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Consulting Engineers Limited

Northacre Facility

Northacre Renewable Energy Limited

Air Emissions Management Plan

ENGINEERING CONSULTING

Document approval

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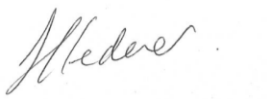
Prepared by:	Hannah Lederer		Environmental Scientist	14/07/2021
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Management Summary

Northacre Renewable Energy Limited (NREL) has applied to the Environment Agency (EA) ;for an Environmental permit (EP) to operate the Northacre Renewable Energy Facility (the Facility), on land off Stephenson Road, Westbury, Wiltshire.

This Air Emissions Management Plan (AEMP) has been produced in support of the development for the Facility, in order to provide details on the provisions which have been taken into account within the design of the Facility to mitigate the risk of nuisance from odour, taint, dust and bioaerosols through the commissioning and operational phase of the Facility. It also takes into consideration, the risk of fugitive emissions from abnormal and unplanned events, which would include fires and other emergency events.

The Facility will be designed in accordance with the recommended best practice and UK odour management guidance, including the following:

- EA Sector Guidance Note S5.06: '*Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste*';
- EA Guidance Note H4: '*Odour Management - How to comply with your environmental permit*';
- '*An industry guide for the prevention and control of odours at biowaste processing facilities*', The Composting Association, 2007; and
- *'Odour Guidance for Local Authorities'*, DEFRA, March 2010.

During normal operations, the potential sources of odour (and any associated taint), dust and bioaerosols are from the main stack, and fugitive emissions from the waste reception areas (which will include the waste tipping hall handling and storage areas as well as the unloading of waste deliveries). , and reagent, ash and residue storage areas.

During periods of commissioning, start up and shut down, the potential sources of odour (and any associated taint), dust and bioaerosols will remain unchanged in terms of fugitive emissions from the waste reception areas, but will also be emitted from the odour stack.

The principal control measures for the mitigation of odours (including associated taint), dust and bioaerosols from the Facility are summarised as follows:

- Waste reception areas will be enclosed and maintained at a negative pressure at all times.
- Air from the waste reception areas will be extracted and used as combustion air within the thermal treatment process. Potential odours (including associated taint), dust or bioaerosols will therefore be combusted at high temperatures which is likely to destroy the majority of odours (including associated taint) and all bioaerosols. Any residual odours (including associated taint) and dusts will be further abated within the flue gas treatment (FGT) system prior to release from the stack.
- Reagent, ash and residues have dedicated storage areas with suitable secondary containment.

In the event that the air from the waste reception areas cannot be used within the combustion process, i.e. during periods of shutdown an odour extraction system will extract potentially odorous air from the waste reception areas. . The odour extraction system will treat the extracted air using a dust filter and a carbon filter (referred to as the odour abatement system), prior to release to the atmosphere via a dedicated odour abatement stack. The stack itself will be 11 m in height and will be located on top of the bunker parapet; therefore, will release emissions 43 m above the surrounding ground level.

Arrangements and responsibilities for the monitoring, reporting, and response to any complaints of odour (including associated taint) dust and bioaerosols from the Facility have been identified. This included reporting to adjacent businesses.

Following completion of detailed design, a system for the periodic review of this AEMP is proposed. Any changes to the requirements of this AEMP will be submitted to and formally agreed with the EA prior to their implementation.

Contents

1 Introduction

Northacre Renewable Energy Limited (NREL) has applied to the Environment Agency (EA) for an Environmental Permit (EP) to operate the Northacre Renewable Energy Facility (the Facility) on land off Stephenson Road, Westbury, Wiltshire.

This Air Emissions Management Plan (AEMP) has been produced in support of the development for the Facility, in order to provide details on the provisions which have been taken into account within the design of the Facility to mitigate the risk of nuisance from odour, taint, dust and bioaerosols through the commissioning and operational phase of the Facility. It also takes into consideration, the risk of fugitive emissions from abnormal and unplanned events, which would include fires and other emergency events.

This document identifies the abatement measures which have been allowed for in the design of the Facility and the management systems which will be implemented to prevent any unacceptable off-site impacts associated with emissions of odour (including any associated taint) dust and bioaerosols from the Facility.

The Facility will be designed in accordance with recommended best practice and UK odour management guidance, including the following:

- EA Sector Guidance Note EPR 5.01: '*Incineration of Waste'*;
- EA Sector Guidance Note S5.06: '*Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste*';
- EA Guidance Note H4: '*Odour Management - How to comply with your environmental permit'*;
- '*An industry guide for the prevention and control of odours at biowaste processing facilities*', The Composting Association, 2007; and
- *'Odour Guidance for Local Authorities'*, DEFRA, March 2010.

1.1 Objective

The objective of this AEMP is to provide detail of the provisions which have been taken into account during the design phase of the Facility to manage operational risk leading to any potential impact from odour (including any associated taint), dust or bioaerosols on local receptors.

2 Site Location and Description

2.1 The Site

The site is approximately 2.6 ha and situated on the Northacre Trading Estate, which is approximately 1.5 km to the north-west of Westbury town centre in Wiltshire Council. The site is located on a parcel of land between Arla Foods Westbury Dairies to the north-east and the Northacre Resource Recovery Centre (NRRC) to the south-east. Stephenson Road is immediately north of the site whilst there are fields to the south side of the site.

Access to the site is from Stephenson Road, which links via the B3097 to the A350. The A350 provides access in all directions via the primary route network. The nearest residential properties are two dwellings on Brook Lane to the east, Brook Farm and Orchard House to the southwest, and a small number of semidetached houses on Storridge Road to the north-east. The Northacre Trading Estate is located approximately 600 m to the north of the site.

A site location plan and installation boundary drawing are presented in Appendix A.

The adjacent NRRC Mechanical Biological Treatment Facility (MBT) plant is a waste processing facility that also poses the risk of producing odours (including associated taint), dust and bioaerosols. The management of these is the responsibility of the NRRC, but it is noted that there may be the potential for in-combination impacts with the Facility and this has been taken into account within this AEMP. However, the primary focus of this report is in relation to the activities which are within NRELs control.

2.2 Summary of Site operations

The Facility will process up to 243,000 tonnes per annum and include the following components:

- waste reception;
- waste transfer;
- waste handling;
- waste storage;
- water, fuel oil and air supply systems;
- furnace;
- boiler;
- steam turbine/generator set;
- facilities for the treatment of exhaust or flue gases;
- flue with associated stack;
- on-site facilities for storage of residues and wastewater;
- residue removal; and
- devices and systems for controlling combustion operations and recording and monitoring conditions.

3 Review of Potential Sources, Pathways and Receptors

3.1 Odour and taint

An odour is the organoleptic attribute perceptible by the olfactory organ on sniffing certain volatile substances. Odorous substances have a property which makes them perceptible to our sense of smell. The chemical compound (i.e. the 'odorant') is volatilised in air and acts as a stimulus which the receptor interprets as an odour. Odourants can, under certain circumstances, be assimilated into or deposited onto materials or products causing a taint.

Volatile organic compounds (VOCs) are common chemical contaminants which are a source of odours and taints. These can arise from natural and synthetic sources via evaporation, and so can be controlled by reducing the rate of evaporation. They can only be detected in gaseous form, so if odours are trapped in a solid or liquid state, they will not cause odour exposure or taint. Although some VOCs are renowned and identifiable as odorants, such as those which have been assessed in the Taint Assessment to support the permit application, there are hundreds of VOCs in existence and so it is not practical for each of the VOCs within the flue gases or odour treatment discharge to be chemically measured. Therefore, as detailed within this report NREL propose to implement a programme of sniff testing around the boundary of the Facility and in proximity to sensitive receptors to monitor odour, under normal Facility operation. During the periods of commissioning and start-up and shut-down of the Facility, when the odour abatement system is in use, NREL will undertake periodic monitoring of concentrations of total VOC's from the odour abatement system.

Typically, odours are detected at very low concentrations of chemicals and compounds in air. The human nose is very sensitive with on average over 5 million scent receptors. Humans can detect concentrations as low as a few parts per billion (ppb).

Odours may be perceived as pleasant or unpleasant. The main concern with odour is its ability to cause a response in individuals that is considered to be objectionable or offensive. Whilst there is often agreement about what constitutes pleasant and unpleasant odours, there is a wide variation between individuals as to what is deemed unacceptable and what affects our quality of life.

Taint in this context refers to when odours are imparted onto to other materials, most commonly foods, which can cause a change in flavour.

3.1.1 Potential sources

The potential point source releases of odour (as associated taint) from the Facility are:

- the main stack which releases the abated combustion gases post flue gas treatment;
- the standby odour abatement system stack, which releases air following abatement of dusts and odours;

The potential sources of intermittent or fugitive emissions of odour are:

- deliveries of incoming waste, during unloading of waste from the vehicles to the bunker;
- vehicle entry and egress from the waste reception area, considering the opening of tipping hall shutter doors;
- waste reception areas have potential of releasing odours to the atmosphere during opening of bunker shutter doors or ventilation louvres;
- bunker emptying and cleaning;

- the boiler ash and air pollution control residues (PCr) storage area;
- chemical and reagent delivery and offloading (lime, PAC, ammonia);
- emergency releases from unplanned events such as fire
- chemicals used for odour masking; and
- vehicle exhausts.

It is note that NRRC will also give rise to potential emission of odour which are likely to give rise to odour, and the potential for in-combination effects has been taken into account However, the primary focus of this report is in relation to the activities which are within NRELs control.

3.1.2 Pathways

Odours released from the sources identified are released to air and have the potential to be conveyed to nearby receptors via transfer through the air. Should the odours come into contact with any food sources, there is the potential for them to cause a taint. The extent to which odour is detectable is dependent upon the following factors, all of which can exhibit substantial variation over time:

- the nature and magnitude of odour emission released from the Facility;
- the wind direction and wind speed; and
- atmospheric turbulence (vertical and horizontal) and the level of dilution and dispersion odours undergo as they travel downwind.

For example, an odour is much less likely to be perceived when stood upwind of the source, compared to downwind. This is also altered by the strength of the wind and other air turbulence, which can be constantly changing. Therefore, it is unusual for a pathway to be constant, hence the often intermittent nature of odours.

3.1.3 Receptors

The identification of potentially sensitive receptors to odour and taint has been conducted on the basis of the level of exposure to odour which is likely to generate annoyance in residential receptors. This tends to be considerably lower than the levels which usually cause annoyance at commercial or industrial receptors.

An assessment of potentially sensitive receptors for odour and taint has been undertaken for a 500 m radius of the Facility, refer to Appendix B. These are the same receptors which potential the potential for odour impacts was assessed in support of the Planning Application. It is not considered to be an exhaustive list of receptors, but they are considered to represent the closest likely areas of exposure, taking into consideration the predicted odour impacts from the Facility, as identified from the assessments to support the planning and EP applications, in each wind direction. They include include a mixture of industrial, commercial and residential receptor locations, including the location of the air vents at Arla Dairies.

3.2 Dust

The impact of dust on human health is very dependent on the size of dust particles. Particles larger than 10 µm cannot be breathed in but can cause irritation to skin and eyes. Particles smaller than 10 µm (referred to as PM_{10}) can be breathed in and can be associated with respiratory disorders. Particles finer than 2.5 µm (referred to as $PM_{2.5}$) may penetrate into the lower respiratory tract and can enter the bloodstream, which has the potential to cause cardiovascular disorders. Additionally,

dust can give rise to annoyance due to the soiling of surfaces by dust. Very high levels of soiling can also damage plants and affect the diversity of ecosystems.

3.2.1 Potential sources

The potential point source releases of dust (particulate matter) from the Facility are:

- the main stack which releases the abated combustion gases post flue gas treatment; the standby odour abatement system stack, which releases air following abatement of dusts and odours;

The potential sources of fugitive dust emissions of from the Facility are:

- deliveries of incoming waste, during entry to and exit from the site and during unloading of waste from the vehicles to the bunker;
- vehicle entry and egress from the waste reception area, considering track out of dust from inside the waste reception area and when tipping hall shutter doors are open;
- the bunker, especially when waste is turned or moved, and any spread of dust into the tipping hall;
- bunker emptying and cleaning;
- ventilation louvres:
- the boiler ash and APCr storage area when shutter doors are open;
- chemical and reagent delivery and offloading (lime, PAC, ammonia);
- emergency releases from unplanned events such as fire or equipment failures.

  Dust release from the waste will be greater during the movement or turning of the waste. Therefore, it is most likely for fugitive dust emissions to be generated during deliveries of waste and during bunker mixing, feeding the waste into the EFW plant, and bunker emptying should that be required. Dust also has the potential to be emitted during the collection and delivery of residues and reagents. The proximity of the NRRC and potential dust emissions from it has also been noted, bearing in mind Hills' responsibility to manage and monitor dust emissions as part of the NRRC EP and the assessment of impact of particulate matter to be negligible and not significant.

3.2.2 Pathways

Dust released from the sources identified are emitted to air and have the potential to be conveyed to nearby receptors via transfer through the air.

The extent to which dust is detectable is dependent upon the following factors, all of which can exhibit substantial variation over time:

- the nature and magnitude of dust emissions released from the Facility;
- the wind direction and wind speed; and
- atmospheric turbulence (vertical and horizontal) and the level of dilution and dispersion dust emissions undergo as they travel downwind.

For example, any dust plumes shape and size will be influenced by the direction and speed of the wind and the atmospheric turbulence at a given moment. Transportation and deposition of dust will also be dependent on these factors.

3.2.3 Receptors

The receptors which have been identified as being sensitive to fugitive emissions of dust from the Facility are the same as those identified above as sensitive to odours and taints, refer to Appendix B. They are not an exhaustive list, but have been chosen to represent the closest likely areas of exposure in each wind direction and include a mixture of industrial, commercial and residential receptor locations, including the location of the air vents at Arla Dairies. They include a mixture of industrial, commercial and residential receptor locations.

3.3 Bioaerosols

Bioaerosols are airborne particles which contain micro-organisms. They are found naturally in the environment and can include bacteria, fungi, viruses, pollen, spores, endotoxins and mycotoxins. There is limited research on the impacts on bioaerosols on human health, but they can be associated with a higher risk of respiratory diseases or symptoms. The Facility treats waste via a combustion process, and does not rely on biological process such as micro-organisms to break down waste. However, there will be a low level of biological activity or composting of wastes off-site prior to its delivery to the facility, as well as within the bunker. This will have a low potential to produce bioaerosols from handling and mixing of the incoming waste before it is combusted.

3.3.1 Potential sources

The potential point source releases of bioaerosols from the Facility are:

- the standby odour abatement system stack, which emits de-dusted and de-odourised air;

Bioaerosols will not be released from the main stack as any bioaerosols in the incoming waste will be destroyed through the combustion process.

The potential fugitive sources of bioaerosols from the Facility are as follows:

- deliveries of incoming waste, during unloading of waste from the vehicles to the bunker; and
- waste reception areas (fully enclosed building including the tipping hall, and waste storage bunker) have potential of releasing bioaerosols to the atmosphere during opening of bunker shutter doors.
- Ventilation louvres

Bioaerosol release from the waste will be greater during the movement or turning of the waste. Therefore, it is most likely to occur during unloading deliveries of waste, bunker mixing, feeding the waste into the EFW plant, and bunker emptying should that be required.

NREL understands that the NRRC, which lies adjacent to the Facility, will release bioaerosols, and this is regulated within the EP for the NRRC. NREL understands that monitoring undertaken on the monitoring of these emissions has demonstrated that the emissions from the NRRC has not identified any unacceptable release of bioaerosols from the NRRC facility.

3.3.2 Pathways

Bioaerosols released from the sources identified are emitted to air and have the potential to be conveyed to nearby receptors via transfer through the air.

The extent to which bioaerosols are detectable is dependent upon the following factors, all of which can exhibit substantial variation over time:

- the nature and magnitude of the bioaerosol emissions released from the Facility;

- the wind direction and wind speed; and
- atmospheric turbulence (vertical and horizontal) and the level of dilution and dispersion bioaerosols undergo as they travel downwind.

Bioaerosol release from the waste will be inflated during the movement or turning of the waste. Therefore, it is most likely to occur during deliveries of waste, bunker mixing, and feeding the waste into the combustion process, and bunker emptying should that be required.

3.3.3 Receptors

The identification of potentially sensitive receptors to bioaerosols has been conducted on the basis of the level of exposure to bioaerosols which is likely to generate annoyance in residential receptors. This tends to be considerably lower than the levels which usually cause annoyance at commercial or industrial receptors.

An assessment of potentially sensitive receptors for bioaerosols has been undertaken for a 500 m radius of the Facility, refer to Appendix B. These are the same receptors which potential the potential for odour impacts was assessed in support of the Planning Application. It is not considered to be an exhaustive list of receptors, but they are considered to represent the closest likely areas of exposure, taking into consideration the predicted odour impacts from the Facility, as identified from the assessments to support the planning and EP applications, in each wind direction. They include a mixture of industrial, commercial and residential receptor locations, including the location of the air vents at Arla Dairies.

4 Management and Control Measures

The Facility is subject to detailed design; however, where design information is available, it has been considered within this AEMP. Following completion of detailed design, this AEMP will be reviewed and updated to include for any additional information in relation to the control measures to be implemented at the Facility.

Prior to commencement of commissioning of the Facility, a commissioning plan will be submitted to the EA for approval. This will include measures to be taken to prove performance of the odour abatement measures detailed in this section. The commissioning plan will include, but not be limited to the following:

- Confirmation of the management arrangements of the waste materials imported into the Facility.
- The dust and odour abatement systems which will be implemented throughout the commissioning phase of the Facility.
- Further details associated with the storage capacity of the waste bunker, with storage times of incoming waste supplied on completion of detailed design of the Facility. The detailed design information will also be used to support the development of the final AEMP.
- The development of waste acceptance criteria that limit the types of waste received at the Facility. This will be supplemented by monitoring of suppliers and the waste to be transferred to the Facility.
- Design and management of the mechanical ventilation system, including odour abatement system, to prevent the release of fugitive emissions from the Facility.
- Design of the building relating to separation and enclosure of building structures where odorous materials may be present, and management of the operation of access doors and ventilation louvres etc. within those areas.
- Identification and management of emergency situations.

4.1 Control measures

As detailed in the sections 3.1 to 3.3, odour (and therefore taint), dust and bioaerosols are mainly emitted from the same sources and have the same pathways. Therefore, the control measures identified in this section are, unless otherwise specified, applicable to emissions of dust, odour and bioaerosols.

4.1.1 Point source emissions – normal operation

During normal operation, the only point source odour or dust emissions from the Facility will be from the main stack when released with the flue gases. There is no risk of the release of bioaerosol from the main stack because they will have been destroyed within the combustion process prior to release from the stack.

Emissions from the Facility will be released to atmosphere from a flue located within the main stack. The waste reception areas within the main process building will be isolated from the rest of the process building to contain potential odours, dusts and bioaerosols within these areas. Air from these waste reception areas will be extracted by a mechanical ventilation system and used as combustion air within the furnace. The Industrial Emissions Directive (IED) requires that any combustion gases passing through a waste incineration plant must experience a temperature of 850^{o}C or more for at least two seconds. Due to the high temperatures associated with the

combustion process, nearly all odorous chemicals and bioaerosols will be destroyed. Any residual odorous chemicals will be abated in the bag filters of the flue gas treatment system.

Bag filters are highly effective at removing all sizes of particles and work via two methods:

- Absolute filtration - particles larger than the holes in the filter obviously cannot pass;
- Adsorption - a layer of particles called "filter cake" builds up on the surface of the filter material which consists of reagents (lime and activated carbon) and reaction products. This layer is essential to the proper functioning of the flue gas treatment system. Within this layer, the final acid gas neutralisation and the absorption of heavy metals and complex organic compounds takes place.

The main stack will assist with dispersion of the flue gases as demonstrated in the Air Quality Assessment. Taking this into consideration, it is considered highly unlikely that there will be any malodorous air from the Facility detectable at sensitive receptors.

To prevent fugitive odour emissions from a bag filter failure, there will be online monitoring of the pressure drop within bag filter compartments to identify when there has been bag filter failure. If a pressure drop is identified, the relevant bag filter compartments will be isolated to prevent uncontrolled emissions and repaired before being brought back on-line. The particulate abatement systems are designed with suitable redundancy which will enable the bag filters to be changed whilst the Facility is in operation without any reduction in performance of the particulate abatement systems.

An SNCR reagent (ammonia solution) will be injected into the furnace prior to the FGT process to abate NOx. As part of the SNCR system, there may be an occasional “ammonia slip” during operation. This refers to when ammonia salts are formed downstream in the flue gas path, and unreacted ammonia can be discharged to the atmosphere. This is controlled by employing systems to control the rate of reagent dosing to ensure that it is kept to a minimum. The impact of emissions of ammonia from the Facility have been assessed in the Air Quality Assessment submitted in support of the EP application. This has demonstrated that the emissions of ammonia from the Facility will have a ‘not significant’ impact upon the environment.

The assessment and management of further abnormal events is detailed in section 6.

4.1.2 Point source emissions – during offline periods

During periods of planned or unplanned shutdown the isolated waste reception areas area will be maintained under negative pressure by a standby air extraction system controlled by the building management system. , The potentially odorous air will be extracted from this area and treated in the odour abatement system, including a dust filter and a carbon filter, which are reported by the Waste Treatment BREF to be have a 70-99% efficiency rate. The filtered air will then be released to the atmosphere via a dedicated odour stack at 43 m above ground level.

As stated in the Bioenergy Infrastructure Group (BIG) Compliance Obligations Schedule Standard (*BIG-HSEQ-FRM-011-v1.0)*, periodic stack testing for emissions to air within the Environmental Permit will be undertaken quarterly.

4.2 Fugitive emissions

4.2.1.1 Deliveries of waste for processing

Deliveries of waste to the Facility will be via road in enclosed vehicles. Waste will not be unloaded until the delivery vehicles are located within the enclosed waste reception area. This will prevent

the release of fugitive odour, dust or bioaerosol emissions during transport of the waste to the Facility.

There is also future potential for waste to be delivered to the Facility directly from the NRRC via a conveyor. The conveyor will be enclosed or covered, with air extraction from transfer points to minimise dust and odour release. It should be noted that Hills Waste Solutions Ltd will be the 'Operator' of the conveyor, and it will not be implemented until a variation to the EP for NRRC has been secured by NRRC for the operation of the conveyor.

The waste reception area will have sufficient space for the inspection of waste deliveries, if needed, and for the potential quarantine of any 'non-compliant' waste. All waste handling, transfer and treatment activities undertaken at the Facility will be contained and undertaken within environmentally controlled buildings which will maintain negative pressure within the waste reception areas, thereby minimising the potential for the release of fugitive odour, dust or bioaerosol emissions from the Facility.

The waste reception areas will have fast opening doors to allow for waste deliveries, and a door control system for vehicles entering or leaving the area will be provided, to limit the number of delivery doors and ventilation louvres open at any time to ensure that negative pressure is maintained in the waste reception area.

The tipping hall will have five waste tipping bays, although it is not expected for all five tipping bays to be used simultaneously. When delivering waste to the Facility, waste delivery vehicles will reverse into an assigned tipping bay and unload their waste into the waste bunker.

If the waste is identified as being 'unacceptable', it will be either rejected and returned to the supplier or quarantined within a dedicated quarantine area prior to transfer off-site. Investigations will be undertaken with the waste supplier to identify the reason for malodourous materials being imported into the site, and appropriate actions taken to prevent reoccurrence.

In the event these control measures do not minimise the release of fugitive odour, dust or bioaerosol emissions, the measures detailed within the action plan (refer to section 7) will be implemented.

4.2.1.2 Waste storage areas

An induced draught (ID) fan and a building control system will be used to maintain negative pressure within the waste reception areas, including the waste storage bunker, with extracted air used as combustion air within the combustion process. This will ensure that odour is unable to escape from the waste storage areas. Potential failure of the ID fan is assessed and planned for within section 6 – Abnormal vents.

Anaerobic conditions can lead to the generation of odorous air within the waste bunker. Incoming waste delivered to the Facility will be stored in the waste bunker for the minimum period of time to prevent the formation of anaerobic conditions within waste bunker area. The continuous operation of the Facility will minimise the storage times for waste within the waste bunker. Waste reception areas will be cleared and cleaned during regular maintenance operations. The assessment and management of further associated abnormal events is detailed in section 6.

The crane operators will employ bunker management procedures which will include for mixing of the waste, using the crane grab, to avoid the development of anaerobic conditions in the bunker, which could generate further odorous emissions.

Where appropriate, prior to periods of planned maintenance, waste stored within the waste bunker will be 'run-down' so that it does not contain significant quantities of old and potentially odorous material during planned shutdown periods. In the event of an unscheduled shutdown, mixing of

the bunker contents will be carried out using the crane. The standby air extraction and abatement system utilising carbon filters will be automatically initiated by the building control system to maintain negative pressure and reduce odour within the waste bunker area, refer to section 4.2.1.6. This will also ensure that all bioaerosols and dust remain within the waste reception areas and will prevent fugitive releases and mitigate off-site impacts of bioaerosols and dusts.

The negative pressure within the waste reception areas will ensure that any dust within these areas is drawn into the combustion process, rather than resulting in fugitive releases from the Facility. The flue gas treatment systems will remove any dust from the combusted air prior to it exiting the main stack. This also includes any further dusts generated from the combustion process. Any dust that is predicted to exit from the main stack has been modelled and impacts assessed in the air quality assessment. This is detailed further in section 4.1.1.

In the event of an unplanned shutdown, a mechanical extraction and abatement system which uses a carbon filtration system will be used to maintain the negative pressure within the waste reception storage and handling system will be released from a dedicated odour abatement stack.

In the event of an extended period of unplanned shutdown, arrangements will be made to stop or divert incoming waste to the Facility. If required, there is potential to remove and backload waste from the bunker in the case of an extended unplanned shut down. In addition, it should be noted that there will be no external handling or storage of waste associated with the operation of the Facility.

In addition, during periods of shutdown, the doors to the waste reception area will remain closed to contain potential fugitive odour emissions, with incoming waste stopped or diverted to an alternative treatment facility. The assessment and management of further associated abnormal events is detailed in section 6.

4.2.1.3 Reagent chemical storage and handing

Ammonia, lime and powdered activated carbon (PAC) are used within the FGT system.

Ammonia solution will be stored within a tank in a dedicated storage area, with secondary containment such as bunding. The ammonia solution will be delivered into the storage tank from a road tanker. When filling the tank, displaced air will be routed back to the road tanker so there is no escape of potentially odorous air.

Lime and PAC will be stored in separate steel silos adjacent to the FGT system. Lime and PAC will be transported pneumatically from the delivery vehicle to the correct storage silo. Exhaust air will be de-dusted using a fabric filter located at the top of the silo – cleaning of the filter will be done automatically with compressed air after filling operations, with the filter inspected regularly for leaks. Silos will also be fitted with high-level alarms.

Fuel oil will be used as the start-up and shutdown fuel by the auxiliary support burners. It will be stored in a dedicated storage tank with suitable secondary containment. Fuel oil will be delivered into the storage tank from a road tanker. When filling the tank, displaced air will be routed back to the road tanker so there is no escape of potentially odorous air.

Boiler make-up water will be supplied from an onsite water treatment plant. Boiler water treatment chemicals will be used to control water hardness, pH and scaling and will be delivered in sealed containers and stored in an area with suitable secondary containment (e.g. bunding) within the water treatment room. Various maintenance materials (oils, greases, insulants, antifreezes, welding and firefighting gases etc.) will be stored in an appropriate manner. Any gas bottles on-site will be kept secure in dedicated area(s).

4.2.1.4 IBA storage and handling

Due to the high temperatures, any organic substances within the waste will have been destroyed within the waste combustion process. Therefore, the incinerator bottom ash (IBA) is not odorous and will not contain bioaerosols and will be managed within the confines of the Facility building within the IBA storage area/building.

IBA is initially wet, or quenched, which both cools the ash and reduces any dust emissions. IBA will then be stored within the enclosed IBA storage area. There will be regular collections of IBA from the IBA storage area for transfer off-site to a suitably licensed waste facility. All ash handling will be undertaken within enclosed buildings, with the ash maintained wet from quenching to prevent the release of dust emissions off site. IBA will be loaded into articulated lorries by front-end loader, within the enclosed IBA storage area.

4.2.1.5 APCr storage and handing

Due to the high temperatures of 850°C or higher, any organic substances within the waste will have been destroyed at the high temperatures within the waste combustion process. Furthermore, the ammonia dosed in the NO_x abatement system will not be dosed into the flue gas stream until after the bag filters. Therefore, the ammonia will not be present in the APCr and will not be odorous.

APCr will be stored within sealed/enclosed silo(s). All silos will be fitted with bag filter protection to prevent the uncontrolled release of dusts during refilling. Maintenance procedures will be developed for routine inspection and testing of the bag filters. The APCr silo will be unloaded by a chute system. Dusty air from the unloading of silo will be extracted and vented to atmosphere via bag filters fitted to prevent the release of dusts from silo unloading operations.

As stated in the BIG Compliance Obligations Schedule (*BIG-HSEQ-FRM-011-v1.0)*, residue testing will be undertaken monthly in accordance with the requirement of the Environmental Permit.

4.2.1.6 Additional measures during shutdown

The Facility will include an effective standby odour abatement system, which will be utilised for the treatment of odorous air from the waste reception areas during planned or unplanned shutdowns. The design of the odour abatement system will include the following:

- Building compartmentalisation of odorous areas (the Odour Compartment),
- A building management system controlling the opening of doors and ventilation louvres and the operation of the standby extraction system to maintain negative pressure in the odour compartment
- Odour abatement system utilising dust filters and carbon filters;
- Fan and ductwork; and
- Discharge via an odour control stack located on the top of the waste reception building.

The odour abatement system includes a dust and carbon filter which removes dust and bioaerosols from the odorous extracted air and is intended to maintain negative pressure within the odour compartment in the absence of the combustion process.

The operation of the carbon filters will be monitored to assess performance and to determine when media replacement is required. The odour abatement system will be designed redundancy in the abatement system to allow carbon replacement whilst the system is operating. The odour abatement system will include inlet self-cleaning bag filters to remove dust and bioareosols and to extend the life of the carbon filters.

The odour abatement system will be controlled automatically by the building management system, and will operate automatically during periods of both planned and unplanned shutdown of the Facility, as required.

During normal operation of the plant, when the abatement system is not operational, the carbon filters will be isolated to prevent the carbon from being unnecessarily exposed to ambient air within the waste bunker area. This will retain the quality of the carbon, and maintain the integrity of the carbon abatement system between periods of shutdown.

During periods of shutdown, all doors to the waste bunker and reception area will remain closed. This will help to contain any odour, dust and bioaerosols within the waste bunker area and ensure that the abatement system is effective in preventing their release. The combination of both enclosing the waste bunker area and the design of the odour abatement system will ensure that the potential for the release of odours outside the building is minimised.

The operational temperature of the carbon filter system will be approximately the same as the ambient temperature in the waste bunker area. This will typically be below 30^{o}C. Ventilation in the waste bunker area, will be provided by the carbon filter system extract fan when the boiler ID fan is not operating, and ambient temperatures will be maintained by drawing air in through louvres in the waste reception storage and processing area There will be a second odour extraction ID fan to cover for the unlikely occasions of any break down of the first odour extraction ID fan. This ensures that there is always the availability for the odour abatement system to work.

Further detail on the monitoring and maintenance of the odour abatement system is subject to detailed design of the Facility. However, it is understood that the system will be subject to regular testing and a planned preventative maintenance regime; taking into account the limited hours of operation of the system the extent of any maintenance during the operational phase of the Facility is expected to be minimal.

5 Monitoring

Due to the proximity of the NRRC and the nature of the monitoring, the potential in-combination impacts with the Facility and NRRC, will be considered.

5.1 Odour

A programme of odour monitoring will be undertaken at the Facility. This will include the following monitoring regime:

- Olfactory (sniff) testing at the installation boundary; and
- Continuous wind direction and wind speed monitoring using an anemometer.

5.1.1 Olfactory testing

Olfactory (sniff) testing will be undertaken at strategic locations around the installation boundary on a regular basis. Where odours at the perimeter are identified, this will be reported to Facility's management team. An investigation to determine the source and cause of the odour will be undertaken in accordance with the systems as set out in Section 7.

5.1.1.1 Competent individuals

Self-monitoring by operators using this method may not be ideal because staff working at the site get used to (i.e. they adapt to) odours from the site and this adaptation means that they may not be able to assess the level of odour objectively.

Therefore, a competent individual will be employed by NREL to undertake olfactory testing. Competency can be qualified by previous experience of accurately characterising and recording odours. NREL will require that the competent individual goes through odour acuity testing (nose calibration) to check that their sensitivity is within what is considered a normal range.

5.1.1.2 Monitoring locations

The proposed locations for odour monitoring are presented in Appendix C. Subject to agreement on access with adjacent premises, monitoring could be extended outside of the installation boundary to include locations within the adjacent premises. The locations may be reviewed following detailed design to ensure that there are no accessibility constraints. Where accessibility constraints are identified, suitable equivalent locations which do not have the same accessibility constraints will be identified and agreed.

5.1.1.3 Monitoring frequency

In order to generate a detailed odour record for the Facility, regular monitoring at the installation boundary will be undertaken daily, or at a different frequency to be agreed with the EA and adjacent premises. This will ensure a detailed data set will be maintained throughout the year.

Monitoring will also be undertaken upon receipt of an odour complaint to identify and record the odours present at the time of the complaint – refer to Section 7.

Monitoring will not be conducted at a set time of day, in order to maintain flexibility and relevance in the monitoring strategy. Instead, the monitoring will be conducted at times when there is a high

risk of odour generation, such as during times where there are waste deliveries to the site or residues collected for transfer off-site.

5.1.1.4 Data collection and recording

Before commencing any odour monitoring, the operative will record pertinent details such as date, time, weather conditions and the nature of the activities being undertaken. This is summarised within a proposed monitoring template, contained within Appendix D.

In order to quantify odour at a specific level, the 'intensity' and the 'offensiveness' are recorded. These are based on a scale of 1 to 5 for 'intensity' and 1 to 4 for 'offensiveness'. The levels for the two scales are shown in Table 1 and Table 2 below.

Table 1: Odour Intensity

Scale	Intensity Rating
0	No odour
1	Very faint odour (barely detectable, need to stand still and inhale facing into the wind)
2	Faint odour
3	Distinct odour (odour easily detectable while walking and breathing normally)
4	Strong odour
5	Very strong odour
6	Extremely strong odour (probably causing nausea)

Table 2: Odour Offensiveness

Scale	Offensiveness Rating
1	No detectable odour
2	Potentially Offensive
3	Moderately Offensive
4	Very Offensive

As well as recording the odour intensity and offensiveness, general comments on the nature of the odour will also be recorded, such as persistence, transience and potential source etc.

5.1.1.5 Action limits

If a score of 1 is recorded for intensity and offensiveness at a monitoring location, it is concluded that odour from the Facility cannot be detected and no action is required.

If a score of 2 or higher for intensity or 2 or higher for offensiveness is recorded, then a more detailed investigation will be undertaken into the activities being undertaken and the root cause of the odour, refer to section 7.1. This approach aims to identify the source of the odour and suggest possible ways to improve operations at the Facility to prevent odour being generated.

If further investigation is needed, all adjacent facilities to NREL will be notified of the event and the corrective actions that will be undertaken to mitigate off site impacts.

5.1.1.6 Wind direction and wind speed

A weather centre including an anemometer will be used to record the wind direction and speed, ambient temperature, air pressure, and humidity, to provide data to inform any investigations into any odour or taint complaints which are received.

5.2 Dust

5.2.1 Visual inspections of the site

Visual dust inspections will be carried out. As this monitoring is complementary to the odour monitoring described in section 5.1, it will utilise the same monitoring locations and frequencies.

The monitoring will include note of any visual dust plumes; the level of surface dust around the site; details of the mud and soil tracked into on-site and off-site roads; and record any changes.

Should any dust events be seen outside of the dust inspections, by site operatives or on CCTV, these shall also be reported to the operative undertaking the visual dust inspections.

5.2.2 Particulate matter CEMS monitoring

Particulate matter from the stack will be monitored as part of the Continuous Emissions Monitoring Systems (CEMS) monitoring. The EP for NREL specifies the emission limits of particulate matter (as both PM_{10} and $PM_{2.5}$), and the emissions from the main stack have been modelled within the air quality assessment to ensure they are compliant with the relevant screening criteria (Air Emissions Guidance) and Air Quality Assessment Levels (AQALs). CEMS monitoring and reporting checks that the emissions limits are adhered to and the impact remains insignificant to human health. Any exceedances will be reported to the EA, as well as any adjacent facilities.

5.3 Bioaerosols

Bioaerosols consist of airborne particles that contain living organisms such as bacteria, fungi and viruses or parts of living organisms, such as plant pollen, spores and endotoxins from bacterial cells or mycotoxins from fungi. These will be monitored in accordance with the Environment Agency Technical Guidance Note M9 ‘Environmental monitoring of bioaerosols at regulated facilities’ Version 2, July 2018.

Bioaerosols will be monitored in the discharge from the standby odour control system stack by an MCERTS accredited organisation for VDI 4257 Part 2, for plant performance monitoring. Bioaerosols will also be monitored at agreed bioaerosol monitoring locations upwind and downwind of the emission source in a fan-like pattern with at least 4 sampling locations in accordance with section 5.2 of EA Technical Guidance Note M9.

6 Abnormal Events

Table 3 identifies those potential abnormal events which may give rise to odour, taint, dust or bioaerosol emissions, and planned responses in the event of these potential abnormal events. The responses will be compliant with the BIG Event Reporting Investigation Standard (*BIG-HSEQ-STD-008).*

Table 3: Abnormal Events and Response Measures

Event	Location	Likely Effect	Response Measures	Approximate Timescales for Response
Failure of an ID fan	Facility building	Reduction in negative pressure within the waste reception, storage and handling areas, and Increased odour concentrations within these areas.	Maintenance engineers sent to rectify the failure. The building management system will detect the reduction in negative pressure and automatically initiate the standby air extraction and odour abatement system utilising carbon filters, which will be used to maintain negative pressure, minimising the risk of odours being released from these areas. The odour abatement system will have two ID fans to ensure that the failure of one does not impact the ability of the odour abatement system.	Immediate
			Facility operations suspended until the problem is rectified. Incoming waste stopped or diverted to an alternative waste treatment facility.	One day
Failure of the Building Management System	Waste reception, storage and handling areas	Standby odour abatement system is not initiated on ID fan failure and odour escapes. Doors and louvres not controlled to prevent odour release.	Manual initiation of the standby odour abatement system. Manual closing of all doors and louvres. Facility operations suspended until the problem is rectified. Maintenance team mobilised to investigate and repair.	Immediate
Development of anaerobic conditions in	waste reception, storage and	Increase in the concentration of marker gases	Crane operation for automatic mixing of the bunker contents to prevent development of anaerobic conditions will be	Immediate

Event	Location	Likely Effect	Response Measures	Approximate Timescales for Response
waste storage areas	handling areas.	(Hydrogen, methane, hydrogen sulphide) and / or low oxygen, within the waste reception, storage and handling areas,	used at all times. Presence of marker gases will be investigated and causes identified and rectified as required.	
Bag filter failure	FGT plant	Pressure drop in the bag filters	The relevant bag filter compartments will be isolated to prevent uncontrolled emissions and repaired before being brought back on-line. This can be undertaken whilst the Facility is in operation without any reduction in performance of the particulate abatement systems.	Immediate
Flue gas leak	FGT plant	Release of flue emissions prior to stack release	The gas pathways within the system are all operated under negative pressure, so all air would be drawn through to the stack and would not 'leak'. The only way there would be a chance of gas leak is due to major high pressures within the boiler - but this is prevented from occurring by the boiler safety pressure vent/valve. Air within the stack is pushed upwards via a fan - furthermore if there were to be any gas leak from the stack it would be clean FGT treated air.	-
APC residues handling failure	FGT plant	Uncontrolled release of APCr from APCr handling infrastructure	Contained transfer systems. Impervious surfaces outdoors. Controlled drainage in areas where residues are stored. Emergency response procedures will be implemented. Clean-up of APCr.	Immediate
		Risk of increased	A supply of critical spares will be maintained on site. The site will	Immediate

Event	Location	Likely Effect	Response Measures	Approximate Timescales for Response
Plant breakdown	Any location	impact from any area of site where normal operations are affected during and after the breakdown	employ maintenance engineers to enact any repairs.	
			If spares or engineers are not available, the relevant operations and their predecessors in the process will be suspended, if necessary, to prevent significant increase in odour emissions	Immediate
Spills during unloading of chemicals	Chemical storage areas	Risk of dusts and odours	Supervision of chemical unloading activities by competent staff. Impervious surfaces outdoors. High level alarms. Secondary containment for storage vessels. Emergency response procedures will be implemented. Clean-up of chemical spills.	Immediate
Overfilling of vessels	Chemical storage areas	Risk of dusts and odours	Supervision of chemical unloading activities by competent staff. Impervious surfaces outdoors. High level alarms. Secondary containment for storage vessels. Emergency response procedures will be implemented. Clean-up of chemical spills.	Immediate
Waste storage failure	Waste reception areas and circulation roadways	Risk of dusts and odours	Emergency response procedures will be implemented. Clean-up of waste.	Immediate
Fire	Any location	Risk of smoke, odour, dust and bioaerosol release from burning material.	The fire prevention plan details the preventive measures, detection systems and response to fires. This will include notification to adjacent facilities and residents.	Immediate

In all instances where waste processing is required to be suspended, the receipt of waste at the Facility will be prohibited and incoming waste will be stopped or diverted to an alternative suitably licenced waste treatment facility.

6.1 Emergency planning

This section lists the acknowledged occasions which may have the potential to result in higher odour, dust or bioaerosol emissions. Should any of these occur, details of the incidents, corrective actions implemented and mitigation measures to prevent re-occurrence will be communicated to adjacent premises where the incident has potential to impact upon them, as explained in section 6.2.

6.1.1 Abnormal meteorological conditions

Abnormal meteorological conditions such as low wind speed and high temperatures may promote elevated levels of odour, dust and bioaerosols either on the site or at nearby sensitive receptors. A wind direction towards sensitive receptors may increase odour, dust and bioaerosol levels. Conversely very low wind strength and temperature inversions may minimise dispersion and potentially create a build-up of odour, dust or bioaerosols. Elevated climatic temperatures during summer months may also increase odorous or bioaerosol emissions.

6.1.2 Staffing issues

Human error and accidents may cause elevated levels of odour, dust or bioaerosols to be created either through the stopping or breakdown of the process or the failure of control equipment. Contingency mitigation measures will be developed as part of the detailed design, construction and commissioning of the Facility. This will include procedures to be implemented in case of staffing issues.

6.1.3 Planned odorous events

If at any time it will be necessary to undertake temporary actions that are likely to cause elevated levels of odour, bioaerosols or dusts, NREL will contact the EA, adjacent facilities and any other relevant stakeholders in advance to inform them of the operations being undertaken, the associated mitigation plans, and that the elevated levels of odour will be of a temporary nature. Where practicable, such actions will only proceed when the prevailing wind direction can be demonstrated to be away from sensitive receptors.

6.2 External communications

The BIG Event Reporting Investigation Standard (*BIG-HSEQ-STD-008)* specifies the requirements for internally reporting events, accidents and near misses, and external reporting to relevant authorities.

Due to the close proximity of other facilities to NREL, including the Arla Dairies to the northwest and the NRRC to the southeast, it is acknowledged that these facilities will be sensitive to releases of odour, bioaerosol or dust to these facilities. As detailed in section 5, if odours, dust or bioaerosols are detected over a certain limit and require further investigation, this will be reported to the local facilities. This also includes the occurrence of emergency planning events stated in section 6.1.

In anticipation of any associated odour, dust or bioaerosol release, adjacent premises will also be notified in the event of any of the events identified in Table 3.

7 Action Plans/Contingencies

7.1 Complaint investigation

It is possible that odour, dust or bioaerosol incidents may be episodic and short-lived, so it is possible that they may not always be picked up by monitoring. Therefore, complaints, including complaints of taint, are a direct indication that odours, dust or bioaerosols may be causing pollution, and should be correctly recognized and responded to. A complaint is considered an event within the BIG Event Reporting Investigation Standard (*BIG-HSEQ-STD-008).* The following actions will be taken on receipt of an external odour, dust or bioaerosol complaint or the identification of odour at the installation boundary:

- Any complaints received will be logged in the Facility's documented management systems. The EA will be informed as soon as is reasonably practicable after a complaint has been received.
- The site management will be given the details of the complaint as soon as possible, including the location, nature, time, and date of the complaint.
- If complaints are received, relevant monitoring will be undertaken in the area from which the complaint has been received in order to assess the presence of any odours, dust or bioaerosols in this area. Where possible, the likely cause will be identified.
- For all complaints, including complaints of taint, reference will be made to the site activities at the time of the complaints, and further onsite investigations will be conducted to determine whether any abnormal operations are (or were) occurring. The following key potential causes of abnormal emissions will be investigated:
  - Is the waste arriving in appropriate vehicles/containers?
  - Are there any unusual characteristics evident in the waste arriving or on site (composition, age, condition etc.)?
  - Are facility operations in 'normal operation'?
  - Are the extraction and ventilation systems (through the stack; the combustion air fans; building ventilation management and standby odour abatement systems) functioning properly?
  - Are there any 'unusual' activities being undertaken at the Facility?
- If investigations identify that the source of the odour, taint, dust or bioaerosol is from an off-site source, feedback will be reported to the complainant, and a complaint will be logged with the off-site source of the emissions.
- If the cause of the odour, taint, dust or bioaerosol is established to be on-site, appropriate actions will be immediately implemented (refer to Section 6), and actions devised to prevent reoccurrence.
- Feedback will be given to all complainants on the findings of any investigations if they are known, and a summary will be provided of any remedial measures taken to rectify the odour or taint issues and ensure that the problem has been suitably resolved. The complainant will be asked if the perceived problem is still occurring to measure any improvement achieved.
- NREL would propose to submit a short factual report to the Environment Agency detailing:
  - the complaint(s) received;
  - the investigations conducted;
  - the findings of those investigations;
  - whether the complaint was substantiated;

  - any remedial measures implemented; and
  - any ongoing improvement actions to be implemented.
- Records of all complaints, subsequent investigations, and remedial actions will be retained on site for a minimum of five years. The site management will ensure that records are readily retrievable and maintained as fit for retention. As applicable, records will be stored in accordance with data protection legislation.

7.1.1 Action plans

In the event that an odour, taint, dust or bioaerosol complaint is proven to be justified and attributable to operations undertaken at the Facility, or a 'non-conformance' occurs with the same effect, a defined Action Plan will be implemented.

The following potential 'non-conformances' have been identified:

- abnormal odour, taint dust or bioaerosol emissions occur;
- significant odour, taint, dust or bioaerosol emissions are detected onsite that is believed to pose a risk of impacts off-site; and
- significant site odour, taint, dust or bioaerosol emissions are detected during off-site monitoring.

In the event that any of the above occurs, the following actions will be taken:

- If not previously undertaken, a walk-around of the entire site and a review of the activities undertaken at the Facility will be conducted in order to identify the likely cause(s). If the complaint is in regard to fugitive dust, a review of CCTV will be undertaken as part of the investigations to identify any visible dust events.
- Upon identification of the likely source(s), appropriate corrective and preventative measures will be identified and implemented, depending on the outcome of the investigations. The measures will consider, but not be limited to the following:
  - Suspension of the receipt of wastes suspected of being unacceptably odorous.
  - Review of the building management system and control of negative pressure in the waste reception, storage and handling areas.
  - Review of the operation of the standby odour abatement system, if the ID fan is not operating.
  - Review of the effectiveness of waste acceptance procedures.
  - Review of the Crane Control system to confirm that automatic mixing of the waste bunker contents is in operation.

In accordance with the BIG Environmental Management standard (*BIG-HSEQ-STD-021-v1.0) and* the BIG Event reporting and Observation Standard (*BIG-HSEQ-STD-008)*, all non-conformances and corrective actions must be recorded within the BIG Computerized Maintenance Management Systems (CMMS) or the online event reporting tool.

Details of any odour, taint, dust or bioaerosol 'non-conformances' including the nature of the incident, results of investigations, action taken and any required amendments to the AEMP will be made available to the Environment Agency on request.

8 Document Review

8.1 Review requirement and timescale

This AEMP will be formally reviewed by NREL initially six months after the commencement of operations, and subsequently every twelve months to ensure that the controls described are effective and reflect best available techniques. In addition, the AEMP will be reviewed following any relevant changes in site operations or procedures that are likely to have implications from an odour, dust and bioaerosol generation/impact perspective.

Any required changes to the conditions set out within this document will be formally agreed with the EA prior to their implementation.

Appendices

A Installation Boundary

ALL INFORMATION ON THIS DRAWING IS INDICATIVE ONLY, AND MAY BE SUBJECT TO FURTHER DESIGN DEVELOPMENT.

DO NOT SCALE

KEY

INSTALLATION BOUNDARY

Silo

Attenuation Pond 300m³

OUT

WB3

Fuel Oil

Ammonium Hydroxide

Pump House

Firewater Tank

STEPHENSON WAY

N

DNO Substation

11/33kV Transformer

11kV Substation

ACCs

EDG

Extent of 325m² Footprint

Odour Abatement System

Odour Stack

CHP

SCR

Electrical Container

Bottom Ash Storage

Conveyor

Electrical Rooms

Turbine Hall

I.D. Fan

LIME

Bag Filter

Vehicle Barrier

PAR

Stack

APCR

Reac. Tower

PAC

High Level Walkway

Tipping Apron

Bunker Hall

Boiler Hall

1

2

3

4

5

6

33 34 35 36 37

22 23 24 25 26 27 28 29 30 31 32

11 12 13 14 15 16 17 18 19 20 21

4e 5e 6e 7e 8e 9e 10e

Admin Block

Bicycle Shelter

Manouevring

Workshop

Gatehouse

Inspection bay

High Level Conveyor from MBT

Conveyor Access Stairs

0 5 25 50m

SCALE 1:500

REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE
R0.0	PRELIMINARY	AO	JS		01.07.20

FICHTNER
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CLIENT: NORTHACRE RENEWABLE ENERGY

SITE: NORTHACRE FACILITY

PROJECT: EP APPLICATION

TITLE: INSTALLATION BOUNDARY

DRAWING STATUS:	PRELIMINARY		
DRAWN BY:	AO	DATE:	01.07.20
CHECKED BY:	JS	DATE:	01.07.20
APPROVED BY:		DATE:	
FILENAME:	S2862-8000-0001 AO1 Installation Boundary R0.0.dwg		
OFFICE OF ISSUE:	STOCKPORT		
SHEET SIZE:	A1	SCALE:	1:500

DRAWING No.: S2862-8000-0001 Sheet 1 of 1

REVISION: R0.0

B Sensitive Receptors

Ref	Receptor	Type	Sensitivity	Approximate Distance/ Direction from Installation Boundary (m)	Comments
OR1	Oakfield Business Centre	Commercial	Medium	94	Commercial receptor downwind of peak in wind directions but considered far enough from the tipping hall and site boundary, and screened from the tipping hall by other buildings.
OR2	23 Storridge Road	Residential	High	286	Residential receptor downwind of peak in wind directions, but at a distance far enough from the tipping hall and site boundary and screened from the tipping hall by other buildings.
OR3	Savencia Fromage & Dairy UK	Industrial	High	101	Industrial receptor downwind of peak in wind directions but considered far enough from the tipping hall and site boundary and screened from the tipping hall by other buildings. However, may be particularly sensitive to taint.
OR4	Brook Lane 1 (Residential)	Residential	High	61	Residential receptor downwind of peak in wind directions but considered far enough from the tipping hall and site boundary and screened from the tipping hall by other buildings.
OR5	Brook Lane 2 (Trading)	Commercial	Medium	85	Commercial receptor in location towards which winds do not frequently blow. Considered far enough from the tipping

Ref	Receptor	Type	Sensitivity	Approximate Distance/ Direction from Installation Boundary (m)	Comments
					hall and site boundary and screened from the tipping hall by other buildings.
OR6	Brook Lane 3 (Trading)	Commercial	Medium	101	Commercial receptor in location towards which winds do not frequently blow. Considered far enough from the tipping hall and site boundary and screened from the tipping hall by other buildings.
OR7	Brook Lane 4(Trading)	Commercial	Medium	190	Commercial receptor in location towards which winds do not frequently blow. Considered far enough from the tipping hall and site boundary and screened from the tipping hall by other buildings.
OR8	Brook Lane 5 (Residential)	Residential	High	368	Residential receptor in location towards which winds do not frequently blow. Considered far enough from the tipping hall and site boundary and screened from the tipping hall by other buildings.
OR9	Brook Drove 1 (Farm)	Residential (Farm)	Medium	190	Residential and farming receptor down wind of secondary peak in wind directions. Considered far enough from the tipping hall and site boundary.
OR10	Brook Drove 2 (Residential)	Residential	High	199	Residential receptor down wind of secondary peak in wind directions. Considered far enough from the tipping hall and site boundary.
OR11	Biss Brook Footpath 1	Passing	Low	197	Passive receptor down wind of secondary peak in

Ref	Receptor	Type	Sensitivity	Approximate Distance/ Direction from Installation Boundary (m)	Comments
					wind directions. Considered far enough from the tipping hall and site boundary.
OR12	Biss Brook Footpath 2	Passing	Low	233	Passive receptor in location in which winds do not typically blow. Considered far enough from the tipping hall and site boundary.
OR13	Westbury Dairies (Arla)	Industrial	High	21	Industrial receptor at a short distance from both the tipping hall and site boundary and particularly sensitive to odour and taint. Winds do not frequently blow in this direction.

385000

152000

OR1
OR2
OR3
OR4
OR5
OR6
OR7
OR8
OR9
OR10
OR11
OR12
OR13

Kingdom Ave
Stephenson Rd
The Ham
Hawker
Westbury
Brook Cottage
Brook Drove
Brook La
Swallows
Oldfield

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385000

Legend

- Stack location
- Installation boundary
- Tipping hall and bottom ash storage building
- Building outline
- Sensitive receptors
- 400 m from tipping hall
- 300 m from tipping hall
- 200 m from tipping hall
- 100m from tipping hall

Client:	Northacre Renewable Energy Ltd
Site:	Northacre ERF
Project:	2862
Title:	Sesnitive Receptors
Drawn by: Hannah Lederer	Date: 30/07/2021

0 0.04 0.08 0.16 km

Scale: 1:4,000

N

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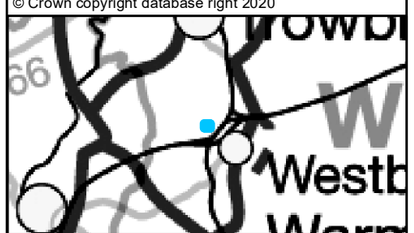
C Monitoring Locations

Legend

- Main stack - A1
- Odour stack - A2
- Installation boundary
- Waste reception areas
- IBA storage and handling
- FGT and reactant storage and handling
- Process buildings
- Monitoring locations

Client:	Northacre Renewable Energy Ltd
Site:	Northacre ERF
Project:	2862
Title:	Indicative monitoring locations

Drawn by: Hannah Lederer | Date: 15/07/2021



0 0.0075 0.015 0.03 km

Scale: 1:871

N

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D Odour Assessment Report

Installation		**Date**	
Weather		**Wind (strength / direction)**	
Temperature (°C)		**Pressure (mbar if known)**	
Ground Conditions		**Cloud Cover**	
General Air Quality		**Time: Start**	
		Time: Finish	
Activity on Site			

Plan attached showing location & extent of odour

YES / NO

Complaint Received?

YES / NO

If **YES** complete the following:

Date & time complaint received		**Number of complaints which may relate to the same source**	
Location of complaint			
Grid Reference (if not a property)		**Time odour noticed and duration**	

Additional Comments:

Action Required:

Signed: …… **Date: ……**

Test Location & Time	Intensity (1 – 5)	Offensiveness (1 – 4)	"Dilution to Threshold" Ratio	Comments (including persistence, transience, potential source)

Note: The "Dilution to Threshold" Ratio is obtained from the testing individual and is only required if an odour is detectable, i.e. a 2 or higher for Intensity.

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