

Intended for

**SC Johnson Professional Ltd**

Date

**April 2024**

Project Number

# Environmental Permit Application: Operations Report

Denby Hall Way, Ripley DE5 8JZ

# Environmental Permit Application: Operations Report

Denby Hall Way, Ripley DE5 8JZ

Project name **SC Johnson Permitting**  
Project no. **1620016489**  
Recipient **SC Johnson Professional Ltd**  
Document type **Operations Report**  
Version **0.1**  
Date **April 2024**  
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Doc ID 1620016489 / Version 0.2

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## Non-Technical Summary

This Part A(1) Environmental Permit Variation application is submitted by SC Johnson Professional Limited (referred to hereinafter as “SC Johnson” or “the Client”) for the continued operation of a liquid hand cleaning and hard surface cleaning products manufacturing plant present at Denby Hall Way, Ripley DE5 8JZ (“the Installation”).

The site consists primarily of one single storey building with profiled roof and occupies a site approximately 225m x 225m. The main factory building is positioned to the western side of the site and is 135m x 80m. There are 2 No car park areas to the east, a service yard to the south, with a fork-lift truck access route to the west and tank farm and external yard to the north.

The site currently operates under a Low Impact Part A(1) Installation Permit but has to vary the permit to a Bespoke Part A(1) Permit due to production increases leading to waste generation above that allowed under a Low Impact Part A(1) Installation Permit. No other changes to the product types, processes, storage or process vessels and techniques is proposed.

While the majority of products produced at the site are blended formulations, some product lines involve a chemical reaction. Under Schedule 1, Part 2, Chapter 1, Section 4.1 Part A(1)(a)(x) of the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (“the EP Regulations”) the production of surface active agents is a regulated activity, and an environmental permit is required to operate the Installation.

### **Raw materials**

The primary raw materials used in the permitted activity consists of liquid and powdered ingredients, which are added to the mixing vessels through automated dosing systems and manual addition. All raw materials are provided with suitable containment measures.

### **Waste**

The permitted activity is expected to generate minor quantities of waste, primarily from production, maintenance and repair activities. All waste generated at the Installation will be managed in line with the waste hierarchy and will be removed from the site by a licenced waste management company.

### **Energy**

Electricity is the predominant primary energy source for the facility. This is sourced from the national grid and no on-site generation from fossil fuels is present (photovoltaic panels are present on the roof of the production building). Electricity purchased for use on site is 100% from renewable sources (REGO). All plant on site is purpose built and highly efficient.

### **Emissions to air**

There are no point source emissions from the current installation relevant to an environmental permit. The current Low Impact Part A(1) Installation Permit does not have any identified air emission points within Schedule 3. As such, none of the diffuse air emission points present on site has a relevant emission limit value. Mixing vessels do not require extraction systems as the blending or reaction processes are carried out at ambient temperature and pressure and release no significant emissions.

### **Emissions to Water and Sewer**

The Installation will not have any process emissions to controlled waters due to the nature of operations. The main drainage system at the Installation comprises surface water drainage, foul drainage and process effluent.

Surface water runoff from the external areas is routed across the site through a dedicated surface water drainage system to a balancing pond and underground flow attenuation system, before being discharged through a purpose built oil/water interceptor. Automated TOC monitoring ensures only uncontaminated surface water is discharged from the site. If the TOC monitors detect out-of-specification surface water, automatic gate valves prevent the discharge of surface water from the site. The surface water ultimately discharges through a culvert into the Bottle Brook.

Process effluent is collected in sealed sumps and pumped to the effluent treatment plant. The treatment plant uses sodium hydroxide dosing for pH correction and addition of antifoaming agent. The drainage from the flammable bund is also flashpoint tested before release into the effluent system.

### **Emissions to Land**

There will be no planned emissions to land from the Installation. All process areas and storage areas are impermeable.

### **Noise**

A noise impact assessment has been undertaken and found that during normal operation, noise levels from the facility are expected to be low. Previously noisy equipment at the site has been moved to reduce external noise levels. The continued noise impact of the Installation is expected to be low. A noise management plan is in place for managing complaints and any required corrective action.

### **Environmental Management Systems**

The Installation is operated in line with an environmental management system (EMS) certified to ISO 14001, to manage the environmental aspects of the operation of the Installation.

### **Site Condition**

This variation does not include any changes to the Installation boundary of the existing Low Impact Part A(1) Permit, and no changes to product or raw material storage or processing have taken place. Therefore, the existing application site condition report is still applicable.

## 1. Introduction

This document supports the application submitted by SC Johnson Professional Limited (referred to hereinafter as “SC Johnson” or “the Client”) to the Environment Agency (“EA”) under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (the “EP Regulations”) for an Environmental Permit (application reference EPR/LP3531XX/V003) for the continued operation of a liquid hand cleaning and ~~sanitising~~ hard surface cleaning products manufacturing plant present at Denby Hall Way, Ripley DE5 8JZ (“the Installation”). An overview of the location of the site is provided in Figure 1 in Appendix 1.

The site consists primarily of one single storey building with profiled roof and occupies a site approximately 225m x 225m. The main factory building is positioned to the western side of the site and is 135m x 80m. There are 2 No car park areas to the east, a service yard to the south, with a fork-lift truck access route to the west and tank farm and external yard to the north.

The site currently operates under a Low Impact Part A(1) Installation Permit but has to vary the permit to a Bespoke Part A(1) Permit due to production increases leading to waste generation above that allowed under a Low Impact Part A(1) Installation Permit. No other changes to the product types, processes, storage or process vessels and techniques is proposed.

This Operations Report is intended to support SC Johnson’s application to the Environment Agency for a Bespoke permit to operate the chemical manufacturing plant at the site and provides an overview of the proposed regulated activity and the Operators management arrangements.

## 2. Process Description

### 2.1 Existing Activity

The process involves the formulation of consumer cleaning chemicals through mixing and blending in above ground mixing vessels. Raw materials are delivered to the yard at the north of the site. Bulk liquid ingredients are delivered by tanker to the flammables tank farm or the internal bulk tank farm as required. Non-bulk liquid ingredients (IBC and drums) as well as dry and powdered goods are delivered to the goods-in warehouse.

Weighed raw materials are fed into mixing vessels with piped liquid ingredients. The products are mixed in the blending vessels and then transferred to formulation storage tanks for transfer to the product filling lines. Packaged goods undergo QA prior to warehousing and subsequent dispatch from site.

Limited product lines undergo minor reaction in the mixing vessels. These product lines (e.g. Swarfega) undergo a gelling reaction, which drives the requirement for an environmental permit. The reactions take place at ambient temperatures and the mixing vessels are not under pressure.

There are no emissions to air from the mixing vessels. Air emissions from the process are limited to the Local Exhaust Ventilation system at the dry ingredients pre-weigh station which is extracted through a roof vent after a bag filter removes the dust from the air stream. The pre-weigh station is not used if the bag filter is not operational.

The internal tank farm comprises 25 No. above ground tanks located in a bunded area within the process building. These tanks range from 40 m<sup>3</sup> to 60 m<sup>3</sup> in volume and are maintained under ambient pressure. The roof of the process building helps to maintain stable tank temperature.

The external flammables tank farm comprises 5 No. above ground tanks located in a bunded area within the process building. These tanks range from 40 m<sup>3</sup> to 60 m<sup>3</sup> in volume and are maintained under ambient pressure.

The mixing/blending vessels comprise 37 No. steel blending vessels. The capacities of these vessels range from 3 m<sup>3</sup> and 23 m<sup>3</sup> and are generally reserved for mixing the same class of product (e.g. soaps, creams, gels etc.) rather than used as multi-product vessels.

All mixing and blending vessels are located over sealed floors, with drainage linked to sumps which are pumped to the effluent treatment plant only.

A summary of the scheduled activities to be retained in the environmental permit and directly associated activities is shown below in Table 2.1.

**Table 2.1: List of Existing Activities to be undertaken at the Installation**

Activity Ref	Schedule 1 – Part 2 Reference	Description of Activity	Limits of Specified Activity
AR1	Section 4.1 Part A(1) (a) (xi)	The production of Surface Active Agents.	From receipt of raw materials to dispatch of finished product.
<b>Directly Associated Activities</b>			
AR2	Waste handling and storage	Handling and storage of wastes	The handling, storage and disposal of packaging and liquid waste arising from the installation.

## 2.2 Proposed Changes under the Variation and Technical Standards

### 2.2.1 Process Changes

The proposed activities at the Installation have not changed. This variation is only required due to the limitations imposed on Low Impact Part A(1) Installations with regard to waste generation.

Low Impact Part A(1) Installations must not:

- Release more than 50 cubic metres per day of waste water.
- Have to use equipment to reduce or remove emissions before they’re released to the outside environment.
- Discharge emissions to groundwater
- Produce more than 1 tonne of waste or 10kg of hazardous waste per day, averaged over a year, with not more than 20 tonnes of waste or 200kg of hazardous waste being produced in any one day.



- Consume energy at a rate greater than 3 megawatts (MW) or, if the installation uses a combined heat and power installation to supply any internal process heat, 10MW (through both imported electricity and by burning fuel on site)

The proposed changes to a Bespoke permit are required due to the site increasing production and will produce waste greater than 10kg of hazardous waste per day.

The site location is shown on Figure 1 and a site layout plan and installation boundary is provided in Figure 2 provided within Appendix 1. No changes to the installation boundary are proposed as part of the variation.

### 2.2.2 Technical Standards

The following technical standards are considered to apply to the installation:

- Environment Agency EPR 4.02 – Specialty Organic Chemicals Sector;
- Best Available Techniques (BAT) Reference (BRef) document for Manufacture of Organic Fine Chemicals<sup>1</sup> (OFC);
- Best Available Techniques (BAT) Reference (BRef) document for Emissions from Storage<sup>2</sup>;

Form C3, Section 3a states *"if the standard set out in the relevant BAT conclusion(s), BAT reference document(s) (BREF) and/or Technical Guidance(s) (TGN) there is no need to justify using them within your documents in Table 3a."*

No changes to the operation of the remainder of the site operations is taking place as part of this variation. All document submitted as part of the original application and variation continue to be relevant to the operating techniques used at the facility.

In addition, the Installation operates in line with a management system which is certified to the ISO 14001 standard.

### 2.3 Ancillary Activities

The following activities are considered to be associated with the principal regulated activity:

- Waste handling and storage;
- Raw material handling; and
- Drainage.

These are discussed further below.

#### 2.3.1 Waste handling and storage

Under normal operating conditions wastes associated with the regulated activity are limited to out-of-specification raw materials, waste raw material packaging, out-of-specification finished product, waste finished product packaging and maintenance and cleaning related materials.

These wastes are limited in volume and will be stored in a suitable sealed containers and stored within the building prior to storage in the appropriate container/skip prior to disposal through licensed contractor. Liquid wastes stored on-site during maintenance / abnormal works will be suitably contained within adequate secondary containment.

<sup>1</sup> Integrated Pollution Prevention and Control Reference Document on Best Available Techniques on Manufacture of Organic Fine Chemicals, EC, August 2006

<sup>2</sup> Integrated Pollution Prevention and Control Reference Document on Best Available Techniques on Emissions from Storage, EC, July 2006

### 2.3.2 Drainage System

The Installation will not have any process emissions to controlled waters due to the nature of operations. The main drainage system at the Installation comprises surface water drainage, foul drainage and process effluent. The storm sewer system for the facility comprises a combination of roof drainage network, drain inlets, storm drainage network, and underground attenuation. An on-site attenuation pond is also present.

Process effluent is collected in sealed sumps and pumped to the effluent treatment plant. The treatment plant uses sodium hydroxide dosing for pH correction and addition of antifoaming agent. The drainage from the external flammable bund is also flashpoint tested before release into the effluent drainage system.

### 2.4 Management System

The Installation is operated under an Environmental Management System (EMS), certified in line with the requirements of the ISO14001 standard. In summary, the management system identifies systems and procedures that minimise the risk of pollution and harm to human health, which may arise from the operation, maintenance, accidents, incidents and non-conformances specific to the plant.

The EMS covers the operation of the entire site and production facilities and ancillary operations. The operator has developed a maintenance plan for the installation and all associated plant and equipment; the maintenance plan includes the frequency of maintenance and is based on Original Equipment Manufacturer (OEM) recommendations. The EMS includes an Emergency Plan identifying potential risks of accidents from the installation and the mitigation and management measures to prevent and control accidents.

There are limited emissions from the site, and limited noise and odour, therefore, the impact of the operation on the surrounding environment is expected to be minimal. However, the operator will regularly review the operation to identify options to improve the environmental impact of the installation. The EMS will include an external complaints procedure to allow anyone aggrieved by the operations to file a complaint with the operator. The complaint procedure describes the follow-on process after a complaint is filed, including communications to be relayed to the complainant outlining the actions undertaken to resolve the complaint. All employees of the installation, both temporary (such as contractors) and permanent, will be made aware of the requirements of the environmental permit and the EMS. All relevant records related to the operation of the installation required by the environmental permit will be retained by the operator for the period required by law.

The management system and procedures is available for inspection at the facility and is applicable to all staff, contractors, and visitors to the facility. The management system enables compliance with the Environmental Permit and other legislative requirements for the protection of the environment and human health.

The management system includes a review of risks from climate change on the operations and considers relevant climate change adaptation measures. A review of climate change related risks to the operation has been undertaken and included in the Environmental Risk Assessment document; this will be reviewed regularly and updated as necessary.

Written procedures clearly describing responsibilities, actions and communication channels are available for operational personnel dealing with emergencies.

The systems and procedures are externally audited (and certified to the ISO 14001 standard) and contingency plans written in preparation for any unexpected complications. Internal review of the

management system (or relevant parts therein) are undertaken at least on an annual basis or in the event of a change in operations / site processes.

Internal audits are undertaken to ensure compliance with the management system, relevant legal requirements, environmental and management performance and to identify preventative / corrective actions to minimise the risk of breach / non-compliance. The findings of any such review and audits are communicated to all staff and relevant external contractors and, where appropriate, improvement works / corrective actions will be implemented. All internal reviews, audits, amendments to the management system and improvement measures implemented will be recorded for reference and inspection purposes.

## 3. Raw Materials, Water & Waste

### 3.1 Raw Materials

#### 3.1.1 Raw Material Use

Raw materials use associated with the operation of the plant include some 250 products including perfumes, talc, fatty acids and alcohols. The raw materials remain largely the same as the original 2008 application and subsequent variations.

#### 3.1.2 Storage & Containment

Bulk liquid ingredients are stored within the tank farms. An external tank farm is present for the flammable liquid raw materials. An internal tank farm is present for the non-flammable liquid ingredients, located within the process building. All bulk tanks are single skinned vertical tanks located within a concrete bund within impermeable floors and no penetrations of the bund walls. The bunds provide containment for at least 25% of the aggregate contents within.

Other liquid ingredients are supplied in drums and 1 m<sup>3</sup> Intermediate Bulk Containers (IBCs) which are stored inside the building to protect against leaks, spills and weather impacts. Flammable and oxidising raw materials are stored in purpose built bunded storage cabinets in the North Yard, away from the main production building.

An emergency response plan is in place to control leaks and spills.

A drainage plan is provided within Appendix 1.

Emergency equipment including emergency spill kits is available on site.

#### 3.1.3 Raw Material Efficiency Measures

Raw material use at the installation is limited to the use of ingredient liquids and dry products. All raw materials have a financial value and therefore waste is minimised as much as possible. Occasionally some products exceed their shelf life and require disposal, but this is limited as far as is practicable through production and batch planning.

A Clean-in-Place (CIP) system is used to minimise the amount of cleaning water required and cleaning/sanitising chemicals required to clean the mixing vessels between batches. This is considered BAT.

### 3.2 Water

#### 3.2.1 Use

Water is routinely used across the Installation for cleaning and within product formulation. Only mains water is supplied to the site.

#### 3.2.2 Efficiency Measures

Water use is subject to periodic audit under the site Environmental Management System. Cleaning water is reused where possible where it would not affect the quality of the products.

### 3.3 Waste

#### 3.3.1 Wastes Generated

Under normal operating conditions wastes associated with the regulated activity are limited to out-of-specification raw materials, waste raw material packaging, out-of-specification finished product, waste finished product packaging and maintenance and cleaning related materials.

Under normal conditions the wastes arising from the regulated activity at the Installation will comprise the following (2023 figures, actual waste generation will depend on fluctuating production requirements, maintenance and other factors):

**Table 3.1: Summary of Wastes**

Description of Waste	Estimated Annual Quantity	Estimated Daily Average
General Waste	32.3 tonnes	88.4 kg
Plastic	22.9 tonnes	62.8 kg
Cardboard	97.5 tonnes	267.1 kg
Metal	11.1 tonnes	30.4 kg
<b>Dry waste (Total)</b>	<b>163.8 tonnes</b>	<b>448.7 kg</b>
Hazardous waste (permitted activities)	58.13 tonnes	159.2 kg

In addition to these wastes, oil contaminated wipes and absorbents may arise on an ad-hoc basis resulting from unintended small-scale releases during maintenance operations.

#### 3.3.2 Storage & Containment

Wastes arising under normal operating conditions are limited in volume and will be stored in a suitable sealed containers and stored within the building prior to storage in the appropriate container/skip prior to disposal through licensed contractor. Liquid wastes stored on-site during maintenance / abnormal works will be suitably contained within adequate secondary containment.

#### 3.3.3 Waste Minimisation

Wastes arising from the regulated activity at the Installation will be limited to the manufacture of product and be limited wherever possible. However, disposal of expired ingredients could be significant one-off disposals, e.g. a 1 m<sup>3</sup> IBC of liquid ingredient could represent a metric ton of

waste generated in one day, exceeding the current limits of 10kg per day (200kg in any one day) allowed under a Low Impact Part A(1) Installation Permit.

## 4. Energy Use & Efficiency

### 4.1 Energy Consumption

The site consumes energy to operate the production equipment and ancillary processes associated with the general running of the entire site. Submetering is in place on key energy consuming equipment within the plant. The site also operates an Energy Management System externally certified to the ISO 50001 standard.

Expected annual energy consumption figures for the entire site are given below (2023 figures, actual energy consumption will depend on fluctuating production requirements, maintenance and other factors):

**Table 4.1: Summary of Energy Consumption**

Energy Source	Approximate Annual Energy Consumption		
	As Delivered (MWh)	Daily Average (MWh)	% of total (primary)
Electricity	1,613.85	4.42	67%
Gas	798.59	2.19	
<b>Energy Usage (Total)</b>	<b>2,412.44</b>	<b>6.61</b>	<b>33%</b>

### 4.2 Energy Efficiency Measures

#### 4.2.1 Operating & Management Procedures

No heating of mixing or reaction vessels is required. Limited generation of hot water is required at the site as part of the clean-in-place system and steam generation, but the boilers are sized for this process.

The ISO 50001 energy management system includes internal auditing of energy efficiency measures on site.

#### 4.2.2 Energy Efficiency Directive – Article 14

Article 14 of the Energy Efficiency Directive (2012/27/EU) requires a cost-benefit analysis in relation to measures for promoting efficiency in heating and cooling at industrial installations with a thermal input exceeding 20MW<sub>th</sub>. This is not relevant to this site.

## 5. Emissions to Air, Water, Sewer & Land

### 5.1 Emissions to Air

There are no point source emissions from the current installation relevant to an environmental permit. The current Low Impact Part A(1) Installation Permit does not have any identified air emission points within Schedule 3. As such, none of the diffuse air emission points present on site has a relevant emission limit value. Mixing vessels so not require extraction systems as the

blending or reaction processes are carried out at ambient temperature and pressure and release no significant emissions.

Small scale emissions to air are generated from ancillary processes including the air compressor, welding bay and two small boilers (<1 MWth) for water heating. These are not considered significant emissions to air.

Fugitive emissions to air at the Installation are expected to be limited. It is not anticipated that the fugitive emissions from the tank vents will be significant. Venting of flammable liquid storage tanks is directed back to the delivery tanker.

## 5.2 Global Warming Potential

The release of greenhouse gas emissions at the Installation is anticipated primarily from indirect use of electricity. While gas is used on site within boilers to generate hot water and steam, this is through small gas boilers and efforts are underway to remove all gas use from site. There is no significant liquid fuel use at the site.

## 5.3 Emissions to Surface Water

### 5.3.1 Point Source Surface Water

Surface water runoff from the external areas is routed across the site through a dedicated surface water drainage system to a balancing pond and underground flow attenuation system, before being discharged through a purpose built oil/water interceptor. Automated TOC monitoring ensures only uncontaminated surface water is discharged from the site. If the TOC monitors detect out-of-specification surface water, automatic gate valves prevent the discharge of surface water from the site. The surface water ultimately discharges through a culvert into the Bottle Brook.

The operation of the Installation will not result in any discharges of wastewater to surface water.

### 5.3.2 Fugitive Emissions to Surface Water

The operation of the Installation will not result in any fugitive discharges of process water to a surface water body.

## 5.4 Emissions to Groundwater

There will be no process emissions to groundwater from the installation.

## 5.5 Emissions to Sewer

Process emissions to sewer are undertaken under a trade effluent consent issued by Severn Trent Water. This consent (Ref. 008282V) was issued on 31<sup>st</sup> July 2015 and subject to volume increases in 2018 and in 2020 to 45 m<sup>3</sup> per day. There is no change to the type of process discharges undertaken under the existing Low Impact Part A(1) Permit.

## 5.6 Emissions to Land

There will be no emissions to land associated with the regulated activity at the Installation.

## 5.7 Odour Emissions

There will be no significant sources of odour from the permitted operations at the Installation, therefore odour is not considered further in this application.

## 5.8 Noise Emissions

### 5.8.1 Noise Assessment

Noise monitoring of the external boundary and plant operations at the Site was undertaken by Wakefield Acoustics Ltd (report reference: C29377-V001, 26th January 2024) in accordance with the requirements of BS4142:2014+A1:2019.

Although not considered a significant environmental risk, a noise management plan was prepared detailing the steps to be taken in the event of noise complaints.

The noise survey and noise management plan have been appended to this application.

There will be no significant sources of vibration from the permitted operations at the Installation, therefore vibration is not considered further in this application.

# 6. Monitoring

## 6.1 Monitoring Emissions to Air

As discussed in Section 5.1 there are no emission limit values applicable to the site. Furthermore, emissions from the generator plant are not anticipated on a routine basis other than for testing or short-term operation in the event of a failure of the National Grid supply. Therefore, emission monitoring will be limited to that undertaken as part of routine maintenance.

## 6.2 Monitoring Emissions to Water

There will be no process emissions to controlled waters i.e., groundwater, surface waters or sewers associated with the proposed installation and therefore no monitoring is required. Roof water is collected for recycling with any surplus being discharged, along with uncontaminated site drainage, to the Bottle Brook.

## 6.3 Monitoring Emissions to Sewer

Discharges to foul sewer will continue to be monitored in line with the requirements of the existing Severn Trent trade effluent consent.

## 6.4 Monitoring Emissions to Land

There will be no emissions to land associated with the regulated activity and therefore no monitoring is required.

# 7. Application of BAT

## 7.1 Determining Applicable BAT

The proposed regulated activity has relevant Best Available Technique (BAT) reference documents and associated published guidance:



- Environment Agency EPR 4.02 – Specialty Organic Chemicals Sector;
- Best Available Techniques (BAT) Reference (BRef) document for Manufacture of Organic Fine Chemicals (OFC);
- Best Available Techniques (BAT) Reference (BRef) document for Emissions from Storage;

## 7.2 BAT for Process Operation

Form C3, Section 3a states *“if the standard set out in the relevant BAT conclusion(s), BAT reference document(s) (BREF) and/or Technical Guidance(s) (TGN) there is no need to justify using them within your documents in Table 3a.”*

No changes to the operation of the remainder of the site operations is taking place as part of this variation. All document submitted as part of the original application and variation continue to be relevant to the operating techniques used at the facility. The existing operations met BAT at the point of original permit issue in 2008 as set out in the above guidance documents.

## Appendix 1 Figures

Drawing 2.1 – Site Environmental and Safety Equipment Map



Equipment Map

Area Number	Area	Area Number	Area
1	Flammable Cabinets (North Yard)	18	External Electricity Isolation
2	Flammable Tank Farm	19	External Gas Isolation Valve
3	Sprinkler House	20	Air Conditioning Units
4	North Yard	21	Attenuation Pond
5	Tanker Offload Point (Non-Flammable)	22	Process Lab Equipment
6	Yard Valve	23	CIP System
7	Aco Drain	24	Compressor Room
8	North Yard Access Road	25	Warehouse Floor
9	South Yard	26	Filling Trade Effluent Floor Drains
10	Surface Water - Attenuation Chamber	27	Mixing Trade Effluent Floor Drains
11	Oil Interceptor	28	Production Floor
12	TOC Management System	29	Mixing Trade Effluent Sump
13	Surface Water Outflow	30	Filling Trade Effluent Sump
14	Trade Effluent Outflow (TE1)	31	Indoor Tank Farm
15	Trade Effluent Tanks	32	Mixing Floor
16	Trade Effluent Pump House	33	Surface Water Drain Runs
17	Trade Drain Runs	34	Rain Water Harvesting System

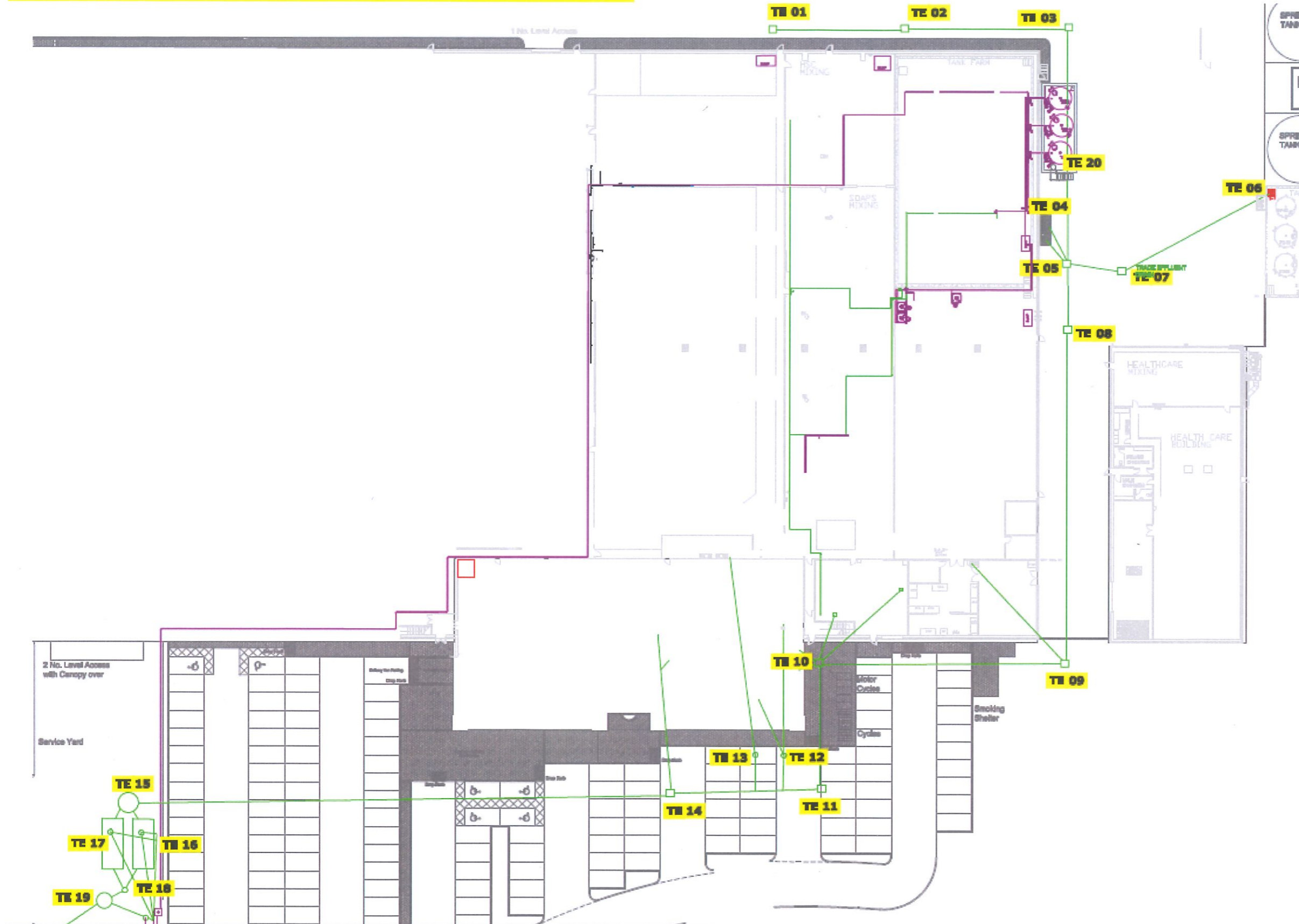
# SURFACE WATER DRAIN PLAN DRAWING 3.0



Form Title:

Q858 – Site Drawings – 005

# TRADE EFFLUENT DRAIN PLAN DRAWING 3.2



## Appendix 2 Noise Survey

## **EXTERNAL NOISE ASSESSMENT**

### **SC JOHNSON PROFESSIONAL**

#### **DENBY, DERBYSHIRE**

**CLIENT:** SC Johnson Professional Ltd

**SITE:** SC Johnson Professional Ltd  
Denby Hall Way  
Denby, Derbyshire  
DE5 8JZ

**CONTACT:** Mr Allan Harley

**REPORTED BY:** Mr Paul Horsley

**CHECKED BY:** Mr Luke Hurren

**REPORT REF:** C29377-V001



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## **1.0 Client**

SC Johnson Professional Ltd

## **2.0 Site**

SC Johnson Professional Ltd

Denby Hall Way

Denby

Derbyshire

DE5 8JZ

## **3.0 Aims**

The aim of this report is to:

- determine the current output noise levels from the site operations of the SC Johnson Professional site.
- determine if the operational output from the site is likely to produce adverse reaction from nearby noise sensitive receptors.
- report on the output noise levels in accordance with the requirements of BS4142:2014+A1:2019.
- provide mitigation recommendations for the site output in order to maintain the amenity of nearby noise sensitive premises, if necessary.

#### **4.0 Location and Description of Existing Noise Sources**

The SC Johnson Professional site is located within an industrial area of Denby, Derbyshire.

SC Johnson Professional is a company specialising in the manufacture of liquid hand cleaning and sanitising products for the cosmetic and industrial markets.

The site consists primarily of one single storey building with profiled roof and occupies a site approximately 225m x 225m. The main factory building is positioned to the western side of the site and is 135m x 80m. There are 2 No car park areas to the east, a service yard to the south, with a fork-lift truck access route to the west and tank farm and external yard to the north.

The primary noise sources at the site boundary are due fixed plant and machinery noise. Other noise sources of significance are due to the product being moved around the site using fork-lift trucks and music played through the audio system throughout the factory site. Noise due to delivery vehicles within the service yard are also audible during daytime periods. External traffic and aircraft overhead are also significant contributors.

The site is bounded to the north by other industrial units. It is surrounded by open farmland to the south, east, and west.

The closest noise sensitive receptor locations are positioned to the south, at Denby Road, and consist of detached houses positioned approximately 200m from the site boundary. There are further noise sensitive receptors located 750m to the southwest at Station Road, 775m northwest at Street Lane and 600m north, beyond the industrial units at Belle View Avenue.

## 5.0 Guidance on the Assessment of Noise Levels.

The purpose of any criterion or standard for environmental noise should be to safeguard against unacceptable levels of community response, deemed as a feeling of annoyance during daytime or disturbance at night. WHO defines annoyance as “...a feeling of displeasure evoked by noise.”

The main source of information relating to noise and the community response are field studies including noise measurements and social surveys. These studies then attempt to establish a correlation between the two sets of results.

In the absence of any definitive guidance and in order to establish suitable noise criteria, it is necessary to rely on general guidance and assessment methods used for community noise sources. Discussions on the current methods are given below.

### 5.1 BS4142:2014+A1:2019 “Method for Rating and Assessing Industrial and Commercial Sound”.

The standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- a) Sound from industrial and manufacturing processes:
- b) Sound from fixed installations which comprise mechanical and electrical plant and equipment:
- c) Sound from the loading and unloading of goods and materials at industrial and / or commercial premises: and
- d) Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and / or commercial site.

The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The standard compares sound from industrial / commercial sources with the background sound level.

In addition to the above, the standard states “Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level.” Such features are considered by adding a correction to the specific sound level depending on the extent to which the distinguishing acoustic characteristics will attract attention. The standard states the following:

**Tonality:** For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of +2 dB for a tone that is just perceptible at the noise receptor, +4 dB where it is clearly perceptible, and +6 dB where it is highly perceptible. Where the subjective method is considered not sufficient for the determination of tonality, alternative methods including a one third octave band analysis method, which assesses the  $L_{zeq}$  sound pressure level in a one third octave band against adjacent one third octave bands. If a tone is identified, then a tonal correction of +6 dB should be applied.

A tone can be considered present where the difference between both adjacent one-third octave bands is as follows.

- 15 dB difference between 25Hz – 125Hz
- 8 dB difference between 160Hz – 400Hz
- 5 dB difference between 500Hz – 10,000Hz

**Impulsivity:** A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of +3 dB for impulsivity, which is just perceptible at the noise receptor, +6 dB where it is clearly perceptible, and +9 dB where it is highly perceptible.

**Other sound characteristics:** Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.

Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be considered. If one feature is dominant, then it may be appropriate to apply a single correction. Where both features are likely to affect perception of response, the correction ought normally to be applied in a linear fashion.

**Intermittency:** When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time-period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over several shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.

BS4142 provides guidance on the assessment of noise impacts as below:

The significance of sound of an industrial / commercial nature depends upon both the margin by which the rating of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs / will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level, and consider the following:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

The Standard introduces additional rating elements, these being subject assessments of tonality, and impulsivity of a sound source, with weighted rating values accordingly applied at the judgment of the assessor.

The introduction of Uncertainty has been applied to the measured values; again, consideration of this is left to the professional executing the survey and assessment. However, steps are provided within the Standard for the reduction of uncertainty in both measurement and calculations of the sound source and rating value. Actual meteorological conditions are now required to be recorded and reported upon for the survey and report.

## **5.2 British Standard 8233:2014 'Sound insulation and noise reduction for buildings'**

The scope of British Standard 8233: 2014: *Sound insulation and noise reduction for buildings* is the provision of guidance for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations; the primary intention of these is to guide the design of new buildings or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

The standard suggests suitable internal noise levels within several types of buildings, including residential dwellings, as shown in Table below.

**Indoor Ambient Noise Levels in Spaces When They Are Unoccupied**

Activity	Typical Situations	Design Range $L_{Aeq, T}$ dB	
		0700h to 2300h	2300h to 0700h
Resting	Living rooms	35	--
Dining	Dining Room / Area	40	--
Sleeping	Bedrooms	35	30

BS8233 states in Note 4 that:

*“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or  $L_{Amax, F}$  depending on the character and number of events per night. Sporadic noise events could require separate values.”*

As such it has been considered appropriate to define a limit for regular maximum indoor noise levels of 45 dB(A) with sporadic events not exceeding 50 dB(A).

BS8233 also suggests noise limits for external areas or a property such as gardens or balconies. It states that:

*‘For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB  $L_{Aeq, T}$ , with an upper guideline value of 55 dB  $L_{Aeq, T}$  which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centre’s or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.’*

**5.3 National Planning Policy Framework, NPPF.**

The National Planning Policy Framework, NPPF, provides advice to planning authorities in England on how they must seek to minimise the adverse impact of noisy activities on noise sensitive receptors. This NPPF, replacing PPG 24, is not prescriptive with respect to specific noise levels, and is mainly concerned with the advising on good practice for environmental noise assessment.

In the absence of definitive noise criterion within the NPPF most Local Authorities in England default to the daytime noise levels inside dwellings not to exceed NR 35 dB; and NR 25 dB, to be achieved inside dwellings at night to avoid sleep disturbance which is not applicable to this application as operations would only take place during daytime periods, based upon ingress of external noise sources.

#### 5.4 World Health Organization 1999 “Guidance for Community Noise”

This document provides a review of the effects of noise and a description of the principles of the WHO health criteria and guidelines for Community Noise.

The effects of noise in dwellings are identified as sleep disturbance, annoyance, and speech interference. For bedrooms, the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LMax for sound events. At nighttime, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value is equivalent to that specifies in the Criteria 12 document; however, it is now assumed that the noise reduction from outside to inside with the window open is 15 dB. To enable casual conversation indoors during the daytime, the sound level of the interfering noise should not exceed 35 dB LAeq.

To protect the majority of people from being **seriously** annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being **moderately** annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq.

Table 1 of the document summarises the guideline values for community noise in specific environments and includes the noise indices to be adopted. Significantly, the corresponding time base to be used for the assessment is also included.

The relevant extracts of Table 1 are reproduced thus:

Specific Environment	Critical health effect (s)	L <sub>Aeq</sub> dB	Time Base hours	L <sub>Amax</sub> dB
Outdoor living area	Serious annoyance, daytime, and evening	55	16	-
	Moderate annoyance, daytime, and evening	50	16	-
Dwelling, Indoors	Speech intelligibility & moderate annoyance daytime & evening.	35	16	-
	Sleep disturbance, night-time	30	8	45
Outside Bedroom	Sleep disturbance, window open (Outdoor Values)	45	8	60

### 5.5 Subjective Impression of Noise Changes

The following Table provides a semantic scale that may be used to “subjectively” rate changes in sound pressure level.

**Table 1: Subjective effect of changes in sound pressure level**

Change in sound level dB	Change in Power		Change in apparent loudness
	Decrease	Increase	
3	1/2	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half / Twice as loud
20	1/100	100	Much quieter / louder

After Bies and Hansen

The above table is taken from Professor Colin H Hansen’s publication “Fundamentals of Acoustics” page 41, for the Department of Mechanical Engineering, University of Adelaide. This table also appears in “Engineering Noise Control” by Colin Hansen and David Bies, a comprehensive reference book, amongst others.

### 6.0 Survey Equipment

Svantek Sound Analyser, SV 979, Type 1, Serial No 92932

Svantek SV 17 Microphone Serial No 106523

RION NC-74 Calibrator Serial No 530712

90mm Windshield

Tripod



## 7.0 Survey Method

The writer conducted attended noise monitoring of the external boundary and plant operations at the SC Johnson Professional site. The survey was executed on 26<sup>th</sup> January 2024 during a typical daytime period in accordance with the requirements of BS4142:2014+A1:2019.

$LA_{eq}$ ,  $LA_{90}$  and  $LA_{Max}$  indices sound measurements were taken using the sound analyser.

The measurement indices noted above are defined as follows:

- $LA_{eq, T}$             the “A” weighted equivalent continuous noise level of sample period T.
- $LA_{90, T}$             the “A” weighted level exceeded for 90% of sample period T.
- $LA_{max}$             The “A” weighted maximum level during the sample period T.

The sound level meter was mounted on a tripod at a height of 1.5m above the floor. The meter was set to record data using a 1/1 Octave Centre Band analysis. Noise monitoring was executed at the various site boundary positions. Close quarters noise monitoring was also conducted for the identified primary fixed plant and operational activities on site.

The sound level meter was calibrated before and after the measurements using the calibrator to ensure accuracy of the results. No variations were noted between calibrations and the results obtained can be deemed to be an accurate representation of the levels recorded.

## 8.0 Prevailing Weather Conditions

26<sup>th</sup> January 2024 Daytime    +8°C, 10% cloud cover, wind 0-4mph W, 1029 mb, 60% Rh.

Road surfaces were dry throughout the monitoring period.

## **9.0 Noise Survey Results**

During the monitoring period noise samples were recorded using a broadband and 1/1 Octave Centre Band analysis for the survey. These monitoring samples were collected from the locations described below. This was to establish the general noise output from the site.

The table of results on the following page indicates the noise levels recorded for the various locations selected during the monitoring period, with a brief description of the noise sources contributing to the individually monitored noise levels recorded.

An overview of monitoring positions is given below: -

1. Location 1 relates to the eastern site boundary within the car park area.
2. Location 2 relates to the northern site boundary position.
3. Location 3 relates to the western site boundary position.
4. Location 4 relates to the southern site boundary position within the service yard area.
5. Location A relates to a position outside the boiler house.
6. Location B relates to the ground level external extract fan units along the northern façade.
7. Location C relates to the northwest corner of the building opposite the high-level extract flue outlet.
8. Location D relates to a position close to the southwest corner of the of the building façade.
9. Location E relates to a position close to a curtain sided trailer.
10. Location F relates to a position close to a steel container unit.

The above monitoring locations should be read in conjunction with the site layout appearing in Appendix A of this report.

Refer to Appendix B for the survey results frequency analysis table.

## 10.0 Noise Survey Results Table

Below are the results tables for the noise monitoring sessions completed for the site.

### Site Boundary Assessment Results

Location	Description	Start date & time	Duration	LAMax dB	LAeq dB	LA10 dB	LA90 dB	Source Description
1	East Car Park Site Boundary	26/01/2024 11:05:28	01:00:06.000	81.0	55.2	56.7	47.1	Off site traffic dominant. Light aircraft. No SC Johnson plant audible. Personnel access gate impact dominant when shut.
2	Northern Site Boundary	26/01/2024 12:14:11	01:00:01.000	67.5	59.7	60.5	59.0	Constant drone from exhaust flues served by ground level extract plant
3	Western Site Boundary	26/01/2024 13:20:21	01:00:02.000	74.7	53.9	54.8	51.0	Traffic movements along Derby Road audible. Façade flue audible and constant drone. On-site FLT movements along ribbed concrete perimeter road dominant when present. Low bass music audible from within factory building.
4	Service Yard Southern Site Boundary	26/01/2024 14:23:25	01:00:09.000	82.2	62.4	65.4	48.8	Loading process of curtain side trailer dominant rumble over durbar plates. Vehicle movements in yard. External traffic and industrial activities audible. Aircraft audible.

### SC Johnson Professional Primary External Noise Sources

Location	Description	Start date & time	Duration	LAMax dB	LAeq dB	LA10 dB	LA90 dB	Source Description
A	Boiler House Façade at 5m	26/01/2024 12:09:40	00:00:47.000	69.9	63.6	64.3	62.4	Boiler house plant outlets dominant.
B	Extract Units at 3m	26/01/2024 12:11:25	00:01:06.000	69.3	68.5	68.9	68.0	4 No fan units located on the ground externally dominant source.
C	North West HL Flue Outlet at 5m	26/01/2024 13:16:41	00:01:41.000	83.4	82.5	83.1	81.7	High level façade exhaust flue dominant source.
D	South West Façade at 2m	26/01/2024 14:21:36	00:00:24.000	59.4	55.2	58.6	50.6	Bass music breakout through façade dominant from high level speaker located inside the factory.
E	Side of Curtain Side Trailer at 3m	26/01/2024 15:28:10	00:01:24.000	92.7	73.6	72.5	57.6	Loading trailer using a powered BT Lifter dominant over loading ramp. Rumble inside trailer bed.
F	Side of Steel Container Unit at 3m	26/01/2024 15:33:03	00:01:27.000	93.5	77.1	80.1	52.4	Loading container using a powered BT Lifter dominant over loading ramp. Rumble inside steel container unit.

Refer to Appendix B for frequency analysis data.

## 11.0 Noise Impact Assessment

The noise assessment conducted has monitored the boundary noise levels and primary noise output items located at the SC Johnson Professional site.

To determine if the site noise output is having a detrimental effect on the nearby noise sensitive receptors, we need to provide an assessment of the recorded noise levels at close quarters and project these readings to the residents. This method of assessment eliminates the extraneous noise associated with the general ambient levels that may be present at the recipients premises.

The considerations to allow the calculation to be completed include a distance correction to residence and a barrier correction for the topography of the intervening land between the site and the identified noise sensitive recipients.

Below is a table showing the results of the above calculation.

Position	Recipient	Direction	Distance from site boundary, m	Primary Noise Source Likely to be Present					Individual Source Contribution At Recipient, dBA					Resultant SC Johnson Source Contribution, dBA
				Boiler House	Extract Fans	HL Flue Outlet	Music Breakout	Trailer Loading	Boiler House	Extract Fans	HL Flue Outlet	Music Breakout	Trailer Loading	
R1	Snape EN, off Denby Road	SSW	200	N	N	Y	Y	Y	0.0	22.6	46.6	14.4	29.9	46.7
R2	Station Road Premises	WSW	750	N	N	Y	Y	Y	0.0	24.6	38.9	3.5	18.8	39.1
R3	Street Lane Primary School, Street Lane	NW	775	Y	Y	Y	Y	Y	19.1	25.2	38.8	1.9	17.2	39.1
R4	Belle View Ave premises	NNE	600	Y	Y	Y	N	N	22.3	28.3	41.0	0.0	0.0	41.3

The resultant noise contribution, when considered at the nearby noise sensitive receptors, is likely to be audible above the background noise climate, consisting of traffic flow along the highway in the absence of the site activity noise.

This is especially relevant when considered at the receptor position R1, Snape EN off Denby Road to the south of the site, where the HL Flue Outlet has been determined as the dominant source.

Inspection of the other considered receptor positions indicates that the same source, the HL Flue Outlet, is the dominant source produced by the site.

### 11.1 BS 4142:2014+A1:2019 Assessment

The accepted method of determining the extent to which sound produced by industrial sources, including fixed plant, is likely to be acceptable is the use of a BS4142:2014+A1:2019 rating.

The following is an assessment in accordance with BS4142:2014+A1:2019, which has been based upon the results above for the specific assessed operations determined at the noise sensitive receptor R1 at Snape EN, off Denby Road, to the south of the site.

The data used in the assessment is the resultant calculation for the operations on site, taken from the table above.

All readings have been rounded to the nearest whole number.

**BS4142:2014+A1:2019 – Receptor Location R1, Snape EN, off Denby Road**

Description	Indices	Sound Level	Comments
Assessed Operational Sound Levels	L <sub>Aeq</sub>	47 dB	Calculated value for the worst-case operations at the residential premises.
Measured Residual Sound Level	L <sub>Aeq</sub>	55 dB	Traffic
Background Noise Level	L <sub>A90</sub>	47 dB	As above
Specific sound source correcting the ambient sound level to remove the residual sound level	L <sub>Aeq</sub>	47 dB	Non applicable as this is a calculated value.
Acoustic feature correction	dB	+6 dB Tone +3 dB Int +3 dB Imp	Constant operation with tonal output, impulsive and intermittent noise sources present.
Rating Level	(47 + 12)	59 dB	
Background Noise Level	L <sub>A90</sub>	47 dB	
<b>Excess of Rating over background sound level</b>		<b>+12 dB</b>	
The excess rating value of +12 dB is above the existing background activities and is classified as significant and likely to produce justifiable adverse comment due to the existing monitored site operations when considered outside the nearby noise receptor location R1, Snape EN, off Denby Road.			
<p>Uncertainty of the assessment</p> <p>There is uncertainty in the calculation as it is based upon a calculated output level with a correction applied which may account for a minimal variation in the actual values for the plant at this location, however, as noted above, the calculated value concurs with the monitored values recorded. The uncertainty is not significant as the rating is high, and the value is in context with the actual area. The measurements presented indicate that the confidence of the rating for the specific source.</p>			

As can be seen from the results of the BS4142:2014+A1:2019 assessment for the site operations results in noise output rated at +12 dB above the existing background level, when considered outside the closest noise

sensitive receptor to the site at R1, 200m south of the site. This rating value is significant and likely to result in justifiable adverse comment or complaints.

All other assessed locations result in lower contribution values due to the site activities and output, therefore, the above can be deemed as the worst-case scenario assessment result.

Inspection of the main noise responsible indicates that the high-level flue outlet located at the northwestern corner of the façade is the dominant source.

### **11.2 WHO and BS8233:2014 Assessments**

If we consider the recommendations of both WHO and BS8233:2014 for the site noise contribution when observed at the nearby noise sensitive receptors, we find the allowable noise level to avoid annoyance is 50 LAeq dB for outside spaces during daytime periods and falling to 45 dBA at night.

The high-level flue outlet plant has been advised as operating in conjunction with the internal factory production time periods of 7am to 10pm, therefore daytime periods only assessed as contributing 46.7 LAeq dB representing a value -3.3 dB below the recognised external limit of WHO of 50 LAeq dB. This is a good indicator that noise is not detrimental to health or likely to give rise to any undue loss of amenity.

Both WHO and BS8233:2014 deal with noise inside dwelling spaces and differentiate between daytime and nighttime periods. The internal noise limit for daytime periods is set at 35 dBA and nighttime is set at 30 dBA to avoid daytime annoyance or nighttime sleep disturbance within both guidance documents.

To project the site noise into an internal space of the residence, we will assume that a window is open for ventilation purposes. The open window scenario provides a reduction to the passage of sound of -15 dB. Therefore, the blower plant contribution inside the premises will be as follows.

46.7 LAeq dB (cumulative site noise) – 15 dB (open window) = **31.7 dBA Site Noise Inside.**

As can be seen the site noise is assessed as below the limits allowable for noise ingress disturbance due the external noise sources, determined as -3.7 LAeq dB below the daytime limit of 35 LAeq dB. Nighttime limits are not relevant since the site does not operate at night, deemed as 10pm to 7am. However, should the plant be operated 24-hours daily, then the fixed plant noise output would exceed the limitations set and are likely to give rise to adverse comment from the nearby residents.

## 12.0 Mitigation Considerations

The noise monitoring of the plant and activities at the SC Johnson Professional site has resulted in output levels that are likely to result in adverse comment as a consequence of the output levels when considered at the closest noise sensitive receptor location to the south, R1 Snape EN, off Denby Road.

Based upon the findings that the site output operating above the background level at the residential premises, with a BS4142:2014+A1:2019 rating value of +12 dB, additional mitigation measures are recommended.

Below are recommendations that should be considered, as follows.

### 12.1 High-Level Flue Outlet

The high-level flue outlet is positioned to the north-western corner of the main factory building and consists of a circular spiral ductwork chamfered at 45 degrees with a mesh welded to the end. The plant serving this specific outlet is located inside the factory and operates close to the indoor tank farm area. See photo below.



**High Level Flue Outlet**

To reduce the output emanating from the high-level flue outlet it is recommended that the ductwork is fitted with an in-line attenuator to reduce the noise levels by at least -15 dBA. The output from the flue has been determined as producing a tonal sound, therefore, it is recommended that the following minimum reduction is provided across the sound spectrum to ensure that the tonal element of the output is minimised accordingly.

Recommended Sound Reduction dB in Frequency Band Hz								Overall Reduction
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB
3	5	17	10	4	5	5	7	15

It is also recommended that the welded mesh is removed as this is producing regenerative noise due to the velocity of the air passage over the steel bars. This regenerative noise would act to negate any sound reduction afforded by the installation of the recommended attenuation noted above.

Finalised selection of any mitigation measures would need to be assessed against the actual fixed plant served by the outlet to ensure comparability with any duty and pressure limitations.

The revised noise contribution at the residents with inclusion of the recommended mitigation measures is provided in the table below.

Position	Recipient	Direction	Distance from site boundary, m	Primary Noise Source Likely to be Present					Mitigated Individual Source Contribution At Recipient, dBA					Resultant SC Johnson Source Contribution, dBA
				Boiler House	Extract Fans	HL Flue Outlet	Music Breakout	Trailer Loading	Boiler House	Extract Fans	HL Flue Outlet	Music Breakout	Trailer Loading	
R1	Snape EN, off Denby Road	SSW	200	N	Y	Y	Y	Y	0.0	22.6	31.6	14.4	29.9	34.2
R2	Station Road Premises	WSW	750	N	Y	Y	Y	Y	0.0	24.6	23.9	3.5	18.8	27.9
R3	Street Lane Primary School, Street Lane	NW	775	Y	Y	Y	Y	Y	19.1	25.2	23.8	1.9	17.2	28.5
R4	Belle View Ave premises	NNE	600	Y	Y	Y	N	N	22.3	28.3	26.0	0.0	0.0	30.9

The mitigated high-level flue outlet is highlighted in red above and accounts for the overall sound reduction of -15 dBA, whilst reducing the tonal content of the outlet.



## 12.2 Post Mitigation BS 4142:2014+A1:2019 Assessment

If we use the above resultant sound level values the revised BS4142:2014+A1:2019 rating for the site noise output as a whole will be as follows.

### BS4142:2014+A1:2019 – Receptor Location R1, Snape EN, off Denby Road (Mitigated)

Description	Indices	Sound Level	Comments
Assessed Mitigated Operational Sound Levels	L <sub>Aeq</sub>	34 dB	Calculated value for the worst-case operations at the residential premises, including mitigation to the HL Flue.
Measured Residual Sound Level	L <sub>Aeq</sub>	55 dB	Traffic
Background Noise Level	L <sub>A90</sub>	47 dB	As above
Specific sound source correcting the ambient sound level to remove the residual sound level	L <sub>Aeq</sub>	34 dB	Non applicable as this is a calculated value.
Acoustic feature correction	dB	0 dB Tone +3 dB Int +3 dB Imp	No tonal output, impulsive and intermittent noise sources present due to service yard activities
Rating Level	(34 + 6)	40 dB	
Background Noise Level	L <sub>A90</sub>	47 dB	
<b>Excess of Rating over background sound level</b>		<b>-7 dB</b>	
The excess rating value of -7 dB is below the existing background activities and is classified as insignificant and not likely to produce justifiable adverse comment due to the mitigated site operations when considered outside the nearby noise receptor location R1, Snape EN, off Denby Road.			
<p>Uncertainty of the assessment</p> <p>There is uncertainty in the calculation as it is based upon a calculated output level with a correction applied which may account for a minimal variation in the actual values for the plant at this location, however, as noted above, the calculated value concurs with the monitored values recorded. The uncertainty is not significant as the rating is so low, and the value is in context with the actual area. The measurements presented indicate that the confidence of the rating for the specific source.</p>			

As can be seen from the results of the revised BS4142:2014+A1:2019 assessment for the mitigated site operations results in noise output rated at -7 dB below the existing background level, when considered outside the closest noise sensitive receptor to the site at R1, 200m south of the site. This rating value is now classified as insignificant and not likely to result in justifiable adverse comment or complaints.

### **12.3 Internal High-Level Speaker Mounting**

The music played internally within the factory is relayed through high-level speakers. The speakers have been advised as being solidly mounted on the steel building columns. The result of this type of mounting is that the sound generated produces a structure borne vibration in the building which has been witnessed as emanating to the outside space as sound. The music output produced by the speakers is especially audible at the south-western corner of the site, Location D, where a low frequency dominant content was noted.

It is recommended that the speaker units are decoupled from the building by means of a solid bracket fixed to the structure with the speakers hung below using anti-vibration hangers, selected to achieve a minimum 1" deflection to provide a minimum 95% efficiency when installed.

Inclusion of the above will minimise the current vibrational energy from entering the structure and reduce the noise output as a consequence.

### **13.0 Summary and Conclusions**

An attended acoustic assessment of the noise levels produced by the activities and fixed plant at the SC Johnson Professional site has been conducted in accordance with the requirements of BS4142:2014+A1:2019.

The primary existing noise sources affecting at the site boundary locations have been identified and found to be due to the externally located fixed plant items and service yard activities. Primary noise sources, away from the site, are due to traffic flow and aircraft noise which was dominant when present.

The noise associated with the operational output of the SC Johnson Professional site has been assessed at the nearby noise receptor locations.

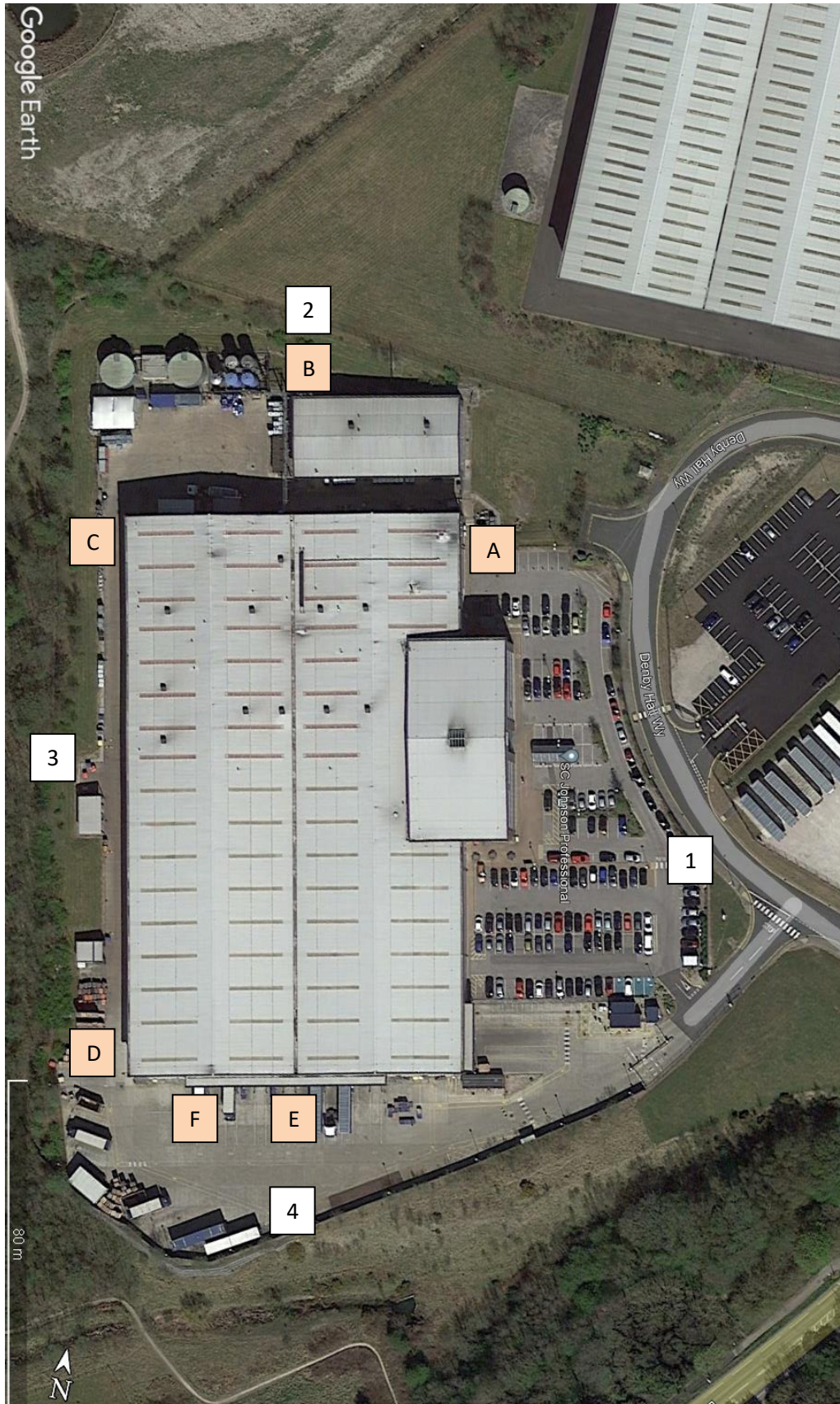
The primary noise sources at the SC Johnson Professional site were also monitored at close quarters on site.

The monitoring data gathered was used to assess the impact of the overall cumulative sound of the site activities. The calculation completed for the site accounted for distance and topographical barrier corrections. The resultant sound levels produced by the site operational output were then determined at the closest noise sensitive receptors.

The noise monitoring results were tabulated and produced a worst-case BS4142:2014+A1:2019 Rating Value of +12 dB at the closest noise sensitive receptor position, deemed as the Snape EN off Denby Road south of the site boundary. A value of this level is likely to result in justifiable adverse comment or complaints.

Mitigation considerations have been proposed for the primary noise source, identified as the high-level flue outlet, positioned at the north-western facade of the factory building. The mitigation proposed is in the form of an in-line attenuator located between the fixed plant and atmospheric outlet. Inclusion of the attenuation will reduce the output from the flue such that the noise from the entire site is no longer unduly affecting the amenity of the nearby noise sensitive receptors.

Appendix A-1 Locational Plan and Survey Points



Appendix A-2 Receptor Locations





## Appendix 3 Noise Management Plan

# Noise Management Plan

## 1. Introduction

### 1.1. Site Description

SC Johnson Professional is a company specialising in the manufacture of liquid hand cleaning and sanitising products for the cosmetic and industrial markets.

The Site consists primarily of one single storey building with profiled roof and occupies a Site approximately 225m x 225m. The main factory building is positioned to the western side of the site and is 135m x 80m. There are two (2) car park areas to the east, a service yard to the south, with a fork-lift truck access route to the west and tank farm and external yard to the north.

The Site is located within an industrial area of Denby, Derbyshire, it is surrounded by open farmland to the south, east and west. Several commercial and industrial properties are located within a 400m radius. These include:

- Haulage
- Warehouses and logistics premises
- Corporate offices
- Industrial units
- Manufacturing plants

### 1.2. Maintenance and review of the Noise Management Plan

This plan will be reviewed by Site management at least annually, following any significant changes in operations or the receipt of noise complaints.

### 1.3. Sector Guidance

The impact of noise from Site operations has been assessed in accordance with BS4142:2014+A1:2019 'Method for Rating and Assessing Industrial and Commercial Sound'.

## 2. Receptors

### 2.1 Receptor List

The closest noise sensitive receptor locations are positioned to the south, at Denby Road and consist of detached housing approximately 200 metres from the Site boundary.

*Table 2.1 Receptor List*

Reference	Receptor	Land use	Distance to site boundary (m)	Direction from site
R1	Snape EN, off Denby Road	Housing	200m	South
R2	Station Road Premises	Housing	750m	South-west
R3	Street Lane Primary School	School	775m	North-west
R4	Belle View Avenue Premises	Industrial units	600m	North



Figure 2.1 Map of site location and receptors



### 3. Noise sources and processes

#### 3.1 Noise monitoring conclusion

Noise monitoring of the external boundary and plant operations at the Site was undertaken by Wakefield Acoustics Ltd (report reference: C29377-V001, 26<sup>th</sup> January 2024) in accordance with the requirements of BS4142:2014+A1:2019. The monitoring report concluded the following:

- The resultant noise contribution, when considered at nearby noise sensitive receptors is likely to be audible above the background noise climate, consisting of traffic flow along the highway in the absence of the Site activity noise.
- The results of the BS4142:2014+A1:2019 assessment for the Site operations results in noise output rated at +12 dB above the existing background level, when considered outside the closest noise sensitive receptor to the Site R1, 200m south of the Site. This rating is significant and likely to result in justifiable adverse comment or complaints.
- All other assessed locations result in lower contribution values due to the site activities and output, therefore, the above can be deemed as the worst-case scenario assessment result.
- Inspection of the main noise responsible indicates that the high-level flue outlet located at the northwestern corner of the façade is the dominant source.
- Predicted internal noise levels at neighbouring residential properties indicate compliance with WHO and BS8233:2014 criteria for inside dwelling spaces, -3.7 LAeq dB below the daytime limit of 35 LAeq dB. Nighttime limits are not relevant since the site does not operate at night, however, should the plant be operated 24-hours daily, then fixed plant noise output would exceed the limitations set.

The Site is reviewing recommendations from the Wakefield Acoustics report to reduce the noise levels at the closest sensitive receptor. The revised BS4142:2014+A1:2019 assessment for the mitigated site operations results in noise output rated -7 dB below the existing background level, when considered outside the closest noise sensitive receptor. This rating is now classified as insignificant and not likely to result in justifiable adverse comment or complaints.

#### 3.2 Noise sources

The Site installation comprises an industrial building for the manufacture of cleaning products, external delivery, storage areas and car parking.

Internal noise sources relate to plant used in the manufacture of cleaning products and music played through the Site audio system.

External noise sources include external plant such as extract fans and a high-level flue outlet, forklift trucks and delivery vehicles for the movement of product around the Site.

The primary noise sources at the site boundary are due to externally located fixed plant and machinery noise.

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*Table 3.1 noise emitting processes*

<b>Location</b>	<b>Noise source</b>
A	<i>Boiler house facade</i>
B	<i>Extract Units</i>
C	<i>Northwest high level flue outlet</i>
D	<i>Southwest facade</i>
E	<i>Side curtain side trailer</i>
F	<i>Side of steel container unit</i>

### 3.3 Overview of noise processes and emissions

Figure 3.3 shows the locations of Site noise emissions.

*Figure 3.3 Site noise emissions*



#### 4. Control measures and process monitoring

## 4.1 Control Measures

Table 4.1 describes the identified potential sources of noise and the actions and processes in place to mitigate them.

Table 4.1 Control measures

Sources of Noise		Mitigation actions
1	High level flue outlet	<ul style="list-style-type: none"> <li>The Site is reviewing recommendations from the Wakefield Acoustics report.</li> </ul>
2	Internal high level music speaker	<ul style="list-style-type: none"> <li>Speaker units decoupled from the building. Site Management to regularly monitor volume of music.</li> </ul>
3	Boiler House	<ul style="list-style-type: none"> <li>Equipment shall be maintained in accordance with manufacturer's recommendations, e.g. periodic lubrication of drives where required.</li> <li>Changes in noise from fan and motor related issues will be identified through changes in sound, and an engineer's visit scheduled.</li> </ul>
4	Extract fans	<ul style="list-style-type: none"> <li>Efficient extraction fans are used and maintained in good condition to avoid excessive noise.</li> <li>Fan related noise complaints will be investigated promptly.</li> </ul>
5	Trailer loading	<ul style="list-style-type: none"> <li>All vehicles are required to be driven onto and off the Site with due consideration to neighbours.</li> <li>Deliveries are made only during daytime hours so that disturbance is minimised.</li> <li>Vehicles must be well maintained and driven slowly around the site.</li> <li>Engines must be turned off when not required.</li> <li>Vehicles which are fitted with audible reversing warning systems are only used during the daytime.</li> </ul>
6	Small vehicles travelling to and from the farm (e.g. staff or contractors, courier van deliveries, etc.)	<ul style="list-style-type: none"> <li>Small vehicles arrive during the working day and are therefore considered as a low risk.</li> </ul>
7	Personnel	<ul style="list-style-type: none"> <li>Staff and other contractors are required to carry out their duties without creating excessive noise through shouting, use of radios, etc.</li> </ul>
8	Repairs	<ul style="list-style-type: none"> <li>When repair work is required at the site it is undertaken during normal working hours and with due regard to possible noise disturbance.</li> <li>In the event of major repair work which is likely to cause significant noise and disruption or an emergency breakdown which is that is likely to</li> </ul>

Sources of Noise	Mitigation actions
	impact on operations, neighbouring residents will be notified.

#### 4.2 Onsite monitoring procedures

Site management shall review internal and external noise levels through regular site walk rounds, should excessive noise be identified it will be investigated.

If a breakdown of equipment occurs, or should a complaint be made, the following response measures will be taken:

Event	Response	Timescale
Fans operating incorrectly	Should a fan stop working or work noisily repair will be requested promptly.	Immediately
Noise from heavy vehicles	If a heavy vehicle is operating noisily, the operator will be requested to not bring it back to site until repaired.	Immediately

#### 4.3 Monitoring off site sound levels

Routine noise monitoring will not be undertaken. If operations at the site gives rise to noticeable noise, or noise complaints, then this will be investigated and any follow up action required.

### 5. Complaints reporting

Should any noise complaints be received from any source, including the above identified sensitive receptors, the Noise Complaint Form in Appendix 1 will be completed. The complaints log will be made available to the Environment Agency on request.

**APPENDIX 1 - Noise Complaint Form**

<i>Complete this form in as much detail as possible, in accordance with the requirements of the Noise Management Plan.</i>	Date Recorded:	Reference Number:
Name and address of complainant:		
Telephone number of complainant:		
<b>Details of complaint</b>		
Date, time, and duration of noise:		
Noise description e.g., hiss, hum, rumble, rattle, etc:		
Possible source e.g., generators, chillers, vehicle, personnel:		
Continuous or intermittent? Any other comments:		
Complainant visited:	Yes / No	
General weather conditions at time of problem:		
Wind strength and direction (e.g., light, steady, strong, gusting):		
Any previous complaints relating to this noise?	Yes / No	
Any other relevant information:		
Potential noise sources that could give rise to the complaint:		
On-site activity at the time offending noise occurred:		
Suggested cause of complaint:		

<b>Follow up</b>			
Date and time complainant contacted:			
Action taken:			
Amendment required to the noise management plan?		Yes / No	
<b>Form completed by</b>		<b>Signed</b>	



## Appendix 4 Environmental Risk Assessment