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*Albus Environmental Limited*

*Odour Management Plan*

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Kent  
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## 1. Introduction

- 1.1 The purpose of this management plan is to identify potential odour emissions from waste treatment and transfer operations. Plan, monitor and implement mitigation measures to prevent the generation of odour at source and prevent the acceptance of malodorous wastes.
- 1.2 The management plan should be read in conjunction with the site Environmental Management System (EMS) and should be reviewed no less than 6-monthly to ensure its effectiveness is maintained.
- 1.3 The following management plans are also in effect at the site and should be read in conjunction with this plan.
  - Dust Management Plan (DMP)
  - Pest Management Plan (PMP)
  - Environmental Management System (EMS)
  - Fire Prevention Plan (FPP)
- 1.4 Odour generation at source is most likely from old waste and from the treatment process, such as shredding and mechanical sorting. Hot and humid conditions promote the degradation of degradable waste therefore it follows that a general review of this management plan should ensue before the onset of traditionally warm weather to ensure its content and procedures reflect the current operations at the site, and ameliorating measures are identified.
- 1.5 The management plan seeks to identify incoming waste streams having the potential to generate odour when tipped. Evaluate through process mapping the path of specific waste streams as they progress through the various treatment processes and note at each point the potential to generate odour and suggest mitigating measures.
- 1.6 Following evaluation of the treatment process and potential for odour generation, creation of a list of measures and suitable equipment to control odour generation at source, prevent airborne passage beyond the site boundary.
- 1.7 Identify immediate sensitive receptors and amenities and align physical barriers at the site boundary to disrupt emissions.
- 1.8 By association, clinical waste has the potential to be odorous and therefore special attention is due to this waste stream.

## 2. Operations Overview

- 2.1 The site is centred on TQ 80920 72953 and is located centrally within the Kingsnorth Industrial Estate, post code ME3 9NZ, some 6 miles distant from Rochester Medway.

The estate is located within a rural setting and is bordered on all sides by farmland. At a distance under 1,000 metres to the south lies the River Medway estuary. To the immediate south east, is an active gas fuelled power station. Boundary to boundary these two operations are some 40 metres apart and separated by the estate arterial road. The estate is enclosed by a security fence and benefits from 24-hour security presence and gated main entrance.

- 2.2 The operations at the facility may be briefly summarised as follows:

Acceptance of non-infectious healthcare and infectious clinical wastes pending storage and treatment by a combination of technologies designed specifically to render the waste suitable for disposal at third party facilities via high and low temperature incineration.

Non-infectious waste is stored and treated within an enclosed building with sealed drainage constructed within an impermeable concrete base. The process for treating non-infectious wastes involves maceration of the waste which is then conveyed directly into enclosed containers in readiness for transport from site.

Conversely, infectious healthcare wastes are treated by high-temperature steam injection following maceration to render the waste non-infectious. These wastes would then meet the necessary criteria for low temperature incineration.

- 2.4 The hours of operation, including heavy goods vehicle movements to and from the site shall be carried out over a continuous 24 hour period.
- 2.5 Waste deliveries to site are undertaken by various types of vehicles, but commonly box vans to small van derived cars. The vast majority of deliveries will be undertaken by Albus Environmental Limited collection vehicles which are designed specifically for collection and transport of healthcare wastes. For deliveries arranged through third party customers strict pre-acceptance procedures are communicated to the prospective customers at the account enquiry stage to set out expectations for waste delivery procedures. Failure of the waste carrier to meet the expectations of the site, and/or legislative requirements, will result in prohibition of waste acceptance and potentially a return of the waste to the producer. At the very least, discussions will ensue between stakeholders and the regulating authorities.

2.6 The table below illustrates the general waste types proposed for the site and likely composition of the load.

Table 1.

Waste Type	EWC	Containment Type	Typical Composition	Potential for Odour
<b>Infectious waste</b>	Chapter 18 – 1801 &1802	Sealed container in a colour coded bin	Waste from human or animal healthcare. Waste from research, diagnosis, treatment or prevention of disease involving animals	Yes
<b>Non-infectious waste</b>	Chapter 18 – 1801 &1802	Sealed container in a colour coded bin	Waste from human or animal healthcare. healthcare. Waste from research, diagnosis, treatment or prevention of disease involving animals	Yes

2.7 Table 2 list the types of waste leaving the site.

Table 2.

Waste Type	EWC	Containment Type	Typical Composition	Potential for Odour
<b>Non-infectious waste</b>	Chapter 19 19 12 10, 19 02 10	Enclosed 30m3 container	Non-infectious healthcare waste	Yes

### 3. Overview of Waste Processing and Odour Controls

3.1 Waste reception and treatment activities are conducted in the following manner.

#### *Non-Hazardous Waste Treatment Process*

- Waste is delivered to site and tipped on the floor inside the main reception/processing building. It is then inspected for any non-conformances.
- The waste will then be loaded into a hopper where it will be transported to the shredder by conveyor (no manual handling).
- The shredder will shred the waste to the required size and then it will be dropped into a conveyor to feed below.
- Waste is then transported to outside the building by covered screw conveyor to a sealed compactor bin.

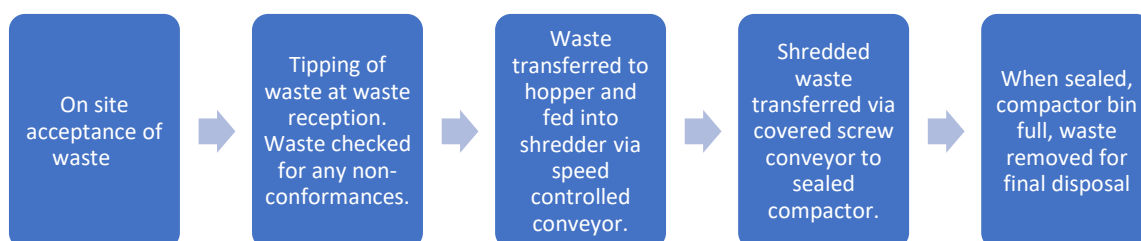
#### *Proposed New Technology: (Hazardous Waste)*

- The treatment process may be briefly summarised as follows:

Waste accepted at site for treatment will be tipped into a shredder hopper. The waste will be fully enclosed by the shredder unit. The shredded waste will then be routed via a screen into the thermal screw auger system. An air extraction system maintains a negative pressure in the shredder system with the exhaust air being filtered to remove dust and odour prior to discharge at elevation outside the process building.

The thermal screw auger system consists of a rotating screw system to move the shredded waste through on a continuous basis. Steam is supplied via the boiler plant in a steam jacket on the thermal screw auger and via “live” steam injection to disinfect the waste. Steam is provided at a temperature of 122°C for 80 minutes to disinfect the waste and ‘render safe’ Steam will be injected both direct into the waste at the bottom of the steam auger and into the auger shaft at the top to ensure exposure to heat as the waste travels. The steam auger length is 14m long to ensure sufficient residence time. Again, air extraction fans maintain a negative pressure in the system to prevent fugitive emissions. The exhaust air is treated to remove moisture, dust and odour prior to being discharged at elevation outside the building.

3.2 Waste acceptance and processing flow chart.



#### 4. Odour Management

4.1 The overall responsibility to implement the odour management plan falls to the senior management team and in particular the Operations Director.

Responsibilities may be disseminated to the Site Supervisor or senior member of the site team with reporting lines leading back to the management team. Review of the performance of the odour management plan is the overall responsibility of the senior management team.

4.2 Site meetings shall be convened at a frequency no less than monthly, less during dry conditions, to determine the effectiveness of the odour control measures and identify actions for improvement if required.

4.3 Contingency plans shall be in place to take account of plant and equipment failure which shall extend to ordering/hiring of replacement equipment, reorganisation of activities affected by the loss of equipment.

4.4 In the unlikely event that all measures fail to contain or prevent fugitive emissions beyond the site permit boundary the Site Manager/TCM shall take the decision to cease the activity causing the incident until full control is resumed. In extreme conditions this may necessitate closing the site until normal operations prevail.

#### 5. Sources and Locations of Potential Odour Emissions

5.1 Table 3 below highlights the potential sources of odour generation and corresponding elements of mitigation and control.

Table 3 (non-infectious waste)

Activity	Location	Mitigation	Control measures	Adequately controlled
Waste delivery vehicles entering the site.	Entire site.	Unlikely to cause odour at this point as loads are contained.	Malodorous loads may be detected at the weighbridge and the vehicle prevented from entering the site.	Yes, weighbridge operator training.
Depositing waste within the building.	Main reception / treatment building.	Waste must be securely contained within the delivery vehicle and in the case of hazardous wastes, within small sealed bins.	Vehicle enters building and the roller shutter doors are closed for the duration of tipping the load.	Yes, but the procedure of opening the roller shutter doors must be minimalised.
Activity	Location	Mitigation	Control measures	Adequately controlled
Waste handling equipment loading conveyor belt.	Main waste reception building.	Roller shutter doors will be closed for this activity.	Ensure doors are firmly closed and waste treatment only takes place within the building	Yes.



			with the doors closed.	
Maceration process.	Main waste reception building and deposit into an enclosed 30m <sup>3</sup> container.	Enclosed conveyer belt and container.	Ensure the container is in the correct position before the treatment of waste takes place and waste is conveyed to the container.	Adequate controls are in place.
Removal of the conveyer belt from the container after the latter is full.	Sited at the front of the main processing building.	Short run of conveyer benefiting from protection from enclosure.	Site supervisor must monitor this procedure to ensure the conveyer is free of waste before extraction from the container and seal the container thereafter.	Controls require monitoring for conformity.
Collection of waste container once full.	External to the main waste processing building.	At this stage the container will be sealed and checked by the supervisor as being ready for transport.	Ensure waste is stored on site for minimum period. Large bulk vehicles are used to transport waste from site ensuring stock rotation.	Yes, procedures are adequate for the task in hand.
Movement of empty wheelie bin type containers.	Main treatment building across the compound to final storage in the mezzanine building.	Bins will have been washed clean at this stage and checked by the site supervisor before relocating to storage.	Ensure loading activities are conducted expeditiously. Consideration of prevailing weather directions.	Infrequent activity for which planning will mitigate fugitive emissions.

Table 4 (infectious waste)

Activity	Location	Mitigation	Control Measures	Adequately Controlled
Waste delivery vehicles entering the site.	Entire site.	Unlikely to cause odour at this point as loads are contained.	Malodorous loads may be detected at the weighbridge and the vehicle prevented from entering the site.	Yes, Site Supervisor or Plant Operative training.

## 6. Enclosure of Waste Storage and Processing Areas

6.1 Albus Environmental Limited is acutely aware of the potential nuisance odour emissions can cause, especially beyond the permit boundary. Through a continuing process of evaluation, the company have identified the potential sources of odour generation and implemented a programme of control and mitigation.

6.2 The predominant source of odour generation has been identified as occurring during the deposit of waste followed by processing activities. It is therefore at these times that special attention is required coupled with measures to prevent or contain potential odour release

without causing unacceptable operational disruption. Table 5 below tabulates the activities that will only be conducted within the building yet still have the potential to cause odour.

Table 5

Activity	Enclosed	Potential to cause odour	Mitigation measures
Waste deposit within the reception area (non-hazardous).	Completely enclosed building.	Yes, if stored for too long and during processing.	The building doors are only open when accepting vehicles and must be closed during processing activities.
Loading hopper with waste (non-hazardous).	Completely enclosed building.	Yes, when processing occurs.	The building doors will remain closed during processing activities.
Actual processing of waste (non-hazardous).	Fully enclosed building but the processing plant is open.	Yes, but contained within the building.	As above.
Waste acceptance hazardous	Waste is delivered in sealed bins.	Minimal.	Waste remains stored in bins until the point of acceptance into the treatment plant.
Treatment of hazardous waste.	Yes.	No, the unit is completely sealed.	Bins are emptied mechanically into the plant hopper which is steam treated at the point of entry.
Transfer of waste from steam sterilisation plant to enclosed container.	Yes.	No, the conveyer is enclosed and at this point the waste has been treated by high-temperature steam.	Building doors will remain closed during treatment and strict adherence to operating protocols shall be maintained.

## 7. Olfactory Odour Monitoring

7.1 The effectiveness of site operational odour mitigation measures is monitored by the Site Manager/TCM:

- On-going olfactory monitoring of waste treatment and transfer operations to determine the potential for odour to migrate from the boundary of the site;
- Regular olfactory monitoring outside and downwind of the site;
- Record actions taken in the site diary.

7.2 Triggers for abnormal operational conditions necessitate additional prevention and suppression measures and additional monitoring. Triggers can include:

- Areas of concern identified in routine checks (e.g. particularly odorous waste);
- Odour complaints received (visual monitoring for potential odorous waste should precede complaints as actions should be planned and not reactive);
- Failure of equipment which means stockpiles may increase;
- Accidents e.g., spilt load, odorous loads;
- High temperatures.

7.3 Any of the above may necessitate additional measures to prevent the generation and release of odour beyond the permit boundary. In these instances, the Site Manager/TCM will implement such additional measures to control the situation, or failing to do so, will cease the activity precipitating the situation.

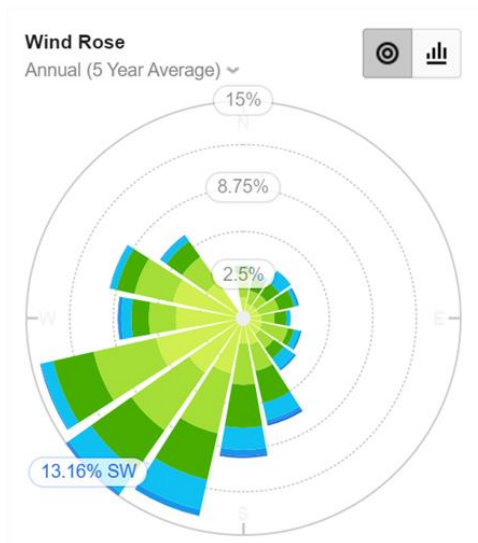
- 7.4 Closing the site to incoming waste streams may not resolve an abnormal situation but may prevent continuation over a longer period.
- 7.5 All monitoring activities should be recorded in the site diary including actions taken if required to resolve an incident. Review of prevailing weather conditions should be conducted before commencement of daily activities in order for planned mitigating measures to be in place commensurate with expected conditions.
- 7.6 Procedures should be in place to account for absence of the Site Manager/TCM, ideally one of the aforementioned should be in attendance at the site in conjunction with the Site Supervisor who should have equal knowledge of this odour management plan.
- 7.7 As a final act of control, consideration should be given to prevent further inputs from a noted odorous source if prevailing conditions cannot be managed adequately.

## **8. Odour Suppression Equipment**

- 8.1 The use of external odour control systems is not considered necessary based on previous experience of treating non-hazardous healthcare waste. Adoption of the operating procedures as previously mentioned in table 4 coupled with the integral extraction system fitted within the negates the potential for odour release.
- 8.2 Waste accepted at site for treatment will be tipped into a shredder hopper. The waste will be fully enclosed by the shredder unit. The shredded waste will then be routed via a screen into the thermal screw auger system. An air extraction system maintains a negative pressure in the shredder system with the exhaust air being filtered to H14 standards to remove dust and odour prior to discharge at elevation outside the process building.

## **9. Sensitive Receptors**

- 9.1 Congruent with the dust management plan, this odour management plan seeks to identify potentially sensitive receptors in the event that management and control measures fail either catastrophically or sufficiently to cause a nuisance beyond the boundary of the site. The assessment needs to consider those businesses in close proximity to the site as well as focusing primarily on non-industrial properties further afield.
- 9.2 The wind rose, and aerial view presented below illustrate the locations within the influence of the site.



## 9.2 Sensitive receptor information Table 6

Table 6

<b>Boundary</b>	<b>Closest property</b>	<b>Approximate distance to Albus Environmental boundary (m)</b>	<b>Up / Down wind of the site</b>
North & North West	Kingsnorth Industrial Estate	0	Up wind
South East	Gas Power Station	40	Cross wind
North West	Beluncle Farm	>1,000	Up wind
Westerly	Nature Study Centre	430	Up wind
West	Village of Hoo Saint Werburgh	2,350	Up wind
Easterly	Water outlet from demobilised power station (Damhead Creek)	860	Cross wind
North easterly	Wetland Area	880	Up wind
North	White Hall Farm	1,000	Cross wind
South	Mud Flats	1200	Up wind

Table 7 Other Potential Dust/Particulate Emitting Operators

<b>Company</b>	<b>Address</b>	<b>Type of Business</b>	<b>Distance from site boundary (m)</b>
Composting Facility Services	212 Kingsnorth Ind Est	Composting Facility	0
Scottish Power	Damhead Creek	Gas fired power station	40

- 9.3 The presence of other, third party, industries having the potential to give rise to odour is not known, therefore it is essential that regular olfactory monitoring is undertaken by persons not directly associated with daily waste operations to identify the type and nature of an odour and its intensity based on a scale range from 1 to 6.
- 9.4 Identifying the type and potential source of odour will help resolve any potential failure of the management system and expeditiously negate the impact on local amenities. It will also help to highlight the possibility of a third-party emission.

## 10. Complaints and Engagement with the Local Community

- 10.1 Albus Environmental Limited acknowledges its duty of care towards its neighbours, local community and environment and is aware of the importance of operating the waste treatment and recycling facility in a professional and responsible manner.
- 10.2 The Site Manager/TCM shall ensure comprehensive records are maintain on site pertaining to the performance of the odour management protocols and are available to the regulating authorities when required.

- 10.3 Regular site meeting shall be convened with interested parties being present and the prevailing performance of the management system, equipment and actions taken, discussed and minutes taken and disseminated to relevant interested parties.
- 10.4 In the event of complaints being received pertaining to the operation the Site Manager/TCM shall investigate the legitimacy of the complaint by verifying prevailing conditions at the time of the complaint; reviewing site operations records, such as the site diary, prevailing weather conditions and managers inspection records for potential causes.
- 10.5 Details of the complainant shall be taken at the time of making the complaint which shall be communicated to the Site Manager/TCM to conduct an internal investigation. The aforementioned shall contact the complainant to inform them of the ensuing investigation and provide an estimated deadline to respond.
- 10.6 Should the investigation extend beyond the anticipated deadline the Site Manager/TCM shall contact the complainant to keep them apprised of progress and any re-estimation of the new deadline.
- 10.7 Dealings with the general public and local commercial neighbours will remain sympathetic regardless of the validity of the complaint. If the situation dictates, the Site Manager/TCM will visit the complainant to explain first-hand the nature of the response.
- 10.8 Complaints received shall be discussed at the site monthly meetings and details reviewed for commonalities and trends. Actions shall be apportioned to individuals if required and plans produced to rectify perceived poor performance issues.
- 10.9 Complaints received to site shall be recorded on the appropriate complaints form which is part of the company Environmental Management System.

## 11. Site Manger's/TCM Action List

Table 8

Trigger	Actions	Recorded Data
No triggers – normal site operations	<i>Normal operations mitigation measures.</i>	Record times of site inspections in site diary
	<p>Daily inspections in and around the site compound for the possibility of any material that may give rise to odour.</p> <p>Keeping waste piles dampened down has a positive effect on odour release.</p> <p>Ascertain what waste is expected for the day, type and source.</p> <p>Check the weather forecast for prevailing conditions.</p>	<p>Daily inspections must be entered into the site diary.</p> <p>Record vehicle numbers removing waste from site.</p> <p>Note the source of any malodorous loads and actions taken to prevent a recurrence.</p> <p>Any problems with transport must be communicated to the</p>

	<p>Check with transport provider that sufficient numbers of vehicles are booked to export waste from site, ensuring stock rotation.</p> <p>Plan for any circumstance that has the potential to compromise the ability to prevent odour emissions.</p> <p>Daily olfactory monitoring at defined points downwind of the site at known sensitive receptors.</p>	<p>Site Manager to action.</p>
<b>Hot Humid Conditions</b>	<p><i>Additional measures/actions.</i> Ensure all normal operating conditions have been met.</p> <p>Give precise instruction to Plant Operatives and Site Supervisor to be alert to malodorous loads - inferred procedures are insufficient in these conditions.</p> <p>Be prepared to reject loads that are odorous as the containment of the waste may be compromised during transport.</p> <p>Ensure waste is processed expeditiously, especially if hazardous.</p> <p>Increase frequency of olfactory monitoring at sensitive receptors.</p>	
	<p><i>Additional Monitoring.</i> Increase routine site inspections to hourly depending on the severity of the wind and operations being undertaken. Before daily operations commence check weather forecast and plan site activities accordingly.</p>	<p>Record weather conditions and subsequent actions in the site diary.</p>
<b>Trigger</b>	<b>Actions</b>	<b>Recorded Data</b>
<b>Problems identified during site inspections i.e. presence of odour on site and/or during routine off-site monitoring</b>	<p><i>Additional measures / actions.</i> Ensure all routine mitigation measures have been completed. Check operational area for the possible source of odour and be prepared to suspend the activity.</p> <p>Call upon transport to remove malodorous waste from site at the earliest opportunity.</p> <p>Review operations for potential source of odour and consider treating non-hazardous waste within the alternative treatment system.</p>	<p>Record all inspections in the site diary, noting actions and results.</p> <p>Should a major failure of the treatment plan occur the Environment Agency should be informed at the earliest opportunity.</p>
<b>Odour complaints</b>	<p><i>Additional actions / measures.</i></p> <p>Firstly, check that all normal operating procedures have been completed. Record details of the complaint on the appropriate form. Check site diary for information</p>	<p>Ensure details of any complaints are noted in the site diary and appropriate forms completed.</p>

	<p>concerning weather / site conditions for the corresponding date and time of the complaint. Should the complaint relate to current operations, investigate the potential source of the complaint and compare available data against the known location of the complainant. Respond to the complainant with findings of the investigation and actions taken, if any. maintain vigilance for remainder of the day. Ensure the site, waste piles are secure during afterhours.</p>	<p>Ensure weather data is recorded for the day and following 24 hours.</p>
<p><b>Failure of plant and equipment</b></p>	<p><i>Additional measures / actions.</i></p> <p>Ensure normal operating procedures have been met. Check condition of waste stockpiles. Arrange for repairs and or, replacement equipment. Cease individual treatment activities until plant / equipment is operational. Suspend operations or reduce inputs to a controllable level. Increase frequency of site inspections and deploy additional resources if required.</p>	<p>Record all details of the event in the site diary. Inform the EA of plant failure, site closure.</p>
<p><b>Planning at the enquiry stage of a contract</b></p>	<p>At the enquiry stage of accepting a new customer a full understanding of the type of waste, components and source, whether this is varied or fixed should be obtained.</p> <p>Commercial team must pass this information to site management to help them prepare and have a full understanding of the type of waste expected</p>	<p>Note event in the site diary and discuss any special requirements with ops team.</p>
<p><b>High Wind</b></p>	<p>Examine the influence of the wind in relation to the facility layout and impact on waste storage. How does the wind react to narrow spaces and is it able to draw waste from the main building. Due to the full containment provided by the building high winds are unlikely to cause operational difficulties. With perhaps on occasions when the roller shutter doors are opened to receive delivery vehicles.</p>	<p>As above but convey positive actions and results to fellow workers.</p>

## 12. Summary.

From production of this odour management plan has arisen a greater understanding of the potential sources of odour generation, likelihood of fugitive emissions entrainment and local



receptors. With this knowledge, coupled with past experience of mitigating odour generation and controlling its entrainment, comes the ability to conduct waste treatment activities without posing a nuisance to local amenities and the environment.

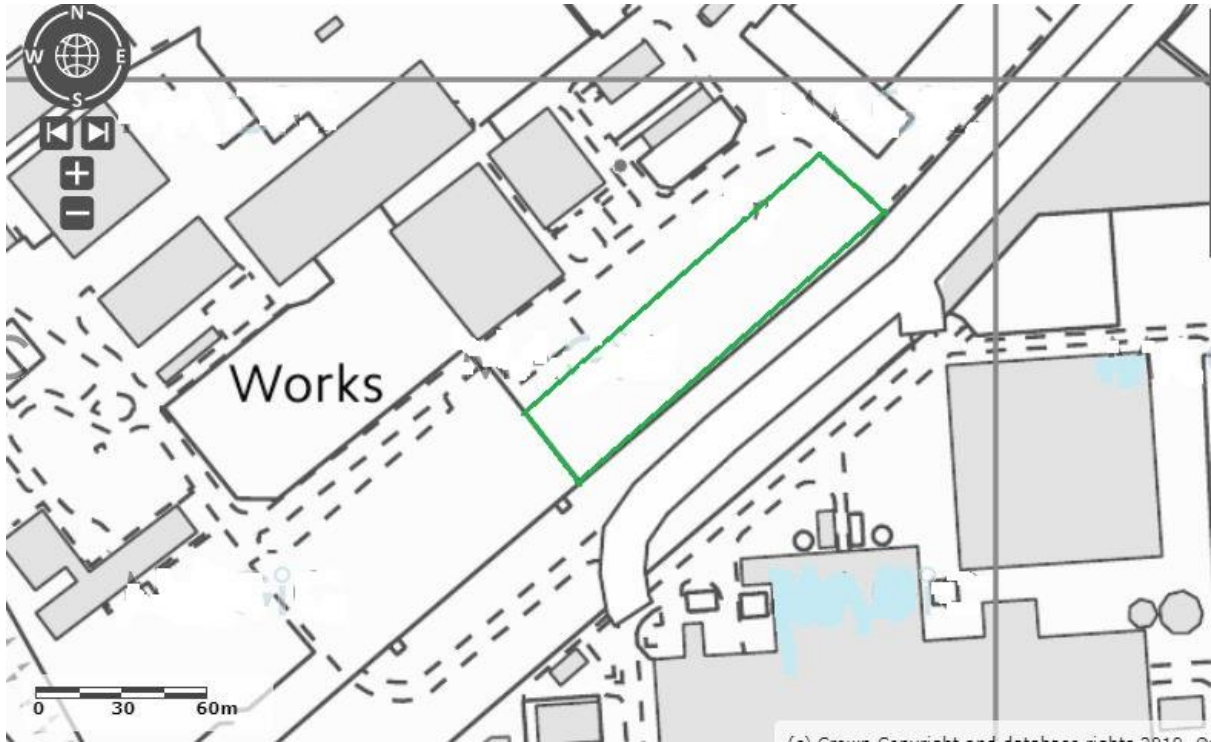
Pre-operational planning is essential to ensure the day's activities are controlled and managed in such a way as to negate the site's impact on the locality and immediate workforce. Understanding the potential for individual activities to generate odour, mitigate the likelihood before it occurs, rearrange procedures to correspond to prevailing conditions serves as a primary means of control.

It must be noted, that the location of the waste treatment and transfer facility, being central within a busy industrial area, has the potential to be influenced by third party activities and by virtue of their business, also have the potential to generate odour. One such facility is located immediately upwind of the site.

This odour management plan should be reviewed in conjunction with prevailing conditions at the site, personnel changeover and prolonged abnormal conditions. It should also be read in conjunction with the EMS, FPP and other supporting management plans.

## **APPENDIX 1**

### Permitted A



Aerial View

