



# Environmental and Climate Change Risk Assessment

Endolys Plastics to Oil Facility

December 2025

Project No.: SOL\_25\_P050\_PYR

---

## Document Details

|                   |  |
|-------------------|--|
| Document Title    | Environmental and Climate Change Risk Assessment                   |
| Document Subtitle | Endolys Plastics to Oil Facility                                   |
| Project No.       | SOL_25_P050_PYR  |
| Date              | December 2025  |
| Version           | QMS_7.5.38_TEM – Template – Report Long Form – New Style (Perm) v5 |
| Author            | Rhys Morgan  |
| Client Name       | Endolys Ltd  |

## Document History

| Version | Comments          | Date       | Author Initials | Reviewer Initials |
|---------|-------------------|------------|-----------------|-------------------|
| 11      | First Issue to EA | 19/12/2025 | RM              | EH                |
|         |                   |            |                 |                   |

---

Signature Page

December 2025

# Environmental and Climate Change Risk Assessment

## Endolys Plastics to Oil Facility

---



Rhys Morgan  
Environmental Consultant



Emily Hingston  
Client & Project Manager

*This report has been prepared by Sol Environment with all reasonable skill, care, and diligence, and taking account of the Services and the Terms agreed between Sol Environment Ltd and the Client. This report is confidential to the client, and Sol Environment accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Sol Environment Ltd beforehand. Any such party relies upon the report at their own risk.*

*Sol Environment disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the Services*

---

Registered office: 10 The Lees, Malvern, Worcestershire, WR14 3HT

Company Registered in England no. 7068933



Sol is ISO 9001:2015 certified by British Assessment Bureau Limited, a UKAS Accredited Certification Body number 8289 for the scope of Environmental Consultancy providing a range of services to companies in the UK and Europe. Certificate number: 259774.

## CONTENTS

|       |  |    |
|-------|--|----|
| 1.    | INTRODUCTION .....                                     | 1  |
| 2.    | SITE DETAILS.....                                      | 2  |
| 2.1   | Site Location .....                                    | 2  |
| 2.1.1 | Site Installation Boundary .....                       | 2  |
| 2.2   | Site Context .....                                     | 5  |
| 2.2.1 | Site Setting .....                                     | 5  |
| 2.2.2 | Nearby Sensitive Receptors .....                       | 5  |
| 2.2.3 | Wind Direction.....                                    | 9  |
| 2.2.4 | Flood Risk .....                                       | 9  |
| 2.3   | Infrastructure and Design .....                        | 10 |
| 2.3.1 | Drainage.....  | 10 |
| 3.    | PROCESS DESCRIPTION .....                              | 12 |
| 4.    | RISK ASSESSMENT METHODOLOGY.....                       | 13 |
| 5.    | ENVIRONMENTAL AND CLIMATE CHANGE RISK ASSESSMENT ..... | 14 |
| 5.1   | Environmental Risk Assessment.....                     | 14 |
| 5.2   | Climate Change Risk Assessment .....                   | 23 |

### List of Tables

|           |   |   |
|-----------|---|---|
| Table 2.1 | Site Setting.....   | 5 |
| Table 2.2 | Sensitive Human Receptors within 1km of the site .....        | 5 |
| Table 2.3 | UK ecologically Designated sites within 2km of the site ..... | 7 |

### List of Figures

|            |  |    |
|------------|--|----|
| Figure 2.1 | Site Location .....  | 3  |
| Figure 2.2 | Installation Boundary .....                                      | 4  |
| Figure 2.3 | Sensitive Receptor Plan .....                                    | 8  |
| Figure 2.4 | Wind Rose for Teesside International Airport (1973 – 2025) ..... | 9  |
| Figure 2.5 | Flood Risk Extent .....  | 10 |

## 1. INTRODUCTION

This document has been prepared by Sol Environment Ltd on the behalf Endolys Ltd (“Endolys” hereafter) for the operation of a chemical recycling facility which converts waste plastics to oil facility utilising a proprietary advanced thermal treatment (pyrolysis) technology.

The document provides a structured risk assessment detailing potential risks associated with the proposed operations in relation to the environment, climate change and human health.

This Environmental Risk Assessment has been undertaken in accordance with the online Environment Agency Guidance for undertaking environmental risk assessments. Environmental risks relevant to the activities proposed, and assessed in this risk assessment are:

- Air;
- Water;
- Land;
- Noise and vibration;
- Odour;
- Fugitive emissions;
- Fire;
- Incompatible Feedstock; and
- Climate change adaptation.

For each of the above environmental criteria the approach to the assessment has followed the following process:

- Identify the risks;
- Identify the receptors;
- Identify possible pathways;
- Assess the risks (assuming that control measures proposed are in place);
- Choose appropriate further measures to control these (if required); and
- Present the assessment.

Results of the assessments are provided in **Table 3.1** and **Table 3.2** below.

When completing this assessment, prevention and control measures proposed by Endolys Ltd are assumed to be in place. Relevant details of these measures are identified within the assessment.

## 2. SITE DETAILS

### 2.1 Site Location

The proposed Installation is located at the Endolys Ltd, Yarm Road, Darlington, DL1 4DE (National Grid Reference: NZ 32060 13554).

The location is provided in Figure 2.1 below.

#### *2.1.1 Site Installation Boundary*

The proposed Installation Boundary is provided in Figure 2.2 below.

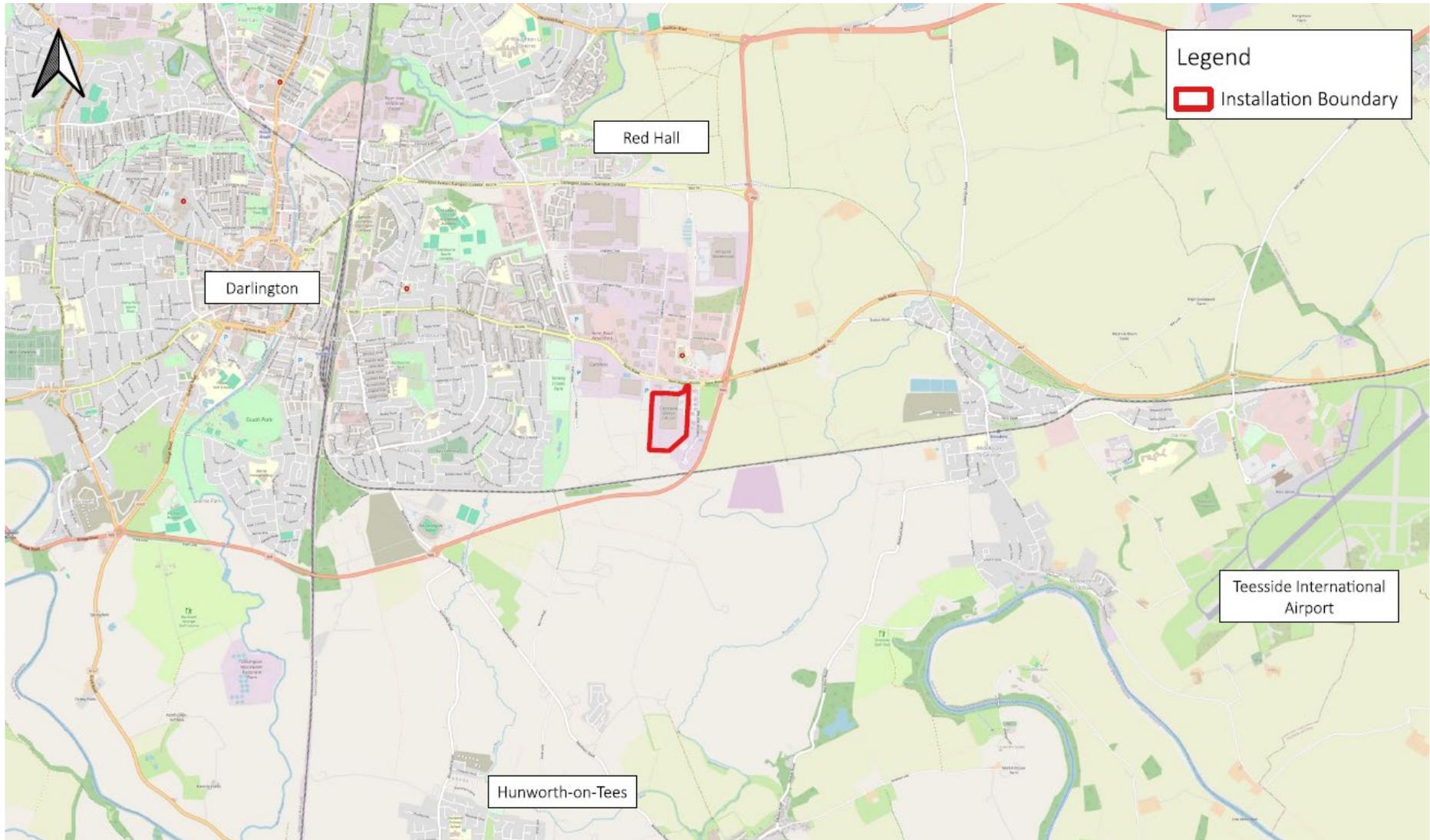


Figure 2.1 Site Location

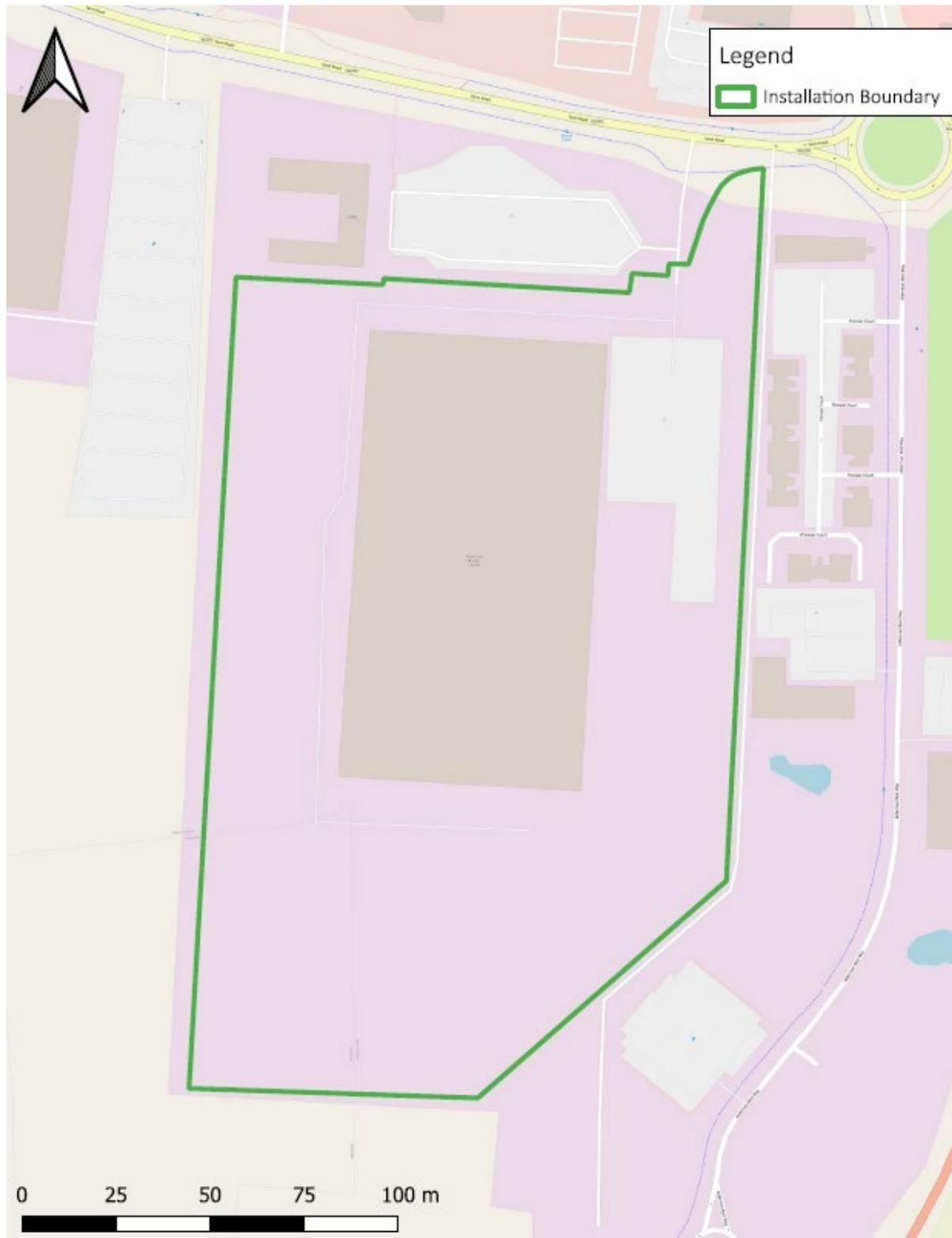


Figure 2.2 Installation Boundary

## 2.2 Site Context

The following sections outline the site context, including the surrounding site setting and any nearby sensitive receptors.

### 2.2.1 Site Setting

The site is located on the southeastern edge of Darlington in a predominantly agricultural and industrial/commercial setting. To the north lies Morton Park shopping centre surrounded by other commercial units including a Premier Inn. Industrial units lie to the west whilst the south and east are predominantly agricultural in nature.

Table 2.1 outlines the surrounding site setting in greater detail, including features in the immediate vicinity, within 500m and beyond 500m of the proposed site.

**Table 2.1 Site Setting**

| Direction | Description  |
|-----------|--|
| North     | Immediate Vicinity: Quick Self Storage, Yarm Road<br>Within 500m: Premier Inn Darlington, ZIGUP Car Rental, Woodlands Hospital Taylor’s Cafe, Roarsome Soft Play, Total Recycling Services<br>Beyond 500m: Commercial units (Stan Robinson, Vertu Vehicle Solutions, Auxillis Services)            |
| East      | Immediate Vicinity: Business Park (Tribe Recruitment, Dash Media Productions, Baxtor Personnel, Darlington Association on Disability)<br>Within 500m: Whessoe Engineering Limited, A66, Agricultural Land<br>Beyond 500m: Agricultural Land, Walton H & Sons Farm, The Beeches Caravan and Camping |
| South     | Immediate Vicinity: Alderman Best Way Car Park, Farm<br>Within 500m: Railway Line, A66, Agricultural Land<br>Beyond 500m: Agricultural Land, Farm  |
| West      | Immediate Vicinity: Darlington Driving Test Centre, Cummins Centenary House<br>Within 500m: Amenity/agricultural land, Cummins Engine Plant<br>Beyond 500m: Maidendale Nature Reserve, Residential Housing (Firthmoor), Firthmoor Primary School   |

### 2.2.2 Nearby Sensitive Receptors

The closest sensitive receptors to the site are located within the industrial / commercial estate to the north, namely at the Premier Inn 150m distant. The closest residential receptors are located at Richmond Way in the residential area of Firthmoor 770m to the west.

The following table summarises the sensitive human receptors within 1km of the site.

**Table 2.2 Sensitive Human Receptors within 1km of the site**

| Receptor Name                             | Distance | Direction |
|---|----------|-----------|
| Yarm Road                                 | 60m      | North     |
| Premier Inn Darlington East (Morton Park) | 150m     | North     |
| Woodlands Hospital                        | 270m     | North     |

|  |             |            |
|--|-------------|------------|
| Commercial Units                         | 450-1000m   | North      |
| Mortin Retail Park                       | 260m        | North-east |
| A66 Road                                 | 350m        | North-east |
| Aeolian House Dog Training and Boarding  | 635m        | North-east |
| Amazon MME1                              | 935m        | North-east |
| Farm                                     | 1000m       | North-east |
| Business Park                            | Adjacent    | East       |
| A66 Road                                 | 225m        | East       |
| Walton H & Sons                          | 690m        | East       |
| Alderman Best Car Park                   | 30m         | South-east |
| A66 Road                                 | 210m        | South-east |
| The Beeches Caravan and Camping          | 1000m       | South-east |
| Farm                                     | 50m         | South      |
| Railway Line                             | 210m        | South      |
| A66 Road                                 | 300m        | South      |
| Farm                                     | 970m        | South-west |
| Farm                                     | 1000m       | South-west |
| Darlington Driving Test Centre           | 30m         | West       |
| Cummins House/Headoffice                 | 110m        | West       |
| Cummins Engine Plant                     | 330m        | West       |
| Maidendale Nature Reserve                | 650m        | West       |
| Firthmoor Primary School                 | 285m        | West       |
| Travelodge Darlington                    | 330m        | North-west |
| Residential Housing                      | 780m-1000m+ | North-west |
| Darlington Retail Park                   | 640m-1000m+ | North-west |
| Residential Housing (Earl Carlson Grove) | 930m        | North-west |
| Commercial units                         | 220m-1000m+ | North-west |

Ecologically, the nearest surface water features are a pond 30m east and a pond and unnamed stream located 115m to the southeast of the site boundary.

Environment Agency (EA) H1 and H5 guidance states that the potential impacts of the site should be assessed for the following habitat sites within 10km of the site:

- Special Areas of Conservations (SACs) and candidate SACs (cSACs) designated under the EC Habitats Directive;
- Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive; and
- Ramsar Sites designated under the Convention of Wetlands of International Importance.

It is also stated that within 2km of the Source:

- Sites of Special Scientific Interest (SSSI) established by the 1981 Wildlife and Countryside Act;
- National Nature Reserves (NNR);
- Local Nature Reserves (LNR);
- Local Wildlife Sites (LWS), County Wildlife Sites (CWS) and potential wildlife sites (PWS);
- Sites of Importance for Nature Conservation (SINC); and
- Ancient Woodland.

Information from the Multi Agency Geographic Information for the Countryside (MAGIC) website (<http://magic.defra.gov.uk/>) has been used to obtain the above information. The nearest designated site is the Maidendale Fishing and Nature Reserve (LNR), located approximately 623m west of the site.

**Table 2.3 UK ecologically Designated sites within 2km of the site**

| Designated Site                       | Designation Status | Distance from Site |
|---------------------------------------|--------------------|--------------------|
| Neasham Fen                           | SSSI               | 1936m SE           |
| Brankin Moor                          | LNR / LWS          | 1694m SW           |
| Maidendale Fishing and Nature Reserve | LNR                | 623m W             |

There are no European designated sites within 10km of the site.

Due to the proximity of the site to human and ecological receptors, the site is considered to be in a low to moderate sensitivity area in relation to potential emissions, such as odour and noise. Nonetheless, numerous operational measures for the control and mitigation of emissions have been applied to site to ensure that all potential releases are prevented or mitigated to reduce the risk of amenity issues.

The figure below identifies the designated receptors tabulated above.

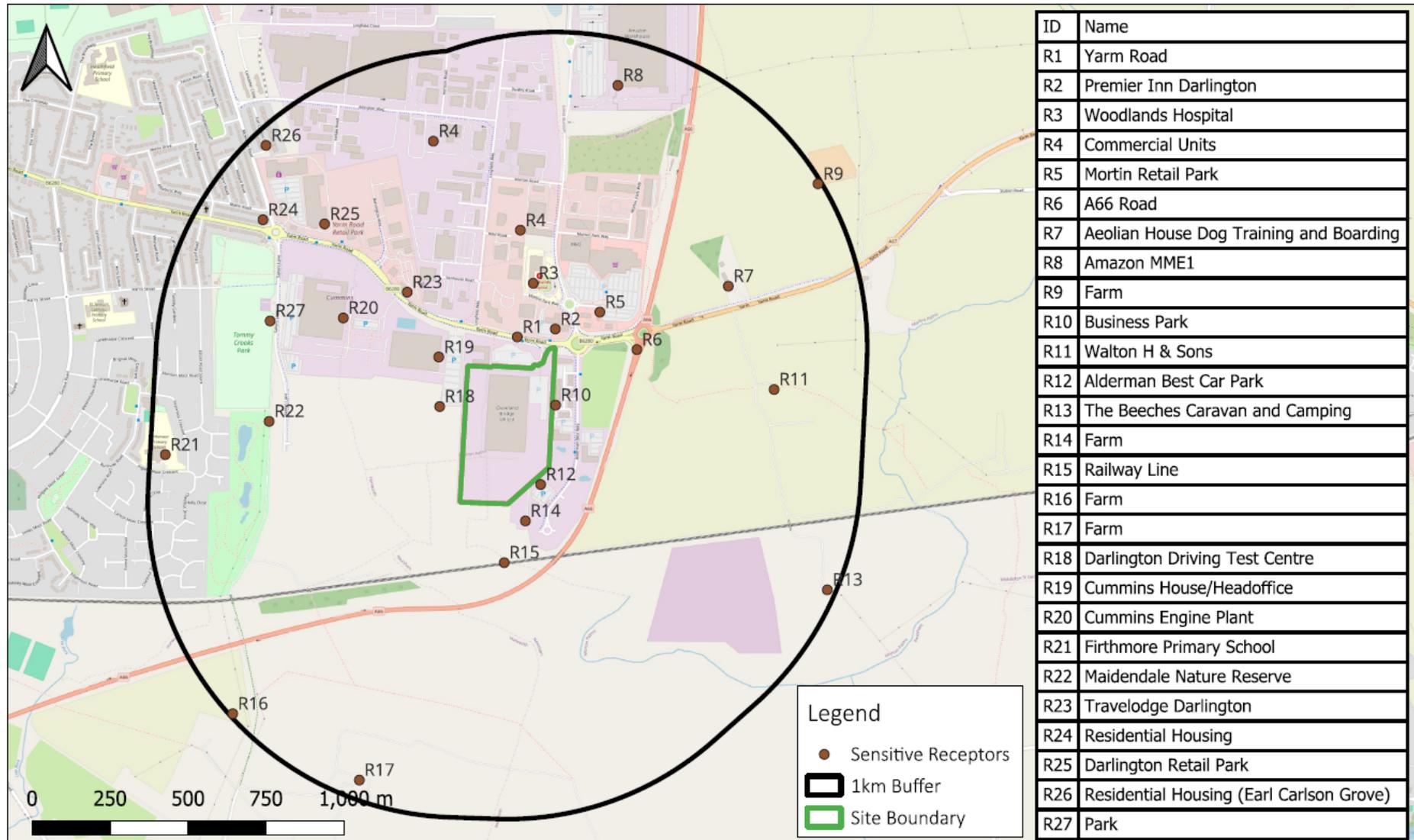


Figure 2.3 Sensitive Receptor Plan

### 2.2.3 Wind Direction

The estimated wind direction for the proposed site comes from a predominantly south-south westerly direction, based on historic wind direction recordings taken from Teesside International Airport located 4.75km east of the site.

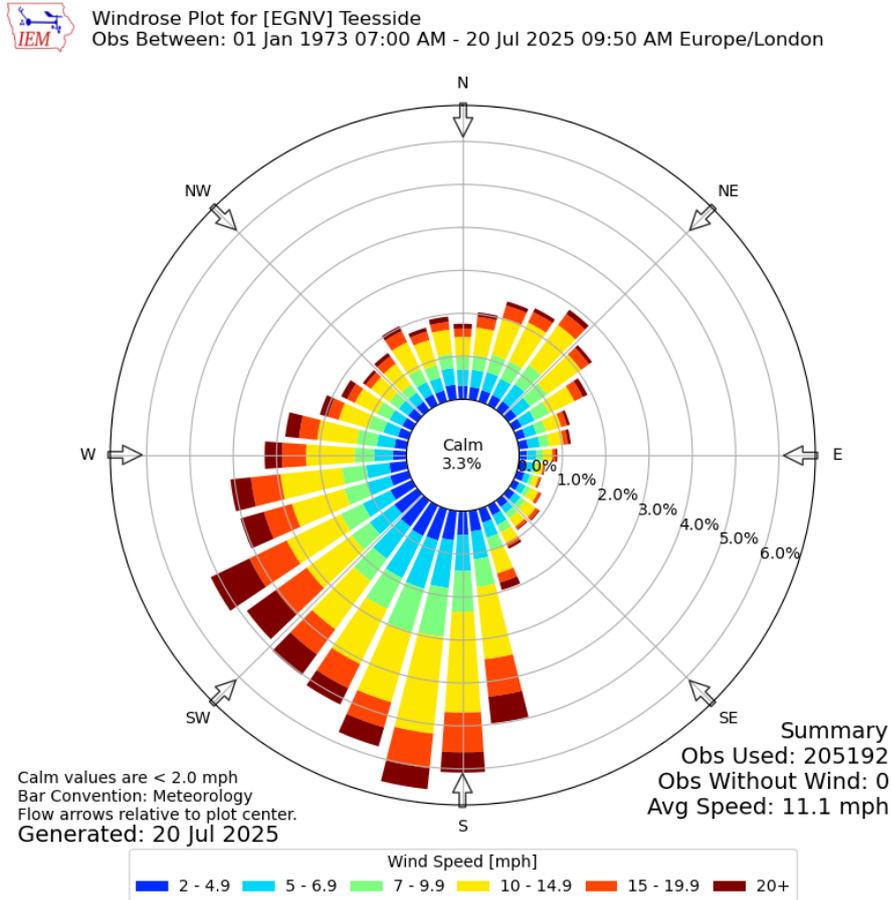
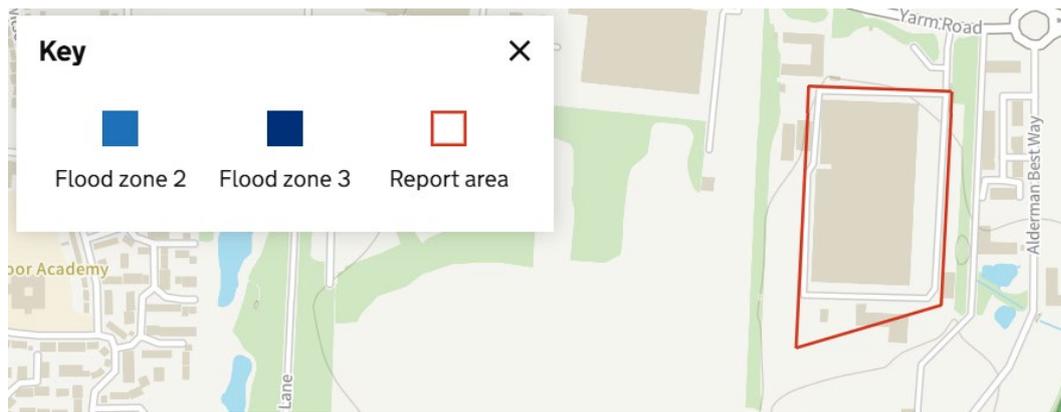


Figure 2.4 Wind Rose for Teesside International Airport (1973 – 2025)

### 2.2.4 Flood Risk

The site is located within flood zone 1, meaning there is a low probability of flooding from rivers and surface waters. The extent of flooding from rivers is shown in the figure below taken from the Defra Flood Risk for Planning Website.



**Figure 2.5 Flood Risk Extent**

## 2.3 Infrastructure and Design

The key infrastructure and design of the site will comprise the following:

- Main processing building;
- Feedstock Reception Hall;
- Pre-treatment system;
- Feed system;
- Pyrolysis Units;
- Flue Gas Treatment System;
- Pyrolysis exhaust stack (A1);
- Syngas Steam Generation Boiler (A2);
- Cooling Towers;
- Oil Purification Plant;
- Settlement and Storage Tanks;
- Nitrogen Storage Tanks;
- Emergency flare (A6);
- Gas Buffer Tank;
- Char collection and cooling system;
- CHP Engine with associated exhaust stack (A5);
- Emergency diesel generator (A7) and associated auxiliary fuel storage.

### 2.3.1 Drainage

There will be no direct process emissions to controlled water arising from the installation.

All wastewater produced by the process will be collected within an onsite wastewater tank and tankered offsite for disposal.

Uncontaminated clean surface water runoff captured from roof drainage and external roadways / car parking areas will be discharged to the existing surface water drainage system.

Domestic foul flows will be directed to the existing sewer network.

Pyoil produced by the process will be stored within a bunded Tank Farm, designed in accordance with CIRIA 736.

### 3. PROCESS DESCRIPTION

The proposed development will treat waste plastic film through an advanced thermal treatment facility utilising pyrolysis technology. Following conversion within the pyrolysis reactor, oil vapours are condensed, the solid residues (char) discharged off site and the syngas produced will be utilised within the pyrolysis systems and onsite boiler to produce steam. Oil vapours will be condensed into Pyoil (Grade 3 Intermediate), which will be transported offsite to an established offtaker for further refinement.

The proposed facility comprises the following stages:

- *Waste Reception* – Pre-accepted bales of plastic film will be delivered into bays within the Feedstock Reception Hall under supervision from a suitably trained operative. Wastes will typically be stored for up to two weeks prior to processing;
- *Pre-treatment system* – This system will include shredding, NIR, metals removal, agglomeration and densification to produce a bead which will be transferred to intermediate storage prior to use as a feedstock for the pyrolysis reactors;
- *Pyrolysis* – Each pyrolysis reactor has the capacity to process 33tpd of waste plastic, producing a yield of 60 – 75% pyrolysis oil (approximately 81,000 tpa), non-condensable combustible gas (aka syngas) and a solid waste char;
- *Oil storage* – The proposed facility will utilise oil storage tanks, typically each with the capacity of approximately 100m<sup>3</sup> (12 in total) for Pyoil storage prior to export;
- *Char storage* – char will be stored internally prior to removal offsite;
- *Syngas Use* – The produced syngas will be utilised as fuel for the pyrolysis process under normal operation. Additionally, syngas will be utilised within an onsite boiler for steam generation for use within the heating system onsite; and
- *Electricity Generation* – The sites power requirement will be met by an onsite CHP unit, which will utilise natural gas during Phase 1, switching to syngas in Phase 2.

#### 4. RISK ASSESSMENT METHODOLOGY

The Environmental and Climate Change Risk Assessment has adopted a risk assessment approach to the potential hazards by combining the probability and magnitude of the potential risk to give an estimation of the risk prior to any mitigation measures. The risk management measures, which are designed to reduce the likelihood of occurrence, are then detailed, followed by an estimation of the actual risk post-mitigation (Residual Risk Rating).

The DEFRA guide to risk assessment<sup>1</sup> and the EA’s guidance indicates the approach of subjectively classifying the magnitude of potential consequences into four categories depending upon the degree of the impact that the potential risk could have and the context in which the risk is being assessed. The classification is used as a guide in this Risk Assessment.

The four categories are as follows:

- Severe: exposure may result in serious damage;
- Moderate: exposure may result in damage that is not severe and is reversible;
- Mild: Minor consequences where damage is not apparent though reversible adverse impacts possible;
- Negligible: The effects are negligible.

The matrix shown below considers the probability of the potential risk against the magnitude of the potential impact, thereby giving an estimation of the resulting likelihood of the risk occurring.

| Probability of potential Risk | Magnitude of Potential Impact |            |            |            |
|-------------------------------|-------------------------------|------------|------------|------------|
|                               | Severe                        | Moderate   | Mild       | Negligible |
| High                          | High                          | High       | Medium/Low | Near Zero  |
| Medium                        | High                          | Medium     | Low        | Near Zero  |
| Low                           | Medium                        | Medium     | Low        | Near Zero  |
| Negligible                    | Medium                        | Medium/Low | Low        | Near Zero  |

The risk assessment below has been based on the matrix outlined above.

The final stage of the risk assessment is the judgment of the severity of the residual risk following implementation of the mitigation measures.

Based on the outcomes of the risk assessment, the EA document provides guidance on further requirements for different risks. These are summarised as follows:

- High risk – additional assessment and active management required;
- Medium risk – likely to require further assessment and may require either active management or monitoring; and
- Low risk – only requires periodic review.

<sup>1</sup> A Guide to Risk Assessment and the Risk Management for Environmental Protection, 1995.

## 5. ENVIRONMENTAL AND CLIMATE CHANGE RISK ASSESSMENT

### 5.1 Environmental Risk Assessment

| Hazard                       | Receptor   | Pathway  | Probability of Exposure   | Magnitude of Potential Impact   | Risk Rating before Mitigation | Risk Management Techniques   | Overall Risk (following Mitigation)                                   |
|------------------------------|------------|----------|---|---|-------------------------------|--|---|
| Point Source Releases to Air | Atmosphere | Airborne | Moderate<br><br>Sensitive receptors including Premier Inn in the vicinity | High<br><br>Unabated emissions from pyrolysis units, gas boiler and CHP units | High                          | <ul style="list-style-type: none"> <li>There will be eight channelled emission points to air introduced with this installation. These comprise continuous emission from A1 from the flue gas treatment system of the pyrolysis units, A2 from the steam generation boiler, A3 from the extraction system of the building, A5 CHP engine and intermittent emissions from A6 the emergency flare and A7 the emergency diesel generator.</li> <li>Additionally, fugitive emissions from five vents (A8 – A12) may occur. These include oil tank breather valves, nitrogen purge vents and overpressure release valves for the pyrolysis units. Carbon filters will be fitted to the continuous fugitive emission sources (namely oil tank breather valves) to reduce VOC and odour emissions.</li> <li>Flue gas from the pyrolysis units is treated at the FGT system prior to release to atmosphere. The FGT system incorporates an air cooler, SCR, water spray cooler, NaOH scrubber and wet ESP.</li> <li>All emissions from the combustion of syngas onsite will be in accordance with Chapter IV of the Industrial Emissions Directive (IED) and relevant BAT-AELS of the Waste Incineration</li> </ul> | <b>LOW</b> due to the proposed abatement technologies employed onsite |

|                    |                                       |            |  |  |          |  |  |
|--------------------|---------------------------------------|------------|--|--|----------|--|--|
|                    |                                       |            |  |  |          | <p>BREF as the syngas is not considered to have achieved End of Waste status as yet.</p> <ul style="list-style-type: none"> <li>▪ Emissions from the combustion of natural gas in the CHP unit during Phase 1 of the project will be in accordance with the Medium Combustion Plant Directive (MCPD).</li> <li>▪ All continuous and intermittent releases have been modelled using ADMAS dispersion software. The AQA and HHRA are provided in <i>Annex D&amp;E</i> respectively.</li> <li>▪ It is concluded that there will be no significant impacts to sensitive human and ecological receptors as a result of site operation.</li> <li>▪ Atmospheric emissions from the pyrolysis plant are continuously monitored using MCERTS certified CEMS equipment to ensure that emission limits are complied with.</li> <li>▪ All CEMS equipment and associated platforms and sampling ports installed on site will meet the requirements of the EA Technical Guidance Note M2. All CEMS equipment shall be MCERTS approved</li> </ul> |  |
| Emissions to Water | Groundwater / Geology / Surface Water | Waterborne | Low<br><br>Distance to sensitive receptors | High<br><br>Storage of high sensitivity substances onsite, eg. oil product | Moderate | <ul style="list-style-type: none"> <li>▪ There are no process emissions to controlled waters arising from the installation.</li> <li>▪ All process effluents, wastewater and liquid effluent are contained and tankered offsite for treatment or disposal.</li> <li>▪ Uncontaminated clean surface water runoff captured from roof drainage and external roadways / car parking areas will be discharged to the existing surface water drainage system.</li> <li>▪ Domestic foul flows will be directed to the existing sewer network.</li> <li>▪ All waste storage and handling takes place internally within the building. There are no drains within the building.</li> </ul>   | <b>LOW</b> due to the proposed management techniques and drainage arrangements |

|                   |                       |                |  |  |          |  |   |
|-------------------|-----------------------|----------------|--|--|----------|--|---|
|                   |                       |                |  |  |          | <ul style="list-style-type: none"> <li>▪ The storage of Pyoil is within dedicated oil tanks within a bunded tank farm. The bunding and containment is designed in accordance with CIRIA 736.</li> <li>▪ All process and storage areas are fully enclosed, therefore any spillages / runoff will be effectively contained within the bunding or building and tankered off site.</li> </ul>  |   |
| Emissions to Land | Groundwater / Geology | Spills / Leaks | Low<br><br>Site almost entirely underlain by impermeable concrete hardstanding | High<br><br>Storage of high sensitivity substances onsite, eg. oil product | Moderate | <ul style="list-style-type: none"> <li>▪ There will be no emissions to land arising from the proposed installation.</li> <li>▪ All waste storage and processing areas are fully enclosed, therefore any spillages / runoff will be effectively contained within the building and tankered off site.</li> <li>▪ Storage of oil externally is within dedicated tanks within a bunded tank farm designed in accordance with CIRIA 736.</li> <li>▪ All operational areas of the site are located upon impermeable concrete hardstanding preventing any spills/leaks reaching underlying geology and groundwater.</li> <li>▪ Spill kits are strategically located around site.</li> <li>▪ Minor spills to be cleaned up immediately, using spill kits. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary.</li> <li>▪ Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal. EA to be informed.</li> <li>▪ Although the risk from potentially polluting leaks and spillages at the site is low, in the event of a spillage immediate measures will be taken to contain and manage it in accordance with the above procedures.</li> </ul> | <b>VERY LOW</b><br>due to the proposed risk management techniques |

|       |                 |          |   |                          |          |   |   |
|-------|-----------------|----------|---|--------------------------|----------|---|---|
| Noise | Local Residents | Airborne | Moderate<br><br>Sensitive receptors in the vicinity at Premier Inn, however mitigated by periodic usage | Moderate<br><br>Nuisance | Moderate | <ul style="list-style-type: none"> <li>The plant has been designed to ensure that all noise emissions are abated and mitigated as far as reasonably possible.</li> <li>Any external plant or equipment will be fitted with appropriate attenuation to prevent disturbance to nearby receptors.</li> <li>The plant has been designed in accordance with best practice and to ensure that internal noise does not present an issue to the employees at the site under the Control of Noise at Work Regulations and to ensure that noise breakout does not lead to noise nuisance at the identified sensitive receptors.</li> <li>Appropriate preventative maintenance will be provided for the plant to ensure no deterioration of plant or equipment that would give rise to increases in noise.</li> <li>An Environmental Noise Impact Assessment has been undertaken in accordance with BS4142:2014+A1:2019 and concludes that site operations are unlikely to cause a significant impact at nearby receptors with the proposed attenuation in place. The NIA is provided in Annex F.</li> <li>The facility will not give rise to reasonable cause for annoyance. In the unlikely event that complaints are received measures described in the integrated management system will be put in place.</li> </ul> | <b>LOW</b> due to the proposed risk management techniques |
| Odour | Local residents | Airborne | High<br><br>Odorous activities are taking place onsite, namely oil                                      | Moderate<br><br>Nuisance | High     | <ul style="list-style-type: none"> <li>Waste feedstocks accepted onsite are clean, free from organic (food waste) materials, pre-processed plastic waste films – not by their nature inherently odorous.</li> <li>Wastes are delivered to site baled and immediately directed to the Reception Hall where they are unloaded and stored prior to</li> </ul>  | <b>LOW</b> – due to the proposed management techniques    |

|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
|  |  |  | <p>related processing and storage. Sensitive receptors in the vicinity at Premier Inn, however mitigated by periodic usage</p> |  |  | <p>processing. There is no external handling or storage of waste onsite.</p> <ul style="list-style-type: none"> <li>▪ The site has stringent waste acceptance procedures which will ensure that no odorous waste will be accepted onto site. Any potentially odorous waste loads are immediately rejected upon arrival in accordance with the sites waste rejection procedures. Should any odorous waste be mistakenly accepted, it will be transferred to the quarantine area and processed at the earliest opportunity.</li> <li>▪ The pyrolysis process itself is not considered odorous, with any odorous compounds within the syngas thermally destroyed prior to release.</li> <li>▪ It is acknowledged that there is odour associated with the oil condensing, separation and storage process.</li> <li>▪ The fundamental design of the facility has a hierarchy of odour control and abatement measures to ensure that the potential for odour impacts are eliminated.</li> <li>▪ Carbon filters are fitted to the oil tank breather vents to reduce fugitive VOC emissions.</li> <li>▪ Odour shall be monitored daily at points around the site boundary and observations shall be noted in the site diary and/or on a daily monitoring document.</li> <li>▪ Although it is considered that there is very little potential for odour complaints arising from site activities, any complaints will be immediately investigated and appropriate measures implemented if necessary.</li> <li>▪ The site has a dedicated Odour Management Plan, please refer to Annex J.</li> </ul> |  |
|--|--|--|--|--|--|--|--|

|        |                 |                        |   |  |          |  |  |
|--------|-----------------|------------------------|---|--|----------|--|--|
| Dust   | Local Residents | Airborne               | Low<br><br>Dust will not be generated by site activities            | Low<br><br>Dust will not be generated by site activities | Low      | <ul style="list-style-type: none"> <li>Permitted waste types do not include dusts, powders or loose fibres.</li> <li>All delivery / collection vehicles are covered.</li> <li>All waste processing and storage activities take place within an enclosed building.</li> <li>Pre-processing of wastes including shredding takes place internally. Localised dust extraction is fitted where required.</li> <li>There is no external operational activities that may generate dust.</li> <li>Char produced by the pyrolysis process is cooled and stored internally within a sealed container prior to export offsite.</li> <li>The site will employ good housekeeping practices to prevent build up of dust on plant and machinery.</li> </ul> | <b>LOW</b> due to the proposed risk management techniques      |
| Litter | Local Residents | Windborne              | Moderate<br><br>Waste plastic films are easily transported via wind | Moderate<br><br>Nuisance                                 | Moderate | <ul style="list-style-type: none"> <li>There is no external handling or storage of waste onsite.</li> <li>Waste plastic film is delivered baled in curtain sided trailers. Unloading, storage and processing activities take place internally within the building.</li> <li>The building is fitted with fast action roller shutter doors.</li> <li>The site shall be inspected daily by the site manager and any litter or accumulated debris shall be dealt with immediately.</li> </ul>  | <b>LOW</b> due to the proposed risk management techniques      |
| Pests  | Local residents | Airborne and migration | Low<br><br>Unlikely   | Moderate<br><br>Nuisance                                 | Low      | <ul style="list-style-type: none"> <li>Pests are not likely to become a problem on site.</li> <li>Monitoring for evidence of pests is included during the daily site perimeter inspection.</li> <li>However, if a problem does develop, reasonable measures will be taken to use commercially available products and services to control pests.</li> </ul>   | <b>VERY LOW</b> due to the proposed risk management techniques |

|              |                                     |           |   |  |      |   |  |
|--------------|-------------------------------------|-----------|---|--|------|---|--|
|              |                                     |           |   |  |      | <ul style="list-style-type: none"> <li>If a particular waste is determined to be the cause of a problem it shall be removed from site at the earliest available opportunity and consideration given to mitigation measures that may be implemented before any more waste from that source is accepted on site.</li> </ul>   |  |
| Vandalism    | Operator                            | Direct    | Low<br><br>Unlikely                                 | Low - High<br><br>Nuisance, damage or fire | Low  | <ul style="list-style-type: none"> <li>The site is manned 24/7.</li> <li>The site will be well lit and secured by a perimeter fence.</li> <li>Gates and fencing are inspected daily by operations staff to identify deterioration and damage and the need for repair.</li> <li>Fencing is maintained and repaired to ensure continued integrity. If damage is sustained, repair will be made within the same working day. If this is not possible, suitable measures will be taken to prevent unauthorised access to the site and permanent repairs will be affected as soon as is practicable.</li> <li>All visitors to the site are required to register in the visitor's book and sign out again on exit, thereby minimising the risk of unauthorised visitors on the site.</li> <li>Operational procedures have been implemented including regular inspections, ensuring continual monitoring of security provision at the site.</li> </ul> | <b>VERY LOW</b> due to the proposed risk management techniques |
| Fire on site | Operator/<br>Residential Properties | Windborne | Moderate<br><br>Ignition sources are present onsite | High<br><br>Fire and damage                | High | <ul style="list-style-type: none"> <li>The site will be operated in accordance with a dedicated Fire Prevention Plan – please see Annex I.</li> <li>The building is equipped with a dedicated fire detection and suppression system.</li> <li>All waste storage is in accordance with EA guidance including pile sizes and storage times.</li> </ul>  | <b>LOW</b> due to the proposed risk management techniques      |

|                        |                                  |  |     |                              |     |  |  |
|------------------------|----------------------------------|--|-----|------------------------------|-----|--|--|
|                        |                                  |  |     |                              |     | <ul style="list-style-type: none"> <li>▪ Waste onsite has a low risk of combustion due to the rapid turnaround time onsite.</li> <li>▪ The site has a regular inspection and maintenance programme which identifies any electrical or mechanical machinery faults which could result in a machinery fire.</li> <li>▪ Arson by intruders is controlled via 24/7 security and perimeter fencing.</li> <li>▪ The site is well lit and secured to prevent unauthorised access.</li> <li>▪ Machinery is regularly cleaned to remove any dust, etc.</li> <li>▪ All necessary equipment on site is equipped with dedicated fire suppression.</li> <li>▪ The site has 2 x dedicated firewater tanks of 200,000 litre capacity each for suppression.</li> <li>▪ The potential for sparks is regularly monitored by site staff.</li> <li>▪ The risk of damaged or exposed electrical cables is controlled via the regular inspection and maintenance programme.</li> <li>▪ Staff and visitors are only permitted to smoke within the designated smoking area. There is no smoking permitted within the operational area of the site.</li> <li>▪ All contaminated firewater will be contained on site and tankered off site for removal.</li> </ul> |  |
| Incompatible Feedstock | Operator/ Residential Properties | If incorrect waste is accepted on site, it could result in adverse emissions / breaking of equipment | Low | Low Nuisance / contamination | Low | <ul style="list-style-type: none"> <li>▪ The following methods will be implemented to ensure that incompatible feedstocks do not compromise the safe operation of the plant:                             <ul style="list-style-type: none"> <li>○ All waste accepted onto site have been subject to 'pre-acceptance' in accordance to an established procedure;</li> <li>○ All waste is accepted in accordance with an established procedure;</li> </ul> </li> </ul>   | <b>VERY LOW</b> due to the proposed risk management techniques |

|  |  |  |  |  |  |   |  |
|--|--|--|--|--|--|---|--|
|  |  |  |  |  |  | <ul style="list-style-type: none"><li>○ Any non-conforming waste will be removed prior to acceptance in accordance with an established procedure.</li><li>▪ Records of incidents involving incompatible substances will be kept on site together with a summary of the remedial action taken.</li></ul> |  |
|--|--|--|--|--|--|---|--|

## 5.2 Climate Change Risk Assessment

| Hazard   | Risk  | Vulnerability   | Consequence(s)  | Risk Management and Adaption Techniques   | Likelihood of Occurrence after Adaption | Overall Risk (following Mitigation) |
|--|---|---|---|---|---|-------------------------------------|
| <p>Summer Daily Maximum Temperature: UK Gov state that this may be around 7°C higher compared to average summer temperatures now, with the potential to reach extreme temperatures as high as over 40°C with increasing frequency based on today's values.</p> |   |   |   |   |   |                                     |
| <p><b>Impact 1:</b> Greater potential for odour and pest from received and stored wastes</p>   | <p><b>Medium to Low</b><br/>All wastes handled on site are pre-treated and notionally devoid of putrescible waste material. Warmer weather likely to increase the temperatures of incoming wastes and increase potential for odour and vermin. Potential for an increase in complaints</p>                            | <p><b>Medium</b><br/>The site has little control over the upstream waste supplies.</p>  | <p>Increased internal odour and potential for offsite odour escape.<br/>Increased flies and vermin.</p>                         | <ul style="list-style-type: none"> <li>Company operates odour management plan as part of the existing EMS systems.</li> <li>Pest control contract will be maintained and monitored and if necessary increased proportionate to the increased observation of vermin.</li> <li>Waste Inventory is only ever approximately 1 week. In the event of a long-term breakdown or shutdown, the waste inventory is minimised and/or removed to another location for disposal.</li> </ul> | <p>Low</p>                              | <p>Low</p>                          |
| <p><b>Impact 2:</b> Increased Risk of Fire, depending on waste storage and management</p>  | <p><b>Medium to Low</b><br/>All wastes handled on site are pre-treated and notionally devoid of putrescible waste material that is likely to be prone to self-heating and run-away thermal event. Site is fitted with fire suppression and deluge systems that will effectively control any fires that may arise.</p> | <p><b>Low</b><br/>The site has comprehensive fire monitoring, detection and suppression systems to ensure that the risk of fire is minimised.</p> | <p>Increased potential for elevated waste pile temperatures within the reception hall.<br/>Increased risk of internal fire.</p> | <ul style="list-style-type: none"> <li>Effective Site Fire Prevention Plan.</li> <li>Effective site fire protection measures.</li> <li>All site fire protection systems backed up on emergency generators.</li> </ul>   | <p>Low</p>                              | <p>Low</p>                          |

|  |   |   |   |  |            |            |
|--|---|---|---|--|------------|------------|
|  | Feedstock is only stored on site for approximately 5 days (max 3 months) before it is consumed.   |   |   |  |            |            |
| Winter Daily Maximum Temperature: UK Gov state that this could be 4°C high than the current average with the potential for more extreme temperatures, both warmer and cooler than present  |   |   |   |  |            |            |
| <b>Impact 1:</b> Extremely cold temperatures could lead to pipes freezing and associated process disruption. But risks are likely to be low due to most pipework being internal. The main risk is likely to be freezing of condensate from air-cooled condensers, particularly under lower plant load. | <b>Medium</b><br>The site has a number of external water systems and condensate pipelines that are vulnerable to freezing. Site uses water treatment chemicals that have freezing points that are above 0°C. Fire water systems are vulnerable to freezing and being ineffective. | <b>Low</b><br>All key water treatment chemicals are stored internally within the building. All fire water systems and pumps are trace heated and inspected daily.   | Restricted access to site by waste delivery vehicles due to access flooding. Restricted access to site by staff due to access flooding. Plant shut down safely until such a time it can resume operation. | Extreme swings of temperature will increase the reliance on the trace heating and monitoring systems but will not change the way that the site operates. <ul style="list-style-type: none"> <li>Site Maintenance Procedures on all critical systems</li> <li>The DCS system monitors all water and chemical systems to ensure that trace heating and temperatures are maintained at correct levels.</li> <li>Site operated Winterisation Protocols for all key plant.</li> </ul>                                   | <b>Low</b> | <b>Low</b> |
| Daily Extreme Rainfall: UK Gov state that rainfall intensity could increase by up to 20% on today's values   |   |   |   |  |            |            |
| <b>Impact 1:</b> Flooding could lead to increased site surface water and flash flooding, leading to: <ul style="list-style-type: none"> <li>Damage to on-site equipment;</li> <li>Possible flooding of the waste bunker.</li> </ul>  | <b>Low</b><br>The site is located in a Flood Risk 1 zone and is therefore has a low potential for flooding.   | <b>Low</b><br>The site is considered to have been designed with flood risk mitigation in mind. In the event that the site is overwhelmed by flood water the plant can be safely evacuated with minimal impact to the environment. | <ul style="list-style-type: none"> <li>Critical failure of plant</li> <li>Failure of chemical systems</li> <li>Failure of firewater systems</li> <li>Failure of Air-Cooled Condenser</li> </ul>           | Extreme rainfall has the potential to impact the operation of the site and prevent material being collected and delivered to site. <ul style="list-style-type: none"> <li>Plant can be safely shut down until such a time it is safe to operate.</li> <li>Site maintains emergency control plans in the event of very high rainfall which includes; <ul style="list-style-type: none"> <li>Safe plant shutdown and staff evacuation</li> <li>Control of Wastes</li> <li>Business continuity</li> </ul> </li> </ul> | <b>Low</b> | <b>Low</b> |

|  |  |  |  |  |                   |                   |
|--|--|--|--|--|-------------------|-------------------|
| <p><b>Impact 2:</b> The site may experience flash flooding issues. The capacity of surface water discharge points may become overwhelmed.</p>              | <p><b>Low</b><br/>                 See above. The site is located within Flood Zone 1 and has been designed with flood mitigation in mind.</p>   | <p><b>Low</b><br/>                 The site is considered to have been designed with flood risk mitigation in mind. In the event that the site is overwhelmed by flood water the plant can be safely evacuated with minimal impact to the environment.</p> | <p>The site drainage system can be isolated.</p> | <ul style="list-style-type: none"> <li>• Increased rainfall and flash flooding have the potential to impact the operation of the site and prevent material being collected and delivered to site.</li> <li>• All drainage systems can be isolated.</li> <li>• Site maintains emergency control plans in the event of very high rainfall which includes;                         <ul style="list-style-type: none"> <li>◦ Safe plant shutdown and staff evacuation</li> <li>◦ Control of Wastes</li> <li>◦ Business continuity</li> </ul> </li> </ul> | <p><b>Low</b></p> | <p><b>Low</b></p> |
| <p><b>Impact 3:</b> Potential for contaminated floodwater or surface water run-off from site causing pollution.</p>  | <p><b>Low</b></p>  | <p><b>Low</b><br/>                 The site is considered to have been designed with flood risk mitigation in mind. In the event that the site is overwhelmed by flood water the plant can be safely evacuated with minimal impact to the environment.</p> | <p>The site drainage system can be isolated.</p> | <p>All contaminated site water can be contained and isolated on site. All chemicals are stored internally.</p>   | <p><b>Low</b></p> | <p><b>Low</b></p> |
| <p><b>Impact 4:</b> Other related extreme daily rainfall events may damage building structures, with increased potential for fugitive odour emissions.</p> | <p><b>Low</b><br/>                 The site is a modern construction with high quality buildings and minimal opportunity for damage. All buildings are inspected regularly under the sites O&amp;M contract.</p> | <p><b>Low</b><br/>                 The site is considered to be well designed with well-constructed buildings and infrastructure.</p>  | <p>N/A</p>                                       | <p>Site O&amp;M contractor responsible for inspection and upkeep of all buildings.</p>   | <p><b>Low</b></p> | <p><b>Low</b></p> |

Average winter rainfall; UK Gov state that the Average winter rainfall may increase by over 40% on today's averages.

|  |   |  |   |   |                   |                   |
|--|---|--|---|---|-------------------|-------------------|
| <p><b>Impact 1:</b> This could lead to localised site flooding causing:</p> <ul style="list-style-type: none"> <li>• Damage to the on-site equipment.</li> <li>• Possible flooding of waste reception</li> </ul> | <p><b>Low</b></p> <p>The site is located in Flood Zone 1 and is therefore has a low potential for flooding. Site has been designed with flood risk in mind and has the following measures included in the basic design of the infrastructure.</p> | <p><b>Low</b></p> <p>The site is considered to have been designed with flood risk mitigation in mind. In the event that the site is overwhelmed by flood water the plant can be safely evacuated with minimal impact to the environment.</p> | <ul style="list-style-type: none"> <li>• Critical failure of plant</li> <li>• Failure of chemical systems</li> <li>• Failure of firewater systems</li> <li>• Failure of Air-Cooled Condenser</li> </ul> | <p>Extreme rainfall has the potential to impact the operation of the site and prevent material being collected and delivered to site.</p> <ul style="list-style-type: none"> <li>• Site Waste Reception typically stored 5 days of materials.</li> <li>• Plant can be safely shut down until such a time it is safe to operate.</li> <li>• Site maintains emergency control plans in the event of very high rainfall which includes;                             <ul style="list-style-type: none"> <li>○ Safe plant shutdown and staff evacuation</li> <li>○ Control of Wastes</li> </ul> </li> <li>• Business continuity</li> </ul> | <p><b>Low</b></p> | <p><b>Low</b></p> |
|--|---|--|---|---|-------------------|-------------------|

Sea level rise: UK Gov state that sea level rise which could be as much as 0.6m higher compared to today's level.

|   |  |   |   |   |                   |                   |
|---|--|---|---|---|-------------------|-------------------|
| <p><b>Impact 1:</b> If located near the coast, a site could experience increased:</p> <ul style="list-style-type: none"> <li>• Risk of flooding and associated impacts</li> <li>• Corrosion due to increase in saltwater spray</li> </ul> | <p>The site is not located in close proximity to the coast.</p>  | <p>N/A</p>  | <p>N/A</p>  | <p>N/A</p>  | <p>N/A</p>        | <p>N/A</p>        |
| <p><b>Impact 2:</b> There could be localised issues with surface water discharge, leading to backing up and worsening site flooding.</p>  | <p><b>Medium</b></p> <p>Please refer to the findings and conclusions relating to extreme rainfall.</p> | <p><b>Low</b></p> <p>Please refer to the findings and conclusions relating to extreme rainfall.</p> | <p>Please refer to the findings and conclusions relating to extreme rainfall.</p> | <p>Please refer to the findings and conclusions relating to extreme rainfall.</p> | <p><b>Low</b></p> | <p><b>Low</b></p> |

Drier Summers: UK Gov state that summers could see potentially up to 40% less rain than now.

|   |   |  |  |   |                   |                   |
|---|---|--|--|---|-------------------|-------------------|
| <p><b>Impact 1</b><br/>                 Potential increased use or reliance on mains water for dust suppression and cleaning.</p>   | <p><b>Low</b><br/>                 All waste is stored and processed internally.</p>  | <p>Low: The site does not have extensive road networks and has no requirement for external dust suppression.</p> | <p>Potential for offsite dust releases due to local winds and gusts.</p> | <p>Site will routinely monitor the site for dust emissions. All buildings are operated with the doors closed. All conveyor systems are enclosed, sealed and fitted with extraction.</p> | <p><b>Low</b></p> | <p><b>Low</b></p> |
| <p><b>Impact 2</b><br/>                 There is an increased reliance on potable water for IBA bottom ash quenching</p>  | <p>N/A</p>  | <p>N/A</p>   | <p>N/A</p>   | <p>N/A</p>  | <p>N/A</p>        | <p>N/A</p>        |
| <p><b>Impact 3</b><br/>                 There is more likely to be dust generated from the ash produced at site.</p>  | <p><b>Low</b><br/>                 All ash and char is stored internally prior to export.</p>                                       | <p>Low: Internal production and handling of APCr and char</p>  | <p>Potential for offsite dust releases due to local winds and gusts.</p> | <p>Site will routinely monitor the site for dust emissions. All buildings are operated with the doors closed. All ash and char is stored in sealed containers prior to export.</p>      | <p><b>Low</b></p> | <p><b>Low</b></p> |
| <p>River Flow: The EA State The flow in the watercourses could be 50% more than now at its peak, and 80% less than now at its lowest.</p>   |   |  |  |   |                   |                   |
| <p><b>Impact 1:</b> The occurrence is likely to be low as Energy from Waste (EfW) plant is not a high-water user and only clean surface water is discharged to water course (with any on-site effluent discharged to foul sewer) other than two hazardous waste incinerators which discharge treated effluent to watercourse.</p> <p>The mitigation would be to monitor and review the situation.</p> | <p><b>Low</b><br/>                 The site does not extract river water or discharge directly to any controlled water courses.</p> | <p>N/A</p>   | <p>N/A</p>   | <p>N/A</p>  | <p>N/A</p>        | <p>N/A</p>        |

|  |  |   |            |  |                   |                   |
|--|--|---|------------|--|-------------------|-------------------|
| <p><b>Impact 2</b><br/>                 At low flow there is likely to be increased stress on a river if the plant is discharging into it.</p>   | <p><b>Low</b><br/>                 The site does not extract river water or discharge directly to any controlled water courses.</p>  | <p>N/A</p>  | <p>N/A</p> | <p>N/A</p>   | <p>N/A</p>        | <p>N/A</p>        |
| <p>Storms<br/>                 Storms could see a change in frequency and intensity. The unique combination of increased wind speeds, increased rainfall, and lightning during these events provides the potential for more extreme storm impacts.</p> |  |   |            |  |                   |                   |
| <p><b>Impact 1</b><br/>                 Storms and high winds could damage building structures with increased potential for fugitive odour emissions.</p>  | <p><b>Low</b><br/>                 The site is a modern construction with high quality buildings and minimal opportunity for damage. All buildings are inspected regularly under the sites O&amp;M contract.</p> | <p><b>Low</b><br/>                 The site is considered to be well designed with well-constructed buildings and infrastructure.</p> | <p>N/A</p> | <p>Site O&amp;M contractor responsible for inspection and upkeep of all buildings.</p> | <p><b>Low</b></p> | <p><b>Low</b></p> |

