



Toyota Liffey Valley Ltd

Proposed Body Shop at Existing Motor Sales Outlet, Liffey Valley

Odour Risk Assessment

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RSK



RSK GENERAL NOTES

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Group Limited.

Contents

1	INTRODUCTION	4
1.1	Site Location	4
2	LEGISLATION, PLANNING POLICY & GUIDANCE	5
2.1	Planning Policy	5
2.1.1	National Planning Framework – Project Ireland 2040	5
2.2	Guidance Documents	5
2.2.1	'Guidance on the assessment of Odour for Planning' (Institute of Air Quality Management, 2018) ('the IAQM odour guidance')	5
3	ASSESSMENT SCOPE AND METHODOLOGY	7
3.1	Scope and Approach	7
3.2	Assessment Methodology	7
3.2.1	Source Odour Potential	7
3.2.2	Pathway Effectiveness	8
3.2.3	Risk of Odour Exposure at Individual Receptors	9
3.2.4	Odour Impact Risk	10
4	QUALITATIVE ODOUR RISK ASSESSMENT	11
4.1	Site Setting	11
4.2	Odour Sources	11
4.3	Pathway Effectiveness	12
4.4	Risk Assessment Outcomes	13
5	MITIGATION	14
6	SUMMARY AND CONCLUSION	15
7	REFERENCES	16

1 INTRODUCTION

RSK Environment Limited (RSK) was commissioned to prepare an assessment to consider the potential odour impacts of the proposed body shop, a part of the extension of the existing motor sales outlet, at Liffey Valley. The site is located within the jurisdiction of South Dublin County Council (SDCC).

This report presents the findings of a qualitative odour assessment comprising:

- Review of meteorological conditions;
- Identification of sensitive receptors; and
- Qualitative odour assessment based on the source-pathway-receptor (S-P-R) approach.

1.1 Site Location

The application site is located south of N4 at Liffey Valley. The Clarion Hotel is located to the west of the proposed extension of the existing Toyota motor sales outlet. The proposed development site location is shown in Figure 1.1 below.

Figure 1-1: Proposed Development Site Location



2 LEGISLATION, PLANNING POLICY & GUIDANCE

2.1 Planning Policy

The land use planning process is a key means of improving air quality, particularly in the long term, through the strategic location and design of new developments. Any air quality concern that relates to land use and its development can, depending on the details of the proposed development, be a material consideration in the determination of planning applications.

2.1.1 National Planning Framework – Project Ireland 2040

In 2018 the National Planning Framework (NPF) was published, providing a framework to protect and enhance the environment.

Section 9 of the NPF deals with Realising Our Sustainable Future, and states the following in regards to the planning system; *'The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental legislation and the sustainable management of our natural capital.'*

Although the NPF does not mention odour directly, the NPF states in National Policy Objective 64: *"Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions."*

2.2 Guidance Documents

2.2.1 'Guidance on the assessment of Odour for Planning' (Institute of Air Quality Management, 2018) ('the IAQM odour guidance')

This guidance, issued by the Institute of Air Quality Management (IAQM) in July 2018, recommends an approach to determine the impact of odour on sensitive receptors.

The IAQM odour guidance indicates that the perception of an odour is generally dependent on the relationship between odour sources, the number and sensitivity of any receptors, and the pathway connecting them. The effects of odour at individual receptors are dependent on the 'FIDOL' factors described below:

- **(F) Frequency of exposure;**
- **(I) Intensity:** The individual's perception of the strength of the odour;
- **(D) Duration:** The overall duration that individuals are exposed to an odour over time;



- **(O) Odour unpleasantness/ offensiveness:** Odour unpleasantness describes the character of an odour as it relates to the 'hedonic tone' (which may be pleasant, neutral or unpleasant) at a given odour concentration/intensity. This can be measured in the laboratory as the hedonic tone, and when measured by the standard method and expressed on a standard nine-point scale it is termed the hedonic score; and
- **(L) Location/ (R) Receptor Sensitivity:** The type of land use and nature of human activities in the vicinity of an odour source. Tolerance and expectation of the receptor. The 'Location' factor can be considered to encompass the receptor characteristics, receptor sensitivity, and socio-economic factors.

3 ASSESSMENT SCOPE AND METHODOLOGY

3.1 Scope and Approach

The IAQM odour guidance provides information on the application of various techniques for odour assessment. Appendix 1 of the guidance suggests a recommended framework for qualitative odour assessments and this framework has been adopted here. Following the IAQM odour guidance, a qualitative odour assessment approach, based on the source-pathway-receptor (S-P-R) model, was adopted for this assessment and is described below.

3.2 Assessment Methodology

3.2.1 Source Odour Potential

The IAQM odour guidance classifies sources into three broad categories of source odour potential: Large, Medium and Small.

The classification is a judgement, based on three key factors: the magnitude of the odour release (taking into account control measures); how inherently odorous the compounds or materials being assessed are; and the unpleasantness (or offensiveness) of the odour.

Definitions are provided for each category in the IAQM odour guidance and reproduced in Table 3.1 below.

Table 3.1: Source Odour Potential

Source Odour Potential	Suggested Definition
Large	<p>Magnitude – Larger Permitted processes of odorous nature or large STWs; materials usage hundreds of thousands of tonnes/m³ per year; area sources of thousands of m².</p> <p>The compounds involved are very odorous (e.g. mercaptans), having very low Odour Detection Thresholds (ODTs) where known.</p> <p>Unpleasantness – processes classed as “Most offensive” in H4; or (where known) compounds/odours having unpleasant (-2) to very unpleasant (-4) hedonic score.</p> <p>Mitigation/control – open air operation with no containment, reliance solely on good management techniques and best practice.</p>
Medium	<p>Magnitude – smaller Permitted processes or small STWs; materials usage thousands of tonnes/m³ per year; area sources of hundreds of m².</p> <p>The compounds involved are moderately odorous.</p> <p>Unpleasantness – processes classed in H4 as “Moderately offensive”; or (where known) odours having neutral (0) to unpleasant (-2) hedonic score.</p> <p>Mitigation/control – some mitigation measures in place, but significant residual odour remains.</p>
Small	<p>Magnitude – falls below Part B threshold; materials usage hundreds of tonnes/m³ per year; area sources of tens m². The compounds involved are only mildly odorous, having relatively high ODTs where known.</p> <p>Unpleasantness – processes classed as “Less offensive” in H4; or (where known) compounds/odours having neutral (0) to very pleasant (+4) hedonic score.</p> <p>Mitigation/control – effective, tangible mitigation measures in place (e.g. BAT, BPM) leading to little or no residual odour.</p>
<p>Reproduced from Table 9 of IAQM odour guidance.</p>	

3.2.2 Pathway Effectiveness

The assessment of the effectiveness of the transport of odours (or the pathway) takes into account five main factors:

- distance from source to receptor;
- frequency of winds blowing from the source towards the receptor;
- the effectiveness of any mitigation or controls;
- the effectiveness of dispersion and dilution (a tall stack for example); and
- topography and terrain in the local area.

Suggested definitions of pathway effectiveness are summarised in the IAQM odour guidance as set out in Table 3.2.

Table 3.2: Pathway Effectiveness

Pathway Effectiveness	Suggested Definition
Highly Effective	<p>Distance – receptor is adjacent to the source/site; distance well below any official set-back distances.</p> <p>Direction – high frequency (%) of winds from source to receptor (or, qualitatively, receptors downwind of source with respect to prevailing wind).</p> <p>Effectiveness of dispersion/dilution - open processes with low-level releases, e.g. lagoons, uncovered effluent treatment plant, landfilling of putrescible wastes.</p>
Moderately Effective	<p>Distance – receptor is local to the source.</p> <p>Where mitigation relies on dispersion/dilution – releases are elevated but compromised by building effects.</p>
Ineffective	<p>Distance – receptor is remote from the source; distance exceeds any official set-back distances.</p> <p>Direction – low frequency (%) of winds from source to receptor (or, qualitatively, receptors upwind of source with respect to prevailing wind).</p> <p>Where mitigation relies on dispersion/dilution – releases are from high level (e.g. stacks, or roof vents > 3m above ridge height) and are not compromised by surrounding buildings.</p>
Reproduced from Table 9 of IAQM odour guidance.	

3.2.3 Risk of Odour Exposure at Individual Receptors

The source odour potential and pathway effectiveness are brought together to predict the risk of odour exposure at the receptor being considered. The IAQM odour guidance suggests a matrix approach for this, reproduced in Table 3.3.

Table 3.3: Risk of Odour Exposure

Pathway Effectiveness	Source Odour Potential		
	Small	Medium	Large
Highly Effective	Low Risk	Medium Risk	High Risk
Moderately Effective	Negligible Risk	Low Risk	Medium Risk
Ineffective	Negligible Risk	Negligible Risk	Low risk
Reproduced from Table 10 of IAQM odour guidance			

3.2.4 Odour Impact Risk

The exposure risk and sensitivity of the receptors are used to assess the likely impact on the receptor.

Guidance on receptor sensitivity is given in the IAQM odour guidance. In residential areas, the normal expectation would be for a high level of residential amenity and this would usually equate to high receptor sensitivity. The impact assessment matrix is reproduced from the IAQM odour guidance in Table 3.4.

Table 3.4: Pathway Likely Magnitude of Odour Effect at the Specific Receptor Location

Risk of Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
High	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
Medium	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
Low	Negligible Effect	Negligible Effect	Slight Adverse Effect
Negligible	Negligible Effect	Negligible Effect	Negligible Effect

Reproduced from Table 11 of IAQM odour guidance.

4 QUALITATIVE ODOUR RISK ASSESSMENT

4.1 Site Setting

The application site is located south of N4 at Liffey Valley. The Clarion Hotel is located to the west of the proposed extension of the existing Toyota motor sales outlet. The distance between the closest point of the hotel to the proposed stack is approximately 30m.

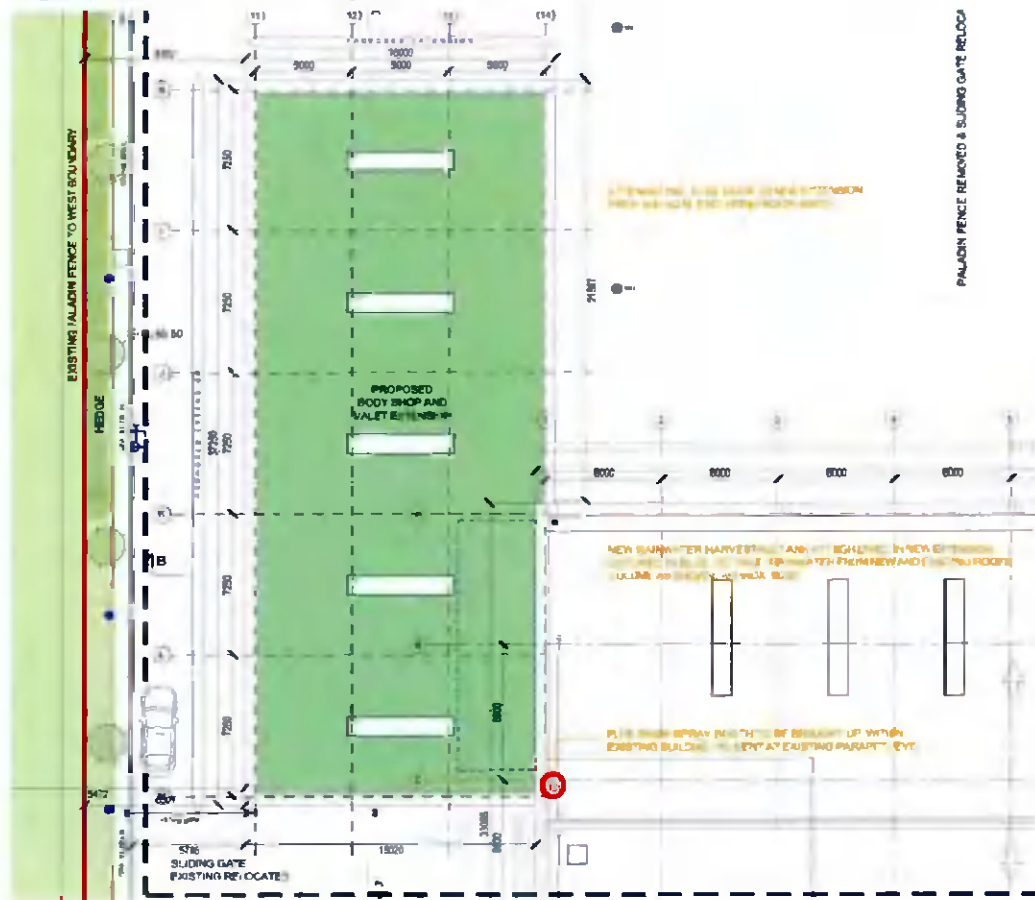
The closest receptors to the proposed body shop are users of the Clarion Hotel. Therefore, the assessment is based on 'High' sensitivity receptors.

4.2 Odour Sources

The main potential odour source is likely to be spray painting activities from the proposed body shop. It is understood that the spray painting activities will take place within a spray booth. A flue from the spray booth will be brought up within the existing building and vent at the exiting parapet level. The location of the proposed exhaust vent is displayed in Figure 4.1 below.

Based on the size of the proposed development, mitigation measures in form of enclosed spray booth, it is considered that the site can be most appropriately classified as having a 'small' Source Odour Potential within the context of the IAQM odour guidance.

Figure 4.1: Location of Proposed Exhaust Vent



4.3 Pathway Effectiveness

The proposed spray booth and associated flue will be located to the east of the existing Clarion Hotel. The closest point of the hotel is located approximately 30m from the proposed stack.

A review has been undertaken of the 2017 – 2019 wind roses for the Casement meteorological station, as shown in Appendix A. Casement station is located approximately 6km south-west of the proposed development site. Casement meteorological station is the nearest meteorological station to the development site and is considered to be most representative. The wind roses illustrate the relative frequency of wind directions and wind speeds, and as is the normal convention, is based on the direction from which the wind blows. The wind roses show that the prevailing wind direction is from the south-west. Therefore, the proposed development is located at an upwind location in relation to the odour source.

Based on above, the pathway effectiveness is assessed as **'Moderately Effective'** with reference to the IAQM odour guidance.

4.4 Risk Assessment Outcomes

The potential impact of odour from the proposed spray booth to affect existing receptors has been assessed and is summarised in Table 4.1, below.

It is considered that the overall impact of the proposed odour source on the existing receptors is likely to be 'negligible'.

Table 4.1: Summary of the Odour Risk Assessment

Odour Source	Receptor Sensitivity	Source Odour Potential	Pathway Effectiveness	Odour Exposure	Likely Odour Effect
Spray painting booth	High	Small	<p>Moderately effective pathway Proposed development is in proximity (30m) to Clarion Hotel. However, receptors are upwind of proposed spray booth with respect to prevailing wind direction.</p>	Negligible risk	Negligible effect

5 MITIGATION

As per Sections 4, the qualitative desk-based odour assessment identified 'negligible' odour effects of the proposed development on existing receptors.

The prevailing wind is from the south-west. The location of the nearest sensitive receptor is to the west of the proposed development, such that odours are only likely to be carried towards the sensitive receptors during periods of easterly winds which are relatively infrequent.

The assessments outcomes suggest that the possibility of significant odour from the proposed body shop being experienced by the existing receptors is unlikely. Therefore, odour mitigation is not considered to be necessary.

6 SUMMARY AND CONCLUSION

RSK was commissioned to prepare an assessment of the potential odour impacts of the proposed spray painting booth at the existing motor outlet on existing receptors.

A desk-based qualitative odour impact assessment has been carried out based on a methodology set out by the IAQM. This assessment was based on a review of the site surroundings, together with local wind data from Casement meteorological station.

Using the IAQM odour guidance methodology, and on the assumption that the proposed spray painting booth is a small source odour potential and with a 'high' sensitivity for existing receptors, then a 'negligible' risk of odour exposure is predicted using the IAQM methodology. The desk-based risk assessment findings are that the proposed spray painting booth is likely to have a "negligible effect" on the surrounding existing receptors.

The assessment outcome suggests that the possibility of significant odour being experienced by the existing surrounding receptors of the proposed development is unlikely. Therefore, odour mitigation is not considered to be necessary.



7 REFERENCES

Institute of Air Quality Management, 2018. Guidance on the assessment of odour for planning 2018 v1.1.

APPENDIX A WIND ROSES

Figure A1 Wind Rose Derived from the Casement Meteorological Station (2017)

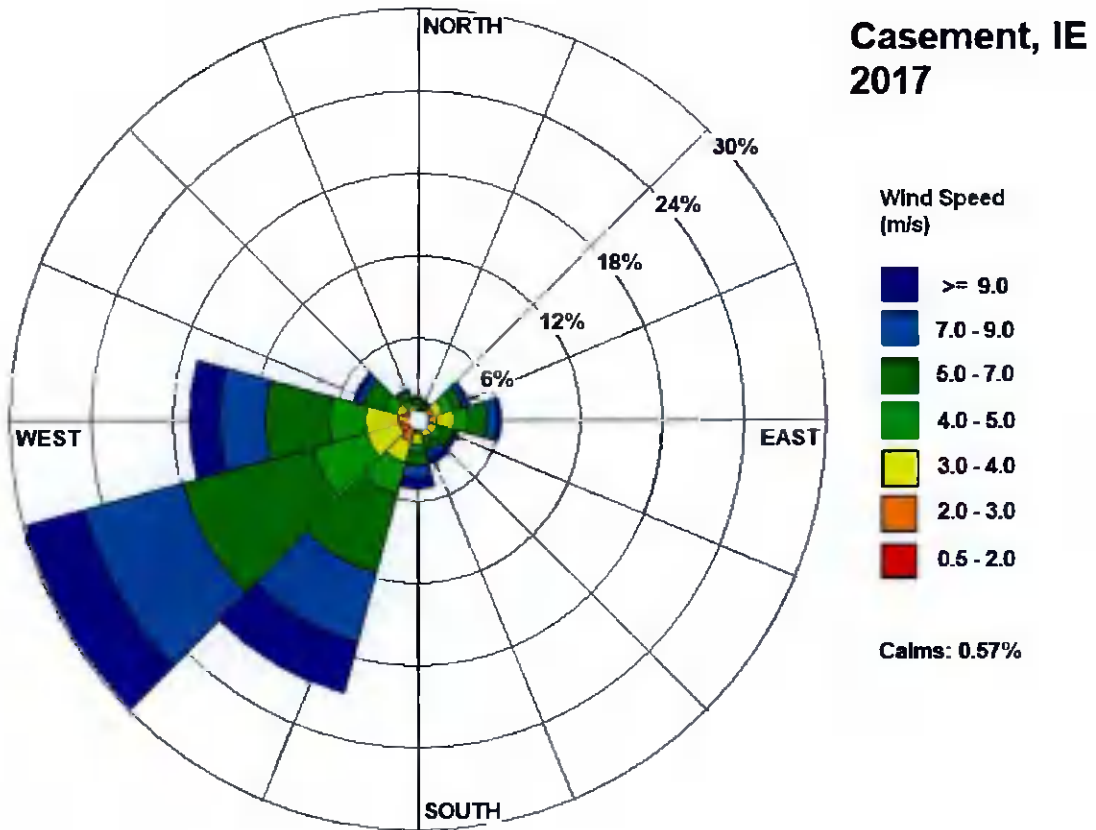


Figure A2 Wind Rose Derived from the Casement Meteorological Station (2018)

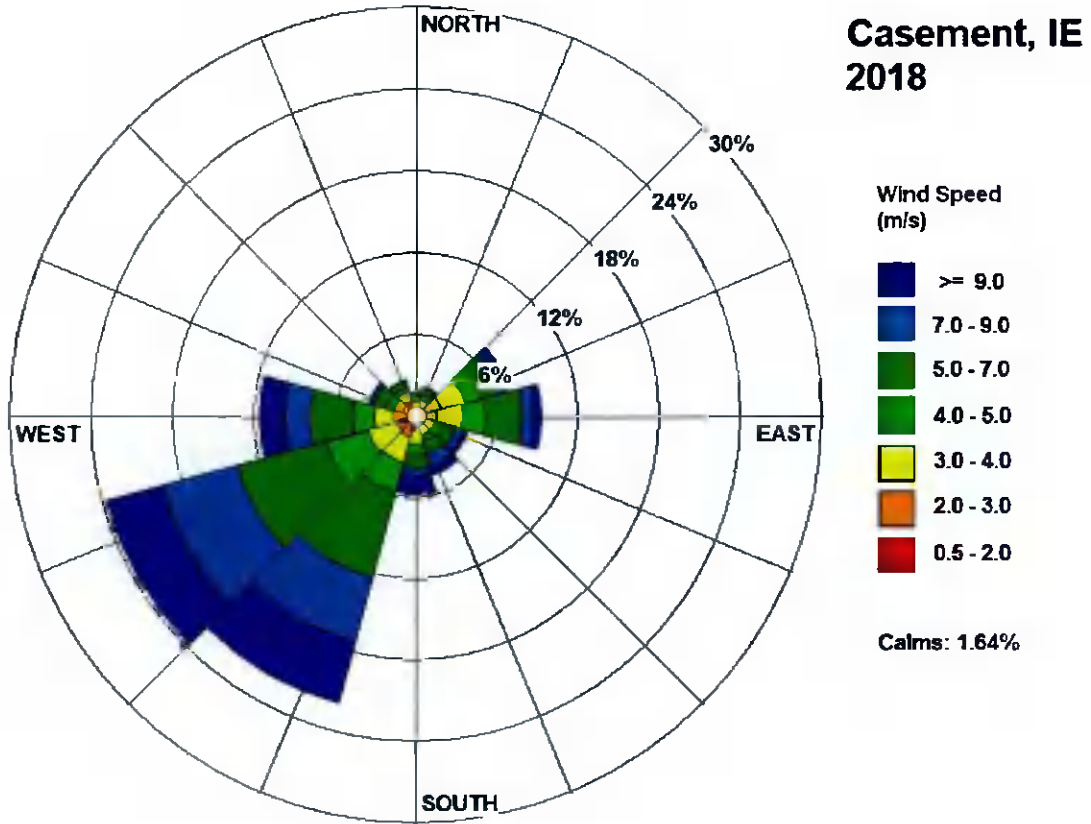


Figure A3 Wind Rose Derived from the Casement Meteorological Station (2019)

