Balgowlah McDonalds

Odour Amenity Assessment

McDonald’s Australia Limited

21-29 Central Avenue
Thornleigh NSW 2120

Prepared by:

SLR Consulting Australia

SLR Project No.: 610.032293.00001

16 December 2024

Revision: v1.0

Making Sustainability Happen

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	16 December 2024	K Barker J Boreham	M Pickett	M Pickett
0.1	3 December 2024	K Barker J Boreham	J A Cox	DRAFT

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with McDonald's Australia Limited (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.

Table of Contents

Tables

Figures

Appendices

1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) was engaged by McDonald's Australia Ltd (McDonald's) to prepare an odour amenity impact assessment (OAIA) for a proposed food and drink premises (the Project) located at 37 Roseberry Street, Balgowlah (the Site), relating to potential odour emissions from kitchen operations.

The OAIA includes the following:

- Project overview – **Section 2.0**
- Approach to the assessment – **Section 3.0**
- Description of the existing environment – **Section 4.0**
- Background to odour amenity impacts – **Section 5.0**
- Regulatory requirements – **Section 6.0**
- Odour control measures – **Section 7.0**
- Odour amenity assessment – **Section 8.0**
- Conclusions – **Section 9.0**

2.0 Project Overview

2.1 Site Location

The Site is located at 37 Roseberry Street, Balgowlah approximately 10 km northeast of Sydney Central Business District (CBD) and is surrounded by a range of commercial, residential uses. The regional location of the Site is shown in **Figure 1** and the proposed layout of which is shown in **Figure 2**.

2.2 Operational hours

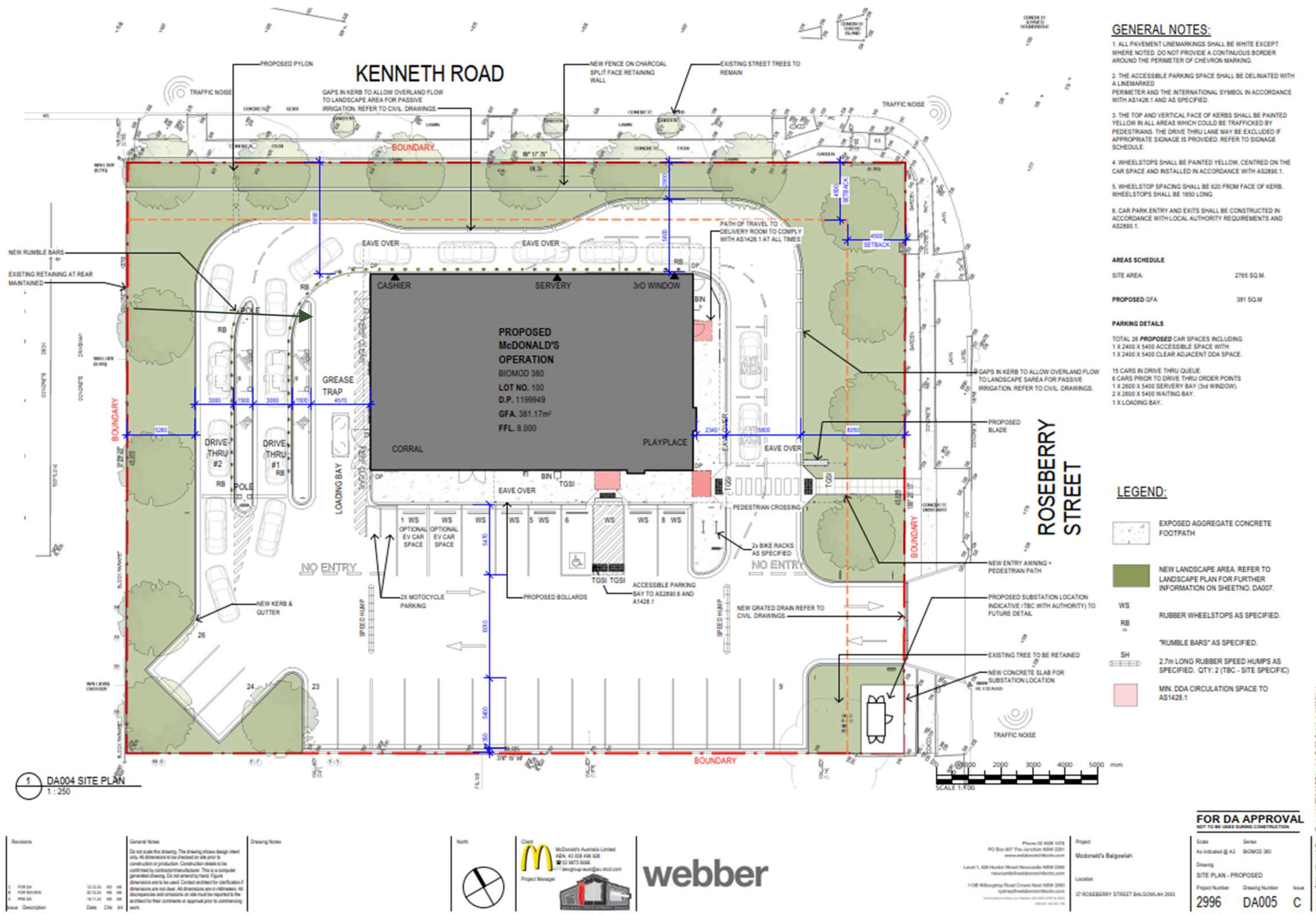
The McDonalds is proposed to operate 24 hours, 7 days a week.

2.3 Deliveries

It is estimated that fresh goods will be delivered daily and dry goods will be delivered 1-2 times per week. Food and supplies. will generally be delivered during periods of low-patronage and not after 10pm.

Figure 1 Site Location

Figure 2 Proposed Site Layout



W

2.4 Identification of Odour Sources

The primary source of potential odorous air emissions from the Project are typically from the cooking and deep frying of food products within the kitchen area. Odorous emissions from kitchens are the result of complex mixtures of odorous VOCs that are formed in the cooking process as breakdown products of natural fats and oils.

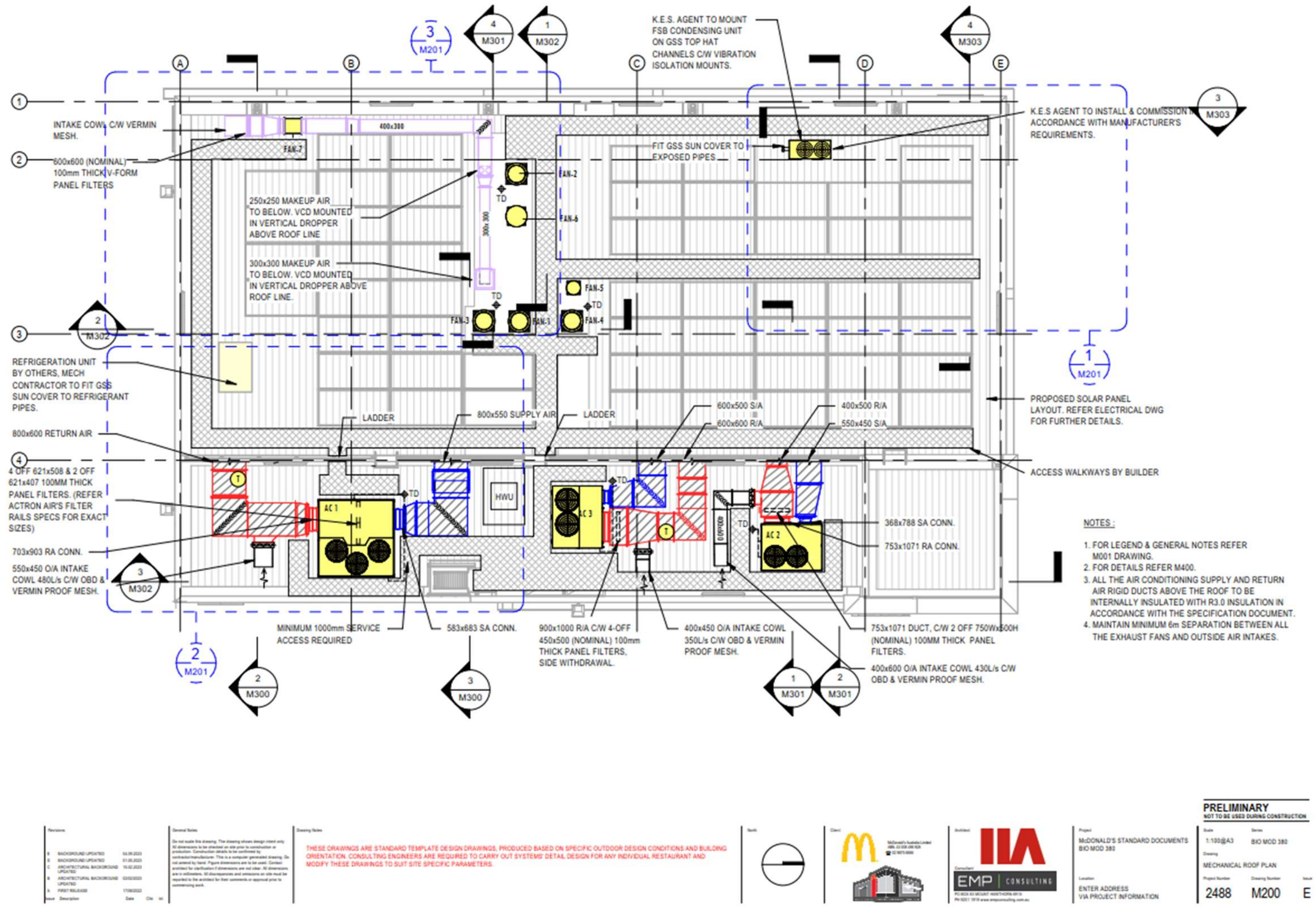
Figure 3 shows the proposed locations of the fans:

- Fan-1: Toilet Exhaust
- Fan-2: Fry exhaust
- Fan-3: Fillet exhaust
- Fan-4: Grill exhaust
- Fan-5: Wash-up exhaust
- Fan-6: IT room
- Fan-7: Makeup air to canopy hoods

The rate of odour emissions from the kitchen exhaust vents would vary throughout the day depending on the demand, with peak times generating more odour. Other potential sources of odorous emissions include the storage and handling of waste at the Site, and to a lesser extent, the storage of raw materials.

It is not anticipated that there will be any significant odours generated by customers entering and leaving the Site via the shared access road. Any odours associated with vehicle emissions would be negligible compared to existing traffic levels, and no significant food-related odours would be associated with this activity. Therefore this source has not been considered further.

Figure 3 Roof-Top Exhaust Locations



3.0 Approach to Assessment

At the time of preparing this report, detailed information on the proposed operational activities (ventilation rates, potential emission rates and how they vary during the day etc.) were not available. A large number of assumptions would therefore be required to be used as input to any quantitative (i.e., air dispersion modelling) assessment. The uncertainty associated with the output of such studies means it would be of limited value and would not (in itself) assist with the identification of air quality control measures to actively manage the risks.

Dispersion modelling is therefore not deemed to be an appropriate tool to assess emissions from the Project due to the following:

- The validated NSW approved dispersion models are less reliable when predicting impacts with short distances between the odour sources and the sensitive receptors. As discussed in **Section 4.1**, the nearest sensitive receptors are approximately 10 m from the Project.
- The validated NSW-approved dispersion models are not able to reliably replicate the complex wind patterns that occur around buildings and influence the distribution of emissions in the near field and ultimately the impact on near field sensitive receptors.
- The wide variability in odour emissions from cooking methods and throughout the day depending on demand is not able to be reliably predicted and is a key factor in the assessment of the potential for adverse odour impacts in the vicinity of the Project.

It is noted that the NSW Environment Protection Authority (NSW EPA) publications (refer to **Section 6.1** for further detail) related to assessment of odour are over 15 years old and in recent times other states have moved away from the requirement to use dispersion modelling for the majority of odour assessments and instead typically defer to a risk-based approach. For example, in Victoria, the Project would be classed as normal food preparation that is deemed to have low odour potential, and in this location, is so different to existing odour sources in the area that it does not have potential to create a cumulative impact. This activity would therefore be classed as requiring a level 1 risk assessment.

SLR has therefore performed a qualitative (risk-based) assessment of operational impacts (based on the information available) to identify activities that have the potential for off-site air quality impacts if not adequately controlled, so that appropriate mitigation measures can be identified and incorporated into the Project design and relevant environmental management plans.

The risk-based operational assessment methodology (see **Appendix A** for full methodology) takes account of a range of impact descriptors, including the following:

- **Nature of Impact**: does the impact result in an adverse or beneficial environment?
- **Sensitivity**: how sensitive is the receiving environment to the anticipated impacts? This may be applied to the sensitivity of the environment in a regional context or specific receptor locations.
- **Magnitude**: what is the anticipated scale of the impact?

The integration of sensitivity with impact magnitude is used to derive the predicted significance of that change. Given the nature of the operations proposed by the Project, and the limited operational data currently available, this approach is considered appropriate to identify those key activities that have the potential to give rise to off-site odour impacts, in order that recommended mitigation measures may be identified.

4.0 Existing Environment

4.1 Surrounding Land Zoning and Sensitive Receptors

As shown in **Figure 4**, the Site is located within a Productivity Support (E3) zone, directly across from a Medium Density Residential (R3) zoned area and a Local Centre (E1). There are Low Density Residential areas further northeast and north west, Public Recreation (RE1) areas to the southeast and southwest, with Private Recreation (RE2) to the southwest also. Condamine Street (SP2 Classified Road) is located approximately 45m to the east.

The closest sensitive receptors to the Site (

Figure 5) are the adjacent commercial activities to its east, south, and west, and residences located to its north. The closest residential boundary of which is approximately 20 m from the Site boundary. The closest exhaust fans are approximately 34 m from the residential receptors façade.

Figure 4 Surrounding Land Zoning

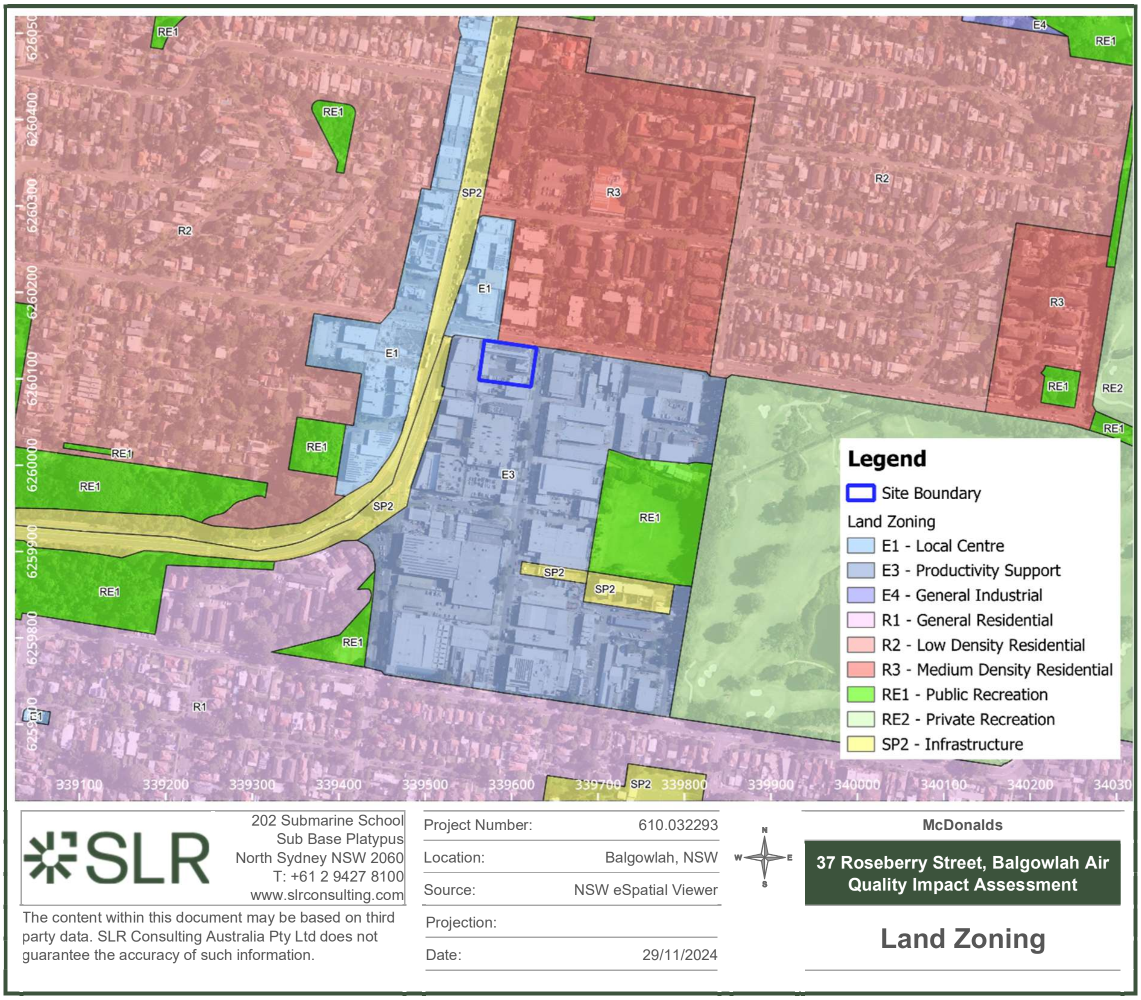
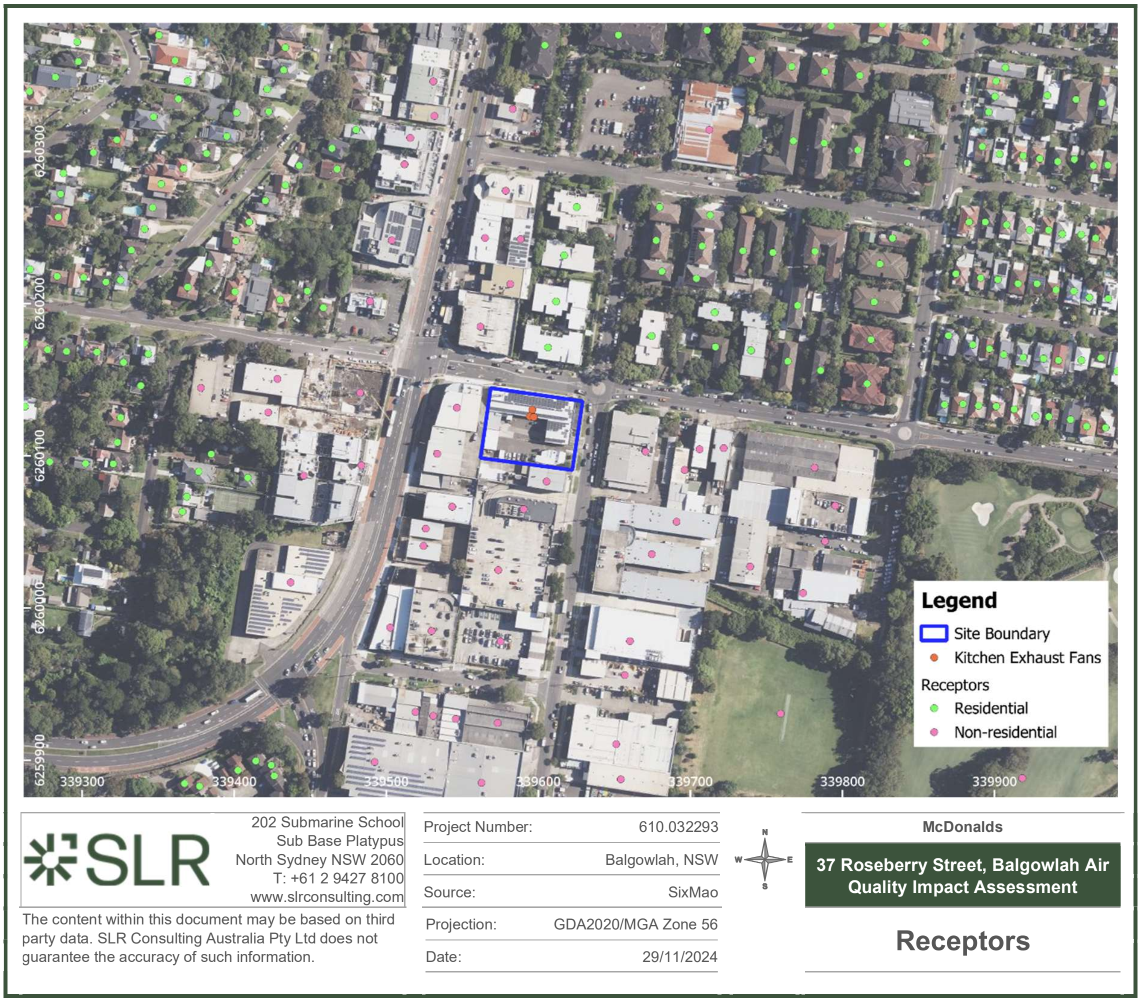


Figure 5 Exhaust Fan Locations and Surrounding Sensitive Receptors



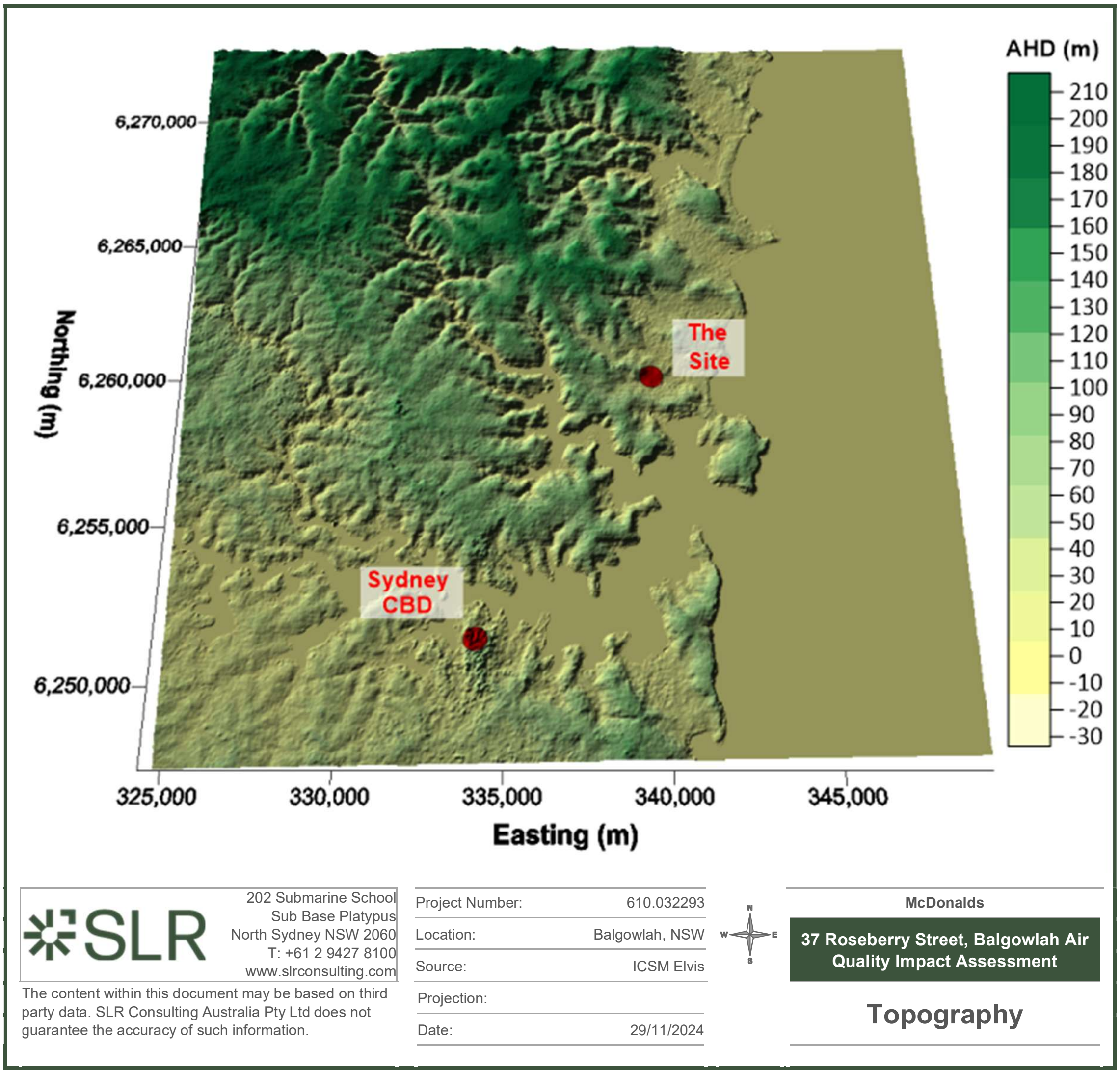
4.2 Local Topography

Local 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.

The regional terrain elevations are illustrated in **Figure 6**.

The topography of the Site is relatively flat with an elevation of approximately 19 m Australian Height Datum (AHD). Land elevations to the west of the Site increases towards North Balgowlah and Manly Dam to an elevation of approximately 90 m and decreases to the east towards Manly Beach.

Figure 6 Topography



4.3 Local Meteorological Conditions

Local wind speed and direction influence the dispersion of air pollutants. Wind speed determines both the distance of downwind transport and the rate of dilution as a result of 'plume' stretching. Wind direction, and the variability in wind direction, determines the general path that pollutants will follow and the extent of crosswind spreading. Surface roughness (characterised by features such as the topography of the land and the presence of buildings, structures and trees) will also influence dispersion.

The Bureau of Meteorology (BoM) maintains and publishes data from automatic weather stations (AWSs) across Australia. The closest such station which records wind speed and wind direction is the Manly (North Head) AWS, which is located approximately 4 km southeast of the Development Site. Considering the relative locations of the Development Site and the North Head AWS, wind data recorded at North Head AWS may not be an accurate representation of winds experienced at the Development Site.

To characterise the winds expected to be experienced at the Development Site, The Air Pollution Model (TAPM) meteorological model (Version 4.0.4) developed by Commonwealth Scientific and Industrial Research Organisation (CSIRO) has been used.

TAPM is a prognostic model that can be used to compile a site-representative meteorological dataset in areas where there is limited observational data available and has been widely used for meteorological and pollutant dispersion modeling studies throughout Australia. The model allows the user to generate synthetic observations by referencing databases (covering terrain, vegetation and soil type, sea surface temperature and synoptic scale meteorological analyses).

The CSIRO has a global data set of synoptic meteorological data that is required as input to the TAPM model. It is derived from analysis data used by meteorological services for weather forecasting. The synoptic meteorological data used in the modelling has been obtained from the CSIRO for the Asia Pacific region for the years of 2019-2023 (inclusive).

Table 1 details the parameters used in the TAPM meteorological model for this assessment.

Table 1 TAPM Input Parameters Used in this Study

Parameter	Value
Number of grids (spacing)	5 (30 km, 10 km, 3 km, 1 km, 0.3 km)
Number of grid points	20 x 20 x 25
Year of analysis	2019-2023
Centre of analysis	339,516 mE 6,260,517 mS (UTM zone 56s)

A summary of the average annual and seasonal wind behaviour predicted by TAPM for the modelled years (2019-2023) at the Development Site is presented as wind roses in **Figure 7**.

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 bar at the top of each wind rose diagram represents winds blowing from the north (i.e. northerly winds), and so on. 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.

The annual wind rose for the years 2019-2023 indicates that throughout the year, wind speeds are mostly between 0.5 m/s and 5.5 m/s with a distribution generally well spread across all directions, with a slightly higher frequency of westerly winds. Calm wind conditions (wind speed less than 0.5 m/s) were predicted to occur approximately 0.7% of the time throughout the modelling period.

The seasonal wind roses for the years 2019-2023 indicate that:

- In summer, winds are predominantly from the northeastern and south eastern quadrants. Calms were predicted to occur approximately 0.7% of the time during the summer months.
- In autumn, winds are similar to the annual distribution, which is generally well spread across all direction, with slightly higher frequency westerly winds. Calms were predicted to occur approximately 0.7% of the time during the autumn months.
- In winter, winds are predominantly from the western quadrant. Calms were predicted to occur approximately 0.5% of the time during the winter months.
- In spring winds are generally well spread across all directions, with a slightly higher frequency of winds from the northeastern quadrant. Calms were predicted to occur approximately 0.7% of the time during the spring months.

.

Figure 7 Annual and Seasonal Wind Roses at the Development Site

5.0 Background to Odour Amenity

Odour performance goals guide decisions on odour management but are generally not intended to achieve 'no odour'. The detectability of an odour is a sensory property that refers to the theoretical minimum concentration that produces an olfactory response or sensation. This point is called the odour threshold and defines one odour unit (ou). An odour goal of less than 1 ou would theoretically result in no odour impact being experienced. Impacts from odorous air contaminants are often a source of nuisance rather than resulting in adverse health-effects. There are various elements that are regarded as combining to cause odour nuisance, which are listed below and are collectively known as the FIDOL factors:

- ***F****requency:* how often the odour occurs
- ***I****ntensity:* how strong the odour is perceived to be
- ***D****uration:* how long the odour is present for
- ***O****ffensiveness:* how offensive the odour is perceived to be
- ***L****ocation or Context:* where the person is experiencing the odour.

In practice, the character of a particular odour can only be judged by the receiver's reaction to it, and preferably only compared to another odour under similar social and regional conditions. Based on the literature available, the level at which an odour is perceived to be a nuisance can range from 2 ou to 10 ou depending on a combination of the following factors:

- *Odour quality*: whether an odour results from a pure compound or from a mixture of compounds. Pure compounds tend to have a higher threshold (lower offensiveness) than a mixture of compounds.
- *Source characteristics*: whether the odour is emitted from a stack (point source) or from an area (diffuse source). Generally, the components of point source emissions can be identified and treated more easily than diffuse sources. Emissions from point sources can be more easily controlled using control equipment. Point sources tend to be located in urban areas, while diffuse sources are usually located in rural locations.
- *Health Effects:* whether a particular odour is likely to be associated with adverse health effects. In general, odours from agricultural activities are less likely to present a health risk than emissions from industrial facilities.

An example for this can be shown in a theoretical case of a bakery. A person walking past the bakery may smell the bakery odours and like these baking odours (it can be shown that people generally react positively to baking odours). However, a person living next to the bakery and who experiences the baking odours throughout their house and garden on a continuous basis may find the baking odours offensive to the point where they complain to local authorities. Other factors may come into play when assessing odour impacts, such as:

- *Population sensitivity*: any given population contains individuals with a range of sensitivities to odour. The larger a population, the greater the number of sensitive individuals it may contain.
- *Background level*: whether a given odour source, because of its location, is likely to contribute to a cumulative odour impact. In areas with more closely located sources it may be necessary to apply a lower threshold to prevent offensive odour.
- *Public expectation*: whether a given community is tolerant of a particular type of odour and does not find it offensive, even at relatively high concentrations. For example, background agricultural odours may not be considered offensive until a higher threshold is reached than for odours from a landfill facility.

6.0 Regulatory Requirements

6.1 NSW Environment Protection Authority

NSW EPA is the regulatory authority responsible for air quality regulation and associated activities, including odour regulation. The Approved Methods (NSW EPA 2022) 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.

With respect to odour, the NSW EPA publications, *Technical Framework: Assessment and management of odour from stationary sources in NSW* (NSW DEC 2006a) and the associated *Technical Notes* (NSW DEC 2006b) provide a policy framework for assessing and managing activities that emit odour and offers guidance on dealing with odour issues.

Odour performance goals guide decisions on odour management. The Technical Framework makes note in several parts of the document that 'no odour' is not a realistic objective for some activities, namely:

- **Executive Summary**: "*Emissions of odour may not be preventable from some activities. 'No odour' is not a realistic objective*."
- **Section 1.2 Context of the framework**: "*It must be recognised that the emission of odour cannot be prevented from some activities and that 'no odour' is not a realistic objective in these cases*."
- **Section 3.3 Odour assessment criteria**: "*Odour assessment criteria guide decisions about effective odour management but recognise it may be neither possible nor desirable to achieve 'no odour'*."

6.2 Australian Standard (AS) 1668.2-2024

Per Clause 3.3.1 (b) of AS1668.2 – 2024 *The use of ventilation and air conditioning in building, Part 2: Mechanical ventilation in buildings* (Australian Standard 2024) see excerpt below - kitchen exhaust emissions are deemed to Type B effluents.

Figure 8 AS1668.2 – 2024 Excerpt 1

3.3 Local exhaust ventilation

3.3.1 Types of effluent requiring local exhaust

Type A and B effluents shall be managed by local exhaust in accordance with Clause 3.3.2, where effluents are —

(a) *Type A effluents:* Significant localized sources of toxic, irritant, asphyxiant, flammable or explosive effluents which include the following:

(i) Gases.

(ii) Dusts.

(iii) Fumes (including direct ducting from tail pipes in accordance with Clause 4.5.3.2).

(iv) Vapours.

Excluding —

(A) contaminants controlled in accordance with Section 2;

(B) contaminants controlled in accordance with Section 4 (other than direct ducting from tail pipes in accordance with Clause 4.5.3.2);

(C) contaminants controlled by a general exhaust ventilation from enclosures listed in Appendix B;

(D) contaminants from apparatus used solely for domestic purposes; or

(E) cooking processes with Type B effluents.

(b) *Type B effluents:* Heated air with or without water or grease vapour produced by cooking or dishwasher equipment employed for the preparation of food within an enclosure, where —

(i) any single apparatus having a total maximum input exceeding —

(A) 3.6 kW if it is a deep fryer and 8 kW for any other electrical apparatus; or

(B) total gas input 29 MJ/h for a gas apparatus.

(ii) multiple apparatus having a total maximum input exceeding —

(A) 0.5 kW/m^2 for electrical apparatus;

(B) 1.8 MJ/m^2 for gas apparatus; or

(C) 3.6 kW for Type 3, 4, 5 and 6 cooking processes where apparatus are located within 2 m of each other.

(iii) any cooking apparatus fuelled with solid fuel.

Excluding —

(A) Coffee machines of all sizes.

(B) Microwave ovens and under bench ovens, dish or glass washers, that are less than 3.6 kW where these apparatus are positioned greater than 1.5 m apart.

(C) Appliances or apparatus used solely for the purposes of reheating or maintaining the temperature of food (e.g. bain-marie).

(D) Apparatus used specifically for space heating.

As shown below, Clause 3.10.1 of AS1668-2-2024 details the flow rates at which discharges are deemed to be objectionable. For Type B effluents, they are deemed objectionable for any solid fuel cooking (e.g. open flame grills and enclosed ovens that burn charcoal and/or wood) at flows greater less than 5,000 litres per second (L/s) when discharged by an appropriate treatment system (see **Figure 10**, or otherwise at greater than 1,000 L/s . For multiple exhaust points located within a single 6 m radius (as is the case for the Project), these will be considered as a single discharge for the purposes of determination of flow rate.

Figure 9 AS1668.2 – 2024 Excerpt 2

3.10 Air discharges

3.10.1 General

For the purpose of this document, any of the discharges at the flow rates specified in Table 3.4 shall be deemed to contain objectionable effluent.

Discharges that are not deemed to contain objectionable effluent shall conform to Clause 3.10.2 and discharges that are deemed to contain objectionable effluent shall conform to Clause 3.10.3.

For the purposes of determination of flow rate, multiple discharges located within a single 6 m radius shall be treated as a single discharge.

Table 3.4 — Objectionable effluent discharges

Exhaust-air discharge	Flow rate
Type A effluent as defined in Clause 3.3.1(a)	Any flow rate
Type B effluent as defined in Clause 3.3.1(b)	Any flow rate from a cooking apparatus that is fuelled by solid fuel
	> 5 000 L/s for local exhaust discharge treated in accordance with Clause 3.10.4
	> 1 000 L/s for local exhaust discharge not treated in accordance with Clause 3.10.4

***C3.10.1** All exhaust air should be discharged to atmosphere in such a manner as not to cause danger or nuisance to occupants in the building, occupants of neighbouring buildings or members of the public. Refer to State and Territory regulations for further information.*

Cooking effluent from wood burning apparatus within a building is collected as a Type B effluent but is discharged as a Type A effluent.

The high temperature processes used to make charcoal for cooking has removed or reduced these volatile compounds, so the emissions from cooking apparatus that burn only charcoal, are discharged as a Type B effluent.

Effluent from smoking processes using a small quantity of smouldering wood for flavouring food, where the wood is not burning with sparks or flames or generating heat for cooking, is discharged as a Type B effluent.

As large exhaust discharges require more detailed engineering, a normative approach using Clause 3.10.4 is limited to 5 000 L/s.

The kitchen exhaust fans are located within a 6 m radius of each other and when combined, will exceed the combined flow rate threshold of 1,000 L/s and will not discharge through treatment systems in Cause 3.10.4 (shown in **Figure 10**). As such, the discharges are deemed objectionable and Clause 3.10.3 (a), 3.10.3(c) and Clause 3.10.3 (d) shown below applies to the Project (**Figure 11**). Clause 3.10.3(b) does not apply as that is only relevant to Type A effluent.

Figure 10 AS1668.2 – 2024 Excerpt 3

3.10.4 Discharges treated to reduce objectionable Type B effluent

Where a treatment system is incorporated in the discharge from a local exhaust serving cooking process Type 1, Type 2, Type 3, Type 4 or Type 7 (or combination of these) to reduce objectionable effluent, all of the following requirements apply:

(a) Where a grease producing cooking apparatus is served by the system, the local exhaust hood shall incorporate a primary grease removal device with a capture efficiency of at least 80 % for grease particles at 10 micron when tested in accordance with —

(i) ASTM F2519-05;

(ii) LPS 1263;

(iii) VDI 2052.1; or

(iv) ULC S649.

(b) Particulates shall be arrested between the hood and the odour treatment device conforming to item (c) with filters that have the following:

(i) A pre-filter stage with a performance conforming to ISO 16890.1 class ePM10 with a minimum 50 % efficiency.

(ii) An additional filter stage with a performance conforming to ISO 16890.1 class ePM1 with a minimum 95 % efficiency.

(c) Odours shall be reduced by adsorption utilizing activated carbon, where the exposure time of the contaminated air to the activated carbon shall be at least 0.2 s; and

(d) Systems including particulate and odour reduction treatments shall include interlocks to stop the operation of the exhaust system when the treatment provisions have been removed or are not operating correctly.

(e) All serviceable parts of the system shall be installed in an accessible location.

C3.10.4 *To replace the concessions in C3.10.3 that were published as a commentary in AS 1668.2:2012, Clause 3.10.4 provides a prescriptive pathway for the treatment of objectionable Type B effluent to allow kitchen exhaust to be deemed not objectionable in accordance with Clause 3.10.2.*

Treatment of discharges of greater than 5 000 L/s, cooking process Type 8 or Type A effluents is excluded from Clause 3.10.4 as the performance requirements will need to be determined for each application through detailed engineering and assessment of the effluent and the outdoor environment.

Particulate filters that meet ISO 29463-1 (Class ISO 15E and above), EN 1822-1 (Class E11 and above) or particulate filtration devices tested to ISO 29463-5 that achieve a minimum 95% efficiency at 0.3 microns are all acceptable substitutes for ISO ePM1 95 % efficient filters.

Examples of suitable interlocks include —

(a) pressure switches (low pressure switch for missing media and high-pressure switch for service life);

(b) equipment fault output; and

(c) timer (where the equipment served is subject to a manufacturer nominated service life).

Figure 11 AS1668.2 – 2024 Excerpt 4

3.10.3 Discharges deemed objectionable

Air discharges that are deemed to contain objectionable effluent (see Clause 3.10.1) shall be in accordance with Clause 3.10.2 and —

(a) be arranged vertically with discharge velocities not less than 5 m/s;

(b) for a Type A effluent or effluent resulting from cooking processes fuelled by solid fuel, be situated —

(i) at least 3 m above the roof at point of discharge, except that in the case of a pitched roof, at least 1 m above the ridge;

(ii) above any part of the building (or adjacent building) that is within 15 m (horizontally) of the discharge point; and

(iii) at least 3 m above a thoroughfare or roof subject to regular traffic, but within 15 m of the discharge point;

(c) located not less than 6 m from a property boundary, any boundary to a public street, any outdoor air intake opening or any natural ventilation device or opening; and

(d) treated to reduce the concentration of contaminants when necessary (see Note).

NOTE Item (d) may be necessary where the ambient air is liable to be significantly polluted by the discharge. Refer to local, State and Territory for further guidance regarding control requirements relating to concentration of contaminants.

Section 8.1 compares the measures for the Project to Clause 3.10.3 (a), 3.10.3(c) and Clause 3.10.3 (d).

6.3 Local Government Air Quality Toolkit

NSW EPA issues the Local Government Air Quality Toolkit[1] ("the Toolkit") in response to requests from council officers for information and guidance on the common air quality issues they manage. In 2023-2024 the Toolkit was updated through the involvement of a number of NSW Government agencies including the EPA in consultation with air quality consultants. It provides contemporary easy-to-access information about air quality management for a number of industries.

The most relevant sections of the Toolkit to the Project is :

- *'Food outlets guidance note'* [2].
- *'Odour from food outlet inspection checklist'*[3]

A comparison of the relevant recommendation from these sections against measures proposed for the Project is presented in **Section 8.2**.

[1] https://www.epa.nsw.gov.au/your-environment/air/air-nsw-overview/local-government-air-quality-toolkit

[2] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/240171-local-government-air-quality-toolkit-food-outlets-guidance-note.pdf

[3] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/local-government-air-quality-toolkit-resource-pack-odour-from-food-outlet-inspection-checklist.pdf

7.0 Odour Control Measures

The kitchen will be serviced by a ventilation system with multiple extraction hoods positioned above the cooking stations. All hoods will be fitted with baffle type grease filters with additional disposable filters and will exhaust to the environment via three (3) roof-top exhaust points, each servicing the hoods over the chip fryers, the fillet fryers and the grill (refer to

Figure 5). Cooking odours from the kitchen will be dispersed vertically into the ambient air with dispersion enhanced by elevating the exhaust point above the roof to approximately 6 m above ground level (in compliance with Australian Standard AS1668.2).

Potential odour emissions from the storage and handling of waste and raw materials at the Site are considered to be minor and can be sufficiently mitigated with normal good housekeeping procedures such as:

- Store all waste materials in sealed/ enclosed bins.
- Ensure regular disposal of waste materials from the site.
- Regularly clean and maintain dining area, kitchen and storage areas.
- Ensuring all raw materials are not left out for excessive periods.

The ventilation design has not yet been finalised for the Project, and thus it is not possible to provide precise details of the discharge velocities or stack heights. McDonald's has extensive experience in managing and mitigating against adverse odour impacts from their operations. All kitchens are designed in accordance with *McDonald's Mechanical Service Master Specification* across all facilities, with the design sized appropriately for the location and anticipated sales volumes, and in accordance with all relevant standards.

8.0 Odour Impact Assessment

8.1 Australian Standard (AS) 1668.2-2024

A comparison of Clauses 3.10.3 (a), 3.10.3(c) and Clause 3.10.3 (d) of AS1668.2-2024 with the measures proposed for the Project is presented in **Table 2**.

Table 2 Australian Standard (AS) 1668.2-2024 Clauses compared to the Project

Australian Standard (AS) 1668.2-2024 Requirements	Does the Project meet the requirements?	Comments
Be arranged vertically with discharge velocities not less than 5 m/s.	Yes	Exit velocities at the Project are estimated to be more than 5 m/s.
Located not less than 6 m from a property boundary, any boundary to a public street, any outdoor air intake opening or any natural ventilation device or opening.	Yes	Exhaust fans are located approximately 8 m from the Site boundary/Street boundary.
Treated to reduce concentration of contaminants when necessary.	Not deemed necessary	McDonald's standard design does not include treatment of emissions and there are multiple similar restaurants operating without them that cause no adverse odour impacts.

8.2 Local Government Air Quality Toolkit

A comparison of the recommendations from the Toolkit's *'Food outlet guidance note'* for Food Outlets (per **Section 6.3**) with measures for the Project is presented in **Table 3**.

Table 3 Local Air Quality Toolkit *'Food outlet guidance note'* – recommendations compared with Project

Recommendations from the Toolkit's *'Food outlets guidance note'*	Does the Project meet the requirements?	Comments
General Approach		
Capture cooking fumes at the source.	Yes	A filtration and mechanical ventilation system will be designed and installed in accordance with the requirements of the Building Code of Australia and Australian Standard AS 1668 Parts 1 & 2 and will be operated in compliance with Section 128 of the POEO Act.
Remove oil and grease by filtration, impingement, or scrubbing.	Yes	

Recommendations from the Toolkit's *'Food outlets guidance note'*	Does the Project meet the requirements?	Comments
Modify cooking methods where feasible (e.g. if using charcoal cooking methods)	Not necessary	Cooking methods at McDonald's are standard electric and frying, and do not include any solid fuel cooking.
Disperse emissions through a stack.	Yes	The ventilation system will be designed and installed in accordance with the requirements of the Building Code of Australia and Australian Standard AS 1668 Parts 1 & 2.
Separate the source from receptors.	Yes	
Maintain good housekeeping to avoid odours from rancid fats and putrefaction of food wastes.	Yes	McDonald's internal procedures and practices currently exceed any industry minimums.
Regularly clean and maintain filters.	Yes	The ventilation system will be maintained as per manufacturers specification.
Advanced control techniques		
Where a solution cannot be achieved using the above basic measures, more advanced control techniques are available, including: • carbon adsorbers • electrostatic precipitators • high-energy wet scrubbers • flameless catalytic oxidisers.	Not necessary	McDonald's standard design does not include advanced control techniques and there are multiple similar restaurants that operate without them and cause no adverse odour impacts.
Other		
Handling and storing of raw materials		
Enclose the activity	Yes	McDonald's internal procedures and practices currently exceed any industry minimums.
Cover materials during transport	Yes	All food and cooking waste is removed by approved contractors.
Cooking (generating smoke, fumes and particulates)		
Installation of fume extraction and ventilation	Yes	A filtration and mechanical ventilation system will be designed and installed in accordance with the requirements of the Building Code of Australia and Australian Standard AS 1668 Parts 1 & 2 and will be operated in compliance with Section 128 of the POEO Act.
Installation of filtration to remove fumes and particulates	Yes	
Installation of carbon adsorbers or more intensive techniques to remove odours	No	McDonald's standard design does not include advanced control techniques and there are multiple similar restaurants that operate

Recommendations from the Toolkit's '*Food outlets guidance note*'	Does the Project meet the requirements?	Comments
		without them and cause no adverse odour impacts.
Installation of a stack (with correct configuration) to aid dispersion of odours	Yes	Ventilation system and exhausts to be designed in accordance with all relevant Australian Standards.
Transporting putrescible waste products off site		
Store wastes in closed containers away from direct sun	Yes	McDonald's internal procedures and practices currently exceed any industry minimums.
Remove wastes promptly from premises	Yes	All food and cooking waste is removed by approved contractors.
Cover wastes during transport	Yes	
Cleaning		
Installation of fume extraction and ventilation	Yes	Ventilation system and exhausts to be designed in accordance with all relevant Australian Standards.
Drying		
Installation of fume extraction and ventilation	Yes	Ventilation system and exhausts to be designed in accordance with all relevant Australian Standards.
Clean Filters	Yes	The ventilation system will be maintained as per manufacturers specification.
Packaging final products		
Installation of fume extraction and ventilation	Yes	Ventilation system and exhausts to be designed in accordance with all relevant Australian Standards.
Brewing		
Configure stacks for optimal dispersion of odours	Not applicable	Not applicable
Installation of a condenser (note this will create a liquid waste stream)	Not applicable	Not applicable
Improving emission performance		
Improving the manner in which the site is operated and maintained, e.g. training site operators to minimise odours when preparing and cooking food	Yes	McDonald's internal procedures and practices currently exceed any industry minimums.
Taking steps to minimise waste, e.g. recycling or reusing waste.	Yes	

8.3 Risk Assessment

As discussed in **Section 2.4**, air quality issues associated with the proposed Project operations predominantly relate to odorous air emissions arising from the cooking and deep frying of food products within the kitchen area. To assess the risk of air emissions from the Site impacting on surrounding sensitive receptors during the operational phase, the following "risk based" approach has been adopted.

The impact descriptors to perform the risk-based assessment include the following:

- **Nature of Impact:** does the impact result in an adverse, neutral or beneficial environment?
  - The pollutants potentially contained within the ventilation air discharged from the kitchen exhausts at the Project have potential to give rise to adverse health impacts and nuisance impacts if emitted in significant enough quantities. The nature of the impact is the therefore defined as '***adverse***'.
- **Receptor Sensitivity:** how sensitive is the receiving environment to the anticipated impacts?
  - With regards to the methodology outlined in **Table A-1**, the sensitivity of the surrounding residential areas to air pollutant emissions generated by the Project is defined as '***high***'.
- **Magnitude:** what is the anticipated scale of the impact?
  - As detailed in **Section 7.0**, a filtration and mechanical ventilation system will be designed and installed in accordance with the requirements of the Building Code of Australia and Australian Standard AS 1668 Parts 1 & 2 and will be operated in compliance with Section 128 of the POEO Act.
  - Based on the above, if odorous cooking methods are used with no controls, the magnitude of potential impacts from the Project could be '***moderate***'. However, even for odorous cooking methods, the magnitude of potential impacts should be reduced to '***negligible***' with the implementation of the proposed controls (refer to **Section 7.0**) and the design of the exhausts stack to comply with AS 1668.2.

Given the above considerations, the potential impact of the Project on the surrounding receptors is concluded to be ***neutral*** (see **Table 4**).

Table 4 Impact Significance

Magnitude / Sensitivity	Substantial Magnitude	Moderate Magnitude	Slight Magnitude	Negligible Magnitude
Very High Sensitivity	Major Significance	Major/ Intermediate Significance	Intermediate Significance	Neutral Significance
High Sensitivity	Major/ Intermediate Significance	Intermediate Significance	Intermediate/Minor Significance	Neutral Significance
Medium Sensitivity	Intermediate Significance	Intermediate/Minor Significance	Minor Significance	Neutral Significance
Low Sensitivity	Intermediate/Minor Significance	Minor Significance	Minor/Neutral Significance	Neutral Significance

9.0 Conclusions

Considering the proposed design of the exhaust points, and distance to the nearest identified sensitive receptors to the Project, odour emissions are expected to be reasonably well dispersed into the ambient air and therefore unlikely to adversely impact the amenity of the surrounding environment. With regular maintenance and cleaning of the ventilation and filtration systems by McDonald's staff and contractors, the physical measures are likely to be effective in managing odour.

Nevertheless, any odour complaints during the operation of the Project should be recorded as per the standard McDonald's Complaints handling procedure. If validated, an investigation to identify the potential odour source should be undertaken and corrective action(s) implemented where practicable.

10.0 References

Australian Standard. 2024. " AS 1668.2-2024. The use of ventilation and airconditioning in buildings. Part 2: Mechanical ventilation in buildings. SAI Global Limited under licence from Standards Australia Limited."

Australian Standard. 2024. "AS 1668.2-2014. The use of ventilation and airconditioning in buildings. Part 2: Mechanical ventilation in buildings. SAI Global Limited under licence from Standards Australia Limited."

EMP Consulting. 2023. "McDonald's Mechanical Services Master Specification."

NSW DEC. 2006a. *Technical Framework - Assessment and management of odour from stationary sources in NSW.* Sydney: NSW Department of Environment and Conservation.

NSW DEC. 2006b. *Technical Notes - Assessment and management of odour from stationary sources in NSW.* Sydney: NSW Department of Environment and Conservation.

NSW EPA. 2022. "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales." August.

Appendix A Operational Phase Risk Assessment Methodology

Balgowlah McDonalds

Odour Amenity Assessment

McDonald’s Australia Limited

SLR Project No.: 610.032293.00001

16 December 2024

Nature of Impact

Predicted impacts may be described in terms of the overall effect upon the environment:

- **Beneficial:** the predicted impact will cause a beneficial effect on the receiving environment.
- **Neutral**: the predicted impact will cause neither a beneficial nor adverse effect.
- **Adverse**: the predicted impact will cause an adverse effect on the receiving environment.

Receptor Sensitivity

Sensitivity may vary with the anticipated impact or effect. A receptor may be determined to have varying sensitivity to different environmental changes, for example, a high sensitivity to changes in air quality, but low sensitivity to noise impacts. Sensitivity may also be derived from statutory designation which is designed to protect the receptor from such impacts.

Sensitivity terminology may vary depending upon the environmental effect, but generally this may be described in accordance with the following broad categories – Very high, High, Medium and Low.

Table A-1 outlines the methodology used in this study to define the sensitivity of receptors to air quality impacts.

Table A-1 Methodology for Assessing Sensitivity of a Receptor

Sensitivity	Criteria
Very High	Receptors of very high sensitivity to air pollution (e.g. dust or odour) such as: hospitals and clinics, and retirement homes.
High	Receptors of high sensitivity to air pollution, such as: schools, residential areas, food retailers, glasshouses and nurseries.
Medium	Receptors of medium sensitivity to air pollution, such as: farms / horticultural land, offices/recreational areas, painting and furnishing, hi-tech industries and food processing, and outdoor storage (ie new cars).
Low	All other air quality sensitive receptors not identified above, such as light and heavy industry.

Magnitude

Magnitude describes the anticipated scale of the anticipated environmental change in terms of how that impact may cause a change to baseline conditions. Magnitude may be described quantitatively or qualitatively. Where an impact is defined by qualitative assessment, suitable justification is provided in the text.

Table A-2 Magnitude of Impacts

Magnitude	Description
Substantial	Impact is predicted to cause significant consequences on the receiving environment (may be adverse or beneficial)
Moderate	Impact is predicted to possibly cause statutory objectives/standards to be exceeded (may be adverse)
Slight	Predicted impact may be tolerated.

Magnitude	Description
Negligible	Impact is predicted to cause no significant consequences.

Significance

The risk-based matrix provided below illustrates how the definition of the sensitivity and magnitude interact to produce impact significance.

Table A-3 Impact Significance Matrix

Magnitude / Sensitivity		[Defined by Table A-2]			
		Substantial Magnitude	Moderate Magnitude	Slight Magnitude	Negligible Magnitude
[Defined by TableA-1]	Very High Sensitivity	Major Significance	Major/ Intermediate Significance	Intermediate Significance	Neutral Significance
	High Sensitivity	Major/ Intermediate Significance	Intermediate Significance	Intermediate/Minor Significance	Neutral Significance
	Medium Sensitivity	Intermediate Significance	Intermediate/Minor Significance	Minor Significance	Neutral Significance
	Low Sensitivity	Intermediate/Minor Significance	Minor Significance	Minor/Neutral Significance	Neutral Significance

Making Sustainability Happen