B Run 1	SC21456	22.06.2021 1027 hrs	23.06.2021 1434 hrs	4	8	--	--	--	215	215
11243: Line 3 Run 1	SC21457	22.06.2021 1046 hrs	23.06.2021 1459 hrs	4	8	--	--	--	197	197
11248: BL Scrubber – In Run 1	SC21458	22.06.2021 1142 hrs	23.06.2021 1533 hrs	4	8	--	--	--	99	99
11249: BL Scrubber – Out Run 1	SC21459	22.06.2021 1142 hrs	23.06.2021 1558 hrs	4	8	--	--	--	83	83

Samples Received in Laboratory – From: SLR Consulting Date: 22.06.2021 Time: 1500 hrs

Note: The following are not covered by the NATA Accreditation issued to The Odour Unit Pty Ltd:

1. The collection of samples by the methods of AS/NZS 4323.4 and the calculation of Specific Odour Emission Rate (**SOER**).
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit Pty Ltd have performed the dilution of samples.

THE ODOUR UNIT PTY LTD

Accreditation Number:
14974

Odour Panel Calibration Results

Reference Odorant	Reference Odorant Panel Roster Number	Concentration of Reference gas (ppb)	Panel Target Range for n-butanol (ppb)	Measured Concentration (ou)	Measured Panel Threshold (ppb)	Does this panel calibration measurement comply with AS/NZS 4323.3 (Yes / No)
n-butanol	SYD20210623_064	51,000	$20 \leq \chi \leq 80$	1,449	35	Yes

Comments

Odour characters (non-NATA accredited) as determined by odour laboratory panel:

SC21449	soapy, detergent
SC21450	soapy, detergent
SC21451	soapy, detergent
SC21452	soapy, detergent
SC21453	soapy, detergent, bleach
SC21454	soapy, detergent
SC21455	soapy, detergent
SC21456	soapy, detergent
SC21457	soapy, detergent
SC21458	soapy, detergent
SC21459	soapy, detergent

Disclaimers

1. Parties, other than The Odour Unit Pty Ltd, responsible for collecting odour samples have advised that they have voluntarily furnished these odour samples, appropriately collected and labelled, to The Odour Unit Pty Ltd for the purpose of odour testing.
2. The collection of odour samples by parties other than The Odour Unit Pty Ltd relinquishes The Odour Unit Pty Ltd from all responsibility for the sample collection and any effects or actions that the results from the test(s) may have.
3. Any comments included in, or attachments to, this Report are not covered by the NATA Accreditation issued to The Odour Unit Pty Ltd.
4. This report shall not be reproduced, except in full, without written approval of The Odour Unit Pty Ltd.

Report Status

Status	Version	Date	Prepared by	Checked by	Change	Reason
Draft	0.1	29.06.2021	A. Schulz	-	-	-
Final	1.0	29.06.2021	A. Schulz	M. Assal	-	-
Revised	1.1	08.07.2021	A. Schulz	-	Sample ID	Incorrect

END OF DOCUMENT

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APPENDIX B

Wastewater Treatment Plant Design

Committed to our Customers, our People, our Solutions

DAF Plant Functional Description and Jalco Horsley Park

Dated: 22/12/2021

Prepared by: Joe Esguerra as - Rev0 22/11/2021

Progress review by: Peter Louskos - Rev0_pl 25/01/2022

Progress Update by: Peter Louskos – Rev1_pl 24/05/2022

CHEMICAL WATER TREATMENT

WASTEWATER & REUSE

PRE-TREATMENT & DESALINATION

CLEANING & HYGIENE

FUNCTIONAL DESCRIPTION

1. PROCESS

The process is designed to treat toll manufacturing and chemical formulation, production wastewater which will enable Jalco Horsley Park manufacturing facility to discharge treated effluent to Licenced Sydney Water Sewer. The system will treat, up to 30,000 litres of wastewater each production day.

Wastewater from production Pit 1 will be transferred to the Balance Tank by a submersible pump.

The Process Flow is shown to drawings: JAL-PID-001,002 & 003 and the general model & plant layout is shown to drawings: JALCO-WTOC-001 and 002 included to Appendix 1 and 2 respectively.

1.1 Balance Tank (capacity 50,000 litres)

When Balance Tank (T1) is above 30% of its level, transfer pump (P1) will run delivering >5kl per hour flow (controlled/ regulate by Process Control Valve - PCV1) to the Intermediate tank. This will continue until Balance Tank (T1) level reaches 30%. High level Alarm will warn of increased capacity at 85% level of Balance Tank level. Normal operating levels are from 30 – 70 percent.

ORP probe will be installed in the Balance Tank. Once Balance Tank reaches 30%, Sodium Metabisulphite dosing pump (DP1) will activate depending on the REDOX value measured by the ORP Controller reading/setpoint. Dosing pump (DP1) activation will stop dosing below 30% of Balance Tank level.

*Aeration manifold shall be installed the balance Tank and the Air Solenoid Valve for Balance Tank (S1) shall generally remain ON all the time.

ORP Controller (OPC) will be powered ON all the time with dosing control sequenced on and off set against the level measured in the tank.

1.2 Intermediate Tank (capacity 22,500 litres)

When Balance Tank (T1) level is above 30% of its level as indicated by (L1), Process Control Valve (PCV1) opens, transfer pump (P1) will run delivering greater than (>) 5kl per hour flow to the Intermediate tank, after 10s delay. When L1 activates; the Intermediate Tank Mixer (M1) will start. There will be flow switch at the discharge line of P1. When flow switch activates, this will start Ferrous Sulphate (DP2), Acid (DP3) and Hydrogen Peroxide (DP4) dosing pumps going to the Intermediate Tank and is dosed proportional to the volume transferred. Acid dosing pump activates depending on the pH Controller reading/ setpoint.

pH sensor (PHP1) is installed to the intermediate tank.

2. OPERATING SEQUENCE

2.1. WASTEWATER TREATMENT PROCESS

2.1.1 START OPERATION

Initiated by a signal from the level sensor (L2) in Intermediate Tank, T2 when it reaches 70%.

2.1.2 DAF SUPPLY

When level of T2 reaches 70% as indicated by (L2), DAF Feed Pump (P2) will start after 3 minutes delay from activation. After 3 minutes, PCV2 will open, P2 will start and will continue until T2 level reaches 30%, then DAF go on shutting down mode.

P2 has a capacity of 3000 - 5000 litres per hour; controlled by Variable Speed Drive (VSD).

2.1.3 DAF

Upon activation of L2 at 70% level in Intermediate Tank, DAF Reaction Tank Mixer (M1), DAF Effluent Tank Mixer (M3), DAF Scrapper Motor (MT1), DAF Recycle Pump (P8) starts.

DAF Recycle Air Solenoid (S2) opens.

2.1.4. DOSING

Upon activation of L2 at 70% level in Intermediate Tank, Coagulant Dosing Pump (DP5) will start. Polymer Dosing Pump (DP6) starts when P2 starts.

2.1.5. ACTIFLOX MK11 1200, pH & ORP

pH (PHC1, PHC2) & ORP (OPC) controllers, flocculant make up system (primary), discharge flow meter (FM) & discharge pump circuit (P3 & P4) need be operational whether the operation selection is Manual or Automatic

2.1.6. DAF SLUDGE PUMP

DAF Sludge Pump (P5) starts and stops depending when high and low level from L4 has been reached.

2.1.7 DAF SLUDGE TANK (capacity 22,500 litres)

DAF Sludge Tank (T3) will incorporate *air diffuser manifold. Air Solenoid Valve to the manifold shall operate to present tank levels or timer. Level Sensor (L3) will initiate an alarm condition at 75% of T3 height, to inform operators to arrange a pump out or undertaken dewatering of the sludge tank; this alarm can be overridden. Secondary alarm will be initiated 90% of T3 height, a high-level alarm will set as audible and visual alarm with the condition requiring immediate attention. The high alarm condition can be rest momentarily, but not overridden.

2.1.6. STOP OPERATION

When low level in Intermediate Reaction Tank (T2) is below (30%), DAF Feed Pump (P2) stops and Process Control Valve (PCV1) closes. DAF Reaction Tank Mixer (M2) and DAF Effluent Tank Mixer (M3), Coagulant Dosing Pump (DP5) and Polymer Dosing Pump (DP6) stop. After 3 mins of low level in the T2, DAF Recycle Air Solenoid (S2) closes, DAF Recycle Pump and DAF Scrapper Motor stops.

*3. OPERATIONAL DIFFERENCE

The proposed wastewater treatment process reflected in the functional description and proposed for the Horsley Park development and has considered the learning gained from the Smithfield facility with two very important distinctions; improved practices and process automation.

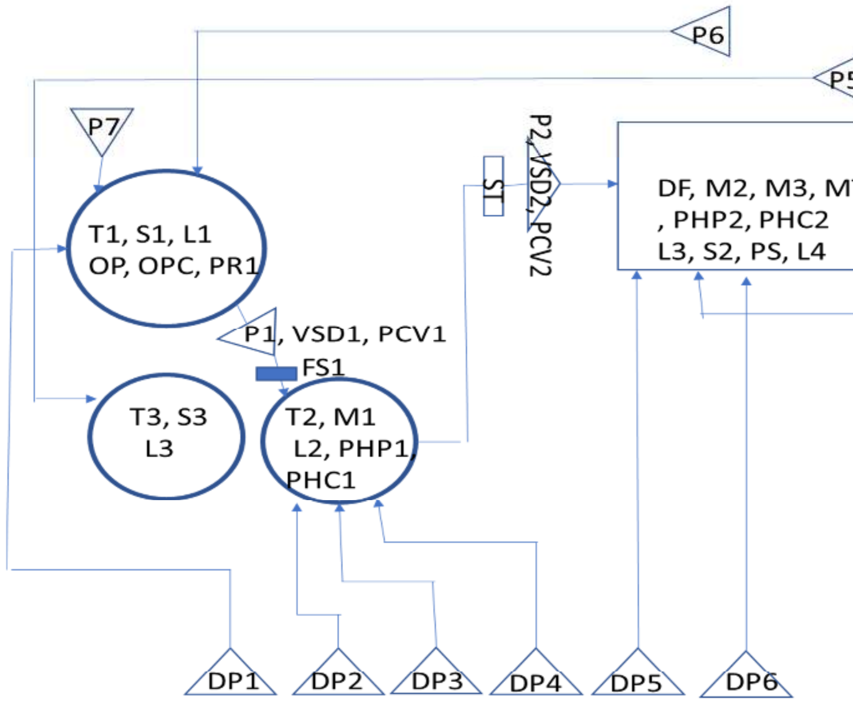
Comparatively; wastewater treatment at the Smithfield has been broadly manual, operator initiated each morning for the treatment of wastewater stored overnight. Aeration of Balance and Sludge tanks has been supplied by compressed air and the tanks vented at the tank. the use of high-pressure air and depth of volume experience overnight would support the scouring of and release of volatile compounds that maybe present.

Automation will around the clock operation, assures that tank levels will be maintained and process consistent.

Specific to Horsley Park Process, the design has employs low pressure air developed by conventional blower, and flow controlled to set backpressure irrespective of tank capacity and avoiding scouring. The Balance Tank described to paragraph 1.1 and DAF Sludge Tank to Paragraph 2.1.7, each being vented by 200mm diameter vent-line with each flowing at velocity greater than 16m/s line velocity. It is intended that both vent lines are joined to single riser at nominally 200mm increasing discharge velocity and rising to 3.0 metres above the roof-line. A model representing the installation has been included to Appendix 2 for reference.

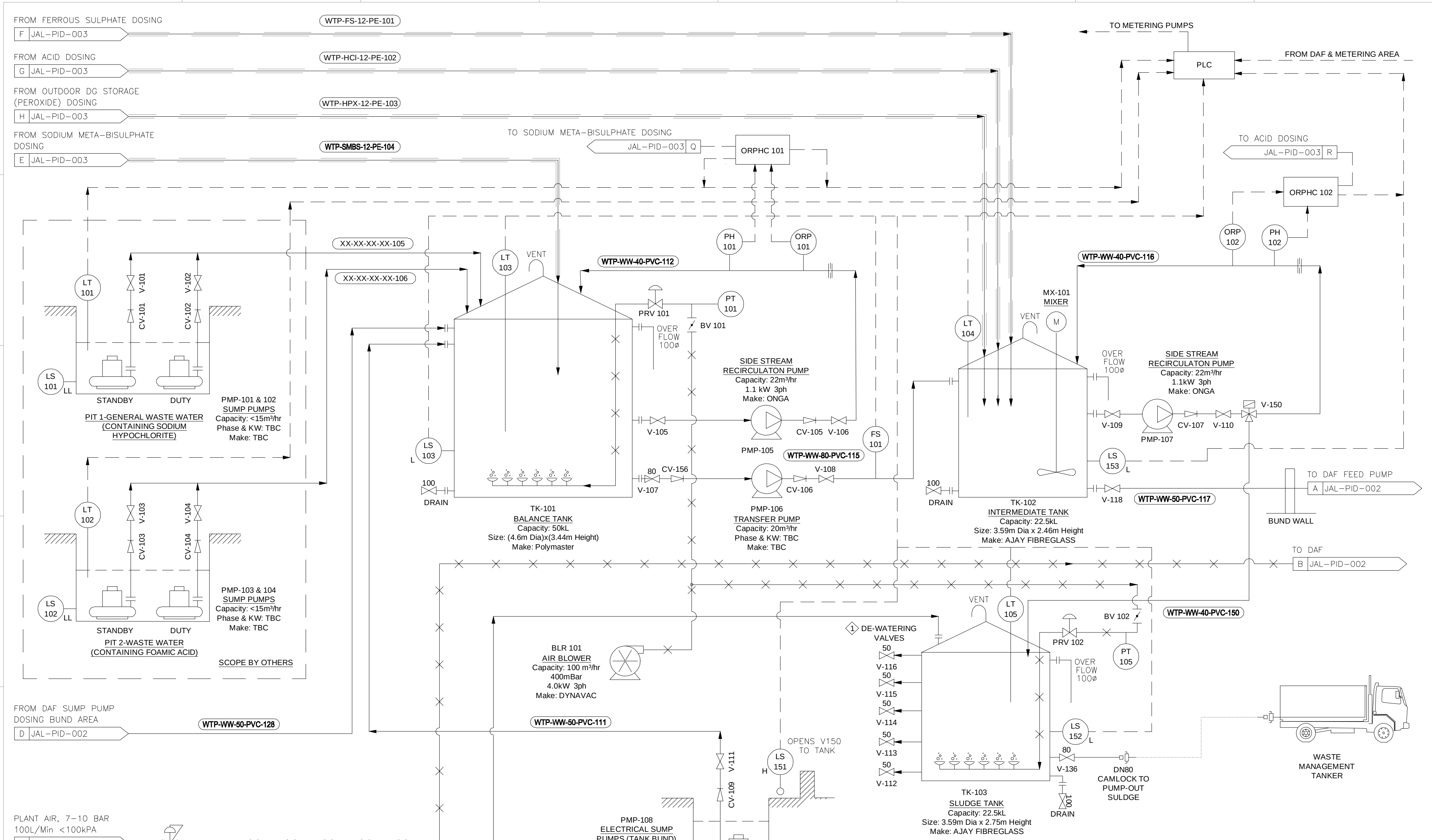
It is important to note that the third tank is not subject to aeration as described above, but rather gentle mechanical mixing. The tank will breath to minimum to maintain equilibrium.

Appendix 1. JALCO HORSLEY PARK FLOW SCHEMATIC



DF – DAF
M2 – DAF Reaction Tank Mixer
M3 – DAF Effluent Tank Mixer
MT1 – DAF Scraper Motor
FM – Discharge Flowmeter
L4 – DAF Sludge Level Sensor
PR1 – Pressure Regulator Air
PCV2 – DAF Feed Pump Process Control Valve

P1 – Transfer pump Balance Tank to Intermediate Tank
P2 – DAF feed pump
P3 – DAF discharge pump 1
P4 – DAF discharge pump 2
P5 Sludge pump
P6 – Sump pump 1
P7 – Sump pump 2
T1 – Balance Tank
S1 – Air solenoid valve for Balance Tank
L1 – Level Sensor/switch
T2 – Intermediate Tank
M1 – Mixer Intermediate Tank
L2 – Level Sensor Switch
T3 – Sludge Tank
S3 – Air Solenoid valve for Sludge Tank
L3 – Level Sensor/switch
DP1 – Sodium Metabisulphite Dosing Pump
DP2 – Ferrous Sulphate Dosing Pump
DP3 – Acid Dosing Pump
DP4 – Hydrogen Peroxide Dosing Pump
DP5 – Coagulant Dosing Pump
DP6 – Polymer Dosing Pump
VSD1 – Transfer Pump VSD Balance Tank to Intermediate Tank
PCV1 – Process Control Valve
FS1 – Flow Switch 1
OP – ORP Probe
OPC – ORP Controller
VSD2 – DAF Feed Pump VSD
VSD3 – DAF scrapper motor VSD
PHP1- DAF Reaction Tank pH Probe
PHC1 – Daf Reaction Tank pH controller
PHP2 – DAF Effluent pH probe
PHC2 – DAF Effluent pH controller
L3 – DAF effluent level sensor/switch
P8 – DAF Recycle Pump
S2 – DAF Recycle Air Solenoid Valve
PS – DAF Recycle Pressure Switch OR Pressure Transmitter



NOTES:

1. DE-WATERING VALVES AT A DISTANCE OF 300mm EA FLOWING INTO THE SLUDGE COLLECTION SUMP.
2. ALL THE EQUIPMENT AND TANKS IN THIS SHEET ARE PRESENT IN TANK BUNDED AREA.

Rev	Description	Drawn	Checked	Appd
I	pH CONTOLLER CHANGED	GR 6/4/22	JE 6/4/22	
H	pH & ORP SIGNALS CHANGED	GR 5/4/22		
G	SLUDGE / INTER. TANK LEVEL SWITCHS ADDED	GR 29/3/22		
J	BLOWER CONTROL CHANGED	GR 28/03/22	PL 28/3/22	

Drawn	SYN
Date	28/01/22
Checked	
Date	
Appd	
Date	

DO NOT SCALE

SCALE NTS A3

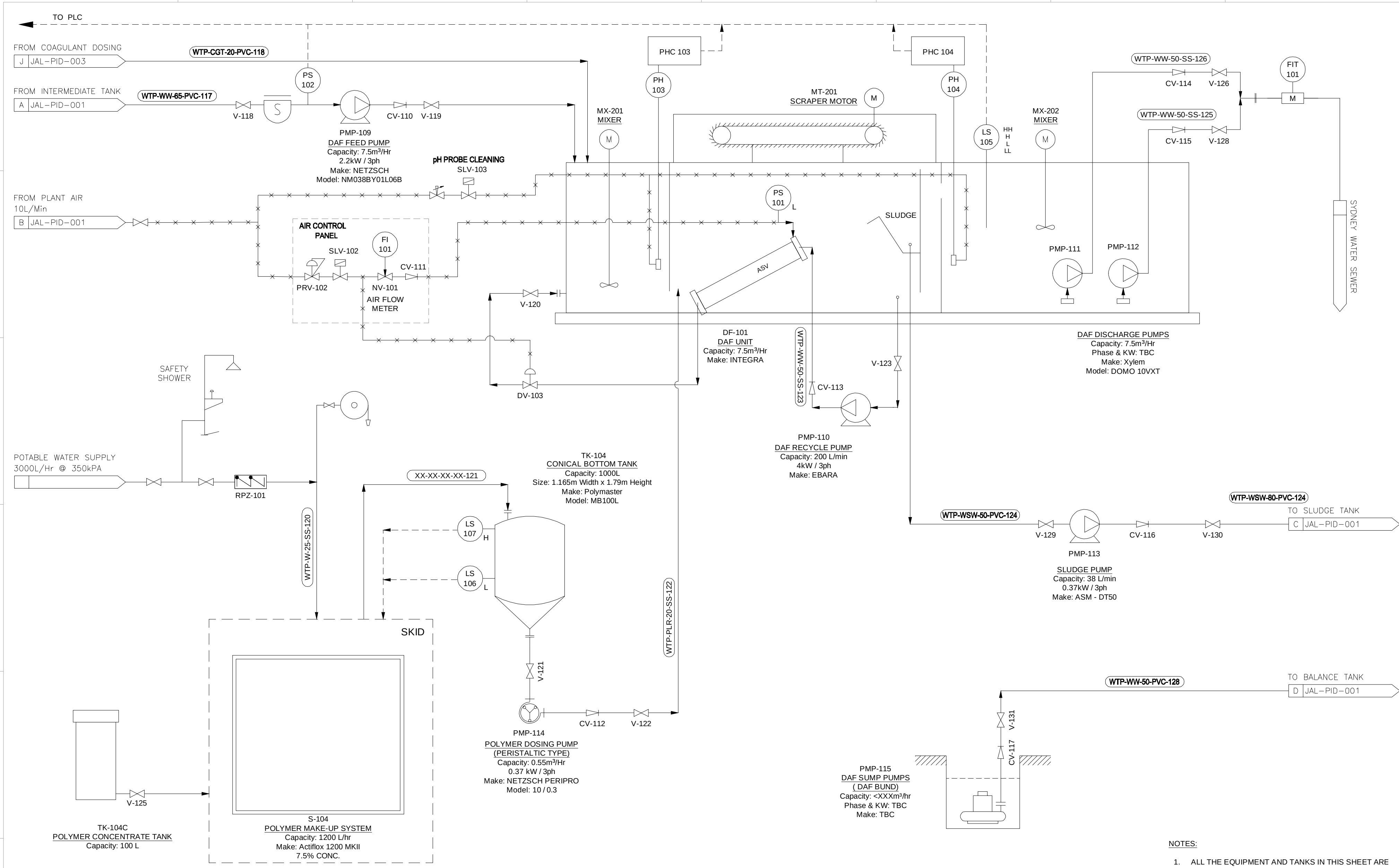
integra WATER TREATMENT SOLUTIONS

JOB No

TITLE 1	WATER TREATMENT SYSTEM
TITLE 2	JALCO
TITLE 3	PROCESS AND INSTRUMENTATION DIAGRAM
TITLE 4	
DRG No	JAL-PID-001

Sheet 1 of 3

Rev J



NOTES:

1. ALL THE EQUIPMENT AND TANKS IN THIS SHEET ARE PRESENT IN PLANT BUNDED AREA.

Rev	Description	Drawn	Checked	Appd
E	PNEUMATICS CHANGED	GR 25/3/22	JE 25/3/22	
H	DAF ALTERATIONS	GR 26/4/22		
G	pH PROBE CLEANING ADDED	GR 20/4/22		
F	CONTROL ADDITIONS	GR 5/4/22		

Drawn	SYN
Date	28/01/22
Checked	
Date	
Appd	
Date	

DO NOT SCALE

SCALE NTS A3

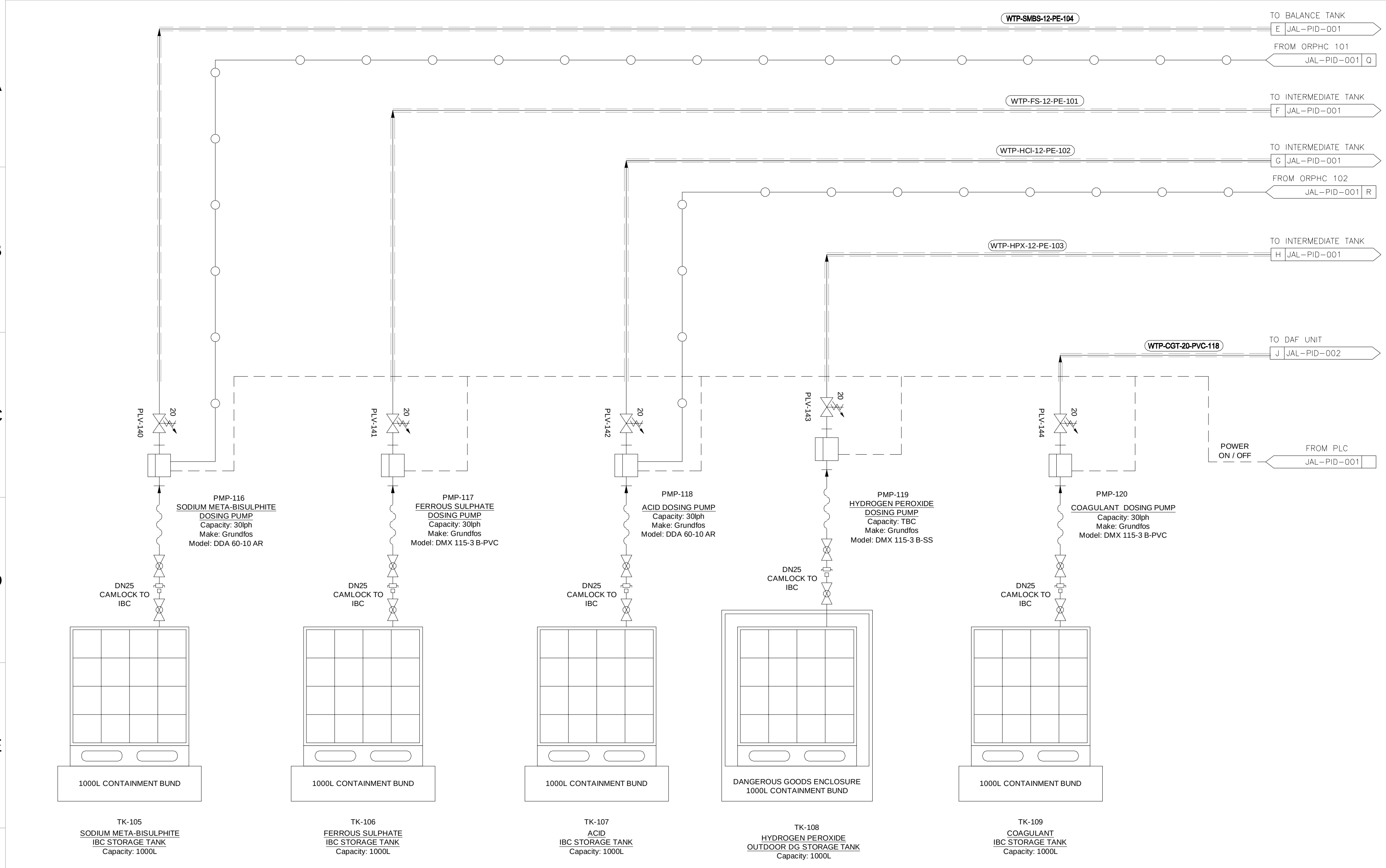
integra WATER TREATMENT SOLUTIONS

JOB No

TITLE 1	WATER TREATMENT SYSTEM
TITLE 2	JALCO
TITLE 3	PROCESS AND INSTRUMENTATION DIAGRAM
TITLE 4	
DRG No	JAL-PID-002

Sheet 2 of 3

Rev H



Rev	Description	Drawn	Checked	Appd
E	IBC VALVE ADDED	GR 25/3/22	JE 25/3/22	
D	PLVs ADDED	GR 25/3/22	JE 25/3/22	
C	VALVES ADDED	GR 22/3/22		
F	CONTROLS ADDED	GR 5/4/22		

Drawn	SYN
Date	28/01/22
Checked	
Date	
Appd	
Date	

DO NOT SCALE

SCALE NTS A3

integra WATER TREATMENT SOLUTIONS

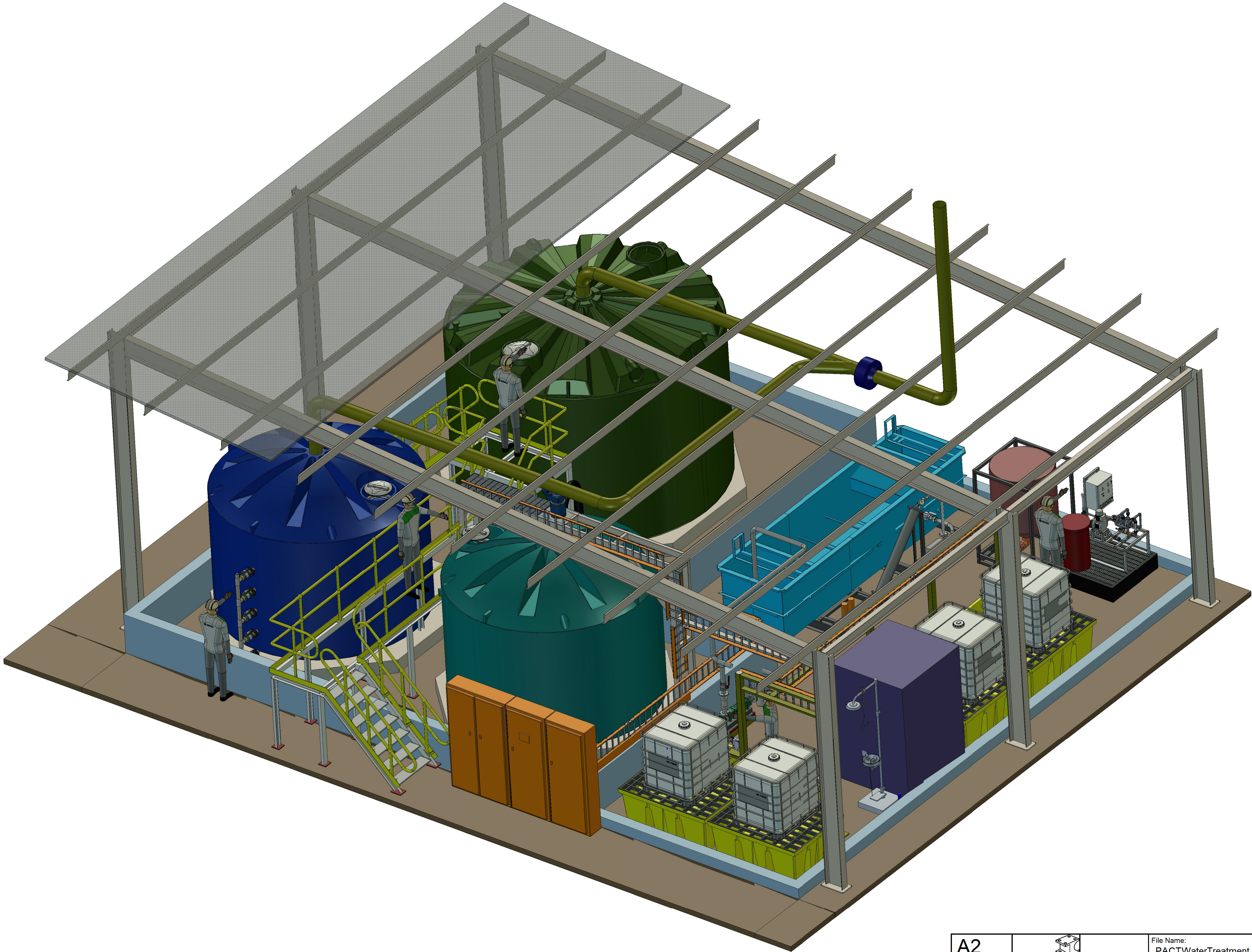
The designs, information and data contained herein are proprietary and submitted in confidence, and shall not be disclosed, used or duplicated in whole or in a part of any purposes whatsoever without prior written consent of Integra Water

TITLE 1	WATER TREATMENT SYSTEM
TITLE 2	JALCO
TITLE 3	PROCESS AND INSTRUMENTATION DIAGRAM
TITLE 4	

JOB No

DRG No JAL-PID-003 | Sheet 3 of 3 | Rev F

Appendix 2. JALCO HORSLEY PARK WWT PLANT LAYOUT



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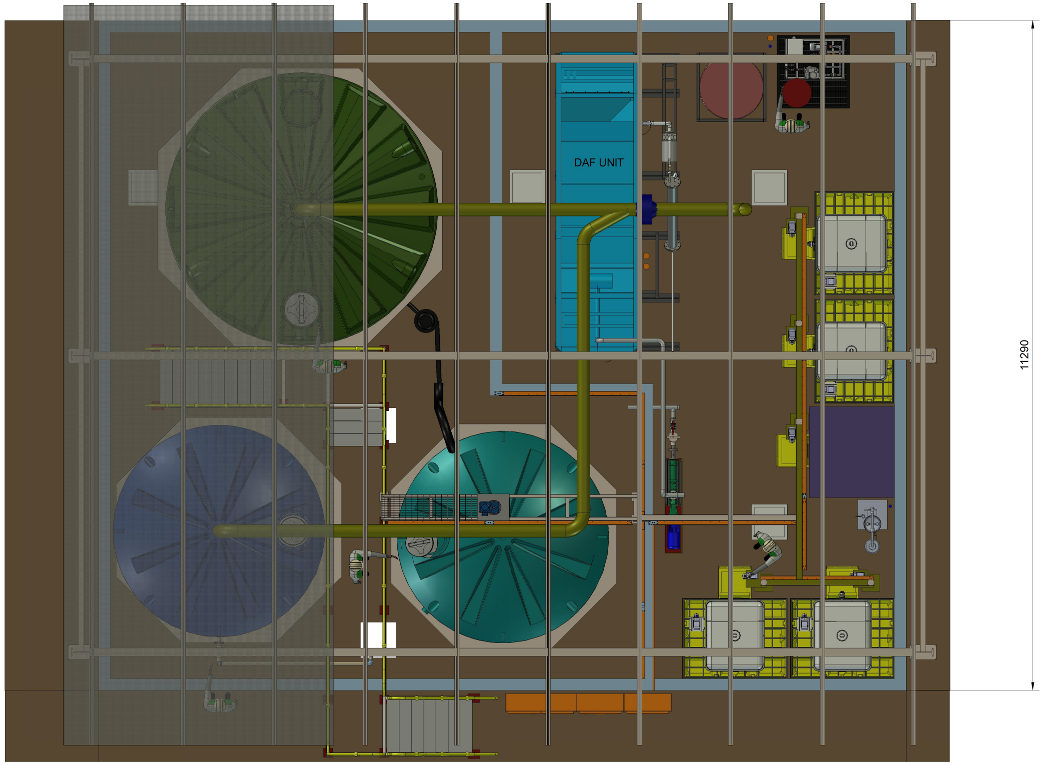
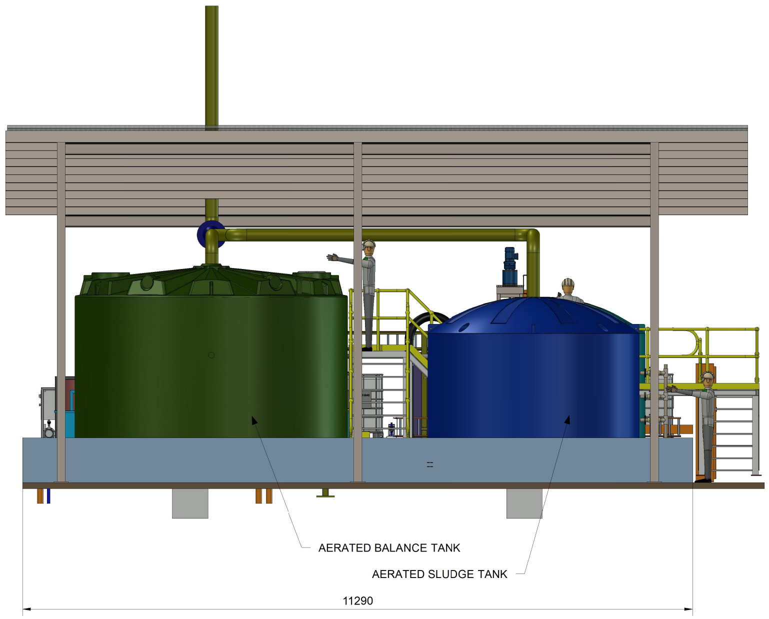
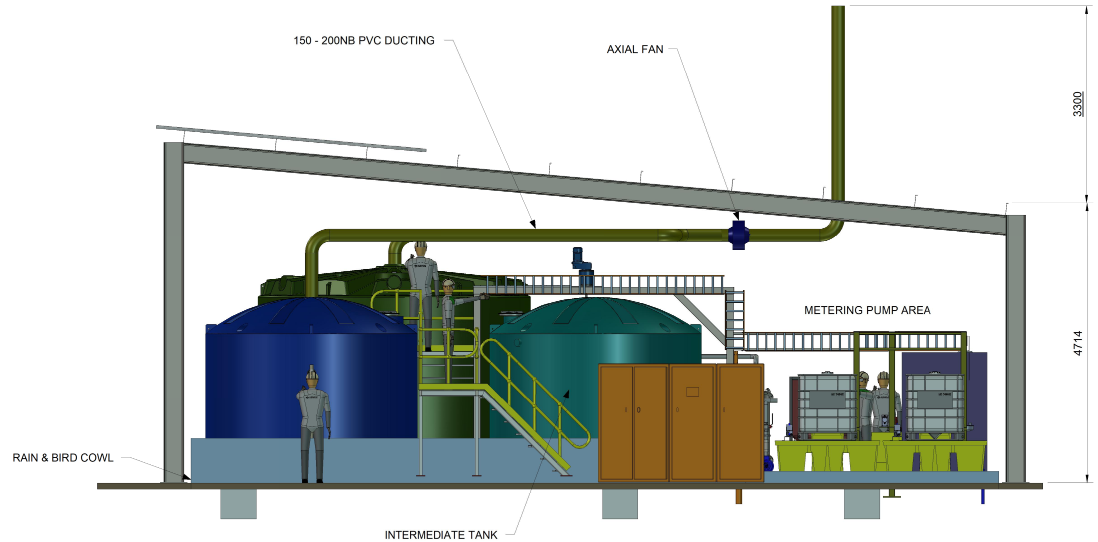
PACT GROUP		TANK VENTING JALCO HORSLEY PARK		Sheet No: 1 Rev. 2 Doc. No: JAL-WTOC-001







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				Created Date: 23/5/2022
PACT GROUP		TANK VENTING JALCO HORSLEY PARK		Sheet No: 2 / Rev. 2
				Doc. No: JAL-WTOC-002

APPENDIX C

Manufacturing Plant Extraction and Filtration Systems Design

Polex™

Polex Environmental Engineering Pty Ltd
ACN 121 129 842

PRELIMINARY / DRAFT REPORT

Company	Pact Group
Attention	Gopi Dhanekula
From	Grant Stevens
Date	26 May 2022
Subject	Extraction systems – rev C

Dear Gopi,

Thank you for the opportunity to prepare this report.

The purpose of the report is for the preliminary design of extraction systems to extract, filter and exhaust fugitive emissions generated during filling and storage of liquid products at the new JALCO plant located in Horsley Park, NSW.

The JALCO production plant consists of multiple bulk storage tanks, mixing tanks and liquid filling lines for the preparation and packaging of liquid products.

There is a large number (150+) chemicals that are used in the storage and filing processes. These chemicals are added to water in low concentrations. A typical 80 tonne batch consists of 80% water and 20% of the various chemicals.

During the filling of the BULK STORAGE and MIXING TANKS, vapour laden air is displaced from the tanks. Our design method is based on localised extraction to ensure that fugitive emissions are captured at source, which is through direct connection to the top of each tank. Replacement air is introduced through an overflow pipe connected to the top of each tank. The fugitive emissions from the LIQUID FILLING MACHINES are managed by creating sufficient air velocity (1 m/s) through the openings into and out of the enclosures associated with the liquid filling lines to ensure that emissions do not escape into the areas occupied by production staff. With proper coverage on the top of the filling machines, a maximum of 10% fugitive emissions into the surrounding workspace is achievable. After the fugitive emissions are captured at source, they are transported through ducting, filters, fans and exhaust stacks.

There are two independent systems being proposed.

One system is for the extraction and filtration of emissions from the Liquid filling lines (LF) and the Enzyme room. Filtration is through 2 stages: HEPA filtration for the enzymes, and CARBON filtration for the odours. The filter system also incorporates pre-filters for the removal of any airbourne particulates, which protects both the HEPA and CARBON filters.

The second system is for the extraction and filtration of emissions from bulk tanks (BT-01 to BT-15), mixing tanks (MT-01 to MT-13), hopper for citric acid area, hopper for salt mixing and the dispensary area. Filtration (adsorption) is through activated CARBON. The filter system also incorporates pre-filters for the removal of any airbourne particulates, which protects the CARBON filters.

Given the large range and various proportions of chemicals used, determination of the reduction of odour units from the production processes is best suited to selecting a maximum vapour / odour contact time with the activated CARBON filters. Activated CARBON filtration efficiency is based on the contact time that the vapour is in contact with activated CARBON to allow proper adsorption. We are basing our design on typical chemical vapour contact times used in industry to provide effective adsorption to achieve 90%-95% adsorption of the range of diluted chemical vapours.

In the event that additional HEPA and/or CARBON filtration is required due to increased fugitive emissions (ie. Due to unexpectedly high vapour concentration), we are proposing to use a MODULAR filtration system. The HEPA and CARBON filter modules are housed in sections that simply bolt together to allow the entire filter assembly to be extended. The area within the factory has been selected to facilitate the extension of the filter system. Please note that the fan size and ducting size will not be affected by the addition of CARBON modules because they will be added in a parallel configuration. For this scenario, the fan airflow and pressure do not need to be increased. We have also allowed for a safety margin in our airflow calculations to cater for slight increases in airflow required.

Below is a summary of the critical conceptual information for airflows, inlet duct, filters, fans and exhaust stacks.

We have attached the following files for reference to our calculations and sketches:

ESR Horsley PK Site V20- Ventilation_1 - POLEX MARKUP 2022-05-05
PACT GROUP AIRFLOWS – CARBON - 2022-05-05
PACT GROUP AIRFLOWS – HEPA CARBON - 2022-05-05
PACT GROUP DUCT PRESSURE LOSS – CARBON - 2022-05-05
PACT GROUP DUCT PRESSURE LOSS – HEPA CARBON - 2022-05-05
J1401-01-A-FI01 - HEPA + CARBON FILTER
J1401-01-A-FI02 - CARBON FILTER

SYSTEM 1: HEPA / CARBON FILTER SYSTEM

EQUIPMENT

Includes airflow from Liquid filling lines (LF) and the Enzyme room.

Liquid filling lines (LF): We have assumed 200 mm dia duct connections with 15 m/s velocity. There is not enough information at this stage for a full airflow gap analysis through the filling machines.

Enzyme room: The largest amount of airflow required is through the roller door.

AIRFLOW

Total airflow calculated: 29,745 m^3/h
(Based on ambient gas temperature)

INLET DUCT

Duct velocity: approximately 15 m/s
Largest inlet duct diameter: 850 mm

EXHAUST STACK

Exhaust stack duct diameter: 850 mm with 700 mm dia final exit to achieve 21.5 m/s discharge velocity

FILTER BOX (HEPA / CARBON)

Filter box dimensions: 4.2 m long x 1.4 m wide x 3.5 m high (excluding fan)
12 x PRE filters 595x595x95 mm
12 x HEPA filters 595x595x300 mm
12 x CARBON filters 595x595x400 mm

AS 4323.1 compliant sampling ports will be installed on the inlet and outlet of the Hepa / Carbon filters to enable emissions testing.

EXHAUST FAN

29,745 m^3/h @ 6,529 Pa (total static)
Belt-drive, single inlet centrifugal 110 kW

SYSTEM 2: CARBON FILTER SYSTEM

EQUIPMENT

Includes airflow from:

Bulk tanks (BT-01 to BT-15)
Mixing tanks (MT-01 to MT-13)
Hopper for citric acid area
Hopper for salt mixing
Dispensary area

AIRFLOW

Total airflow calculated 11,394 m^3/h
(Based on ambient gas temperature)

INLET DUCT

Duct velocity: approximately 15 m/s
Largest inlet duct diameter: 600 mm

EXHAUST STACK

Exhaust stack duct diameter: 600 mm with 450 mm dia final exit to achieve 20 m/s discharge velocity

FILTER BOX (CARBON)

Contact time: 1 second
Carbon bed depth: 400 mm

Filter box dimensions: 7.7 m long x 1.4 m wide x 2.4 m high (excluding fan)
22 x PRE filters 595x595x95 mm
22 x CARBON filters 595x595x400 mm

AS 4323.1 compliant sampling ports will be installed on the inlet and outlet of the Carbon filters to enable emissions testing.

Polex Environmental Engineering Pty Ltd
ACN 121 129 842

EXHAUST FAN

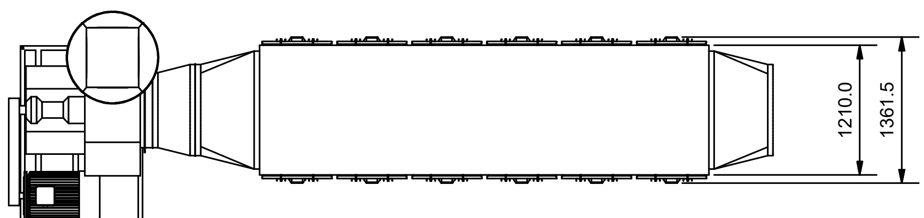
11,394 m^3/h @ 6,217 Pa (total static)
Belt-drive, single inlet centrifugal 45 kW

If you need any further information at this stage please contact me.

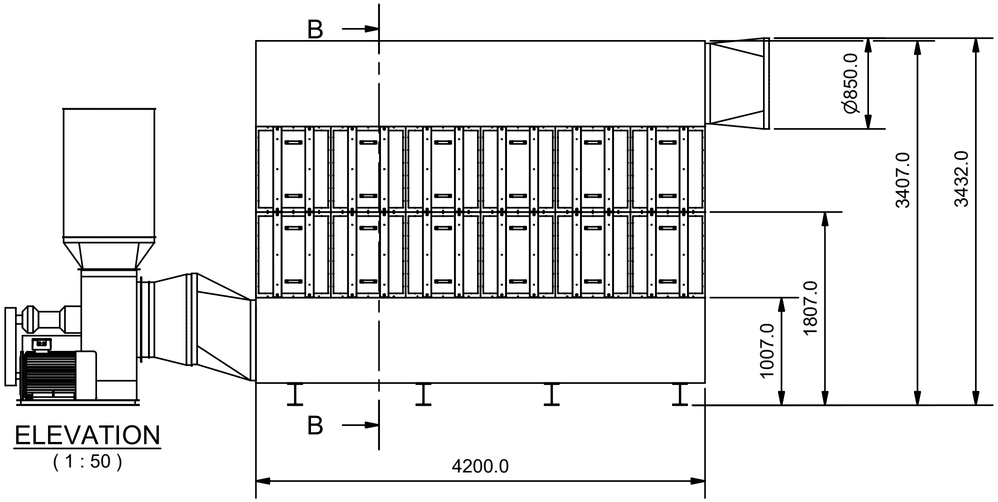
Yours sincerely,

Grant Stevens

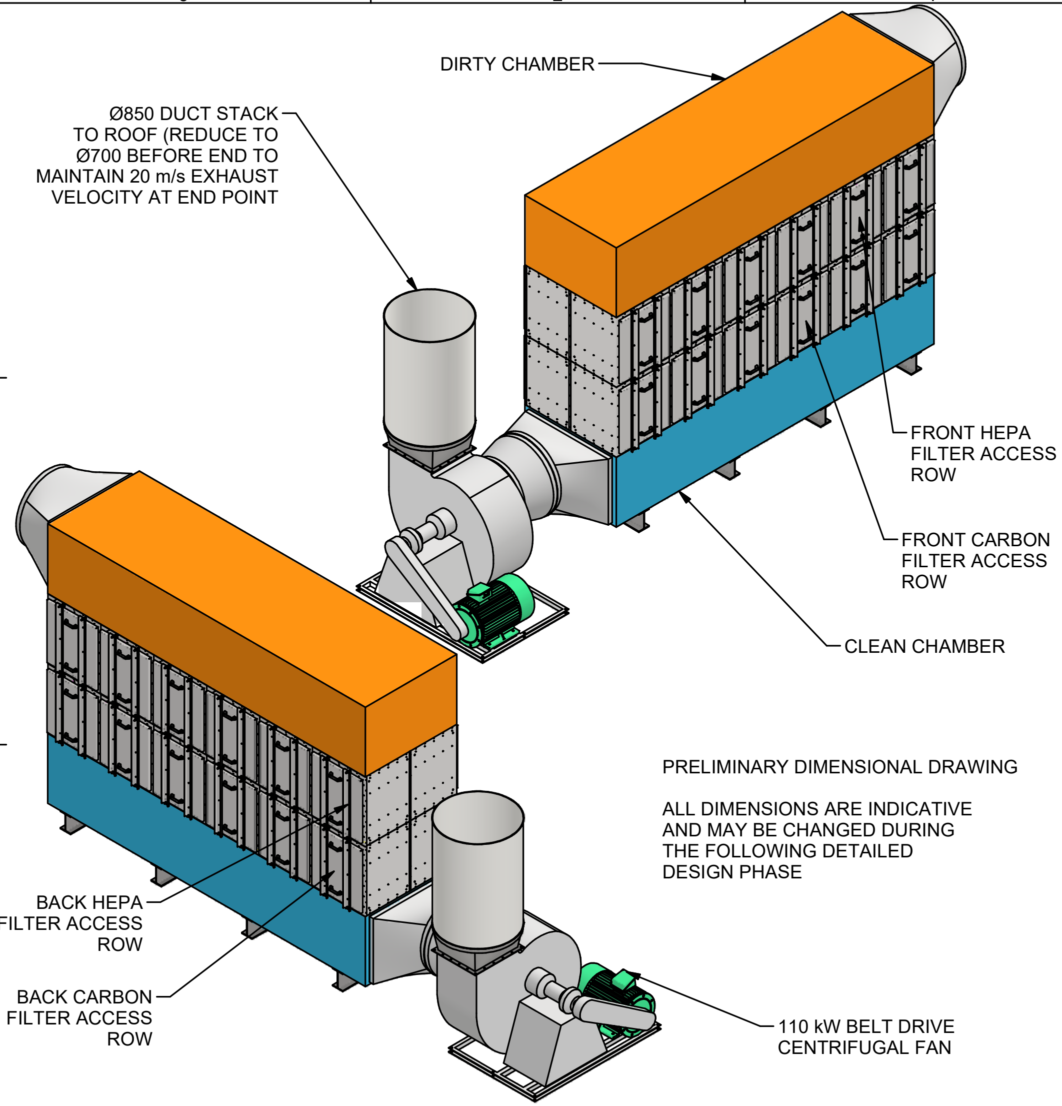
B.E. (Mech)
Managing Director
Polex Environmental Engineering Pty Ltd



PLAN
(1 : 50)



ELEVATION
(1 : 50)



PRELIMINARY DIMENSIONAL DRAWING

ALL DIMENSIONS ARE INDICATIVE AND MAY BE CHANGED DURING THE FOLLOWING DETAILED DESIGN PHASE

PRELIMINARY SPECIFICATIONS:

AIRFLOW

Total airflow calculated: 29,745 m3/h

INLET DUCT

Duct velocity: approximately 15 m/s
Largest inlet duct diameter: 850 mm

EXHAUST STACK

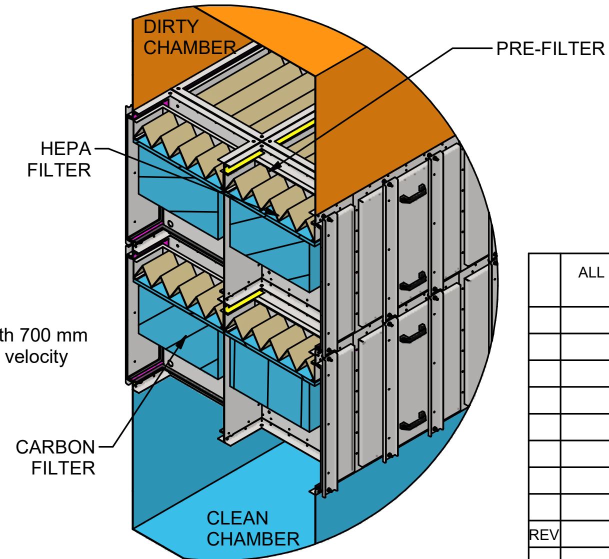
Exhaust stack duct diameter: 850 mm with 700 mm dia final exit to achieve 20 m/s discharge velocity

FILTERS

12 x PRE filters 595x595x95 mm
12 x HEPA filters 595x595x300 mm
12 x CARBON filters 595x595x400 mm

EXHAUST FAN

29,745 m3/h @ 6,529 Pa (total static)
Belt-drive, single inlet centrifugal 110 kW



CROSS-SECTIONED VIEW
(1 : 25)

ALL DIMENSIONS ARE IN mm

REV	DESCRIPTION	BY	DATE

REVISIONS

A3

SALES ORDER NO: 1401
CLIENT: PACT GROUP

PROJECT:
JALCO POWDERS
HEPA + CARBON FILTER

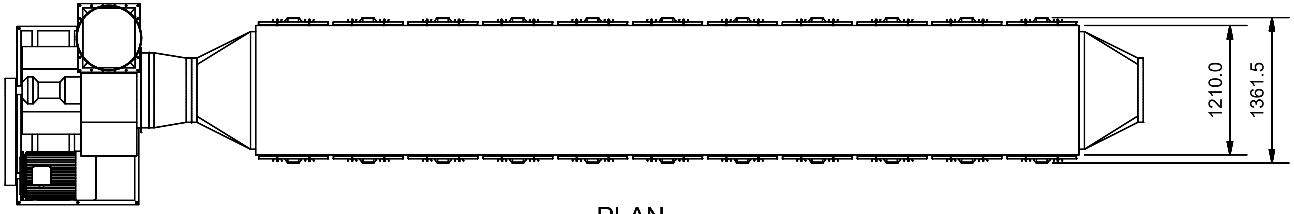
DRAWN	DT	6/05/2022	SCALE
CHECKED			SHEET 1
APPROVED			

Nordfab Pty Ltd
22 CHISHOLM ROAD, SEFTON, NSW 2162, AUSTRALIA
PH +61-02-9738-1777, FAX +61-02-9738-1999
EMAIL: grant@polex.com.au

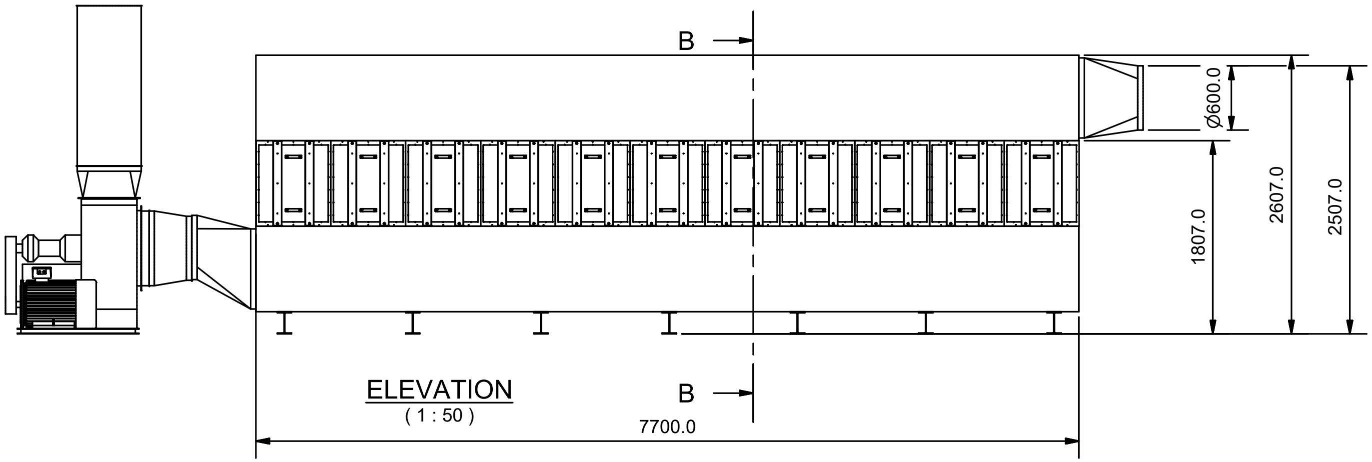
DRAWING NO.
J1401-01-A-FI01

PART NO.
J1401-01-A-FI01

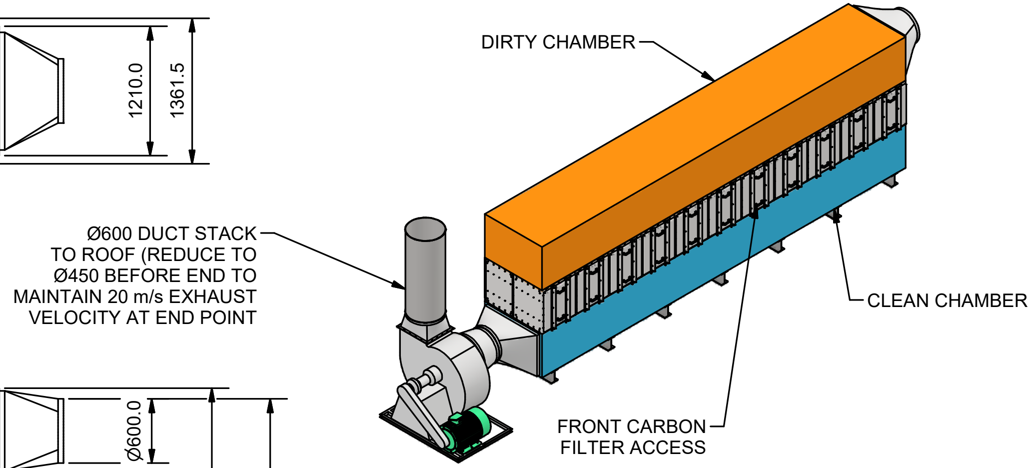
REV
01



PLAN
(1 : 50)

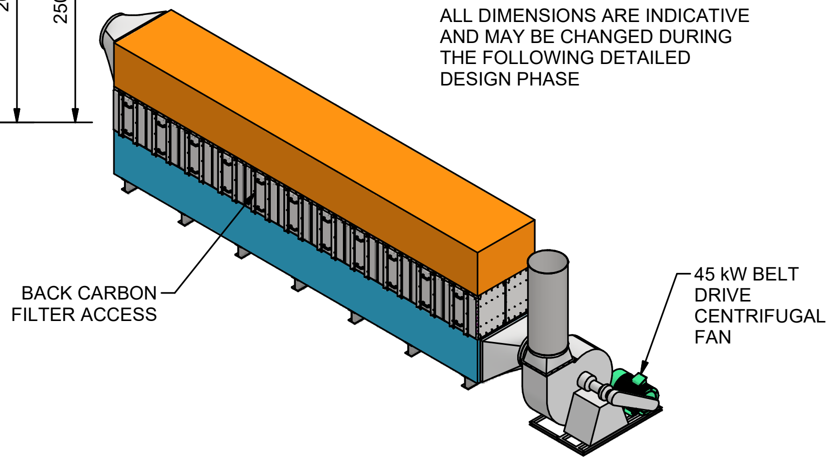


ELEVATION
(1 : 50)



PRELIMINARY DIMENSIONAL DRAWING

ALL DIMENSIONS ARE INDICATIVE AND MAY BE CHANGED DURING THE FOLLOWING DETAILED DESIGN PHASE



PRELIMINARY SPECIFICATIONS:

AIRFLOW

Total airflow calculated 11,394 m3/h

INLET DUCT

Duct velocity: approximately 15 m/s
Largest inlet duct diameter: 600 mm

EXHAUST STACK

Exhaust stack duct diameter: 600 mm with
450 mm dia final exit to achieve 20 m/s discharge velocity

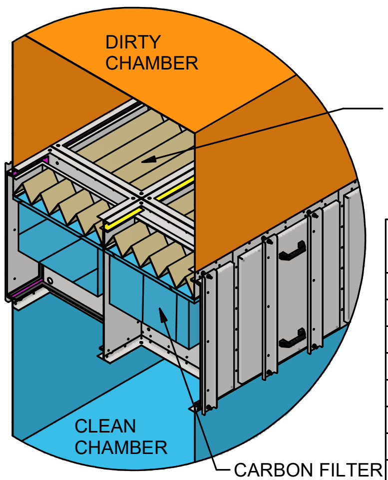
FILTER BOX (CARBON)

Contact time: 1 second
Carbon bed depth: 400 mm

22 x PRE filters 595x595x95 mm
22 x CARBON filters 595x595x400 mm

EXHAUST FAN

11,394 m3/h @ 6,217 Pa (total static)
Belt-drive, single inlet centrifugal 45 kW



CROSS-SECTIONED VIEW
(1 : 25)

	ALL DIMENSIONS ARE IN mm		
REV	DESCRIPTION	BY	DATE
	REVISIONS		

A3

SALES ORDER NO: 1401
CLIENT: PACT GROUP

PROJECT:
JALCO POWDERS
CARBON FILTER

DRAWN	DT	2/05/2022	SCALE
CHECKED			SHEET 1
APPROVED			

Nordfab Pty Ltd
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DRAWING NO.
J1401-01-A-FI02

PART NO.
J1401-01-A-FI02

REV
01

Extraction point	Filter type	Tank liquid filling rate (max)	Qty	Hood width	Hood length	Dia	v	q
		m^3/h		m	m	mm	m/s	m^3/h
MT-01	Carbon	40				100	7.07	200
MT-02	Carbon	40				100	7.07	200
MT-03	Carbon	40				100	7.07	200
MT-04	Carbon	40				100	7.07	200
MT-05	Carbon	40				100	7.07	200
MT-06	Carbon	40				100	7.07	200
MT-07	Carbon	40				100	7.07	200
MT-08	Carbon	40				100	7.07	200
MT-09	Carbon	40				100	7.07	200
MT-10	Carbon	40				100	7.07	200
MT-11	Carbon	40				100	7.07	200
MT-12	Carbon	40				100	7.07	200
MT-13	Carbon	40				100	7.07	200
Hopper for ciric acid area	Carbon	40				100	7.07	200
Hopper for salt mixing	Carbon	40				100	7.07	200
BT-01	Carbon	40				100	7.07	200
BT-02	Carbon	40				100	7.07	200
BT-03	Carbon	40				100	7.07	200
BT-04	Carbon	40				100	7.07	200
BT-05	Carbon	40				100	7.07	200
BT-06	Carbon	40				100	7.07	200
BT-07	Carbon	40				100	7.07	200
BT-08	Carbon	40				100	7.07	200
BT-09	Carbon	40				100	7.07	200
BT-10	Carbon	40				100	7.07	200
BT-11	Carbon	40				100	7.07	200
BT-12	Carbon	40				100	7.07	200
BT-13	Carbon	40				100	7.07	200
BT-14	Carbon	40				100	7.07	200
BT-15	Carbon	40				100	7.07	200
Dispensary area	Carbon	N/A	5	0.6	0.5	357	1	5400
								11394

Filter		
Contact time	s	1
Carbon filter depth	mm	400
Carbon filter width	mm	595
Carbon filter length	mm	595
Carbon filter quantity	N/A	22.4
Fan		
Pressure loss (total static)	Pa	6517
Motor power	kW	33.0
Motor size	kW	45
Stack		
Stack velocity required	m/s	20
Stack diameter (calculated)	mm	449
Stack diameter (actual)	mm	450

Extraction point	Filter type	Qty	W	D	H	Roller door		Dia	v	q
			m	m	m	m	m	mm	m/s	m^3/h
No ref	HEPA							200	15	1696
NEW LF2 - 4 HEAD BLEACH (EXISTING LF2)	HEPA							200	15	1696
NEW LF7 - SACHET LINE (EXISTING LF11)	HEPA							200	15	1696
NEW LF 6 - OP.2 (PASCOES LINE	HEPA							200	15	1696
NEW LF 5- 5L (EXISTING LF3)	HEPA							200	15	1696
NEW LF4 - OP.2 (EXISTING LF5, 7 & 9)	HEPA							200	15	1696
NEW LF3- 6 HEAD CMI (EXISTING LF4)	HEPA							200	15	1696
No ref	HEPA							200	15	1696
Enzyme room - Manual Handling	HEPA							100	15	424
Enzyme room	HEPA	6						50	15	636
Enzyme room	HEPA		11.8	4.2	5	2.4	3.5			15120
										29745
Filter										
HEPA filter velocity	m/s									2
HEPA filter width	mm									595
HEPA filter length	mm									595
HEPA filter quantity	N/A									11.7
Fan										
Pressure loss (total static)	Pa									6517
Motor power	kW									86.2
Motor size	kW									110
Stack										
Stack velocity required	m/s									20
Stack diameter (calculated)	mm									725
Stack diameter (actual)	mm									700

		Units	Dia 1	Dia 2	Dia 3	Dia 4	Dia 5	Dia 6	Dia 7	Dia 8	Dia 9	Dia 10	Dia 11	Dia 12	Dia 13	Dia 14	Dia 15	Dia 16
Input																		
Air density		kg/m^3	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130
Air Temperature		deg C	20															
Diameter of Duct	d	m	0.100	0.100	0.125	0.150	0.180	0.180	0.200	0.200	0.450	0.450	0.450	0.450	0.500	0.500	0.500	0.500
Length of Duct	L	m	15.0	2.0	2.0	2.0	4.0	2.0	2.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0
Number of Elbows			4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Branches			0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Number of Connections and Cones			1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Valves			1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Length of Flexible Hose	m		2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Volume	Q	m^3/h	200	400	600	800	1000	1200	1400	1600	7000	7200	7400	7600	7800	8000	8200	8400
Maximum air volume	Q	m^3/h	**11200**															
Output																		
Velocity	V	m/s	7.1	14.1	13.6	12.6	10.9	13.1	12.4	14.1	12.2	12.6	12.9	13.3	11.0	11.3	11.6	11.9
Dynamic Loss	Pd	Pa	28	113	104	89	67	97	87	113	84	89	94	100	69	72	76	80
Linear Pipe Loss	Pl	Pa	85	45	33	24	30	22	17	23	15	8	17	9	11	6	12	6
Pressure Loss in Elbows	Pc	Pa	23	34	31	27	20	29	26	34	25	27	28	30	21	22	23	24
Pressure Loss in Branches	Pdev	Pa	0	23	21	18	13	19	17	23	17	18	19	20	14	14	15	16
Pressure Loss in Connections & Cones	Prac	Pa	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure Loss in Valves	Pval	Pa	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure Loss in Flexible Hose	Pfl	Pa	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure Loss in duct per Diameter			135	102	85	69	64	70	61	79	57	53	64	59	45	42	50	46

		Units	Dia 17	Dia 18	Dia 19	Dia 20	Dia 21	Dia 22	Dia 23	Dia 24	Dia 25	Dia 26	Dia 27	Dia 28	Dia 29	Dia 30	Dia 31	Dia 32
Input																		
Air density		kg/m^3	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130
Air Temperature		deg C																
Diameter of Duct	d	m	0.500	0.500	0.500	0.500	0.500	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.600	0.450
Length of Duct	L	m	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0	30.0	1.0
Number of Elbows			2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	0
Number of Branches			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Number of Connections and Cones			0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Number of Valves			0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Length of Flexible Hose	m		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Volume	Q	m^3/h	8600	8800	9000	9200	9400	9600	9800	10000	10200	10400	10600	10800	11000	11200	11200	11200
Maximum air volume	Q	m^3/h																
Output																		
Velocity	V	m/s	12.2	12.4	12.7	13.0	13.3	11.2	11.5	11.7	11.9	12.2	12.4	12.6	12.9	13.1	11.0	19.6
Dynamic Loss	Pd	Pa	84	88	92	96	100	71	74	77	80	84	87	90	93	97	68	216
Linear Pipe Loss	Pl	Pa	13	7	15	8	16	5	11	6	12	6	13	7	14	7	68	10
Pressure Loss in Elbows	Pc	Pa	25	26	27	29	30	21	22	23	24	25	26	27	28	29	41	0
Pressure Loss in Branches	Pdev	Pa	17	18	18	19	20	14	15	15	16	17	17	18	19	19	14	43
Pressure Loss in Connections & Cones	Prac	Pa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
Pressure Loss in Valves	Pval	Pa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
Pressure Loss in Flexible Hose	Pfl	Pa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure Loss in duct per Diameter			55	51	60	56	66	41	48	44	52	48	56	52	60	55	147	53

Ave velocity		m/s	12.5	
Dynamic Loss	Pd	Pa	88	
Inlet Pressure Loss	Pe	Pa	44	
Outlet Pressure Loss	Pu	Pa	88	
Pressure Loss in PRE FILTER	Pcyclone	Pa	250	
Pressure Loss in CARBON FILTER	Pfilter	Pa	3000	
Static Pressure Loss	Pstatic	Pa	**5406**	
Safety Factor for Additional Parts Required			15%	
Static Pressure Loss (adjusted)		Pa	6217	
Static Pressure Loss (with temp correction)		Pa	**6217**	
Fan dynamic pressure		Pa	300	estimated
Total Pressure Loss (inc fan dynamic pressure)	Ptotal	Pa	**6517**	
Fan Efficiency		%	75%	
Internal Power		kW	27.0	
Fan Losses		%	20%	
Required Power		kW	**32.4**	
Fan Motor Selected		kW	45	

Extraction point	Filter type	Qty	W	D	H	Roller door		Dia	v	q
			m	m	m	m	m	mm	m/s	m^3/h
No ref	HEPA							200	15	1696
NEW LF2 - 4 HEAD BLEACH (EXISTING LF2)	HEPA							200	15	1696
NEW LF7 - SACHET LINE (EXISTING LF11)	HEPA							200	15	1696
NEW LF 6 - OP.2 (PASCOES LINE	HEPA							200	15	1696
NEW LF 5- 5L (EXISTING LF3)	HEPA							200	15	1696
NEW LF4 - OP.2 (EXISTING LF5, 7 & 9)	HEPA							200	15	1696
NEW LF3- 6 HEAD CMI (EXISTING LF4)	HEPA							200	15	1696
No ref	HEPA							200	15	1696
Enzyme room - Manual Handling	HEPA							100	15	424
Enzyme room	HEPA	6						50	15	636
Enzyme room	HEPA		11.8	4.2	5	2.4	3.5			15120
										29745
Filter										
HEPA filter velocity	m/s									2
HEPA filter width	mm									595
HEPA filter length	mm									595
HEPA filter quantity	N/A									11.7
Fan										
Pressure loss (total static)	Pa									6529
Motor power	kW									86.3
Motor size	kW									110
Stack										
Stack velocity required	m/s									20
Stack diameter (calculated)	mm									725
Stack diameter (actual)	mm									700

APPENDIX D

Warehouse Roof Vent Design

FANTECH

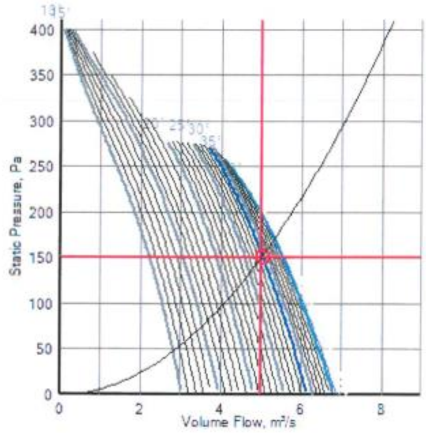
Represented by:
Fantech Pty. Ltd.
A.B.N. 11 005 434 024
63 Vision Street
Dandenong South VIC 3175
Telephone: +61 (03) 9554 7845
Facsimile: +61 (03) 9554 7833
E-mail: info@fantech.com.au

Technical Data - Fan Model RVE0714BP7/29

Location:

Designation:

Performance - Required		**Actual**	
Air Flow :	5.00 m³/s	Air Flow:	5.04 m³/s
Static Pressure :	150 Pa	Static Pressure:	152 Pa
Selection Pressure:	150 Pa	Total Pressure:	250 Pa
Installation Type:	TYPE -		
Air Density:	1.204 kg/m³		
- Atmos. Temp:	20 °C		
- Altitude:	0 m		
- Humidity:	0.0 %		

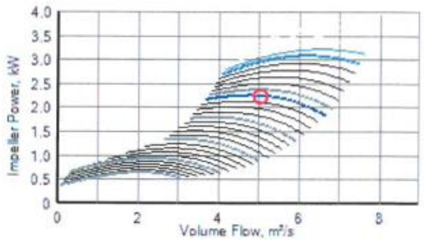


Fan Data

Catalogue Code:	RVE0714BP7/29 (RVE0714BP7B030)		
Description:	Vertical exhaust axial roof unit		
Diameter:	710 mm	Hub:	250 mm
Impeller Type:	Axial	Pitch:	29°
Blade Material:	GRP	Blades:	7
Speed:	1440 r/min @50 Hz	Form:	A
Power, Abs:	2.25 kW	Peak:	2.26 kW
Input Power:	2.57 kW		
Efficiency Total:	55.8%	Static:	34.0%
Fan Weight:	116.9 kg		

Motor Data (at STP)

Motor Type:	Standard	
Electrical Supply:	415V 3ph 50Hz	
Motor Frame:	D100L	
Motor Power:	3.30kW (AOM)	(3.00kW IEC)
FLC/Start:	6.82A (AOM) / 35.96A	(6.20A FL IEC)
Motor Speed:	4 pole	
Motor Efficiency:	87.5%	



Energy Efficiency, NCC/BCA Vol. 1, Table J5.2 compliant
+ 2010 - 2012
+ 2013 - 2016
+ 2015 - 2016 Carpark
+ 2019

Sound Data

Spectrum (Hz):	63	125	250	500	1K	2K	4K	8K	dBW	dB(A) @ 3m
Inlet (dB):	88	84	83	82	80	77	75	66	92	64
Outlet (dB):	89	85	82	82	82	80	78	75	93	66

Sound levels are quoted as in-duct values. dB(A) values are average spherical free-field for comparative use only.

Energy Sustainability Data

Hours Per Day:	10	Annual Electricity Cost ($):	1235.6
DaysPerYear:	300	Annual GH Gas (Tonnes):	11.3
CO2 per kWh (kg):	1.467	Annual Carbon Usage (Tonnes):	3.1
Cost per kWh ($):	0.16		

As part of our continuous improvement processes, Fantech reserves the right to make changes in design or specification to products without notice.

Printed 17-Aug-21 9:10:38 AM

APPENDIX E

Site Plans and Elevations

DEVELOPMENT SUMMARY (LOT 201)	
SITE 1 AREA (Warehouse 1)	36,582 sqm
SITE 2 AREA (Warehouse 2 & 3 & Cafe Site)	40,728 sqm
SITE AREA (Lot 201 Total)	77,310 sqm
EFFICIENCY	52.48%
WAREHOUSE 1	19,731 sqm
MAIN OFFICE 1 (2 Level)	536 sqm
WAREHOUSE 1 DRIVER'S AMENITIES	38 sqm
WAREHOUSE 1 Switch & Compressor Room	140 sqm
WAREHOUSE 1 Storage Area	375sqm
WAREHOUSE 2	18,403 sqm
MAIN OFFICE 2 (2 levels)	578 sqm
MAIN OFFICE 3 (2 levels)	415 sqm
WAREHOUSE 2 GENERAL WASTE AREA	100 sqm
WAREHOUSE 2 PLANT ROOM	200 sqm
ESTATE CAFE	60 sqm
TOTAL BUILDING AREA	40,576sqm
CAR PARKING PROVIDED	232 spaces
CAR PARKING PROVISIONAL	2 spaces

Parking Schedule (Lot 201 WH1)

Type Mark	Type	Count
PK-CP1	PK-CP1-5500 x 2500mm - 90 deg	106
PK-DP1	PK-DP1-5500 x 2500mm - (Disable)	2
Grand total		108

Parking Schedule (Lot 201 WH2)

Type Mark	Type	Count
PK-CP1	PK-CP1-5500 x 2500mm - 90 deg	96
PK-DP1	PK-DP1-5500 x 2500mm - (Disable)	2
Grand total		98

Parking Schedule (Lot 201 - WH3)

Type Mark	Type	Count
PK-CP1	PK-CP1-5500 x 2500mm - 90 deg	15
PK-CP3	PK-CP3-5500 x 2400mm - 90 deg 2	4
PK-DP1	PK-DP1-5500 x 2500mm - (Disable)	1
PK-PP2	PK-PP2 5.9 x 2.2m Parallel (Provisional Parking)	2
Grand total		22

Parking Schedule (Cafe)

Type Mark	Type	Count
PK-CP1	PK-CP1-5500 x 2500mm - 90 deg	5
PK-DP1	PK-DP1-5500 x 2500mm - (Disable)	1
Grand total		6

Site Facilities Plan (Lot 201)

1 : 500 @B1

DEVELOPMENT APPLICATION

PROJECT: ESR HORSLEY LOGISTIC PARK

ADDRESS: 327-335 BURLEY ROAD HORSLEY PARK NSW

PROJECT NUMBER: 200226

Rev	Description	Date
P22	WH1 Tenancy plant fitout added.	30.07.21
P23	Lot 201 - Warehouse 2B & 3 consolidated to 2B, Mechanical roof plant and with screening added.	05.08.21
P24	WH1 internal rooms added.	09.08.21
P25	Warehouse 1 fitout updated.	20.09.21
P26	Racking layout added.	08.10.21
P27	Jalco fitout and stacks revised..	26.05.22

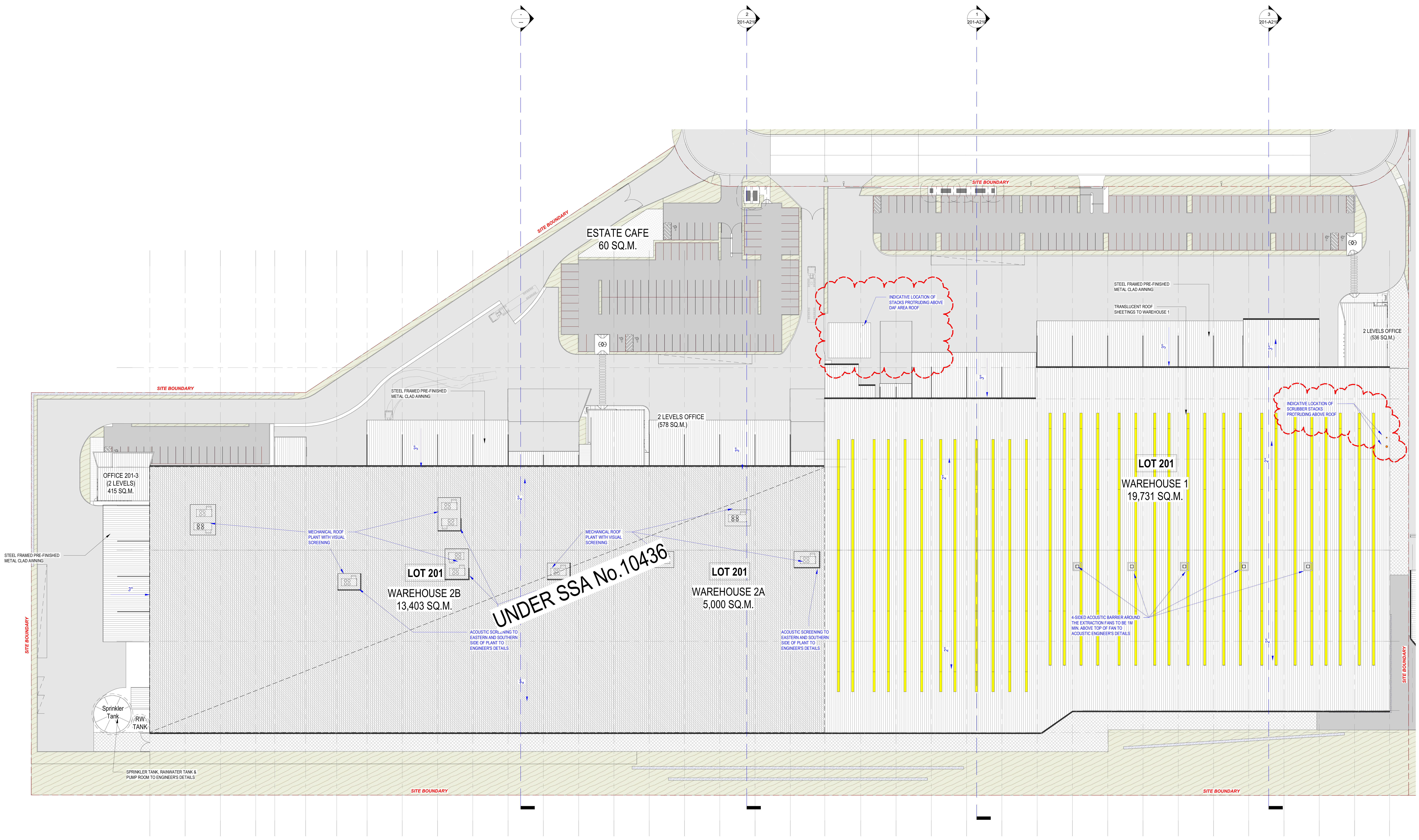
General Notes:-
Architectural drawings to be read in conjunction with all other consultants detailed drawings, specifications & reports.
Do not scale this drawing. Verify all dimensions on site.
Refer all discrepancies to HLA before commencing any work.

HL Architects Pty Ltd A.C.N. 161 638 320
nominated architect: Kok Hong LAU
(Reg.No. NSW #7559, QLD #5003, TAS #1101)
e admin@hlarchitects.com.au
t 02 9166 9942
m 0424 160 365
w www.hlarchitects.com.au
a Suite 53, 9 George St, North Strathfield NSW 2137

DRAWING TITLE: LOT 201 SITE & FACILITY PLAN

DRWN: AB | CHK: HL

DRAWING NUMBER: 200226 - DA - 201-A100 | ISSUE: P27



1 201 Roof plan
201-A200 1 : 500 @B1

DEVELOPMENT APPLICATION

ESR

PROJECT: ESR HORSLEY LOGISTIC PARK
ADDRESS: 327-335 BURLEY ROAD HORSLEY PARK NSW
PROJECT NUMBER: 200226

Rev	Description	Date
P1	Lot 201 - Warehouse 2B & 3 consolidated to 2B, Mechanical roof plant and with screening added.	05.08.21
P2	Lot 201 Roof plant platform finalised.	02.09.21
P3	Acoustic screen added to roof plant.	07.10.21
P4	Acoustic fence added to extraction fans. WH 2A & 3 elevations updated.	28.10.21
P5	Stacks above roof added.	01.11.21
P6	Jalco fitout and stacks revised..	26.05.22

General Notes:-
Architectural drawings to be read in conjunction with all other consultants detailed drawings, specifications & reports.
Do not scale this drawing. Verify all dimensions on site.
Refer all discrepancies to HLA before commencing any work.

HL Architects Pty Ltd A.C.N. 161 638 320
nominated architect: Kok Hong LAU
(Reg.No. NSW #7559, QLD #5003, TAS #1101)
e admin@hlarchitects.com.au
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w www.hlarchitects.com.au
a Suite 53, 9 George St, North Strathfield NSW 2137

hla architects

DRAWING TITLE: ROOF PLAN
DRWN: Author
CHK: Checker
DRAWING NUMBER: 200226 - DA - 201-A105
ISSUE: P6

26/05/2022 5:18:55 PM BIM 360://327-335 Burley Rd/03_V3 Burley Rd.rvt

3 Lot 201 Cross Section (WH-1 - Storage Shed)

201-A105 1 : 250 @B1

1 Lot 201 Cross Section (WH-1 Flush Dock)

201-A105 1 : 250 @B1

DEVELOPMENT APPLICATION

ESR

PROJECT: ESR HORSLEY LOGISTIC PARK

ADDRESS: 327-335 BURLEY ROAD, HORSLEY PARK NSW

PROJECT NUMBER: 200226

Rev	Description	Date
P10	Acoustic screen added to roof plant.	07.10.21
P11	Acoustic fence added to extraction fans. WH 2A & 3 elevations updated.	28.10.21
P12	Stacks above roof added.	01.11.21
P13	Acoustic screen levels clarified.	25.01.22
P14	Acoustic screen levels clarified with minor adjustment.	27.01.22
P15	Jalco fitout and stacks revised..	26.05.22

General Notes:-
Architectural drawings to be read in conjunction with all other consultants detailed drawings, specifications & reports.
Do not scale this drawing. Verify all dimensions on site.
Refer all discrepancies to HLA before commencing any work.

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DRAWING TITLE: LOT 201 WAREHOUSE SECTIONS

DRAWN: AB
CHK: HL

DRAWING NUMBER: 200226 - DA - 201-A210

ISSUE: P15

APPENDIX F

List of MSDS' Reviewed

MSDS name	MSDS name
Fr Lustrous 1034901 (Seven Scent)	Calcium Chloride (Redox)
Acticide Rsc (Thor)	Carezyme Premium 4500l (Novozymes)
Sds Global Fragrance_Apple Splash 10776_Ap17358200	Cbsx Optical Brightener Sds (Redox)
95 Sgf4-Zci 200l Drum 1000l Ibc (Ethanol (Wilmar)	Citric Acid Anhydrous Sds (Redox)
Eucalyptus Compound A209010 (Gr Davis)	Cmc Dt 1000 Finnfix Bda (Sodium Carboxymethyl Cellulose) (Redox)
Eucalyptus Oil Bp7075 (Auschem Pacific)	Dequest 2047g (Edtmpa) (Redox)
Frag Ballerina 77 (Givaudan)	Detercal G Blue (Albright & Wilson)
Cold Active 525 Eo (Givaudan)	Direct Blue 86 (Kayarus Turquoise Blue Gln) (Cathay)
Elegant Silk A Tsg14-07934 Sds (Takasago)	Telon Turquoise M-5g 85% 2013 Sds (Dyechem)
Everlasting Blue 51_Aad0636800 (Givaudan)	Acid Light Yellow 2g (Cathay)
Frag Solar Spark 217 Eo (Givaudan)	Exacol Carmoisine (Cathay)
Tender Touch B Tsg14-07937 Sds (Takasago)	Exacol Chocolate Brown Ht (Cathay)
Gardilene Ssas-Ssasj (Albright & Wilson)	Exacol Tartrazine (Cathay)
Gardiquat 1450 (Albright & Wilson)	Lanaset Violet B (Ascher Colour)
Gardiquat 1450dodigen 1611actici Bac50 (Clariant)	Edta Acid Trilon Bs (Redox)
Lactic Acid Sds (Redox)	Fluorescein Lt (Cathay)
Oxamin Lo-Ammonyx Co (Indorama)	Gardilene Fd Sds 45886 (Albright & Wilson)
Perf Citron (Firmenich)	Gardilene Sq70 (Albright & Wilson)
Perf Citrus Fantasy Cp187459 (Firmenich)	Gardilene Sx40au(Albright & Wilson)
Perf Forever Summer 4905 (Iff)	Gardinol Esb 30 (Albright & Wilson)
Fragrance Green Apple Rf8420 (Givaudan)	Genagen Cab Uqs Dehyton Ke-As (Basf)
Fragrance Indigo Rose 6921	Genagen Cab Uqs (Clariant)
Perf Lavender Fresh Mod Sds (Iff)	Mermaid Grade 6-9 Salt (Cheetham Salt)
Domestos Blue Lb0045h(1021) (Givaudan)	Liq Sod Silicate D.Vitrasol A5 (Pq Australia)
Lemon Soap Fragrance (Iff)	Hi-Foam 750 (Rpl)
Sinbad 88e Vs3 (Givaudan) (2)	Isopropyl Laurate Palmester 1505 (Axieo)
True Lime 185 (Givaudan)	Aximul Dsn18 (Axieo)
Fragrance Velvet 6282 (Givaudan)	Lactic Acid Sds (Redox)
Fragrance Fresh R191951 (Givaudan)	Lamesoft Po 65 (Rspo) (Basf)
Fragrance Mountain Forest (Givaudan)	Liquitint Aquamarine (Rpl)
Polyquart Pro A (Basf)	Liquitint Blue Hp (Rpl)
Peracetic Adic Peraclean 5 (Redox)	Liquitint Bright Yellow (Rpl)
Rhodamine 25% Ww I.M.S. (Cathay)	Liquitint Green Cg (Milliken)
Sodium Hydroxide 46 -50% Sds (Ixom)	Liquitint Pink Al (Milliken & Company)
Sodium Hypochlorite Sds (Ixom)	Liquitint Red St (Milliken)
Sodium Metasilicate 5h20 (Redox)	Dye Liquitint Yellow Lp (Milliken)
Sunqat_Ctn90-Sds (Rpl)	Mannaway 4 0l Sds (Novozyme)
Teric 164 (Indorama Ventures)	Mannaway 4 0l Sds (Novozyme)

MSDS name	MSDS name
Pinechem 560_Au Ghs Sds (Axieo)	Mermaid Table Salt (Free Flowing Agents) (Cheetham Salt)
Fragrance Tiger Lily Petals 13037 (Givaudan)	Nd-Acid Brilliant Blue 150% (Cathay)
Trilon Bx Liquid (Basf)	Palmera A9912 (Lauric Acid 99%) (Axieo)
Yellow Citrus 12789 (Givaudan)	Lemon Splice 600 (Givaudan)
Fragrance Sunglow 481 (Givaudan)	Propylene Glycol Bp-Usp (Avo1p05700) (Imcd) (2)
Fragrance Blue Fresh 151 (Givaudan)	Propylene Glycol Bp-Usp (Avo1p05700) (Ingredients Plus)
Frag Alice Springs 738603 Sds (Symrise)	Rhodamine B540 (Cathay)
Perf Wattle & Orange Flower 5042 (Iff)	Sixin_G-920s-Sds 23-11-16 (Rpl)
Poseidon 17dd (Iff)	Sixin_G-9051-Sds (Rpl)
Thor 57aa (Iff)	Soda Ash Dense (Natrio Pty Ltd)
So Fresh 1636 (Iff)	Soda Ash Dense Sds (Ixom)
Eucalyptus (Symrise)	Soda Ash Dense Sds (Redox)
Cpd Lavender (Iff)	Soda Ash Dense 25kg Wpp Bags (Redox) (2)
Frag Orange Paradise 9463 An04125201 (Givaudan)	Soda Ash Light (Tangshan Sanyou)
Fragrance Fresh Peel 8407(Givaudan)	Soda Ash Light (Redox)
Triclosan (Dksh)	Soda Ash Light Sds (Sanyou)
Lemon Blitz (Iff)	Sodium Benzoate Bp (Emerald Performance Chemicals)
Flower Blue 79 Hypo (Givaudan)	Sodium Bicarbonate Sobica7420 Animal-Ind (Redox)
Perf Honey Blossom & Black Orchid 7335 (Iff)	Sodium Citrate Hydrous (Redox)
Eucafresh 661 (Iff)	Sodium Stearate (Rpl)
Mambo 244175 Be (Firmenich)	Sokalan Cp 5 Granules (Basf)
Bluefusionpowder 187398 F (Firmenich)	Stepanol Dcfas (Ixom)
Citrus Fantasy 147831kb (Firmenich)	Stpp (Redox)
Frag Ceremonia Hl 18 12962 (Henkel)	Stpp T701 25kg Bag -Sotrip0800 (Redox)
Frag Baremeplus Hl 18 12971 (Henkel)	Teric La8n (Indorama Ventures)
Frag Sunny Hl 17-12907 (Henkel)	Teric La8n(Indorama Ventures)
Frag Louisa Hl 17-12909 (Henkel)	Tinopal Cbs X Sds (Basf) (003)
Frag Glamorous Hl 17-12904 (Henkel)	Tinopal Dma-X (Basf)
Frag Frangi Flower Hl 18 12966 (Henkel)	Triethanolamine 99% (Redox)
Flora Bleach Lfa2865 (Ixom)	Trilon B Powder (Basf)
Purple Romance Hl 18-13080 (Henkel)	Urea Prill (Ixom)
Teric 12a4n-Mb (Indorama Ventures)	Vitamin E Acetate (Brenntag)
Garidquat Obau (Albright & Wilson)	Vitrasol N40 (Na-Silic) (Pq Australia)
Bio Spotless 66 Hf (Givaudan)	Peractive Ac White (White Taed) (Zhejiang Jinke)
Thor 57aa Rspo Mb (Iff)	Zeolite (Pq Australia)
Adele 60ba (Rspo)(Mb) (Iff)	Sodium Sulphate Anhydrous (Redox)
Perf Lychee&Lime Blossom 5459(Mb)(Rspo) (Iff)	Liquanase Evity 3.5l (Novozymes)
Perf Frangipani Dreams T15112708 (Takasago)	Boric Acid (Optibor Tg)
Blue Boost Encap-T15045517-S (Takasago)	Intensa Envity 200 T (Novozymes)
Markio Hl 18-12969 (Henkel)	Pelben 35 White N1 (Interchem)

MSDS name	MSDS name
Perfume Oil Prem 18-12963 Be Pure Lfg Hl (Henkel)	Magnesium Sulphate Sds (Redox)
Seascape Mod 4824 (Iff)	Polyquta 550d (Ingredients Plus)
Acticide M20 (Thor)	Lemon Dial 788564 (Symrise)
Perf Black Beauty M2 T15129944 (Takasago)	Xpect 1000 L (Novozymes)
Perf Cold Active 525 F (Givaudan)	Trisodium Phosphate (Tsp) (Redox)
Perf Creamy White Mod 5497 (Iff)	Sunset Yellow C155 1610132 (Range Products)
Perf Fabulous Cov (Symrise)	Dowanol Dpnb (Imcd)
Gardilene Hs73au Pf (Albright & Wilson)	Fragrance Mercury 8366 (Givaudan)
Rebirth Lf (Symrise)	Laneto 50 (Rita)
Perf Ocean Mist (Givaudan)	Nipaguard Dmdmh (Clariant)
Perf Blessing 17 (Givaudan)	Liquitint Patent Blue Blue Mc (Rpl)
Perf Active Fresh 91 (Givaudan)	Glucopure Up Glucotain Plus (Clariant)
Frag Lime Time 0193 (Iff)	Guardmax Dtpmp Na7 (Rpl)
Exodus 275 Dz (Givaudan)	Flosoft Fs 222 (Snf)
Perfume 19-13280 Floral Fever Bloom Tc (Henkel)	Progress Uno 100l (Novozymes)
Parrot 303 (Iff)	Medley Boost 200 T (Novozymes)
Perf 20-13462 Roseclean Couture (Henkel)	Alfresco Nat Be 450 (Iff)
Lavabloom 237761 (Symrise)	Sokalan Pa 30 Cl Granules (Basf)
Frag Ceremonia Plus Hl 20-13481 (Henkel)	Coconut Fatty Acid Palmera B1210 (Albright & Wilson)
Vivaldi Pretec Lfg 17-12637 (Henkel)	Dehyton Pk45 (Mb) (Rspo) (Basf)
Perf Deep Azure T15141281 (Takasago)	Praepagen Tqsv-Ipa Rspo(Clariant)
Perf Blooming Season T15142997 (Takasago)	Gardinol Esb70cp (Albright & Wilson)
Fr Lemon & Spearmint (Sevenscent)	Teric La8n-Mb (Indorama Ventures)
Fr Violet & Wild Blackberry (Sevenscent)	Guardmax Hedp Granule (Rpl)
Blancolia 11383p (Rpl)	Sixin Sx 60t (Rpl)
Mr Lemon (Symrise)	Palmfonate Mes Mb (Rpl)
Coco Milk (Symrise)	Jalcoclean V2 (Novozymes)
Active Citrus (Symrise)	Victoria C9099 (Iff)
Lemony Grass (Symrise)	Intensa Core 200l (Novozymes)
Violet & Lavender (Symrise)	Detersoft White (Albright & Wilson)
Sivanase 12 T (Novozymes)	Glucopon 215 Up (Basf)
Amplify 12l (Novozymes)	Xanthan Gum Tnas-Cs (Rpl)
Xpect 1000 T (Novozymes)	Antistatic Pf7 (Imcd)
Carezyme Premium 5000 T (Novozymes)	Sanolin Lave Green G Liq Vp5525 (Clariant)
Sokalan Hp 56 Granula (Basf)	Bitrex (Rpl)
Sokalan Hp 56 Granules Msds	Kayarus Turquoise Blue Gl (Cathay)
Acticide Mbs (Thor)	Sequion Clr (Rpl)
Acusol 445n Polymer Sds (Redox)	Texapon N 25bz (Basf)
Acusol Op305 Opacifier (Redox)	Perf Nd Rose & Rhubarb 11 (Givaudan)
Acusol Op301 (Redox) (3)	Channel 28 6565033-144 (Novozymes)

MSDS name	MSDS name
Aloe Vera Inner Leaf Gel Decolorized 10x (Ingedients Plus)	Lactic Acid 88%(Foodgrade) Class 8-A (Redox)
Aloe Vera Inner Leaf Gel Doeodorised 1x From Concentrate (Ingedients Plus)	Dichloromethane Sds (Honeywell)
Peractive Ac Blue (Blue Taed) (Zhejiang Jinke)	Dichloromethane Sds (Rowe Scientific)
Borax Decahydrate (Redox)	Dichloromethane Sds (Vwr)
Brilliant Blue Fcf Austracert (Cathay)	Sulphuric Acid +51% (Ixom)
Britesil H20 (Interchem)	Blue White Taed Sds (Jinke)
Butyl Glysolv Butyl Icinol (Indorama Ventures)	Butter Natural

APPENDIX G

Negative Pressure Determination

GROSVENOR] **engineering group**
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Part of Grosvenor Engineering Group: KL AIR · AIR-RITE

23 February 2022

ESR Australia

Level 29, 20 Bond St,

Sydney NSW 2000

Attention: Mr David Mollerstrom - Project Manager

Dear David,

Re: Jalco – Liquid Storage Area

We wish to advise that the air exchange rate documented on mechanical services drawings is 1.5 air changes per hour and should create a negative pressure with the fans running. The volumetric flowrate to achieve this air change rate is 25,000 l/s that is facilitated by 5 off roof mounted axial fans at 5,000 l/s each. The success in creating this negative pressure is how well the structure is sealed form the wall mounted air openings to the intake of the fans. Each doorway into this area must have seals and where the walls meet the roof sheets must be sealed. If doorways are not maintained closed the pressure difference will equalise and may have leakage. The room volume is large so we expect the pressure difference to be between negative 1 and 3 Pascals.

Please do not hesitate to contact the undersigned on 0411473518 if you have any further queries on the above advice.

Peter Souflias BE(Mechanical) Fellow EA, MAIRAH
Director and National Engineering Manager
For Grosvenor Engineering Group Pty. Ltd.

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Grosvenor proudly provides building services across Australia. For all enquiries, please call 1300 255 247 www.gegroup.com.au
ABN 12 003 608 795 - ARC Authorisation No. AU10078 - NSW HVAC Contractor No. 60279C - NSW Fire Contractors No.241708C
QLD HVAC Contractors/Electrical No. 77407 - QLD QBCC Contractor No. 1238328 - VIC REC No. 23787 - TAS Electrical No. 1390947

APPENDIX H

Process Flow Diagram

ELECTRICITY

Smithfield 500 KW
Total Required 870 Amps
@60% = 522 Amps for
Liquids

FUEL

Gas Supply
28960 GJ/Year

STEAM

Boiler 500KW

TOWNS / DI WATER
235 + 30% Peak
= 305T/ DAY

COMPRESSED AIR

10bar @ 260L/sec

FIRE PROTECTION

TBC

BULK DELIVERY

Max 4 Trucks/ Day
Single 20T Tanker

PACT DELIVERIES

Max
1 B Double
Truck/ Day

PACKAGING MATERIALS

Sachet Reels
Bottle Labels
Carton Cases
Shrink wraps

24 Trucks/Day
Single 20T Truck

OPERATIONS PLANS

Production :

Phase 1	Phase 2	Phase 3
2000T/week	3000T/week	4000T/week

Packaging Storage

4000 Pallets

Ingredients
Storage (PALLETS)

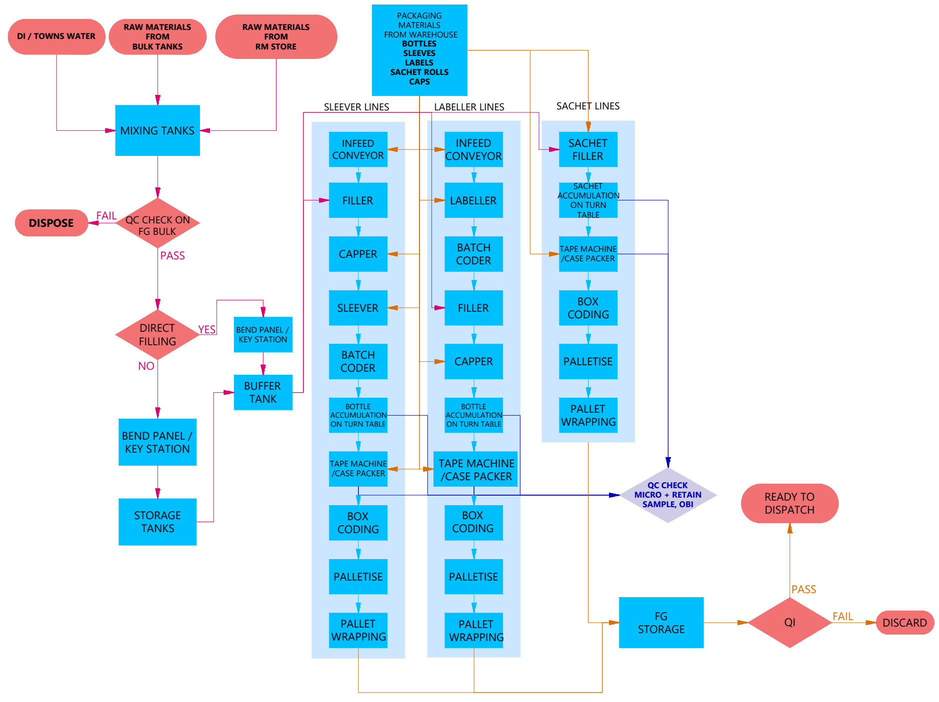
Drums - 250 Pallets
IBCs - 150 Pallets
DG - 50 Pallets

Finish Goods

4500 Pallets

Total Storage area required (Pallets)

FG	16000
Bottles	12000
Shippers	3000
Raw Material	3000



Revised Current Plus
Future Filling Lines

7 Lines
1 New HS Filling Line

17 B Doubles &
5 Single Trucks /Day

FG (Peak Pallets/Day)
Smithfield Site

726 Pallets

Air Emission Control System
1x Carbon/HEPA filter serving
filling lines and dispensary
1x Carbon filter serving Mixing
Tanks and Bulk Tanks

STAFF

Liquid	- 94
Warehouse	- 18
Quality	- 4
Admin	- 10
Engineering	- 9
TOTAL	- 135
New Site Target	- 114

1 Rubbish Bin
Truck /Day

SOLID WASTE

Plastic
Cardboard
General
Scrape Products

CIP WASTE

Reject Products
Rework

Total 60KL

WASTE WATER TREATMENT

100KL for Smithfield
50KL for other sites

Total 150 KL all sites

ASSUMPTIONS

FG Pallet 820Kg (average)
970Kg Max
Truck - 34 Pallets load

COMMENTS :

REVISION	DESCRIPTION	DATE	SIGN	DATE		
			DRAWN	SS	26/05/22	SCALE: NTS
			CHECKED			SHEET SIZE: A3
			APPROVED			SHEET NO.
						ALL DIMENTION ARE IN mm UNLESS OTHERWISE SPECIFIED

DRAWING TITLE :
LIQUID PROCESS FLOW DIAGRAM

DRAWING NO. :

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