

# Odour Management Plan

## Site details

|               |                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------|
| Site Name     | Saddlebow Paper Mill                                                                                      |
| Trading as    | Palm Paper Ltd                                                                                            |
| Site Address  | Saddlebow Paper Mill<br>Saddlebow Industrial Estate<br>Poplar Avenue<br>Kings Lynn<br>Norfolk<br>PE34 3AL |
| Operator Name | Palm Paper Ltd                                                                                            |
| Permit Number | EPR/FP3132UE                                                                                              |

## Job titles of responsible persons

|                    |
|--------------------|
| Compliance Manager |
|--------------------|

## Document Owner

|                    |                                   |
|--------------------|-----------------------------------|
| Responsible person | Compliance Manager                |
| Version number     | 1.0                               |
| Contributor 1      | Compliance Manager Palm Paper Ltd |
| Contributor 2      |                                   |
| Contributor 3      |                                   |

## List of Revisions

| Version | Revision Owner     | Revision Author    | Description of Changes | Date Submitted to EA for approval |
|---------|--------------------|--------------------|------------------------|-----------------------------------|
| 1       | Compliance Manager | Compliance Manager | Original version       | 08/06/2026                        |

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# 1. Introduction

## 1.1. Site description

The installation is sited at Saddlebow Industrial Estate, located on Poplar Avenue in the town of King's Lynn, Norfolk, United Kingdom. It is situated approximately 2.5 km southwest of the town centre of King's Lynn, along the bank of the River Great Ouse. The site covers an area of approximately 3 hectares; centered on National Grid Reference TF 60876 17786. The site location is shown below on Figure 1-1.

The installation comprises an integrated recovered paper facility which receives around 630,000 tonnes of recycled newspaper and magazines and produces approximately 550,000 tonnes per annum of newsprint for sale into wholesale paper distributors and newspaper outlets.

All process effluent from the paper manufacturing process is directed to the Effluent Treatment Plant (ETP) where it is subjected to biological wastewater treatment prior to discharge to the River Great Ouse. This is the only release to water and there is no discharge to sewer or groundwater.

Palm Paper proposes to upgrade the effluent treatment process with the installation of upstream anaerobic digestion (AD) prior to the ETP. The biogas produced during anaerobic purification will be processed into biomethane and injected into the paper mill's low pressure gas grid for use on site.

This odour management plan has been developed to identify and manage potential odour risks associated with the introduction of an anaerobic treatment stage for effluent treatment.

Figure 1-1 – Site Location Map

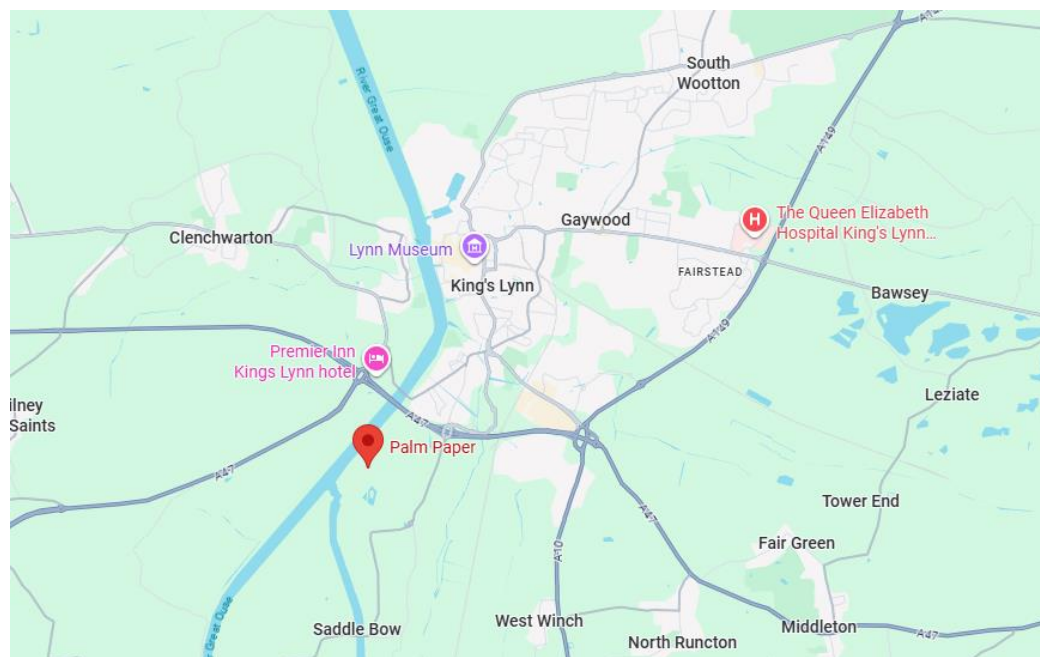
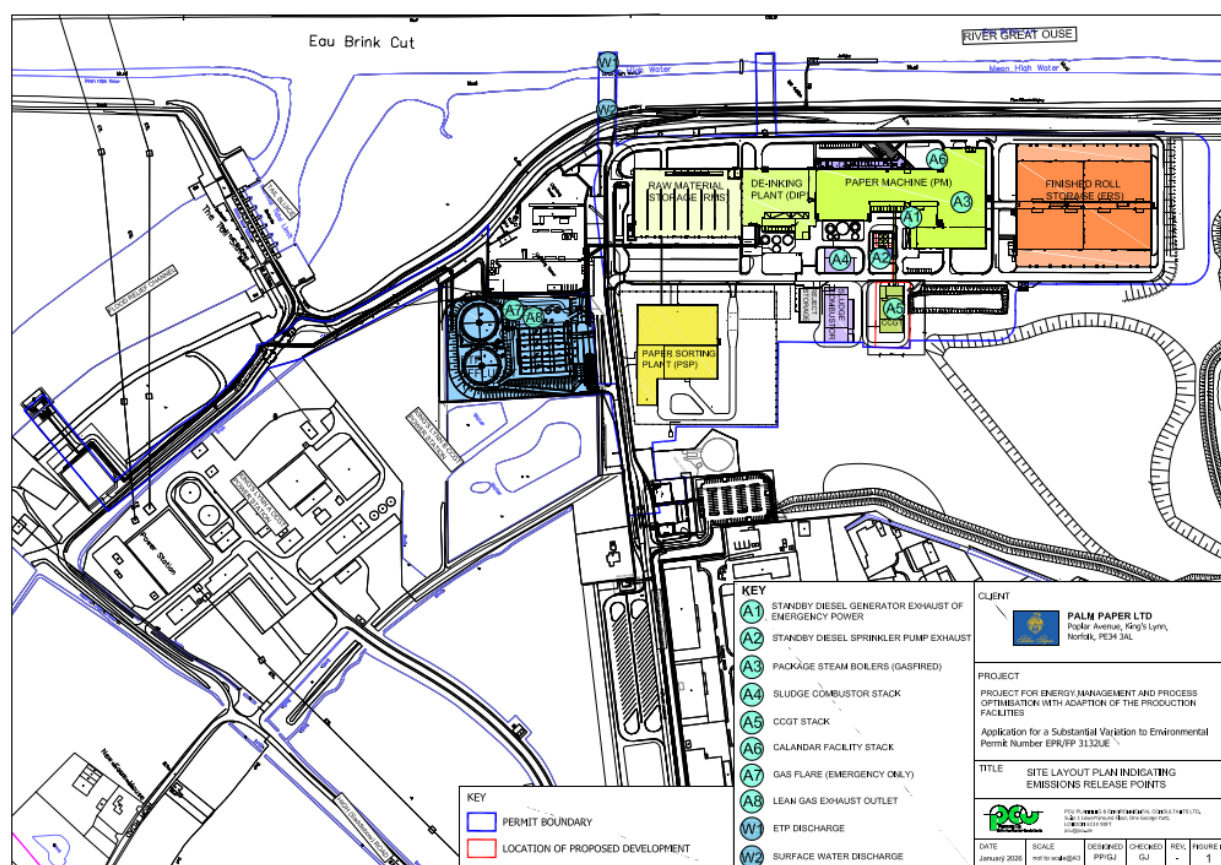


Figure 1-2 - Site Operational Map



## 1.2. Maintenance and review of the OMP

This OMP shall be reviewed annually, if there is a significant or specific change to site operations, or if there is a proven odour complaint in the vicinity of the site, which is attributable to the activities. If changes are required, then revision to the OMP will be made and can be subject to review by the Environment Agency during compliance visits or permit updates.

## 1.3. Relevant guidance and other sources

- Odour management: comply with your environmental permit (GOV.UK)
- Risk assessments for your environmental permit (GOV.UK)
- Develop a management system: environmental permits (GOV.UK)
- Biological waste treatment: appropriate measures for permitted facilities - 1. When appropriate measures apply - Guidance - GOV.UK
- Production of Pulp, Paper and Board BAT Conclusions (EU BRITE)

## 2. Risk assessment

### 2.1. Odorous and potentially odorous materials

| Material ID                               | Description                                                                                                                                                                                           | EWC Waste Code | Odour Potential | Location                 |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|--------------------------|
| Untreated process effluent (AD feedstock) | Process effluent from the paper mill process which will feed into the AD plant.                                                                                                                       | N/A            | Low             | Effluent Treatment Plant |
| Seeding and Re-seeding sludge             | Seeding sludge will be required for commissioning of the AD plant and may be required infrequently as a contingency for reseeded in case of process issue. Seeding sludge will not be stored on site. | 03 03 11       | High            | Effluent Treatment Plant |
| Digestate                                 | Process effluent that is being treated within the AD plant.                                                                                                                                           | N/A            | High            | Effluent Treatment Plant |
| Treatment gases                           | Under emergency conditions, treatment gases may escape via pressure release valves                                                                                                                    | N/A            | High            | Effluent Treatment Plant |

### 2.2. Pathways linking sources to receptors

Processes releasing odours to air

| Activity                | Site Map Ref. | Frequency      | Duration | Emissions Risk | Releases                                                                                                                             | Containment feature |
|-------------------------|---------------|----------------|----------|----------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Gas Flaring             | A7            | Emergency only | N/A      | Low            | NO <sub>x</sub> – 350 mg/Nm <sup>3</sup><br>SO <sub>x</sub> – 20 mg/Nm <sup>3</sup>                                                  | None                |
| Lean Gas Exhaust Outlet | A8            | Continuous     | 24/7     | Low            | CO <sub>2</sub> – 1954.49 g/Nm <sup>3</sup><br>SO <sub>x</sub> – 5.27 mg/Nm <sup>3</sup><br>CH <sub>4</sub> – 9.29 g/Nm <sup>3</sup> | None                |

| Activity                | Site Map Ref. | Frequency      | Duration | Emissions Risk | Releases | Containment feature |
|-------------------------|---------------|----------------|----------|----------------|----------|---------------------|
| Pressure Release Valves | N/A           | Emergency only | N/A      | Low            | Biogas   | None                |

## 2.3 Receptors

The Palm Paper facility is situated in an industrial area, largely surrounded by farmland to the south and to the west. To the north-east of the site, the centre of King's Lynn is located approximately 2km from the site boundary and is surrounded by residential suburbs.

The closest sensitive odour receptor to the Palm Paper facility is The Elms residential property, located approximately 480m to the north-west of the site boundary. Residential properties are also present within the South Lynn/Saddlebow area, with the nearest located approximately 500m to the north-east along Hillen Road. A caravan park is situated approximately 580m to the east of the site. To the south, a standalone residential property is located on High Road approximately 540m away, while farm buildings lie off Pullover Road to the west, approximately 640m from the facility boundary.

These receptors have been classified below in accordance with Environment Agency H4 guidance, with residential receptors considered high sensitivity. These receptors are shown in Figure 2-1 below.

Figure 2-1 - Receptor Map



Table 2-1 – Sensitive Odour Receptors

| Description                   | Approximate No of People | Relative Sensitivity | Distance (m) | Direction |
|-------------------------------|--------------------------|----------------------|--------------|-----------|
| The Elms residential property | 4                        | High                 | 480          | NW        |
| South Lynn                    | 6000                     | High                 | 500          | NE        |
| High Road                     | 4                        | High                 | 540          | W         |
| Caravan Park                  | 100                      | High                 | 580          | E         |
| Pullover Farm                 | 4                        | High                 | 640          | S         |

### 2.3. Poor dispersion conditions

- Strong winds blowing towards sensitive receptor.
- Low wind speeds leading to poor dispersion.

- Failure of aeration system in AD lanes leading to pockets of anaerobic conditions.
- Containment failure causing significant release of materials and odour potential.
- Poor design and positioning of release points / stacks / vent etc.
- cold drainage (adiabatic or katabolic) flows

### 3. Appropriate measures / BAT as applied to this site

#### 3.1. General procedures for materials reception

Waste materials are not being accepted as they are at typical AD sites. There will be a single, controlled delivery of a small quantity of feed material to enable the AD process to be seeded and commence operation.

The seeding sludge will be delivered by sealed tankers from another AD facility and transferred directly to the anaerobic digesters via enclosed systems to maintain anaerobic conditions and minimise air ingress, with only minimal and transient exposure to atmosphere during handling. This is only expected to be required to commission the plant, after which time no external wastes will be accepted on site. The duration of the transfer of seed material will be minimised as far as possible to reduce risk of air ingress and odour release.

The effluent from the paper mill process will be engineered to transfer directly to the digesters from the main site via a dedicated sealed pipeline. The risks associated with the delivery of waste materials are negligible.

#### 3.2. Waste acceptance procedures

Palm Paper will not accept any external wastes for the purpose of feed into the AD process. The only accepted waste will be AD plant sludge for seeding (03 03 11). This is not considered a waste activity or operation as it is critical to the commissioning of the process, and not part of normal operation.

The proposed AD process will take process effluent from the paper mill itself to generate biogas for injection into the grid network with the remaining effluent continuing to be directed to the existing effluent treatment plant by pipeline.

#### 3.3. Inventory controls

| Material       | Location            | Max Quantities and Holding Times | Appropriate measure                                                                             |
|----------------|---------------------|----------------------------------|-------------------------------------------------------------------------------------------------|
| Seeding sludge | Anaerobic digesters | TBC                              | Seeding sludge will be delivered to the site in a sealed state and transferred to the anaerobic |

| Material                       | Location                               | Max Quantities and Holding Times | Appropriate measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|----------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                |                                        |                                  | <p>digesters via a pressurised delivery system directly connecting the vehicle storage to the digester tanks. Following delivery, the digesters will remain in a sealed state. The duration of the transfer will be minimised as far as possible to reduce the risk of odour release. The seeding sludge will not be stored on site to prevent the risk of odour arising from storage.</p> <p>All plant will be subject to regular visual inspections.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Process effluent and digestate | Anaerobic Digesters                    | 4 x 1004m <sup>3</sup>           | <p>Four new Anaerobic Reactors, each with a volume of 1004m<sup>3</sup>, will be installed upstream of the aeration tanks. During the anaerobic treatment stage, the majority of organic substrate in the effluent will be biologically converted to biogas and digestate. An Expanded Granular Sludge Blanket (EGSB) process will be used due to its high volumetric loading rate and its well-established use for wastewater treatment in the paper industry. The reactor is gas-tight so that no escape of biogas or odour will occur under normal operating conditions.</p> <p>All plant will be subject to regular visual inspections. Odour emissions from the digestate in the anaerobic digesters will be minimised through routine visual inspections and preventative maintenance to ensure all hatches, seals, and pipework remain fully enclosed and intact, to prevent fugitive releases.</p> |
| Biogas                         | Digesters/biogas treatment plant/flare | N/A                              | Pipework will be subject to pressure tests to identify potential breaches and leaks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Material | Location | Max Quantities and Holding Times | Appropriate measure                                                                                                                                                                                                                                           |
|----------|----------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |          |                                  | <p>Gas will be subject to treatment via the activated carbon filters.</p> <p>Process and gas pipework will have remote controls overseen and supervised by trained and experienced staff.</p> <p>All plant will be subject to regular visual inspections.</p> |

### 3.4. Housekeeping

| Location                                                  | Inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Frequency                                                                                                 | Record keeping                                                                                                                                                                                                                                   |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Anaerobic digesters (applies to all associated equipment) | <p>Regular inspections will be performed to ensure the AD process area is cleared, clean and free from leaks or spillages. Spill kits will be located at the effluent treatment plant, and operatives are trained in their use. Any leaks/spillages will be immediately investigated to identify the cause and cleaned appropriately in a timely manner to prevent odour release.</p> <p>Any materials or substances to be used as part of the process will be stored in</p> | Visual inspections will be undertaken on a daily basis, and maintenance checks will be undertaken weekly. | <p>Records will be maintained for all inspections, including any associated clean-up activities and spillages.</p> <p>All records will be recorded, maintained, and securely stored within the site's Environmental Management System (EMS).</p> |

|  |                                                                                                                                                                              |  |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  | <p>designated containers/bunds as appropriate, to reduce the risk of uncontrolled spillages.</p> <p>All inspections, necessary clean ups and spillages will be recorded.</p> |  |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

### 3.5. Processes controls

| Location           | Process Description                                                  | Monitoring method                                                                 | Monitoring frequency                                            | Decision levels                                                | Control measures                                                                                                                                                                                                                                                                                                |
|--------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Anaerobic reactors | Anaerobic treatment and biogas generation using sealed EGSB reactors | Online monitoring (pH, temperature, COD, flow); visual inspections ; odour checks | Continuous instrumentation; daily checks; weekly odour walkover | <72% COD (>5755 mg/l COD in the influent), pH outside 6.5-7.5, | The process is contained within a gas-tight sealed system; The tanks have recirculation control to ensure system homogeneity and prevent trapped gas pockets and dead zones. The sludge is retained using three-phase separators and extracted to allow controlled removal of excess sludge without exposure to |

|                                                                                                                                                                                                                                                                                                                                                 |                                                       |                                                         |                                            |                 |                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                 |                                                       |                                                         |                                            |                 | air. Continuous monitoring of key parameters and operating conditions will ensure a stable load is maintained, preventing process issues and odour spikes.                                                                                             |
| Details: The reactor is sealed and odour risks only arise from leaks, overloading, or poor sludge management. Operating conditions are monitored to maintain stable anaerobic conditions, ensuring optimal digestion and preventing the generation of odours associated with process instability (such as odours associated with high acidity). |                                                       |                                                         |                                            |                 |                                                                                                                                                                                                                                                        |
| Biogas pipework                                                                                                                                                                                                                                                                                                                                 | Collection and transfer of biogas to treatment system | Gas flow, pressure, composition monitoring, leak checks | Continuous monitoring; routine inspections | Pressure levels | All pipework will be gas-tight to prevent fugitive losses. System pressure will be monitored to enable the early identification of leaks or loss of containment.<br>Condensate will be managed via dedicated traps, collection, and pumping systems to |

|                                                                                                                                                                                                                                                                                                                          |                                                                                                             |                                                                                                              |                                                 |                                                      |                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                          |                                                                                                             |                                                                                                              |                                                 |                                                      | <p>prevent liquid build-up within the biogas pipework. This will help prevent stagnant anaerobic conditions from which odour can be generated. In the event of high sulphurous concentrations, the emergency flare will be utilised to prevent risk of odorous emissions and protect the downstream biogas treatment system.</p> |
| <p>Details: Biogas from the anaerobic treatment system is fully contained in sealed pipework. The risk of odour arises from leaks or abnormal sulphurous compound concentrations. In this case, the biogas will be flared as the biogas treatment system is not designed to handle high sulphurous compound content.</p> |                                                                                                             |                                                                                                              |                                                 |                                                      |                                                                                                                                                                                                                                                                                                                                  |
| Biogas desulphurisation                                                                                                                                                                                                                                                                                                  | Chemical and biological removal of H <sub>2</sub> S using NaOH scrubber and biological oxidation to sulphur | H <sub>2</sub> S concentration (inlet/outlet), pH, Chemical dosing rate, visual checks for process stability | Continuous monitoring and daily operator checks | - Outlet H <sub>2</sub> S >100 ppm (target <100 ppm) | The biogas treatment system is fully enclosed with controlled pressure and monitoring to reduce risk of odour release. The                                                                                                                                                                                                       |

|                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                      |                                                                                        |                                                                                     |                                                                                                                                                                                          |                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                      |                                                                                        |                                                                                     |                                                                                                                                                                                          | <p>use of a high-efficiency H<sub>2</sub>S removal system (&lt;100 ppm) will significantly reduce odour of the biogas and automated dosing control of sodium hydroxide will ensure process optimisation. The separate biological stage prevents contamination of gas.</p> |
| <p>Details: Biogas desulphurisation is a key control step for odour minimisation. Final gas polishing, routine inspection and maintenance, and the use of an emergency flare during abnormal conditions will ensure that the potential for odorous emissions from the biogas produced as a result of AD is minimised.</p> |                                                                                                                                                                                      |                                                                                        |                                                                                     |                                                                                                                                                                                          |                                                                                                                                                                                                                                                                           |
| Lean gas exhaust                                                                                                                                                                                                                                                                                                          | Emission source A8 on Figure 1.2. Small amounts of lean gas from the biogas treatment stage will be treated using activated carbon filters and regularly released. This will compose | Odour checks will be performed daily, and carbon filter performance will be monitored. | Daily Odour checks and continuous monitoring to identify carbon filter performance. | <p>An investigation will be initiated if abnormal odour is detected at source or if off-site odour reports are received.</p> <p>The lean gas will be monitored to ensure composition</p> | <p>Activated carbon filtration removes concentration of sulphurous compounds to very low levels and subsequently reduces the odour associated with the lean gas release. These will be routinely replaced,</p>                                                            |

|                                                                                                                            |                                                                                              |  |  |                                            |                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--|--|--------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                                                                                                                            | of carbon dioxide, methane and traces levels of sulphur dioxide (hourly mass flow of 1.4 g). |  |  | on is within specified limits for release. | and two filters will be maintained in parallel to ensure a standby unit is available when required. |
| Details: Odour loads of 0.1 to 0.3 x10 <sup>6</sup> OU <sub>E</sub> /h are expected from the lean gas emission point (A8). |                                                                                              |  |  |                                            |                                                                                                     |

### 3.6. Evaporation controls

Not applicable to AD or any other processes performed on site. Evaporation controls are not considered applicable to the AD plant as the digestion process is undertaken within fully enclosed tanks operating under anaerobic conditions. As such, there are no exposed chemicals or material surfaces from which evaporative emissions could occur. Any gases generated are contained and managed via the sealed biogas handling system, rather than being released through evaporation.

### 3.7. Containment and abatement

#### General approach

The AD stage of the effluent treatment process has been designed with a range of inherent and operational measures to minimise odour generation.

The feedstock for the anaerobic reactors consists of process effluent from the mill which will arrive fully contained within the on-site pipework, preventing the release of any odours at this stage.

The anaerobic reactors are fully enclosed, preventing fugitive emissions, while fixed gas detection systems will be installed to promptly identify any leaks.

The installation of the AD stage will reduce the chemical oxygen demand (COD) of the effluent, which in turn lowers the odour potential in the downstream aerobic treatment stage. This is because of a reduced organic load in the aerobic stage, helping to prevent oxygen depletion and reducing the availability of compounds that would otherwise form odorous gases.

Gas extracted from the anaerobic digesters is routed to abatement systems in the biogas treatment system, which includes coarse biological sulphur removal and activated carbon filters. Biogas is scrubbed with caustic in the scrubber tower to remove H<sub>2</sub>S (from 10,000 ppm to 100 ppm). The biogas is dried and activated carbon filters further remove hydrogen sulphide to trace levels, significantly reducing odour

potential of the final product. The gas is then either used in the gas network on-site or sent to the flare if it does not meet specification for use. Due to the removal of sulphurous compounds during the desulphurisation stage, the potential for odour release during downstream aeration in the aeration lanes of the ETP will be reduced.

The lean gas exhaust outlet will release off gas from the biogas treatment stage and will operate for 8760 hours per annum. The released gas has undergone biological desulphurisation and activated carbon adsorption to remove remaining sulphurous compounds to trace levels and subsequently greatly reduce the risk of odour. Trace levels of sulphurous compounds are expected to generate odour loads of 0.1 to 0.3  $\times 10^6$  OUE/h, and subsequently odour levels will be in line with existing odour emissions on the company premises. Emissions from the lean gas outlet will be discharged at an elevated height of approximately 6.4 m with a maximum volume flow of 1.8 m/s to support dispersion of the gas and further reduce the potential for off-site odour impacts.

If the biogas is identified to have high sulphurous compound levels, odour risk can be managed through gas flaring. The flare is only expected to operate when the desulphurisation equipment or biogas treatment stage is out of commission or unable to achieve sufficient biomethane quality. The flare will release emissions from a stack height of 7.9 m and an exit flow velocity of 13.3 m/s, to aid dispersion prior to reaching ground level. Possible odour emissions from the flare, due to sulphur-containing compounds, are largely destroyed by the combustion-related oxidation, so that no deterioration in terms of odour is to be expected outside the company premises.

General good practice measures will also be implemented across the facility. The area surrounding the AD infrastructure will be regularly inspected and cleaned to monitor for the build-up of odour. Maintenance inspections will be carried out regularly to ensure the integrity of the sealed process vessels and prevent fugitive emissions. The introduction of seeding sludge to the plant will be carefully managed using sealed delivery tankers. These controls are supported by a Planned Preventative Maintenance Programme (PPMP), overseen by site management, to ensure that all odour mitigation systems remain effective throughout operation. There is a complaints procedure implemented at site that ensures that any reports of odour will be investigated and resolved, as explained below.

### Specific control points

| Primary containment | Secondary containment                                          | Abatement                                                          | Air Flow rate | Max odour emissions concentration |
|---------------------|----------------------------------------------------------------|--------------------------------------------------------------------|---------------|-----------------------------------|
| AD tank             | Concrete plinth and drainage system for liquids. N/A for odour | The AD tanks have been designed to the tank standard NEN-EN 14015. | N/A           | Unknown                           |

|                            |                                                                |                                                                                                                                  |     |         |
|----------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|                            |                                                                | The system is fully enclosed and gas tight, preventing the release of fugitive odour emissions.                                  |     |         |
| Pipework                   | Concrete plinth and drainage system for liquids. N/A for odour | All pipework associated with AD and biogas transfer will be sealed to prevent the release of fugitive emissions                  | N/A | Unknown |
| Desulphurisation equipment | N/A                                                            | Highly odorous compounds are removed from the biogas via a sodium hydroxide scrubber, biological desulphurisation, carbon filter | N/A | Unknown |
| Gas storage                | N/A                                                            | Released in emergency conditions via gas flare                                                                                   | N/A | Unknown |

### 3.8. Enhanced dispersion

Dispersion is a natural process where air pollutants mix with ambient air and become less concentrated.

The flare (emission point A7 in Figure 1.2) will release emissions from a stack height of 7.9 m and an exit flow velocity of 13.3 m/s, to aid sufficient dispersion of any potential odours the stack plume and any potential odours to be considered at ground level. Emissions from the lean gas outlet (emission point A8 in Figure 1.2) will be discharged at an elevated height of approximately 6.4m with a maximum volume flow of 1.8 m/s.

The surrounding trees, shrubs, paper mill and effluent treatment plant act as a physical barrier and encourage turbulent mixing to aid odour dispersion.

### 3.9. Record keeping

Effective record keeping is essential to demonstrate that odour is being appropriately managed and that the site is operating in accordance with the Environmental Permit and this Odour Management Plan (OMP). Palm Paper Ltd will maintain comprehensive records to support proactive odour control, facilitate investigation of complaints, and provide evidence of compliance to the Environment Agency.

Effective record keeping is implemented at the Palm Paper AD plant to demonstrate that odour is appropriately managed in accordance with the Environmental Permit and this OMP. Records are maintained for routine odour inspections. Complaints are managed under Palm Paper's Complaints Procedure. A complaints log is maintained to document the date, time, location and nature of any odour complaints, investigation findings and corrective actions taken. Operational records will be kept for activities with potential odour impacts, such as the seldom event in which reseedling is required. Maintenance logs will be held for odour control infrastructure, including tank covers, seals, air abatement systems and activated carbon filters, alongside records of their performance and any failures or exceedances. Records will be regularly reviewed to identify trends, assess the effectiveness of control measures and inform continuous improvement.

All records will be retained for a minimum of six years, stored in an accessible and auditable format, and made available to the Environment Agency upon request. Site management will ensure that records are completed accurately and that any issues identified are addressed promptly.

## 4. Odour incident investigations

Members of the public can contact Palm Paper using a contact form or the main switchboard number, both of which are publicly available on the company website. In the event of an odour complaint issue, the details will be passed to the Compliance Manager, and the Senior Management Team will be informed.

If Palm Paper become aware of odour reports from the facility itself, the community or by notification from the Environment Agency, an investigation will be commenced immediately. If the incident is raised outside of normal working hours, the investigation will be commenced on the next working day. All complaints are investigated promptly to identify the root cause, the remedial actions required, and preventative measures necessary to avoid recurrence.

The preliminary odour investigation procedure will consist of a review of the condition of all materials held on site and any activities undertaken at or around the time of the reported incident. This will be used to identify if there is a problem with materials, process controls, containment or abatement methods attributing to odour release.

A response acknowledging the complaint will be provided within five working days. A full response outlining the findings of the investigation will be issued within

20 working days of the initial response and will identify root causes and any associated remedial actions. The results of odour complaint investigations, any secondary investigations, remedial actions taken will be recorded on the site's EMS and records will be held for a minimum of 10 years.

## 5. Odour incident response planning

| Abnormal event                                                                                  | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loss of sealed containment                                                                      | Palm Paper will hold stock of critical spare parts in the event of equipment breakdown.<br>In the case of emergency failure, the AD system can be bypassed to allow incoming paper mill effluent to be treated by the aerobic treatment stage at the effluent treatment plant. The feed rate to the AD plant will be suspended to stop odour-generation while the loss of containment is investigated/corrected.                                                                                         |
| Power failure                                                                                   | In the event of loss of power to the biogas treatment system, biogas can be automatically diverted to the flare to prevent over-pressurisation and uncontrolled venting of biogas (and therefore odour release).                                                                                                                                                                                                                                                                                         |
| Failure of odour control equipment (biogas treatment system failure / pressure control systems) | Biogas that cannot be received downstream or which does not meet the required gas quality for use will be flared. Possible odour emissions from the flare are largely reduced due to the combustion-related oxidation of sulphur-containing compounds. Further to this, the resultant gas will be ejected vertically from the flare at 13.3m/s and from an effective stack height of 7.9m to enable dispersion of the stack plume and any potential odours when considering ground level concentrations. |
| Spillages / leaks / improper material handling                                                  | A housekeeping procedure will be followed to ensure prompt clean-up of any spillages and removal of odorous materials outside of sealed equipment. Sludge will be transferred via enclosed systems to avoid exposure to air and odour release.                                                                                                                                                                                                                                                           |
| Gas network failure leading to release of biogas                                                | Biogas will be burned in a flare before release to atmosphere. This will combust sulphur-containing compounds and significantly reduce the possibility of odour emissions.                                                                                                                                                                                                                                                                                                                               |

| Abnormal event                    | Mitigation measures                                                                                                                                                                                                                                           |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flood/fire/abnormal weather event | See fire risk assessment and emergency response plan. The emergency flare will be utilized as explained above.                                                                                                                                                |
| Staff availability                | The site will ensure there is sufficient competent staff to implement the actions in the odour management plan whilst operating the site. Staff will be trained to operate the AD plant and implement an odour incident response following a report of odour. |

## Escalation to the Environment Agency

Whilst odour complaints will be notified to the Environment Agency within a reasonable timescale, those constituting a significant or major effect on amenity value or human senses (i.e. category 1 or 2 impacts under the Environment Agency instruction for assessing impact from odour 'incidents and their classification, common incident classification scheme <sup>1</sup>(2)) will be notified to the Environment Agency immediately on their incident number 0800 80 70 60.

## 6. Declaration

Palm Paper has carefully considered all aspects of this permitted activity and identified those materials, activities and conditions which may pose a risk of odour pollution. These risks are documented in section 2 of this OMP.

There are no historic odour pollution incidents that have been attributed to this site and there has been no occurrence of odour complaints to date.

Palm Paper commits to implementing the control measures specified in section 3 of this OMP. These are all the measures which we currently believe are necessary, proportionate, and adequate for the control of odour pollution, and this will be kept under review.

If there are any changes to activities which impact the risks identified in section 2, the effectiveness of measures specified in section 3, or if odour pollution occurs, adequacy of associated odour control measures will be assessed.

If the activities at the site cause off-site odour pollution and all appropriate measures have not been used to prevent or where that is not practicable, to minimise the odour, including those specified in this plan, then we understand we may be subject to enforcement action.

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<sup>1</sup> Appendix\_4.18\_LIT\_11227\_-\_Incidents\_and\_their\_classification\_common\_incident\_classification\_scheme\_...

Considering the risks identified and control measures specified, we have concluded that it is unlikely that our activities will cause serious off-site odour pollution. If activities at the site do cause serious odour pollution off-site, then we understand that we may be subject to enforcement action even if we can demonstrate that we are using all appropriate measures.