AC ENVIRONMENTAL CONSULTING

Bioaerosol Risk Assessment

Site Clear Solutions
12-13 Conduit Road, Norton Canes, Cannock, WS11 9TJ

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Ref: SCS.PT.BRA.2501
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CONTENTS

This Bioaerosols Risk Assessment is for the Advetec XO22 aerobic digestion unit at the Site Clear Solutions site at 12-13 Conduit Road, Norton Canes, Cannock, WS11 9TJ.

1. LOCATION

The site is located on a purpose-built industrial estate at 12-13 Conduit Road, Norton Canes, Cannock. It is bordered by additional industrial buildings to the north, west and south, with woodland and fields situated to the east. There are residential areas beyond the industrial estate to the north, east and west. The nearest residential housing is approximately 220m to the west on Walsall Road. The site location is shown on drawing 230327SCS102, and the sensitive receptors plan can be seen on drawing 230327SCS103.

2. ABOUT THE SITE

The site operates as a facility for the recycling and storage of non-hazardous and hazardous waste. The site originally operated as a steel stockholding business. In 2019, the site was granted planning permission Ref: CH.19/01/778W to operate as a recycling and storage facility for non-hazardous and hazardous waste. The planning permission allows for the site to accept up to 21,800 tonnes of waste per annum, of which no more than 3,050 tonnes per annum will be hazardous waste. The site has held a bespoke environmental permit, reference EPR/WE4296AB for the site since August 2023.

Technological advancements in waste management have led Site Clear Solutions to partner with Advetec, a biotechnology company that specialised in minimising the environmental impact of non-recyclable waste. Advetec's aerobic composting machines, which combine advanced engineering with bio-stimulants are designed to accelerate the breakdown of organic matter. Site Clear Solutions will install an aerobic digestion unit which will enable the rapid aerobic digestion of organic matter which is contained in non-hazardous 'offensive' waste, which is defined as waste that has been produced from the treatment of non-infectious patients and are contaminated with body fluids, including from sanitary and nappy waste, PPE, dressings, soiled sanitary towels, incontinence waste etc. This aerobic digestion process will significantly reduce the waste volume and produce a valuable output suitable for use as Solid Recovered Fuel (SRF)."
The Advetec XO22 will handle up to 8 tonnes of bagged offensive waste each day. The objective of this study is focused on bioaerosols and aims to identify the risks to human health in the workplace, dwellings or public buildings within the vicinity of the site and to demonstrate that bioaerosol risks can be maintained at acceptable levels.

It's important to note that other waste materials on the site are not stored for extended periods,

which minimises the risk of significant decomposition and the subsequent release of additional bioaerosols. The site layout can be seen in drawing 230327SCS104v9b.

3. PLANT DESCRIPTION AND THE AEROBIC DIGESTION PROCESS

The Advetec XO22 is a sophisticated system designed to handle organic waste in an environmentally friendly manner. It operates as a fully enclosed aerobic digester – and provides a controlled environment where micro-organisms break down organic matter in the presence of oxygen.

Waste awaiting processing will be stored within Site Clear Solutions Clinical Waste Transfer Station, within the building, in accordance with their currently permitted arrangements on site.

The waste from the Clinical Waste Transfer Station will be moved from the building, as it is required, to be loaded into a hopper which connects to a shredder, both of which will be located externally, in the yard. The shredder will be located parallel to the Advetec XO22 aerobic digester. The shredder will shred the waste into 50mm particle size, and the shredded waste is then augered into the digester, where bacteria and bio-stimulants are automatically dosed into the waste to promote aerobic digestion. The digester will be located externally to the building.

The micro-organisms (bacteria) consume the organic matter as a food source. In the presence of oxygen, these organisms break down complex organic molecules into simpler substances, producing heat, water vapour and carbon dioxide (CO2) as byproducts. The Advetec XO22 process effectively harnesses this natural process. Organic waste is introduced into the digester, where it is mixed with a specific microbial culture. The micro-organisms then get to work, breaking down the organic matter. The resulting mixture, known as ‘floc’, is a biostabilised, dry, and odourless material.

Analysis has determined that there is sufficient organic matter and moisture for the aerobic biological process (composting) to work successfully, using the bagged offensive waste as a feedstock. This has been further demonstrated through on-site trials with the feedstock with a site in Derby. The biological process is speeded up with the addition of bio-stimulants. However, the biological process – composting – stays within expected composting parameters of temperature (no greater than 70 degrees and oxygen content of the waste). Under these conditions there is no breakdown of complex synthetic organic material. In essence is it’s the same process as used in large scale aerobic composting or bio-drying Mechanical Biological Treatment Plants (MBTs), that accept this type of feedstock nappies etc. as part of the residual waste stream.

The process does not sterilise the waste as this is not required for onward handling and disposal at

the end destination. Current practice sees this type of waste mechanically treated only e.g. shredding with no biological process to stabilise the organic fraction and reduce the moisture content which reduces odour and leachate potential whilst making it easier to store and transport. The Advetec process enhances the quality of the waste as an SRF.

Aerobic digestion takes place in a sealed vessel made of 304 Stainless Steel, meaning the potential for fugitive emissions to escape is considered very low.

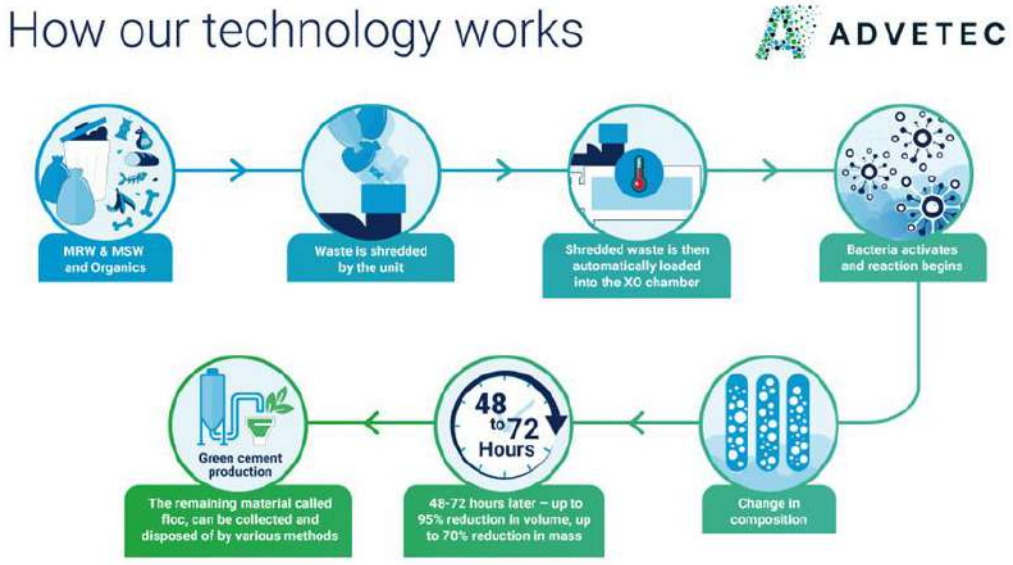
After undergoing the aerobic digestion process, which typically takes around 72 hours, the organic waste undergoes a significant transformation. The mass of the waste is reduced by approximately 45-50%, and its volume shrinks by about 15%.

This transformation results in a floc that is ideal for off-site recovery as a Solid Recovered Fuel (SRF). SRF is a valuable resource that can be used to generate energy in various industrial applications. By producing SRF from organic waste, the Advetec XO22 process contributes to a more circular economy and helps to reduce reliance on fossil fuels. This post-process floc exits the unit via an enclosed auger which conveys to a 40 yd^3 Roll-on Roll-off (RORO) compactor with a maximum capacity of up to 8 tonnes. Waste is stored within the compactor before being collected and transferred off-site.

It is considered unlikely that the aerobic digester will emit significant levels of bioaerosols due to the small scale of the machine.

An illustration of the process is provided in Figure 1.

Figure 1: An illustration of the Advetec aerobic digestion process



The only by-products from the aerobic digestion system are heat, water vapour, carbon dioxide (CO2), condensate, which are vented to the air, and the floc. There are no pumps or pipework associated with this process other than the outlet vents which are stainless steel 304 attached to external plastic vent stacks. There will be two point source emissions to air from the aerobic digester, which are these vents. These are located at the outfeed end of the process.
The process uses exothermic aerobic respiration; therefore, it generates its own heat, which is channelled internally back into the process, using a closed-loop heating system. The process does not use water.

The XO22 is accessible via a regulated cloud-based portal. Data points are collected, logged and stored at programmable intervals, including temperature, humidity, rotational speeds, emissions monitoring, power consumption, maintenance schedules. Alert and alarm levels are programmed into the system to notify in the event of system errors or parameters moving out of range. There is also an in-line gas monitoring system which continuously monitors levels of methane (CH4), carbon dioxide (CO2), volatile organic compound (VOCs) and Hydrogen sulphide (H2S). Preset levels of detection are set on the system and in the event of detection of any of these parameters, an alarm is raised.

4. LEGISLATION AND POLICY CONTEXT

Regulation of Aerobic Digestion Facilities

The management and control of emissions including bioaerosols released from the aerobic digestion facility will be regulated by the EA using a Bespoke Permit Variation to complement the Bespoke Permit already in force (EPR/WE4296AB).

There is guidance from the EA which relates to bioaerosol emissions from aerobic and anaerobic processes to treat organic waste. 'Appropriate measures for the biological treatment of waste' was published in 2020, which includes standards for regulated facilities with environmental permits to treat organic waste. Additionally, 'How to comply with your environmental permit.

Additional guidance for Anaerobic Digestion' has also been published by the EA, which provides indicative Best Available Techniques (BAT) and environmental standards for Anaerobic Digestion (AD) processes.

Bioaerosol

Bioaerosol consists of airborne particles of biologically derived material, including microorganisms such as bacteria and fungi, viruses, parts of living organisms such as plant pollen, spores and endotoxins from bacterial cells or mycotoxins from fungi.

Ambient bioaerosol is a complex mixture of biological particles, including many species of bacteria and fungi. Populations are ubiquitous and variable. 'Background' levels typically range from 1 to 1,000 CFU/m3 (colony forming units per cubic metre of air), of viable bioaerosol, although higher background levels may be encountered.

The small particle size of bioaerosols means that most bioaerosols are inhalable and some smaller particles may be respirable.

There is a limited scientific evidence base on the human health impacts of bioaerosols, and of any potential dose-response relationships. Previous research (CIWEM, 2002 & Enviros, 2004) has identified some associations between bioaerosol exposure and respiratory and gastro-intestinal illness, in particular inflammation of the respiratory system, coughs, fevers and exacerbation of existing respiratory illnesses. Possible links have also been established between bioaerosols and Organic Dust Toxic Syndrome (ODTS) (Rylander, 1997).

From a health risk point of view, Aspergillosis caused by Aspergillus fumigatus, can give rise to a

severe infection of the respiratory system and can be fatal. Similarly, inhalation of other respirable biological dusts can lead to a condition called Farmers' Lung which causes inflammation of the respiratory system and can progress to a chronic condition which is considered to be dangerous.

As there is currently no clear evidence of dose-response relationships, no defined 'safe' limits have been determined in respect to mixed bioaerosol concentrations. Appropriate levels are therefore typically determined with reference to background levels as determined by monitoring.

The Waste Industry Health and Safety Forum Information Booklet WISH INFO 23 Bioaerosols in waste and recycling (Issue 1 October 2023) is informative.

The EA research document Health Effects of Composting – A Study of Three Compost Sites and Review of Past Data (2001) assumes reference levels for 'total' bacteria, total fungi and gram-negative bacteria of 1,000 CFU/m3, 1,000 CFU/m3 and 300 CFU/m3 respectively. The EA published Guidance on the evaluation of bioaerosol risk assessments for composting facilities (2009), http://publications.environment-agency.gov.uk/pdf/GEHO0809BQUO-e-e.pdf which expanded on these levels and suggested threshold limits that should not be exceeded downwind of a composting facility.

Review of Bioaerosol Emissions from Aerobic Processes

These technologies depend on large populations of microorganisms to break down organic material in the waste fed into them, therefore there may be potential for fugitive emissions of bioaerosol from such waste treatment processes, when vented to atmosphere.

There is a large body of research into the impacts of bioaerosol emissions from the processing of organic wastes. Numerous studies have shown concentrations of bioaerosols decrease to background levels within 250m of open composting sites and this distance is typically lower for sites operating 'in vessel' technologies. One such example is a study by Defra, 'Bioaerosols and odour emissions from composting facilities' (Defra 2013).

Research indicates that bioaerosol concentrations decline rapidly with distance from outdoor composting facilities due to dilution and dispersion effects, and concentrations approach background values at a distance of about 100m downwind 'Exposure-response relationships for bioaerosol emissions from waste treatment processes Final report Defra Project: WR0606 IOM Contract: 611- 00319' (Defra 2008)'

Other Potential Bioaerosol Sources

Bioaerosol is ubiquitous from natural and other sources. Arable fields can lead to a high level of bacteria and fungi release (which can include Aspergillus fumigatus spp) during certain parts of the growing and harvesting cycle, as can vegetated areas amongst arable land which can generate large numbers of spores during certain parts of the spring and summer seasons. Land used for livestock grazing and associated housing is also a potential bioaerosol source, particularly bacteria, deriving directly from livestock in fields and also from activities associated with livestock such as manure stock piling, manure spreading, and winter feed and bedding storage.

The closest arable fields to Site Clear Solutions are situated approximately 650m to the north-west of the site.

5. ASSESSMENT OF IMPACTS

5.1 Approach to Site Specific Bioaerosol Risk Assessment (SSBRA)

A standard risk assessment framework was employed to create a conceptual site model, outlining the environmental conditions and potential source-pathway-receptor (S-P-R) interactions. The subsequent assessment summarises these significant S-P-R linkages, providing a qualitative evaluation of associated risks.

Risk is determined by both the likelihood and severity of a specific hazard. In the following assessment, each contributing factor is categorised as 'Very Low,' 'Low,' 'Medium,' or 'High,' reflecting its impact on the overall risk ranking. These definitions align with the Environment Agency's 2009 risk assessment guidance.

5.2 Source Characterisation

Due to its enclosed nature, the anaerobic digestion process does not generate bioaerosols during typical operation. While emergency pressure release valves could potentially emit bioaerosols, these valves would only activate under emergency conditions. Consequently, the risk of significant impacts from such emissions is considered negligible and has not been further evaluated in this assessment. Sources of bioaerosol emissions to air from the Advetec process are considered Table 1.

Table 1: Bioaerosol Emission Sources-'Critical Control Points'

Operation	Description of Operation	Potential for Bioaerosol Emissions
Feedstock Storage and loading of the Unit.	Waste in "Tiger Bags" is relatively contained compared with the same waste outside of bags, but nonetheless the waste is to be shredded. The shredded waste will drop straight into the aerobic digestion unit and therefore will be quickly contained.	Low to Medium release potential: Reducing handling and drop heights when moving waste using mechanical shovels will be helpful.
Aerobic Digestion Unit(s)	Aerobic digestion uses aerobic bacteria to "compost" the incoming feedstock. This process results in a significant reduction in volume of waste and a residue which is of sufficient quality to be accepted as Solid Recovered Fuel (SRF).	Very Low release potential: The aerobic digestion process is completely enclosed, therefore is unlikely to release bioaerosols. It is also considered unlikely that the aerobic digesters will emit significant levels of bioaerosols due to the small scale of the activity involving treatment of up to 8 tonnes of waste per day. The vents from the unit, are the only potential source of bioaerosol emission. The vents allow the release of CO_2 and water vapour, plus heat. There are no other potential sources of bioaerosol emissions from the plant. As detailed later in this document, ambient monitoring of bioaerosols undertaken at a similar plant using identical process technology at Advetec's Cribbs Causeway Shopping Centre installation found bio-aerosols to be below levels of detection or at very low values in all samples and similar performance is expected from the plant proposed for the site.

Flocs Storage (SRF)	SRF will be augured into a 40 cubic yard compactor. It will be collected and swapped when full.	Low release potential: The SRF will be augered into an enclosed 40 cubic yard compactor unit, which will be swapped when full. Because this is fully enclosed there will be no release of bioaerosol emissions. When the compactor nears capacity a swap over with an empty compactor will be arranged, with the full one being transported off site. [Solid recovered fuel (SRF) is a refined form of RDF (refuse derived fuel) intended for use in energy recovery facilities.]

5.3 Identification of Receptors

According to the Environment Agency's guidance RPS 209 (updated July 18, 2023), bioaerosol risk assessments are necessary for regulated facilities with receptors located within 250 metres.

To identify potential receptors within 250 metres of the Site Clear Solutions XO22 aerobic digestion unit, the nearest residential locations were measured using the shortest distance between the receptor and the Advetec XO22 aerobic digestion unit.

Receptors within 250 metres of the aerobic digestion unit are listed in Table 2. The majority of these sensitive receptors are neighbouring industrial units within the industrial estate where Site Clear Solutions site is situated. There are also two locations, one to the east and one to the west, which are residential housing areas. No sensitive receptors within 250 metres were identified associated with residential facilities.

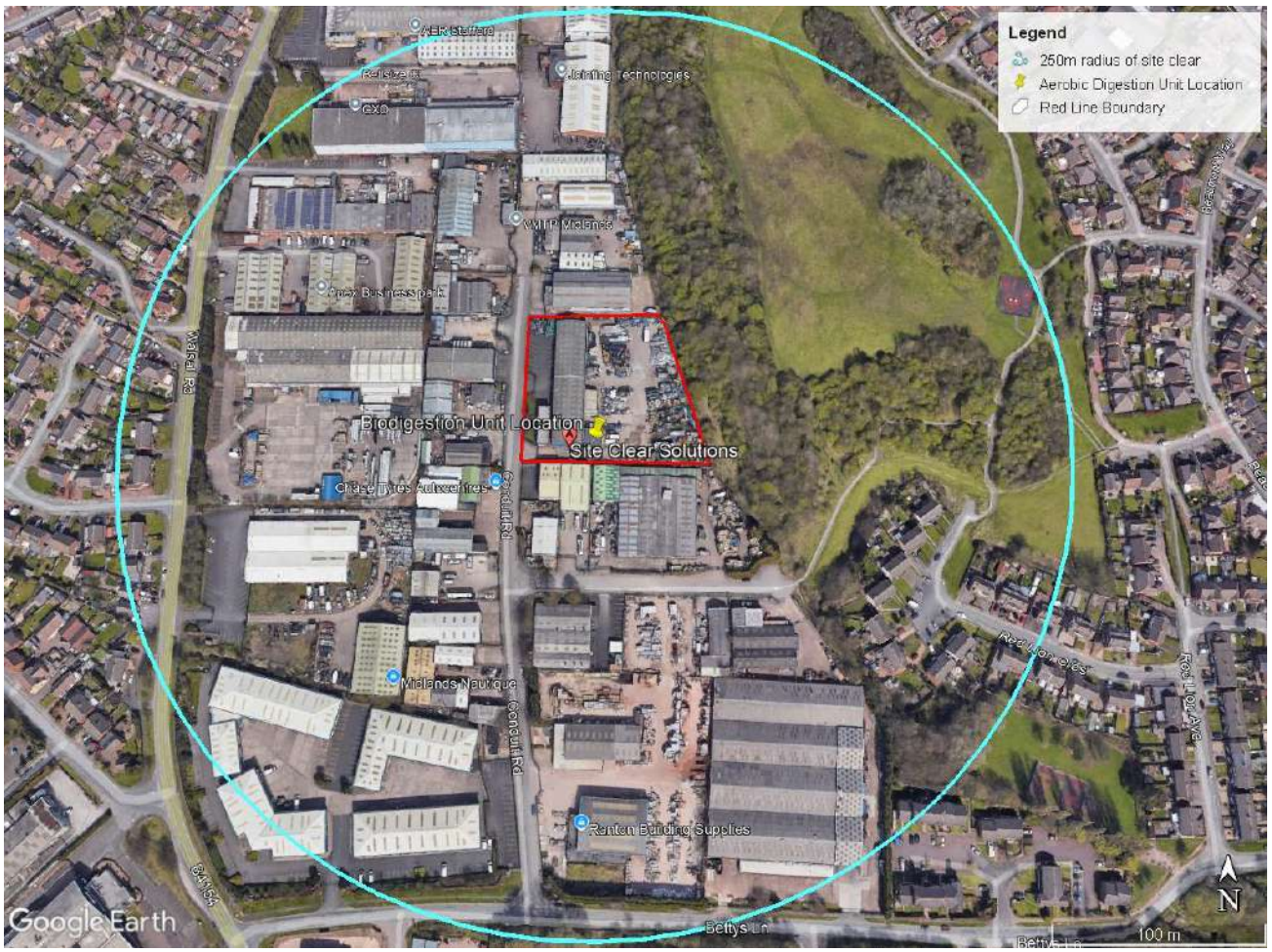
Table 2: Receptors Considered within the Assessment

Receptor	**Approximate distance from nearest potential source (m)**	**Direction**
JSW Uniwear	30m	South-west
WP Transmission	43m	South-east
HLB Plastics	51m	South-east
Chase Tyres Autocentres	60m	West
Rimac Fabrications	65m	North-west
TGI Corporation	73m	North

Yazoo Personalised Clothing	75m	North
Marcote UK Ltd Industrial Coatings	89m	South
Shire Travel International	91m	South-west
Cannock Windows and Doors	95m	South-west
Hill & Wood	96m	South-east
DG Automotive	108m	South
Joyce & Reddington	119m	North
T S Wholesale	121m	West-northwest
VMTP Midlands	125m	North-northwest
Reliance Manufacturing	125m	South-east
Autosmart International Ltd	126m	West
The Army Sports Club	127m	South-west
RA Auto Repairs	130m	North
Redmore (UK)	139m	South
Midlands Nautique	140m	South-west
QC Signs & Graphics	145m	North
Bas Engineering	147m	North-west
Cannock Dairy Ice Cream	148m	South-west
Residents on Red Lion Crescent	149m	East
Stakapal Limited	154m	South-southeast
The Café	162m	South-southwest
Trust Automotive	167m	West-northwest
Nemacom Ltd	167m	South-southwest
EDCO	168m	South-southwest
T M A Property Maintenance Ltd	173m	North-west
Jointing Technologies Ltd	175m	North
H&V	175m	South-southwest
Ranton Building Suppliers	181m	South
SKD Tapes	186m	South-west
GXO	191m	North-west
Wiltshire Farm Foods	196m	South-southwest
A & J Designs (Staffs)	198m	West-northwest
Canine Capers	201m	West-northwest
Actemium	217m	South-southwest

Residents on Walsall Road	225m	West
Labcyte Ltd	229m	South-west
AER Stafford Ltd	232m	North-west
Zunsport	232m	South-southwest
Tension Pro	234m	South-west
AJ Autos	241m	North
Residents on Lock Keepers Close	241m	West
Sitech	241m	South-east

Figure 3.2: Plan Showing Sensitive Receptors within 250m of the Site Clear Solutions Aerobic Digestion Unit



5.4 Pathway Characterisation

General Considerations

In addition to offering a standardised method for assessing environmental risk, the Source-Pathway-Receptor (SPR) model provides a framework for mitigating pollution, specifically from bioaerosols.

Source	Pathway	Receptor
Release of bioaerosols during loading of shredder feed hopper, operation of shredder and aerobic digestion unit, storing and transport of SRF	Airborne transportation.	Nearby sensitive receptors identified in Table 2.
HAZARD		
Mucous Membrane; Irritation; Systemic symptoms e.g. fever, headache; sensitisation; allergic reaction; Infection e.g. Aspergillus fumigatus.		

The primary means of transporting potential bioaerosol emissions from the identified sources to sensitive receptors is wind dispersion.

Key factors influencing the assessment of these pathways include separation distances (to potential receptors) and meteorological conditions affecting the direction, distance, and dispersion of any bioaerosols released from the facility.

Assuming all other factors remain constant, sensitive receptors nearest to the aerobic digestion unit are generally at the highest risk of impact. The severity of any impact will vary depending on the frequency of wind blowing from the proposed development towards specific receptors.

The distance a bioaerosol particle travels from its source to a receptor may be inversely correlated with the risk it poses. This means that bioaerosol concentrations typically decrease rapidly away from the emission source, returning to background levels within approximately 100 metres, as indicated by the Defra study referenced in Section 4.

A key finding from the Health and Safety Executive's (HSE) 2010 report on bioaerosol emissions from composting (RR786) is that bioaerosol concentrations significantly decrease with distance from the source.

The report found that at just 50 metres and 100 metres downwind, bioaerosol levels were substantially lower compared to those measured directly at the source. In fact, the document indicates that bioaerosol concentrations at 10 metres downwind were only 1-4% of what they were at the source itself.

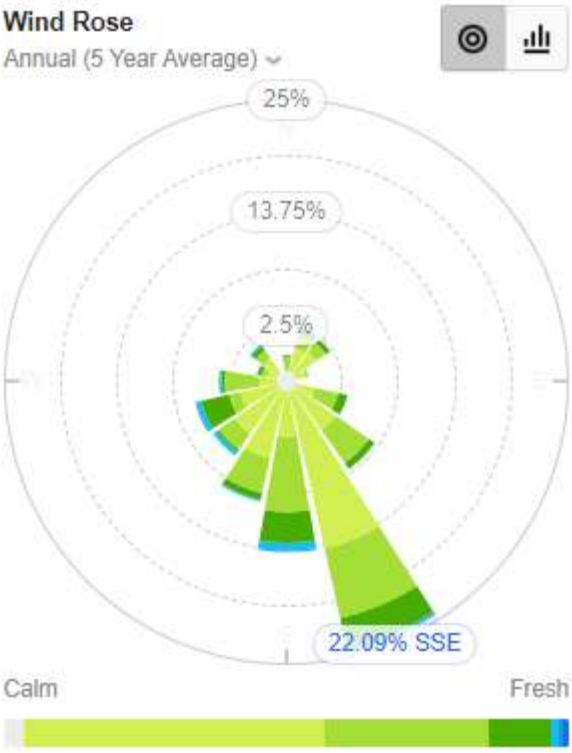
Mitigation for individuals at a receptor site is achieved by staying indoors, as this can significantly reduce exposure to the bioaerosols.

Meteorological Conditions

The Met Office weather station at Coleshill is the closest weather station to Site Clear Solutions for which data was available, located approximately 31km to the south-east of the site and is considered likely to be reasonably representative of the meteorological conditions experienced at Site Clear Solutions.

Five years of meteorological data from the Coleshill weather station were used to generate a wind rose, shown in figure 2. This illustrates the relative frequency of wind directions and wind speeds used in the assessment, and it shows a relatively common pattern of prevailing south-southeasterly wind directions.

Figure 2: Windrose, Coleshill Weather Station



Wind in Relation to Sensitive Receptor Locations

Table 3 presents a summary of how often winds blow towards potentially sensitive areas. Wind frequencies are reported for the directions where receptors are located.

Table 3: Frequency of Wind Directions from Sources to Receptors

Receptor	Wind direction, potentially carrying emissions towards receptor	Approximate frequency of winds from these directions
JSW Uniwear	Northeast (40-50°)	4.21% (infrequent)
WP Transmission	Northwest (310-320°)	3.62% (infrequent)
HLB Plastics	Northwest (310-320°)	3.62% (infrequent)
Chase Tyres Autocentres	East (80-100°)	0.72% (infrequent)
Rimac Fabrications	Southeast (130-140°)	8.57% (frequent)
TGI Corporation	South (170-190°)	13.63% (frequent)
Yazoo Personalised Clothing	South (170-190°)	13.63% (frequent)
Marcote UK Ltd Industrial Coatings	North (350-10°)	2.11% (infrequent)
Shire Travel International	Northeast (40-50°)	4.21% (infrequent)
Cannock Windows and Doors	Northeast (40-50°)	4.21% (infrequent)
Hill & Wood	Northwest (310-320°)	3.62% (infrequent)
DG Automotive	North (350-10°)	2.11% (infrequent)
Joyce & Reddington	South (170-190°)	13.63% (frequent)
T S Wholesale	East-southeast (110-120°)	4.96% (infrequent)
VMTP Midlands	South-southeast (150-160°)	22.09% (very frequent)
Reliance Manufacturing	Northwest (310-320°)	3.62% (infrequent)
Autosmart International Ltd	East (80-100°)	0.72% (infrequent)
The Army Sports Club	Northeast (40-50°)	4.21% (infrequent)
RA Auto Repairs	South (170-190°)	13.63% (frequent)
Redmore (UK)	North (350-10°)	2.11% (infrequent)
Midlands Nautique	Northeast (40-50°)	4.21% (infrequent)
QC Signs & Graphics	South (170-190°)	13.63% (frequent)
Bas Engineering	Southeast (130-140°)	8.57% (fairly frequent)
Cannock Dairy Ice Cream	Northeast (40-50°)	4.21% (infrequent)
Residents on Red Lion Crescent	West (260-280°)	5.45% (fairly frequent)
Stakapal Limited	North-northwest (330-340°)	0.00% (infrequent)
The Café	North-northeast (20-30°)	4.38% (infrequent)
Trust Automotive	East-southeast (110-120°)	4.96% (infrequent)

Nemacom Ltd	North-northeast (20-30°)	4.38% (infrequent)
EDCO	North-northeast (20-30°)	4.38% (infrequent)
T M A Property Maintenance Ltd	Southeast (130-140°)	8.57% (fairly frequent)
Jointing Technologies Ltd	South (170-190°)	13.63% (frequent)
H&V	North-northeast (20-30°)	4.38% (infrequent)
Ranton Building Suppliers	North (350-10°)	2.11% (infrequent)
SKD Tapes	Northeast (40-50°)	4.21% (infrequent)
GXO	Southeast (130-140°)	8.57% (fairly frequent)
Wiltshire Farm Foods	North-northeast (20-30°)	4.38% (infrequent)
A & J Designs (Staffs)	East-southeast (110-120°)	4.96% (infrequent)
Canine Capers	East-southeast (110-120°)	4.96% (infrequent)
Actemium	North-northeast (20-30°)	4.38% (infrequent)
Residents on Walsall Road	East (80-100°)	0.72% (infrequent)
Labcyte Ltd	Northeast (40-50°)	4.21% (infrequent)
AER Stafford Ltd	Southeast (130-140°)	8.57% (fairly frequent)
Zunsport	North-northeast (20-30°)	4.38% (infrequent)
Tension Pro	Northeast (40-50°)	4.21% (infrequent)
AJ Autos	South (170-190°)	13.63% (frequent)
Residents on Lock Keepers Close	East (80-100°)	0.72% (infrequent)
Sitech	Northwest (310-320°)	3.62% (infrequent)

Probability Exposure

In accordance with the Guidance on the evaluation of bioaerosol risk assessments for composting facilities (2009), the probabilities of harm can be described as follows:

- **High**: exposure is probable, direct exposure with no / few barriers between source and receptor.
- **Medium:** exposure is fairly probable, barriers less controllable.
- **Low:** exposure unlikely, barriers exist to mitigate.
- **Very low:** exposure very unlikely, effective and multiple barriers

The probability of exposure for each identified receptor was estimated under the assumption of 305 days of annual operation and potential worker exposure of 9 hours per day.

To calculate the probability of exposure, three factors are considered:

1. Exposure Duration and Frequency: The amount of time a receptor is exposed, relative to total operational hours.
2. Wind Direction: The likelihood of the receptor being downwind of emission sources, based on prevailing wind patterns.
3. Operational Release: The frequency of emissions from primary sources during operational hours.

The formula for calculating probability of exposure is:

*Probability of Exposure = (Exposure Duration/Frequency) * (Downwind Probability) * (Operational Release)*

Table 3.1 summarises the calculated probabilities for identified primary receptors.

We classify exposure levels as follows:

- Negligible: Less than 25 hours per year (0.5 hours per week)
- Low: 25-100 hours per year (less than 2 hours per week)
- Medium: 100-250 hours per year (less than 5 hours per week)
- High: More than 250 hours per year (more than 5 hours per week)

Table 3.1: Probability of Exposure at identified Receptors

Receptor	Frequency of Wind Towards (%)	Exposure Duration/ year (hours) *(based on 24/7)*	Operation duration (hrs/year)	Probability (hrs/year)	Probability Class
JSW Uniwear	4.21	8760	2080	88	Medium
WP Transmission	3.62	8760	2080	76	Medium
HLB Plastics	3.62	8760	2080	76	Medium
Chase Tyres Autocentres	0.72	8760	2080	15	Negligible
Rimac Fabrications	8.57	8760	2080	179	Medium
TGI Corporation	13.63	8760	2080	284	High
Yazoo Personalised Clothing	13.63	8760	2080	284	High
Marcote UK Ltd Industrial Coatings	2.11	8760	2080	44	Low
Shire Travel International	4.21	8760	2080	88	Medium
Cannock Windows and Doors	4.21	8760	2080	88	Medium
Hill & Wood	3.62	8760	2080	76	Medium
DG Automotive	2.11	8760	2080	44	Low
Joyce & Reddington	13.63	8760	2080	284	High
T S Wholesale	4.96	8760	2080	104	Medium
VMTP Midlands	22.09	8760	2080	460	High
Reliance Manufacturing	3.62	8760	2080	76	Medium
Autosmart International Ltd	0.72	8760	2080	15	Negligible
The Army Sports Club	4.21	8760	2080	88	Medium
RA Auto Repairs	13.63	8760	2080	284	High
Redmore (UK)	2.11	8760	2080	44	Low
Midlands Nautique	4.21	8760	2080	88	Medium
QC Signs & Graphics	13.63	8760	2080	284	High

Bas Engineering	8.57	8760	2080	179	Medium
Cannock Dairy Ice Cream	4.21	8760	2080	88	Medium
Residents on Red Lion Crescent	5.45	8760	2080	114	Medium
Stakapal Limited	0	8760	2080	0	Negligible
The Café	4.38	8760	2080	92	Medium
Trust Automotive	4.96	8760	2080	104	Medium
Nemacom Ltd	4.38	8760	2080	92	Medium
EDCO	4.38	8760	2080	92	Medium
T M A Property Maintenance Ltd	8.57	8760	2080	179	High
Jointing Technologies Ltd	13.63	8760	2080	284	High
H&V	4.38	8760	2080	92	Medium
Ranton Building Suppliers	2.11	8760	2080	44	Low
SKD Tapes	4.21	8760	2080	88	Medium
GXO	8.57	8760	2080	179	High
Wiltshire Farm Foods	4.38	8760	2080	92	Medium
A & J Designs (Staffs)	4.96	8760	2080	104	Medium
Canine Capers	4.96	8760	2080	104	Medium
Actemium	4.38	8760	2080	92	Medium
Residents on Walsall Road	0.72	8760	2080	15	Negligible
Labcyte Ltd	4.21	8760	2080	88	Medium
AER Stafford Ltd	8.57	8760	2080	179	High
Zunsport	4.38	8760	2080	92	Medium
Tension Pro	4.21	8760	2080	88	Medium
AJ Autos	13.63	8760	2080	284	High
Residents on Lock Keepers Close	0.72	8760	2080	15	Negligible
Sitech	3.62	8760	2080	76	Medium

Consequence of Exposure

To assess the potential consequences of exposure, we must consider:

- The nature of the source: The type of emission and its characteristics.
- The hazard presented to the receptor: The potential health or environmental risks posed by the exposure.
- Acceptable exposure levels: The maximum concentration or duration of exposure deemed safe.

Following the guidelines outlined in the Guidance on the evaluation of bioaerosol risk assessments for composting facilities (2009), we categorise the potential consequences of exposure as follows:

- High: Severe consequences, where exposure may lead to serious harm.
- Medium: Significant consequences, where exposure may result in damage that is not severe but is reversible.
- Low: Minor consequences, with no apparent damage but the possibility of reversible changes.
- Very low: Negligible consequences, where there is no evidence of adverse effects.

To evaluate the potential consequences of bioaerosol releases at the identified receptors, the categories presented in the Guidelines for Environmental Risk Assessment and Management (DETR, 2000) and the Guidance on the evaluation of bioaerosol risk assessments for composting facilities (Cranfield, 2009) have been modified and expanded.
These modified categories are outlined in Table 4. This approach allows for a more comprehensive and comparative assessment of the potential risks.

Table 4: Scale of Consequences

Consequence Descriptor	**Indicative Range (cfu/m3)**	**Consequence Description**
Negligible	<300	No observable effect on individuals or populations. No effect on local ecosystem, individual species or local features. Low range of natural environmental levels
Mild	300-1,000	No observable effect on health of individuals. No observable effect at the population level or on local ecosystem. Midrange of natural environmental levels.
Moderate	1,000-3,000	Health effects generally not noted. Short term – no significant impacts on robust

		individuals, populations or ecosystems. Potential minor health or nuisance impacts for vulnerable individuals (frail/elderly/sick). Continuous long term - robust individuals unaffected. Potential health effects on vulnerable individuals (frail/elderly/sick). Potential minor effect on population structure or size. No observable effect on local ecosystem. Upper-range natural environmental levels.
High	3,000-10,000	Short-term - no significant impacts on robust individuals. Vulnerable individuals affected including welfare and nuisance. Continuous long term - vulnerable individuals affected including health, welfare, nuisance. Potential effects on population structure or size and local ecosystem impacts possibly detectable. Equivalent to occupational exposure levels. High range of natural environmental levels.
Severe	10,000-30,000	Short term and long term. Some robust individuals affected including health, welfare, and nuisance. Local dysfunction of communities if continuous. Local ecosystem changes detectable. Short term highest natural environmental levels for specific events e.g. harvesting.
Extremely Severe	>100,000	Widespread health effects. Impacts on the functioning of regionally important ecosystems. Maximum of natural environmental events.

Estimation of Exposure Concentrations

Air quality testing at the Advetec aerobic digestion unit in Cribbs Causeway detected the following bioaerosol levels:

- Total Mesophilic Bacteria (Total Viable Count - TVC): 48 colony-forming units (CFU) per cubic metre of air, where the acceptable level is 1,000 colony-forming units (CFU) per cubic metre of air.
- Aspergillus fumigatus: Less than 8 CFU per cubic metre of air, where the acceptable level is 500 CFU per cubic metre of air.

These measurements were taken at the unit's carbon filter outlet and are detailed in Max Recycle UK Ltd's Site Specific Bioaerosol Risk Assessment (SLR Ref: 416.063972.00001, July 2024). Max Recycle UK Ltd's Bioaerosol Risk Assessment uses the Ambient Bioaerosols Monitoring Report, which was produced for the Cribbs Causeway site, a similar plant using identical process technology.

The Advetec Unit at Site Clear Solutions will operate without exhaust filtration. Assuming the carbon filter used at the Cribbs Causeway Unit removes 99.5% of both bacterial and fungal loads, the pre-filtered values at Site Clear Solutions Ltd could be significantly higher. Estimated pre-filtered

concentrations might approach 10,000 CFU/m³ for Total Viable Count (TVC) and 1600 CFU/m³ for Aspergillus fumigatus.

Assuming a minimum reduction of 4% at 10 metres, as observed in HSE RR786 (see Section 5.4), and a further pessimistic reduction of 10% at 50 metres (the nearest receptor), we can estimate potential bioaerosol concentrations. Given an anticipated exposure period of 9 hours per day for 305 working days out of 365, and the wind direction to the receptors we can calculate the following expected concentrations at the receptors.

Table 3.2: Predicted Consequences of Exposure at identified Receptors

Receptor	**Approximate distance from nearest potential source (m)**	**Indicative Concentration Range (cfu/m3)**	**Consequence Category (assuming hypothetical long term exposure)**
JSW Uniwear	30m	300-1,000	Mild
WP Transmission	43m	300-1,000	Mild
HLB Plastics	51m	300-1,000	Mild
Chase Tyres Autocentres	60m	<300	Negligible
Rimac Fabrications	65m	300-1,000	Mild
TGI Corporation	73m	1,000-3,000	Moderate
Yazoo Personalised Clothing	75m	1,000-3,000	Moderate
Marcote UK Ltd Industrial Coatings	89m	<300	Negligible
Shire Travel International	91m	300-1,000	Mild
Cannock Windows and Doors	95m	300-1,000	Mild
Hill & Wood	96m	300-1,000	Mild
DG Automotive	108m	<300	Negligible
Joyce & Reddington	119m	1,000-3,000	Moderate
T S Wholesale	121m	300-1,000	Mild
VMTP Midlands	125m	1,000-3,000	Moderate
Reliance Manufacturing	125m	300-1,000	Mild
Autosmart International Ltd	126m	<300	Negligible
The Army Sports Club	127m	300-1,000	Mild
RA Auto Repairs	130m	1,000-3,000	Moderate
Redmore (UK)	139m	<300	Negligible
Midlands Nautique	140m	300-1,000	Mild

QC Signs & Graphics	145m	1,000-3,000	Moderate
Bas Engineering	147m	300-1,000	Mild
Cannock Dairy Ice Cream	148m	300-1,000	Mild
Residents on Red Lion Crescent	149m	300-1,000	Mild
Stakapal Limited	154m	<300	Negligible
The Café	162m	300-1,000	Mild
Trust Automotive	167m	300-1,000	Mild
Nemacom Ltd	167m	300-1,000	Mild
EDCO	168m	300-1,000	Mild
T M A Property Maintenance Ltd	173m	300-1,000	Mild
Jointing Technologies Ltd	175m	1,000-3,000	Moderate
H&V	175m	300-1,000	Mild
Ranton Building Suppliers	181m	<300	Negligible
SKD Tapes	186m	300-1,000	Mild
GXO	191m	300-1,000	Mild
Wiltshire Farm Foods	196m	300-1,000	Mild
A & J Designs (Staffs)	198m	300-1,000	Mild
Canine Capers	201m	300-1,000	Mild
Actemium	217m	300-1,000	Mild
Residents on Walsall Road	225m	<300	Negligible
Labcyte Ltd	229m	300-1,000	Mild
AER Stafford Ltd	232m	300-1,000	Mild
Zunsport	232m	300-1,000	Mild
Tension Pro	234m	300-1,000	Mild
AJ Autos	241m	<300	Negligible
Residents on Lock Keepers Close	241m	<300	Negligible
Sitech	241m	<300	Negligible

While it's acknowledged that shredding operations might lead to higher peak concentrations of bioaerosols, these elevated levels are expected to be brief and occur less than 10 times per day.

Risk Assessment

Considering both the probability of exposure and the severity of potential consequences, Table 7 presents the overall bioaerosol risk assessment for the receptors. The risks were categorised as 'low' and are deemed acceptable at all receptor locations.

To estimate the bioaerosol risk associated with primary emission sources and their emissions

magnitude, we must evaluate both the probability and the consequence of exposure, as identified in Table 3.1 and 3.2. While there is no standardised formula for combining these factors, a risk matrix approach is commonly used to assess the overall risk level at specific critical control points.

Table 5: Risk Estimation Matrix

Probability	Consequence						
	Negligible	Mild	Moderate	High	Severe	Very Severe	Extremely Severe
Negligible	1	2	3	4	5	6	7
Low	2	4	6	8	10	12	14
Medium	3	6	9	12	15	18	21
High	4	8	12	16	20	24	28

The estimated risk scores were categorised based on their position within the risk estimation matrix. These categories reflect the overall risk magnitude and tolerability. The specific criteria used for this assessment are outlined in Table 6.

Table 6: Tolerability of Risk

Overall Risk Magnitude	Description
Low	Risks are in the low range and are likely to be acceptable in all circumstances
Medium	Risks are in the medium range and are likely to be acceptable where appropriate controls measures are employed to mitigate risks
High	Risks are unlikely to be acceptable under any circumstances.

Table 7: Bioaerosol Risk Assessment

Receptor	Source	Emissions magnitude	Pathway effectiveness	Probability of exposure	Predicted consequence	Magnitude of risk
JSW Uniwear	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
WP Transmission	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic	Medium	Release to atmosphere from	Medium	Mild	Low

	Digestion Unit		tank, low due to it being enclosed and a moisture derived process.			
HLB Plastics	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Chase Tyres Autocentres	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Negligible	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Negligible	Negligible	Low
Rimac Fabrications	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
TGI Corporation	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Moderate	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Moderate	Low
Yazoo Personalised Clothing	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Moderate	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Moderate	Low
Marcote UK Ltd Industrial Coatings	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Low	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Low	Negligible	Low
Shire Travel International	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Cannock Windows and Doors	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Hill & Wood	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low

	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
DG Automotive	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Low	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Low	Negligible	Low
Joyce & Reddington	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Moderate	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Moderate	Low
T S Wholesale	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
VMTP Midlands	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Moderate	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Moderate	Low
Reliance Manufacturing	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Autosmart International Ltd	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Negligible	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Negligible	Negligible	Low
The Army Sports Club	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
RA Auto Repairs	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Moderate	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Moderate	Low
Redmore (UK)	Pre-shredding	Medium	Release to atmosphere of bioaerosols from the bagged	Low	Negligible	Low

	waste		wastes when shredded			
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Low	Negligible	Low
Midlands Nautique	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
QC Signs & Graphics	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Moderate	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Moderate	Low
Bas Engineering	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Cannock Dairy Ice Cream	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Residents on Red Lion Crescent	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Stakapal Limited	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Negligible	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Negligible	Negligible	Low
The Café	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Trust Automotive	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low

Nemacom Ltd	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
EDCO	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
T M A Property Maintenance Ltd	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Mild	Low
Jointing Technologies Ltd	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Moderate	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Moderate	Low
H&V	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Ranton Building Suppliers	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Low	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Low	Negligible	Low
SKD Tapes	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
GXO	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Mild	Low
Wiltshire Farm Foods	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture	Medium	Mild	Low

			derived process.			
A & J Designs (Staffs)	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Canine Capers	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Actemium	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Residents on Walsall Road	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Negligible	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Negligible	Negligible	Low
Labcyte Ltd	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
AER Stafford Ltd	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	High	Mild	Low
Zunsport	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
Tension Pro	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Mild	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Mild	Low
AJ Autos	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	High	Negligible	Low
	Aerobic Digestion	Medium	Release to atmosphere from tank, low due to it being	High	Negligible	Low

	Unit		enclosed and a moisture derived process.			
Residents on Lock Keepers Close	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Negligible	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Negligible	Negligible	Low
Sitech	Pre-shredding waste	Medium	Release to atmosphere of bioaerosols from the bagged wastes when shredded	Medium	Negligible	Low
	Aerobic Digestion Unit	Medium	Release to atmosphere from tank, low due to it being enclosed and a moisture derived process.	Medium	Negligible	Low

6. MITIGATION MEASURES

A thorough risk assessment has been conducted for the Advetec XO22 unit, focusing on potential impacts on various receptors. The analysis indicates that the risk of significant impacts is very low or low for all foreseeable scenarios.

However, because the Advetec XO22 unit is not yet operational at the site, future bioaerosol monitoring will be necessary to accurately determine the exact risk levels. This monitoring will be carried out in accordance with the EA Technical Guidance Note TGN M9 Environmental Monitoring of Bioaerosols at Regulated Facilities.

If the monitoring reveals that the bioaerosol levels are not acceptable during operation, Advetec engineers will design, build, and install appropriate abatement technology to the XO22 unit.

To minimise the potential for bioaerosol generation, the unit will undergo regular maintenance and checks. Additionally, site staff will be instructed to handle materials carefully, avoiding excessive dropping from loaders into the feedstock bay and shredder. This will help to prevent the creation of dust and aerosols.

7. CONCLUSION

It is recognised that the operation of one Advetec XO22 Aerobic digestion unit at Site Clear Solutions Limited's site at 12-13 Conduit Road, Norton Canes, Cannock, WS11 9TJ, has the potential for bioaerosol generation. Given the proximity of relevant receptors within 250 metres of potential bioaerosol sources, a comprehensive risk assessment has been conducted to evaluate the potential impact of emissions on these nearby individuals or communities. This assessment includes a detailed

analysis of the source characteristics, receptor sensitivity, and potential exposure pathways to determine the overall risk level.

The detailed bioaerosol risk assessment, employing a qualitative source-pathway-receptor model and adhering to established guidance, resulted in a definitive determination of low and tolerable risk across all receptors within 250m. This robust analysis provides a strong foundation for concluding that the operation of the Advetec XO22 unit poses minimal bioaerosol concerns.

APPENDIX 1 – DRAWING REF: 230327SCS102

AC ENVIRONMENTAL
Environment House
Werrington Road
Stoke-on-Trent
ST2 9AF

JEROME ROAD
NEWBURY ROAD
R K AVE
BRIDGES ROAD
RIDGES CRES
WALLACE CL
BELLSIZE CLOSE
MERE CROFT
LOCKKEEPERS CL
LINGFIELD ROAD
BEAUMONT W
Fire Hydrant
NORTON GRANGE
CONDUIT ROAD
RED LION CRES
RED LION AVENUE
Morgans
Business Park
Factory
KNIGHTS CT
BETTY'S LANE
MILL RD
B4154

0 15 40 100
Scale (meters)

REV	DATE	DETAIL

CLIENT
SITE CLEAR SOLUTIONS

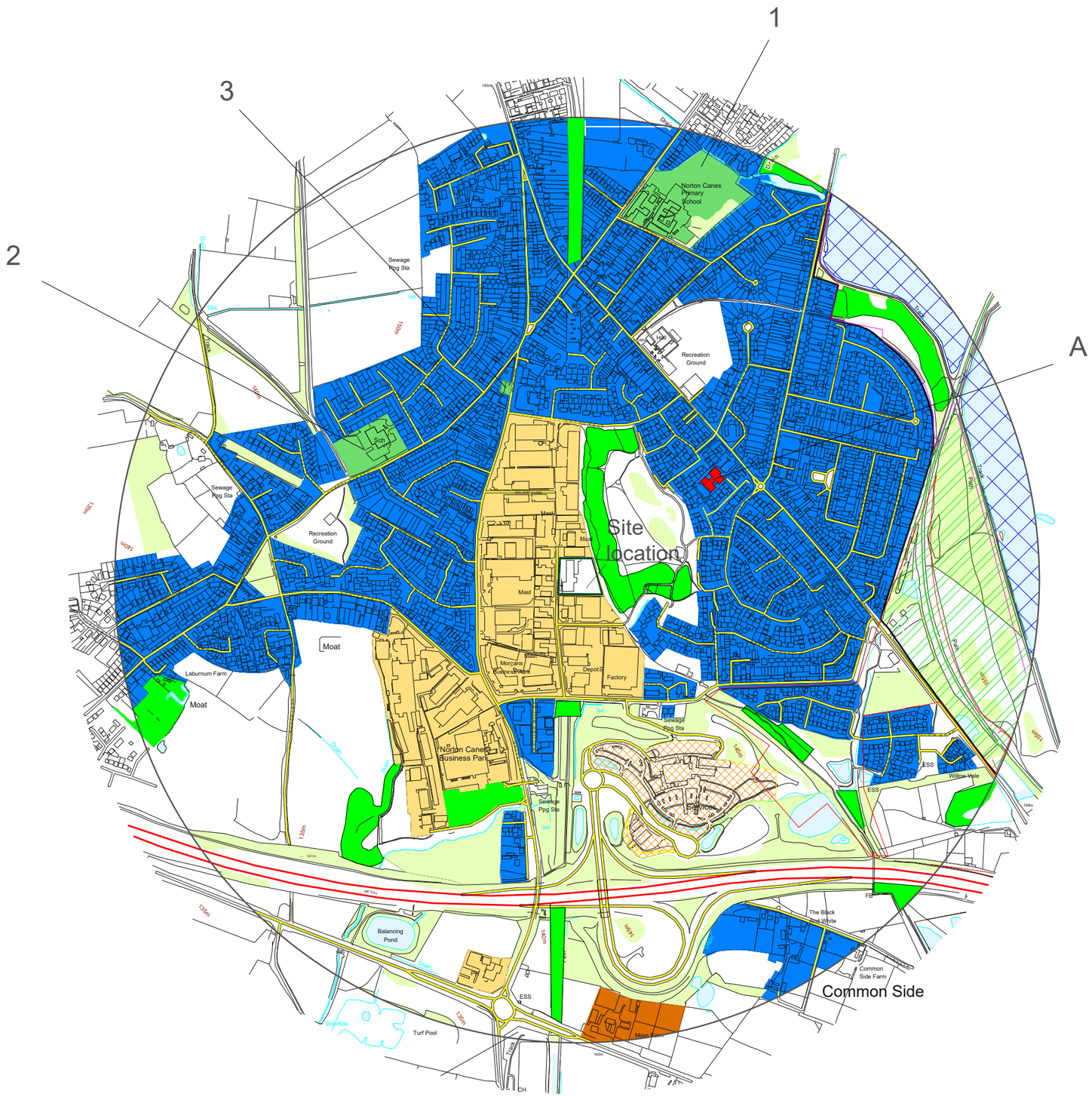
SITE

PROJECT
PERMIT APPLICATION

TITLE
SITE LOCATION PLAN

SCALE @A3	DATE	DRAWN BY	CHECKED BY
1:1250	Mar 2025	T Kearns	D Alcock
	DRAWING NO		REVISION
	230327SCS102		

APPENDIX 2 – DRAWING REF: 230327SCS103



0 100 250 500

Scale (meters)

SCHOOLS

1. Norton Canes Primary school
2. Jerome Primary School
3. Honeybuns Nursery

Medical Facilities

A. Norton Canes Medical Centre

SSSI

A. Chase Water

Local Nature Reserve

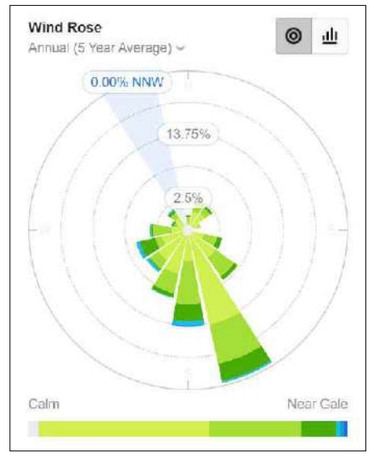
A. Chase Water

Protected Habitats

A. Chase Water

AC ENVIRONMENTAL
Environment House
Werrington Road
Stoke-on-Trent
ST2 9AF

N



- Local Nature Reserve
- SSSI
- Motorway service station
- Educational Facilities
- Industrial/ Commercial
- Residntial
- Medical Facilities
- Motorway
- Roads

CLIENT

SITE CLEAR SOLUTIONS

SITE 12-13 Conduit Road
Norton Canes
Cannock
WS11 9TJ

REV	DATE	DETAIL

PROJECT

PERMIT APPLICATION

TITLE

KEY RECEPTOR PLAN

SCALE @A3	DATE	DRAWN BY	CHECKED BY
1:10000	Mar 2025	T Kearns	D Alcock

DRAWING NO	REVISION
230327SCS103	

APPENDIX 3 – DRAWING REF: 230327SCS104V9B

Palisade Fence 2.1m high

Concrete Panels 4m high

Concrete Panels 4m high

Stopcock on pavement

CAR PARK

CHEM LAB

Kerb

Fire Door

Poly M/C

Bench

WEEE PROCESSING

Mobile plant storage

Baler

Aco Drain

Receiving Area

Vehicle Loading

Roller Shutter

Granulation

Roller Shutter

Shredder

Compactor

FUEL TANK 910L

Roller Shutter

CONSUMABLES

Roller Shutter

OFFICE / HQ

CLINICAL WASTE TRANSFER STN

Advetec XO22

Compactor

TRAFFIC OFFICE

MEZZANINE STORAGE

EMPTY BINS AND GENERAL STORAGE

OVERNIGHT TRUCK PARKING

NEW BINS STORAGE

Site Entrance

WEIGHBRIDGE

CANTEEN

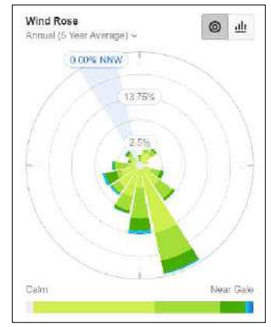
Concrete Panel Wall 2m high

Concrete Panels 4m high

0 5 15 25

SCALE (METERS)

1. Hazardous Processing Area - 6 x 6 x 3 = 108m³
2. Cardboard / Plastics - 6 x 12 x 3 = 216m³
3. WEEE** - 6 x 6 x 3 = 108m³
4. Non Conforming Waste - 6 x 4 x 3 = 72m³
5. Flammable Hazardous Waste* - 14 x 6 x 3 = 252m³
6. Flammable Hazardous Waste* - 12 x 6 x 3 = 216m³
7. Aerosols and expanding foam - 6 x 8 x 3 = 144m³
8. Gas Cage = 2.9m³
9. Gas Cage = 2.9m³
10. Glass Skip - 12cyd Skip - 9.18m³
11. Tyres - 10 x 9 x 3 = 270m³
12. Lithium Store - 5m³
13. Batteries - 9 x 10 x 3 = 270m³
14. Fridges - 9 x 10 x 3 = 270m³
15. Flammable Hazardous Waste* - 11 x 5 x 3 = 165m³
16. Asbestos - Enclosed 40 cyd skip = 30.6m³
17. Low Grade WEEE - 40 cyd skip = 30.6m³
18. Scrap Metal - 40 cyd skip = 30.6m³
19. Wood - 40 cyd skip = 30.6m3
20. General Waste - 40 cyd skip = 30.6m³
21. Pops Containing Waste - 40 cyd skip = 30.6m³
22. Plasterboard - Covered 8cyd skip = 6.1m³
23. Inert waste - 8cyd skip = 6.1m³
24. WEEE ** in IBCs - 6 x 2 IBCs stacked 2 high - total 24 IBCs = 35.04m³
25. Consumables Storage - Racking - 7m x 1 x 4 = 28m³
26. Shredded Plastic & Copper - 40cyd Compactor = 33m³
27. Cable in IBCs for granulation - 6 IBCs stacked 3 high - total 18 IBCs - 26.25m³
28. Granulated plastic and copper in bagged IBC's - 6 IBCs stacked 3 high - total 18 IBCs = 26.25m³
29. Bagged clinical waste in yellow bins *** - 30 x 1,100 ltr bins = 73.2m³
30. Flocs - 40cyd Compactor = 33m³



* Including solvents, paints, resins, mastics, expanding foam, oil and oil contaminated wastes

** Including cables, smoke alarms, plugs and ends, pc's, monitors.

*** Including sharps, dialysis fluid, dental waste.

- Permit Boundary
- Fire Wall
- Spill Kit
- PPE Storage
- Fire Extinguisher
- Automatic Fire Extinguisher
- Legio Block
- Covered buildings
- Covered bay
- Concreted area
- CCTV Camera
- Clinical Waste in Yellow wheelie bins
- Interceptor

AC ENVIRONMENTAL
Environment House
Werrington Road
Stoke-on-Trent
ST2 9AF

CLIENT: SITE CLEAR SOLUTIONS

SITE:

PROJECT: PERMIT APPLICATION

TITLE: ENVIRONMENTAL MANAGEMENT SYSTEM

SCALE @A3	DATE	DRAWN BY	CHECKED BY
1:300	Mar 2025	T Kearns	D Alcock

DRAWING NO: 230327SCS104v9b

REVISION:

APPENDIX 4 - MAX RECYCLE UK LTD'S SITE SPECIFIC BIOAEROSOL RISK ASSESSMENT (SLR REF: 416.063972.00001, JULY 2024).

Site Specific Bioaerosol Risk Assessment

EPR/BP3590VJ/V003

Advetec Holdings Ltd on behalf of Max Recycle UK Ltd

Hawthorne House,
Blackthorn Way,
Sedgeletch Industrial Estate,
Fencehouses,
Tyne and Wear
DH4 6JW

Prepared by:

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SLR Project No.: 416.063972.00001

15 July 2024

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	2 July 2024	M Webb	G Altria	G Altria
	Click to enter a date.			
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	Click to enter a date.			

Basis of Report

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Table of Contents

Tables in Text

Figures in Text

1.0 Introduction

Advetec Holdings Ltd has instructed SLR Consulting Limited (SLR) on behalf of Max Recycle UK Ltd (Max Recycle) to prepare a Site Specific Bioaerosol Risk Assessment (SSBRA) to assess potential impacts associated with the operation of an aerobic digestion unit at the Max Recycle waste transfer station located at Blackthorn Way, Sedgeletch Industrial Estate, Fencehouses, Tyne and Wear, DH4 6JW.

The objective of the SSBRA is to

- Establish the likely sources of bioaerosols arising from proposed operations at the site;
- Identify the proposed mitigation and control measures to minimise potential offsite risks;
- Assess the potential for significant risk of impact to human health at sensitive receptors located in the vicinity of the plant as a result of bioaerosol emissions from the process; and,
- Identify any additional mitigation required to control potential effects.

2.0 Relevant Guidance and Standards

2.1 EA Guidance for the Treatment of Biological Waste

The Environment Agency has issued sector specific guidance in relation to the treatment of biological waste[1].

Section 11.4 of this guidance sets out the requirements for control of emissions of bioaerosols , which are:

1. You must take measures to minimise the release of bioaerosols from your process.
2. You must document potential bioaerosol emission sources and identify measures to minimise their release. Measures include, for example:
    - processing waste promptly and monitoring it according to defined processing conditions;
    - taking corrective measures to address unfavourable conditions;
    - using slow-speed shredders in sensitive locations with misting devices fitted or carrying out these activities in covered areas;
    - taking into account meteorological conditions when managing activities;
    - avoiding activities such as turning and shredding in unfavourable meteorological conditions;
    - stopping activities when the wind is blowing in the direction of sensitive receptors;
    - dampening haul roads and processing areas and stopping activities when the wind is blowing in the direction of sensitive receptors;
    - using static aeration and covering piles where possible and practicable.
3. If your facility is within 250 metres of a sensitive receptor, you must:
    - write and implement a site specific bioaerosol risk assessment;
    - monitor bioaerosols to make sure that the control methods you have stated are effective.
4. You must implement the control measures identified in your risk assessment. You must also consider the exposure of staff and visitors and take measures to avoid or reduce prolonged exposure to bioaerosols.

The Environment Agency (EA) has also issued Regulatory Position Statement 209[2] which sets out the requirements for monitoring of bioaerosols at regulated facilities.

Given that the aerobic digestion plant is not yet in place and operational, it is not possible to undertake monitoring at this time to provide a quantitative assessment of potential risks and impacts, and the EA has therefore requested that a qualitative site specific bioaerosols risk assessment (SSBRA) is prepared.

[1] Biological waste treatment: appropriate measures for permitted facilities – Environment Agency -Issued 02 February 2024 - https://www.gov.uk/guidance/biological-waste-treatment-appropriate-measures-for-permitted-facilities

[2] Bioaerosol monitoring at regulated facilities: RPS 209 – Environment Agency – 18 July 2023 - https://www.gov.uk/government/publications/bioaerosol-monitoring-at-regulated-facilities-use-of-m9-rps-209/bioaerosol-monitoring-at-regulated-facilities-use-of-m9-rps-209

2.2 Benchmark Data / Definition of Acceptable Bioaerosol Levels

The EA has adopted a precautionary risk-based approach in determining guidance levels for bioaerosols. The EA position statement 'Composting and potential health effects from bioaerosols: our interim guidance for permit applicants'[3] specifies the following criteria for acceptable concentrations of bioaerosols which are derived from values for an 8-hour working day:

Table 1: Acceptable Levels for Bioaerosols

Bioaerosol Species	Level (cfu/m³)
Gram-negative bacteria	300
Aspergillus fumigatus	500
Total Bacteria	1,000

[3] Environment Agency - Composting and Potential Health Effects from Bioaerosols: Our Interim Guidance for Permit Applications, November 2010, Version 1.0.

3.0 Assessment Methodology

3.1 Overview of Risk Assessment Approach

The Bioaerosol Risk Assessment has been undertaken in accordance with the general principles of EA document 'Guidance on the evaluation of bioaerosol risk assessments for composting facilities' which refers to guidelines produced by the Department for Environmental, Farming and Rural Affairs (DEFRA) and the EA for a tiered and staged risk assessment. The methodology described within these documents, and used for the undertaking of this risk assessment, is summarised below.

3.2 Tier 1 – Risk Screening

Risk screening prioritises issues for assessment. Tier 1 assessment, covering all environmental aspects of waste management summarises the existence of a potential hazard-pathway-receptor linkage.

In the case of bioaerosol risk assessment, the presence of sensitive receptors within 250m of the site boundary is applied when identifying a hazard-pathway-receptor linkage.

3.3 Tier 2 – Generic Risk Assessment

The generic risk assessment to determine the significance of risk is undertaken on the basis of the probability and consequences of exposure as follows:

The probability of exposure is the likelihood of the sensitive receptors being exposed to the hazard.

- High – exposure is probable: direct exposure likely with no / few barriers between hazard source and receptor;
- Medium – exposure is fairly probable: feasible exposure possible, barriers to exposure less controllable;
- Low – exposure is unlikely: several barriers exist between hazards source and receptors to mitigate against exposure;
- Very Low – exposure is very unlikely: effective, multiple barriers in place to mitigate against exposure.

The consequences of a hazard being realised may be actual or potential harm.

- High – the consequences are severe: sufficient evidence that short or long-term exposure may result in serious damage;
- Medium – consequences are significant: sufficient evidence that exposure to hazard may result in damage that is not severe in nature and reversible once exposure ceases;
- Low – consequences are minor: damage not apparent though reversible adverse changes may occur;
- Very Low – consequences negligible: no evidence of adverse changes after exposure.

The overall risk (magnitude) is determined by combining the probability with the potential consequences using a matrix to categorise as high, medium, low or very low. The overall risk matrix is provided in Table 2.

Table 2: Tier 2 Assessment – Overall Risk Matrix

		Consequence			
		Very Low	*Low*	*Medium*	*High*
Probability	*High*	Low	Medium	High	High
	Medium	Low	Medium	Medium	High
	Low	Low	Low	Medium	Medium
	Very Low	Very Low	Low	Low	Medium

Based on the outcomes of the risk assessment the EA document provides guidance on further requirements for different risks.

These can be summarised as follows:

- High risks - additional assessment and active management will be required;
- Medium risks - likely to require further assessment and may require either active management or monitoring; and,
- Low and very low risk - will only require periodic review.

Mitigation to reduce risk can also be applied to avoid the requirement for further assessment and/or monitoring.

3.4 Tier 3 – Tailored Quantitative Risk Assessment

A tailored quantitative risk assessment extends the site-specific assessment to include estimations based on information such as wind direction frequency and duration of site activity. It develops categories for the assessment of the magnitude of consequences and relevant exposure to bioaerosol concentration.

4.0 Site Data

4.1 Site Location

The aerobic digestor will be situated on the Site of the Max Recycle waste transfer station which is located at Blackthorn Way, Sedgeletch Industrial Estate, Fencehouses, Tyne and Wear, DH4 6JW, centred on National Grid Reference (NGR) NZ 32119 50674.

The village of Houghton Le Spring is located 2.3km Southeast and the City of Sunderland lies 10km to the Northeast.

To the south and east, the Site is immediately bounded by buildings as part of Sedgeletch Industrial Estate. To the north and west lies park land. Immediately to the east lies industrial and commercial and residential properties.

The site layout and location is shown on Drawings 001 and 002, dated April 2024.

A summary of the immediate surrounding land use is provided in Table 3.

Table 3: Surrounding Land Use

Direction	Description
North	Moors Burn and open ground (Elba Park)
East	Industrial / commercial premises include a timber engineering facility and residential properties.
South	Commercial/industrial properties with residential properties beyond.
West	Open ground (Elba Park)

4.2 Identification of Potentially Sensitive Receptors

Human health and welfare is the focus for SSBRAs.

EA Guidance note M9 ‘environmental monitoring of bioaerosols at regulated facilities’ 4 defines a sensitive receptor as follows:

"Nearest sensitive receptor means the nearest place to the permitted activities where people are likely to be for prolonged periods. This term would therefore apply to dwellings (including any associated gardens) and to many types of workplaces. We would not normally regard a place where people are likely to be present for less than 6 hours at one time as being a sensitive receptor. The term does not apply to those controlling the permitted facility, their staff when they are at work or to visitors to the facility, as their health is covered by Health and Safety at Work legislation, but would apply to dwellings occupied by the family of those controlling the facility."

Hence for the purposes for this SSBRA, a sensitive receptor is defined as meaning locations within a 250m range of the aerobic digester where people will be present on a frequent basis or for prolonged periods. The selected receptor types for this assessment are defined below.

[4] M9 environmental monitoring of bioaerosols at regulated facilities, Environment Agency, 8th February 2017 - https://www.gov.uk/government/publications/m9-environmental-monitoring-of-bioaerosols-at-regulated-facilities

Commercial and Industrial Receptors

There are a number of commercial properties within 500m of the site's environmental permit boundary. The closest of these is Fencehouse Timber Engineering located adjacent to the southeast of the site.

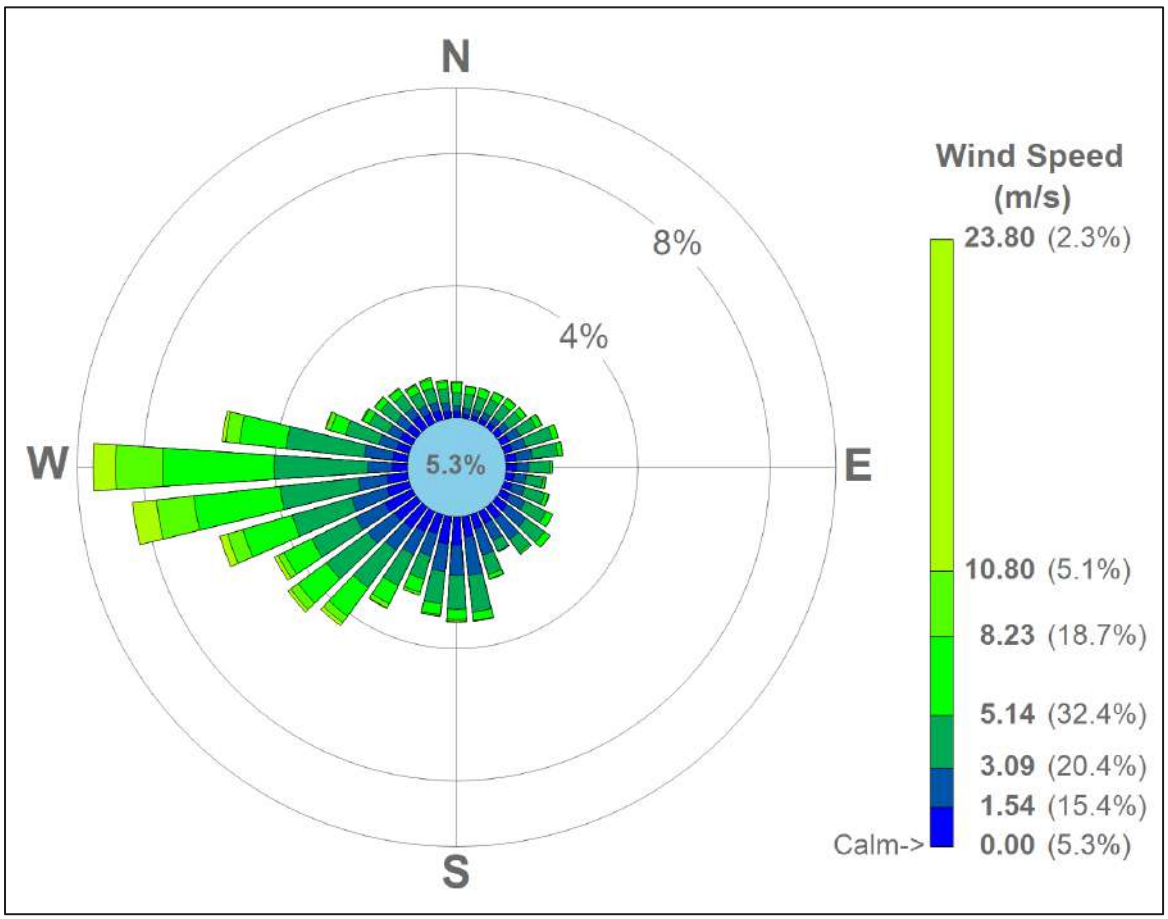
Residential Receptors

Areas of residential properties surround the site to the north, east and west of the Site. The nearest residential properties to the location of the proposed aerobic digester are adjacent to the east of the site.

4.3 Meteorology

The wind direction and frequency should be considered when looking at the impact of emissions on receptors. Figure 1 shows the wind patterns between 2014-2017 as identified at Newcastle meteorological station located approximately 24.3km to the north of the Site. The predominant wind direction is from the west and southwest, with winds from the east and north relatively infrequent.

Figure 1: Wind Rose from Newcastle Meteorological Station (2014-2017)



4.4 Site Activities

The site is proposing to install an Advetec XO22 aerobic digestion unit at the site, with a capacity to process up to 10 tonnes of residual municipal type waste per day.

Waste awaiting processing will be stored within Max Recycle's waste transfer station building in accordance with their currently permitted arrangements on Site.

The waste will be loaded within the existing waste transfer station building into a bulk loading system which feeds a shredder. The shredder which is also located internally will shred waste into 50mm² particle size. The shredded waste is then augered into the digester, where bacteria and bio-stimulants are automatically dosed into the waste to promote aerobic digestion. The digester will be located externally to the building.

There will be two point source emissions to air from the aerobic digestor.

Aerobic digestion takes place in a sealed vessel, meaning the potential for fugitive emissions to escape is considered very low.

The entire aerobic digestion process takes approximately 72 hours to complete, after completion the post-process floc exits the unit via an enclosed auger which conveys to a 40 yd³ Roll-on Roll-off (RORO) compactor with a maximum capacity of up to 8 tonnes. Waste is stored within the compactor before being collected and transferred off-Site.

It is considered unlikely that the aerobic digester will emit significant levels of bioaerosols due to the small scale of the machine.

5.0 Site Specific Risk Assessment

5.1 Tier 1 – Risk Screening

Tier 1 risk screening purely identifies the existence of potential hazards and receptors. No account is taken of the existence or non-existence of pathways or mitigation measures and the probability of consequences is assumed to be absolute.

5.1.1 Sources of Bioaerosol Emissions

The only potential sources of bioaerosol emission would be from the vents from the aerobic digestion unit.

There are not considered to be any other potential sources of bioaerosol emissions from the plant.

Ambient monitoring of bioaerosols undertaken at a similar, but smaller, plant using identical process technology and abatement systems at Advetec's Cribbs Causeway Shopping Centre installation found bio-aerosols to be below levels of detection or at very low values in all samples[5] and similar performance is expected from the plant proposed for the site.

The maximum levels reported for the Cribbs Causeway site are shown in Table 4 which clearly show that the emissions of bioaerosols are well below the acceptable level.

Table 4: Predicted Emission Levels for Bioaerosols

Bioaerosol Species	Acceptable Level (cfu/m³)	Maximum Level Recorded at Cribbs Causeway (recorded at the outlet from the carbon filter) (cfu/m³)
Gram-negative bacteria	300	Not assessed / Not present
Aspergillus fumigatus	500	<8
Total Bacteria	1,000	48

On the assumption that the proposed aerobic treatment plant for the site can be expected to achieve similar levels of performance to that monitored at the Cribbs Causeway site, it would be reasonable to anticipate that the emissions of bioaerosols from the proposed plant will be at acceptable levels at point of discharge, and hence would not pose any significant risk to the identified nearby sensitive receptors.

5.1.2 Receptors

The tier 1 risk screening has identified the following nearby receptors:

Commercial and Industrial Receptors

There are a number of commercial properties within 250m of the site's environmental permit boundary. The closest of these is Fencehouse Timber Engineering located adjacent to the southeast of the site.

[5] Ambient Bioaerosols Monitoring - Cribbs Causeway - SLR Report 416.11977.00001 – October 2021

Residential Receptors

Areas of residential properties surround the site to the north, east and west of the Site. The nearest residential properties are located adjacent to the east of the location of the proposed aerobic digester.

5.1.3 Conclusion of Tier 1 Risk Screening

The initial screening assessment has identified that there are potential sources of bioaerosols at the site, and that there are sensitive receptors within 250m of the emission points.

However, the level of bioaerosol emissions are anticipated to be sufficiently low to not pose any significant risk to human health at the defined nearest receptors.

5.2 Tier 2 – Generic Risk Assessment

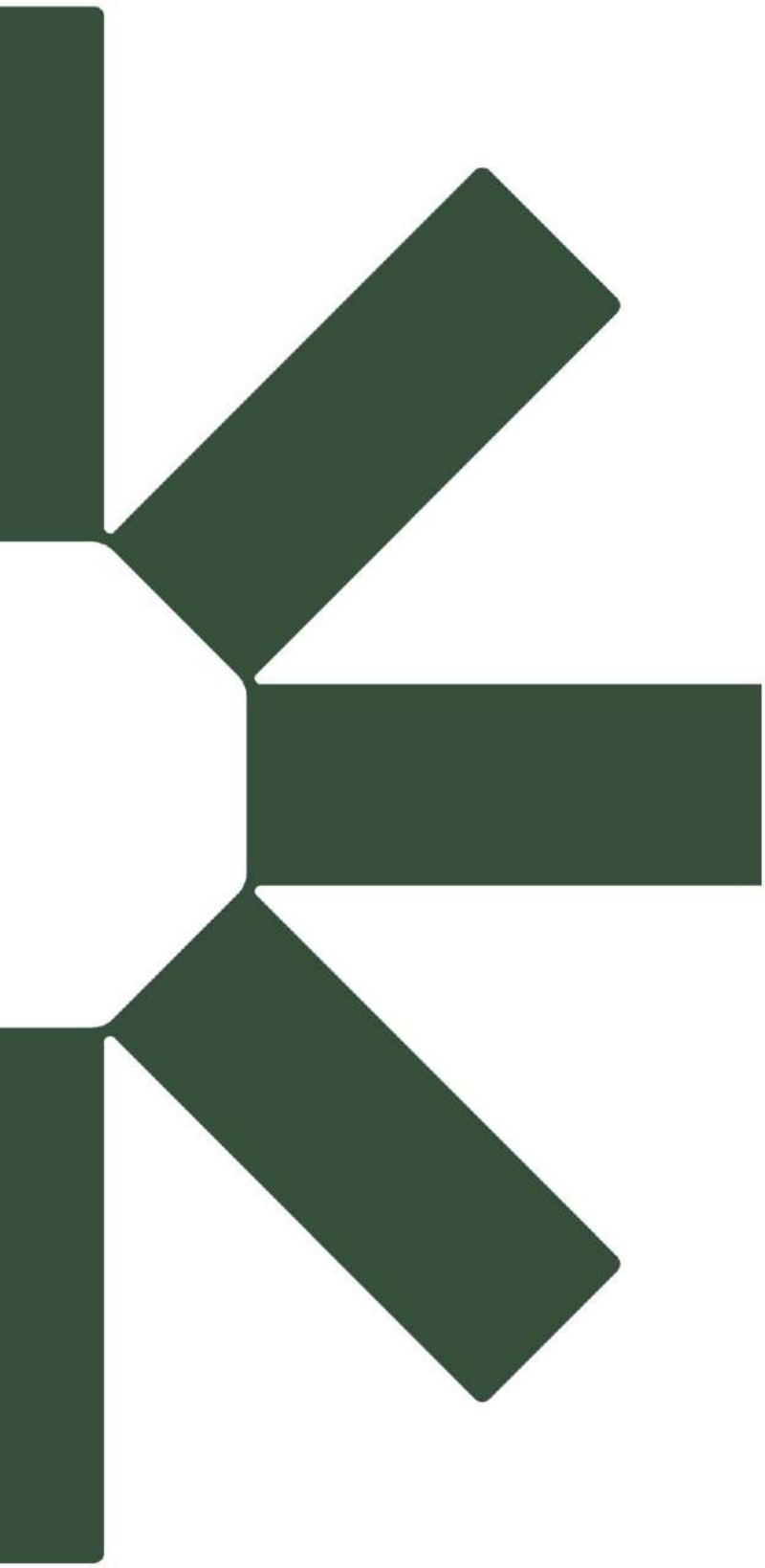
Table 5 presents the results of the Tier 2 risk assessment.

Table 5: Tier 2 Risk Assessment

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard / Source	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequences**	**What is the Overall Risk**
What has the potential to cause harm?	**What is at risk/What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? Who is responsible for what?**	**How likely is the contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence**
Bioaerosols released during aerobic digestion.	Residential receptors 90m to the southeast of the digester Commercial properties within 250m of the site	Air	It is considered unlikely that the aerobic digesters will emit significant levels of bioaerosols due to the small scale of the activity involving treatment of up to 10 tonnes of waste per day. Ambient monitoring of bioaerosols undertaken at a similar, but smaller, plant using identical process technology and abatement systems at Advetec's at Cribbs Causeway Shopping Centre installation found bio-aerosols to be below levels of detection or very low in all samples and similar performance is expected from the plant proposed for the site. The digestion process is undertaken within a sealed vessel. Operational procedures will be in place to ensure that the digester is maintained in good working order. Once operational confirmatory monitoring of bioaerosol emissions will be undertaken as required by RPS 209.	Low Exposure is unlikely: Predicted emission levels are very low and controlled to mitigate against exposure. Based on the emission levels predicted there will be no emission of bioaerosols at concentrations that could potentially cause harm to human health, so this could potentially be rated Very Low.	Low Consequences are minor: Based on the emission levels predicted there will be no offsite human health impacts, and so this could potentially be rated Very Low. However, giving consideration to the uncertainty linked to the reliance on monitoring data from the Cribbs causeway site the rating has been increased to low so as to provide a conservative assessment of potential risk.	Low The risk is suitably low and will only require periodic review.

6.0 Conclusion

The risk assessment concludes that the risk of potential human health impacts associated with bioaerosol emissions form the plant is low and hence is acceptable without additional abatement or controls.



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