Landmark House
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**Tel:** 0114 263 1824
**ehsprojects.co.uk**
Registered no. 04845638

# Wolfmet H1 air quality risk assessment

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# Contents



## Disclaimer

# 1 Introduction

EHS Projects were commissioned by M&I Materials Limited to undertake a H1 Assessment to address request from the Environment Agency following the submission of the application for an environmental permit:

*'With regards to emissions to air of paraffin wax vapours, we do require a quantitative assessment of these emissions. In this case we consider that this can be an assessment against Environmental Assessment Levels (EALs) derived from Workplace Exposure Limits, like the approach taken for the M&I Hibernia Way site.'*

The following sections of this report outline the assessment of impact in accordance with the guidance provided on the Environment Agency (EA) web page 'Air emissions risk assessment for your environmental permit' and associated H1 Assessment tool.

# 2 Process Description and H1 Inputs

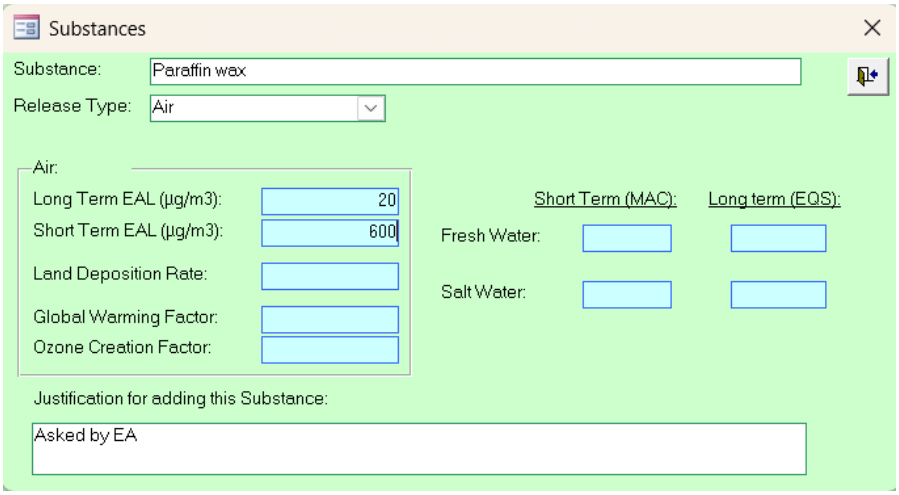
As a precursor to the sintering process, small amounts of paraffin wax are is mixed into the tungsten powder mix prior to the melting stage in the furnace. Once the powder is pressed, then the pressing is placed in a de-waxing furnace. As the part is heated, the wax is melted and runs out of the pressings to be burnt off in the furnace. These fumes are extracted via LEV at the furnace door. The LEV will discharge the waste gas approximately parallel with the roof height of the new Wolfmet installation.

Based on a review of the materials consumption at Wolfmet, it was determined that approximately 300g of paraffin wax is used per week in this process. This assessment assumes that all of this wax is burnt off and extracted by the LEV.

The LEV supplier, Filtermist, has confirmed that the LEV exhaust will discharge the waste gas with a volumetric flow of 10,000m$^3$/hr and an efflux velocity of 18m/s. The facility is operating approximately 8 hours per day, 5 days per week. This means there is 300,000 mg of wax discharged within 400,000m3 of air. This generates a discharge rate of 0.75mg/m$^3$. In order to provide a worst case estimation, we have assumed the emissions occur 100% of the time. This is a an overestimation by a factor of greater than 4, as the process is only operation a maximum of 40 hours in any given week.

# 3 H1 Risk Assessment

The newest MS Excel Version of the H1 tool was the first choice for undertaking this assessment. However, it is not able to be amended to add new substances to air. Therefore the MS Access Version of the tool was utilised. The inputs to the tool are available below (the tool can not be sent over email as it throws up IT security issues).



## Air Release Points

**Please define your Release Points for Releases to Air**

Are there any Air emissions? Yes Click the Add button below

| Number | Description | Location or Grid Reference | Activity or Activities | Effective Height | Efflux Velocity | Total Flow |
|---|---|---|---|---|---|---|
| | | | | metres | m/s | m3/hr |
| e.g. | A1 | North stack | | 150 | 25 | 5,000 |
| 1 | A3 | Sintering LEV | | 0 | 18 | 10000 |

## Air Emissions Inventory

**Please list all Substances released to Air for each Release Point identified in the previous page.**

| Number | Substance | Meas'ment Method | Operating Mode (% of Year) | Data relating to Long Term effects: Conc. | Release Rate | Meas'ment Basis | Data relating to Short Term effects: Conc. | Release Rate | Meas'ment Basis | Annual Rate | ELV Conc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | mg/m3 | g/s | | mg/m3 | g/s | | tonne/yr | mg/m3 |
| e.g. | sulphur dioxide | Estimated* | 70% load | 1510 | 3000 | annual avg | 1510 | 3000 | hourly avg | 55,000 | 2000 |
| 1 | Paraffin wax | Estimated | 100.0% | 0.8 | 0.002083 | calculated | 0.8 | 0.002083 | Calculated | 0.0657 | |

## 4 H1 Test 1

The results show that, assuming the emissions are discharged at all times the long term emissions do not screen out. Therefore, emissions can not be screened out at H1 test 1 phase.

## Air Impact Screening Stage One

**Screen out Insignificant Emissions to Air**

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened om further assessment as they are likely to have an insignificant impact.

| Number | Substance | Long Term EAL | Short Term EAL | Long Term: PC | % PC of EAL | > 1% of EAL? | Short Term: PC | % PC of EAL | > 10% of EAL? |
|---|---|---|---|---|---|---|---|---|---|
| | | µg/m3 | µg/m3 | µg/m3 | % | | µg/m3 | % | |
| 1 | Paraffin wax | 20.0 | 600 | 0.309 | 1.55 | Yes | 8.13 | 1.36 | No |

## 5 H1 Test 2

This test assumes that the atmospheric background concentration of Paraffin wax is 10ug/m3. This is likely a significant overestimation as it is unlikely that there is any paraffin wax vapour in the local atmosphere. Regardless of this overestimation, long and short term emissions screen out. Therefore, it is concluded that the paraffin wax emissions from Wolfmet will be insignificant.

## Air Impact Modelling Stage Two Screening

**Identify need for Detailed Modelling of Emissions to Air**

This page displays the Process Contributions in relation to the backgound pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment.
Also complete this page if you have already done detailed modelling.

| Number | Substance | Air Bkgrnd Conc. | Long Term: PC | % PC of headroom (EAL - Bkgrnd) | PEC | % PEC of EAL | % PEC of EAL >=70? | Short Term: PC | % PC of headroom (EAL - Bkgrnd) | % PC of headroom >=20? |
|---|---|---|---|---|---|---|---|---|---|---|
| | | µg/m3 | µg/m3 | | mg/m3 | % | | µg/m3 | | |
| e.g. | | 12 | | | | | | | | |
| 1 | Paraffin wax | 10 | 0.309 | 3.09 | 10.4 | 51.6 | No | 8.13 | 1.41 | No |