Polyethylene Terephthalate Plastics Recycling Facility (PETPRF) Environmental Risk Assessment Review

Client: Enviroo Project Company Ltd

Ref No.: K0419-AYE-R-ENV-00002
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Content

[1] Introduction

[1.1] Report Context

Ayesa were commissioned by Enviroo Project Company Ltd (Enviroo) to prepare an application for an Environmental Permit to operate a Plastic Recycling Facility (PRF).

This Environmental Risk Assessment (ERA) report has been prepared to support the Permit application. This risk assessment has been undertaken using current Environment Agency (the Agency) Guidance on risk assessments for your environmental permit issued as web-based guidance[1]. The guidance referenced identifies a five-step process to risk assessments which can be summarised as:

- Identify and consider risks and the sources of the risks;
- Identify the receptors at risk;
- Identify the possible pathways from the sources of the risks to the receptors;
- Assess risks relevant to the activity and check they are acceptable and can be screened out; and
- State what controls will be in place if the risks are too high.

The guidance indicates that the following parameters require assessing:

- Any discharge, for example process water to surface or groundwater.
- Accidents.
- Odour.
- Noise and vibration.
- Uncontrolled or unintended 'fugitive' emissions e.g. dust, litter, pests and pollutants that should not be in the discharge.

The following parameters do not require assessing as they are not identified as a potential risk associated with the operation of a PRF.

- visible emissions, for example smoke or visible plumes
- release of bioaerosols, for example from shredding, screening and turning, or from stack or open point source release such as a biofilter

The Agency guidance requires information to be presented in the form of risk assessment tables, one table each for odour, noise and fugitive emissions. Identification of accidents scenarios and their prevention through operation management should also be detailed. Each table should identify the hazard, the potential receptors and the pathway from the hazard to those receptors. The tables

[1] Risk assessments for your environmental permit - GOV.UK (www.gov.uk)

should also include the preventative risk management practice to be employed along with an assessment of the mitigated risk.

The following risk assessments and management plans have been sent with this application:

- Air Emissions Risk Assessment (attached as Appendix B)
- Odour Management Plan (report reference: K0419-AYE-R-ENV-00004)
- Fire Prevention Plan (report reference: K0419-AYE-R-ENV-00007)
- Noise Impact Assessment and Noise & Vibration Management Plan (report reference: K0419-AYE-R-ENV-00006)

[1.2] Site Location

The site is located at Plot 13 of Protos Plastic Park part of the wider Protos Recovery Park located at Ince Marshes. The recovery park covers an area of approximately 54 hectares with various waste and energy industries occupying plots. Adjacent plots comprise a glass bottle manufacturing plant, resource recovery facility and biomass facility. The plastic park will comprise various plastic recycling and recovery facilities and a plastic to hydrogen facility.

The site occupies an area of approximately 2.3 hectares and is located approximately 1.6km east of the town of Ince, and 1.1km northeast to the town of Elton, within a mixed industrial and semi-rural setting. The site address is Enviroo Project Co., Marsh Lane, Ince, CH2 4FP at approximate National Grid Reference 346508 376458.

The site lies at circa 8m AOD. There is a fall from west to east with the western boundary at approximately 9m AOD and the eastern boundary at 4.5m AOD. The northern boundary is formed by Marsh Lane, to the northwest is Protos Plot 10b and to the south a restricted byway (public right of way), which runs adjacent to Grinsome Road. The eastern boundary is located approximately 20m from the restricted byway which links to Marsh Lane to the northeast of the site.

The Environmental Permit Boundary is shown on drawing reference. K0419.1.001.

[1.3] Site Layout

Access is via Marsh Lane to the north of the site. The PRF will comprise a portal framed modular build warehouse building with a pitched roof approximately 170 m in length, 45 m in width and at its highest point will be 17.45 m (PRF building).

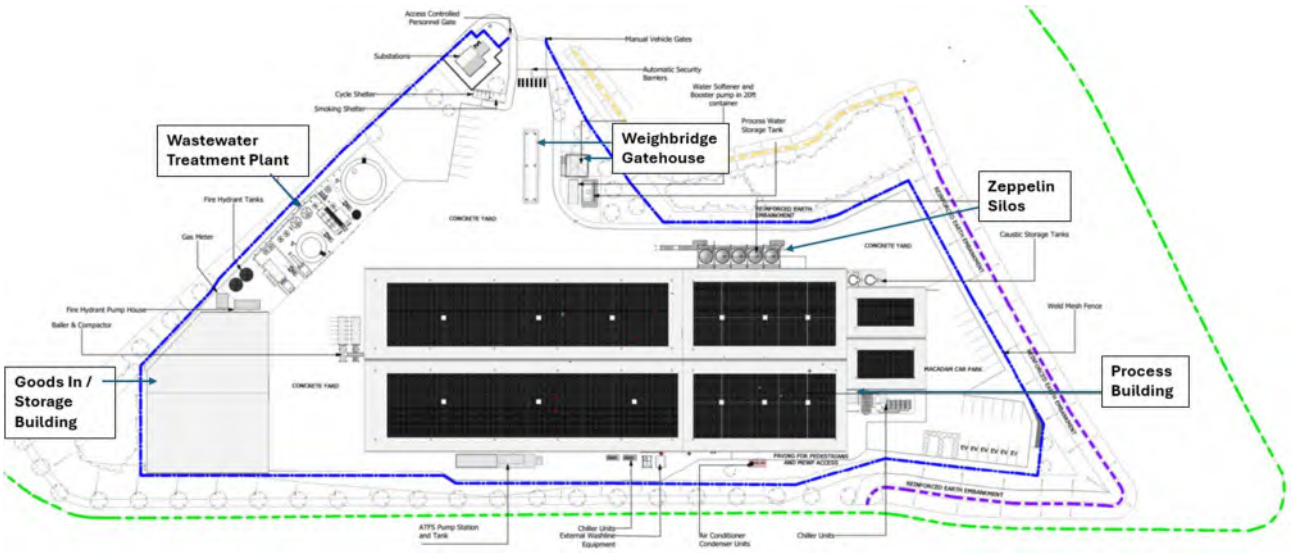
The PRF building will have five vehicular access doors, two on the northern aspect, one on the southern aspect and two on the western aspect to allow delivery of waste plastic and the export of rPET and waste materials. The site layout is shown on drawing reference 250064-WDK-XX-XX-D-A-0400 entitled Proposed Site Layout dated 21 May 2025. A feedstock area is to be located in a separate goods in / storage building to the west of the PRF building.

A weighbridge and gatehouse will be located adjacent to the site entrance to the north and off Marsh Lane.

To the northwest of the site will be the Wastewater Treatment Plant (WwTP).

An extract of the site layout is provided below at Figure 1.

Figure 1 Site Layout Extract



[1.4] Site Drainage

The Protos Recovery Park (PRP) Flood Risk Assessment and Surface Waste Management Plan dated December 2021, submitted to discharge condition 23 of the PRP planning permission, describes the approach adopted to the strategic drainage scheme for the wider recovery park and to describe changes that had occurred since 2018. The scheme includes provision for surface water flows from Plot 13. This was subsequently revised in December 2023 (Report Ref: 70047912-P2-RP-FRA23) which is pending approval. The 2023 update is to align the latest ecological mitigation design changes and reflect as-built storage capacity. The report validates the flood storage compensation and proposed site levels for flood protection whilst confirming that the surface water from the recovery park is effectively managed. The drainage ditches encompassing the recovery park comprise of SuDs treatment via a swales and attenuation basins.

The site's surface will comprise impermeable kerbed concrete hardstanding with sealed drainage that will collect surface water in a sealed drainage system. Surface water will pass through silt chambers designed to capture sediment and other pollutants and finally through a Full Retention Separator prior to discharge off-site. Penstock valves will be in place to enable the surface water system to be isolated for cleaning or repairs, and in the event of a pollution incident or fire. Penstock valves can be automated or manually operated. Surface water will be discharged into the surface water ditch which runs around the north, east and southern boundary of the site. This ditch is part of the larger PRP drainage network. The drainage ditches form part of a network of main rivers and ordinary watercourses that form part of the Ince Marshes catchment and are drained by the Agency operated surface water pumping station to the north of the site. The water in the drainage ditches eventually flow into the Mersey Estuary.

The recycling process is water intensive and process water will be recirculated with a portion being pumped to the on-site WwTP for physico-chemical and biological treatment prior to discharge off-site to surface water.

All surface water and treated process effluent will be discharged to surface water. A surface water risk assessment has been undertaken in support of this application to allow discharge into the drainage ditch around the perimeter of the site (Report Ref: K0419-AYE-R-ENV-00005).

[2] Scope of the Assessment

[2.1] Proposed operations

Enviroo (the Operator) propose to accept up to 35,000 tonnes per annum of baled waste plastic for processing for recovery. The processing includes sorting, shredding, grinding, heating, washing and drying to create a plastic pellet product which meets end of waste criteria specifically food grade recycled Polyethylene terephthalate (rPET) for the plastic manufacturing sector. Annual production of recycled plastic pellets is estimated at 17,500 tonnes. All activities will be confined within a new portal framed modular build warehouse with air extraction and treatment.

The plastic bales used in the process will be purchased from PRFs pre-sorted to ensure high PET content and minimum contamination. The plastic waste will be subject to sorting, at source and/or at a third-party materials recycling facility prior to receipt at the PRF and will be further segregated at the PRF.

The treatment includes screening and de-labelling, sorting and segregation, reduction in size and washing, flaking of PET material, drying and extrusion to a rPET product.

The treatment requires a large amount of process water, which is primarily reused. The remaining waste process water is proposed to be treated onsite within a WwTP prior to discharge to surface water. The PET will be separated from other types of plastics such as high-density polyethylene (HDPE), low-density polyethylene (LDPE) and polypropylene (PP). The washing process will remove contaminants from the plastic feedstock such as paper labels and residual liquids.

A summary of recycling process involving the following main processes is provided below:

- Delivery of baled plastic.
- Screening and delabelling.
- Sorting and segregation.
- Reduction in size of plastic waste and washing.
- Flaking of PET material and drying.
- Extrusion involving blending and heating of flakes to create a PET product.

The waste and final product storage arrangements will take place within the following areas.

- Goods in / storage building; and
- Final product storage area (Zeppelin Silos).

[2.1.1] Feedstock store

The goods in / storage building will be located to the west of the PRF building.

Six bays are to be located in the building. These will be 3-sided and constructed from 80 cm thick Legioblock walls. Bales are to be stacked pending treatment in a designated storage bay. The bays will be constructed from pre-cast concrete blocks up to 3.5. m. Bays 3 to 6 are to be used for

feedstock. Bays 1 and 2 will be used for waste bale storage and for storage of other waste such as flake reject bags, caps and labels bags, extruder waste.

[2.1.2] Final product storage

After treatment the final pelletised plastic product will either be gravity fed into 5 rPET pellet silos on the north of the building; or stored in bulk bags on racking in the PRF building. A maximum of 200 bags will be stored here.

Residual waste from the wash plant will be stored within either 20 and 40 m^3 RoRos and quarantined material to be stored in skips and/or bays.

[2.1.3] WwTP

The effluent to be discharged will be produced at an estimated rate of 240 m^3/day. The discharge will be produced as the final treated effluent from the Washing Plant process.

The process water will be treated via the following treatment technologies:

- Raw wastewater screening;
- Inlet screening;
- Flow and quality balancing;
- DAF separation system;
- Membrane Biological Reactor (MBR);
- Sand or activated carbon filtration; and
- Sludge dewatering for combing biological and DAF sludges.

[2.2] Potential Hazards

The proposed activities to be undertaken at the site result in the potential hazards of odour, noise & vibration, fugitive emissions of dust and point source emissions requiring further assessment to assess the impacts on human health or the environment. Each hazard will be addressed with regards to the process that causes the hazard.

[2.2.1] Discharges

The volume of effluent generated by the activities on site is limited by prioritising the reuse and recirculation of process water.

The following principles are to be applied to control emissions to water:

- water use should be minimised, and wastewater be reused where possible.
- contamination risk of process or surface water should be minimised
- Where any potentially harmful materials are used, measures should be taken to prevent them entering the water circuit.

There are no direct releases off-site other than via the engineered surface water drainage systems.

The site is to be located on impermeable reenforced concrete slab with sealed drainage to a minimum depth of 340 mm. The entire perimeter of the slab is to be kerbed.

[2.2.1.1] Surface water

Surface water sources will comprise:

- Roof runoff
- Yard and access road drainage
- Loading and unloading bays

Externally all surface water from the concrete slab will be collected via slot drains, yard gullies and channel drains and roof water will be collected in a series of separate drainage channels and pipework. Surface water will pass through silt chambers designed to capture sediment and other pollutants and finally through Full Retention Separator prior to discharge off-site. Penstock valves would also be included within the surface water drainage system to enable flows from the site to be isolated in the event of a major pollution incident / fire. No waste is to be stored external to the PRF building.

Surface water flows would discharge into a surface water ditch that flows around the northern, eastern and southern boundary of the site. This ditch forms part of the strategic drainage network developed for the consented Protos development area. The approved Protos Surface Waste Management Plan includes provision for surface water flows from the site. The surface water attenuation volumes provided for the plots, which includes Plot 13, are well in excess of the required volume to achieve greenfield runoff rates and also include an allowance for climate change. The surface water drainage system has penstock values that can be isolated in the event of a spill or contamination.

All drainage infrastructures will be inspected, maintained and repaired as necessary.

For potentially polluting substances comprising process water and treatment chemicals, containment measures will be in place as detailed in Section 2.2.2.3.

The site surface, drainage infrastructure, tanks and storage are to be subject to an inspection and maintenance programme. The inspection and any necessary maintenance required will be recorded. In the event that any damage breaches the integrity of the engineered containment so that it no longer meets the required standards, necessary remedial work will be completed immediately with a temporary solution, and a permanent solution will be implemented within 7 days. Any potential polluting substances subject to containment will be transferred or removed until containment has been rectified.

[2.2.1.2] Process water - Point source emission to surface water

Effluent in the process will drain via grade-level industrial floor gullies and sealed pipework, with interceptors where appropriate. Drainage lines are routed to a below-ground collection sump or holding tank with level control and solids screening. A pumping station will pump the collected sump pits and process water to the treatment plant. Process water is proposed to be treated in a WwTP. This will comprise a modular system which will treat process water via physical and biological treatment. There are no foul sewer connections at Protos. An option to discharge the foul drainage by gravity was investigated along with strategic foul pumping stations. However, these were found to be unviable, due to the flat nature of the site and its surrounding area, long distance from nearest existing foul sewer and the size of the Protos site. In addition, there were concerns regarding flooding. Any treated effluent will therefore be required to be discharge to surface water. It is proposed that any sewer discharge will be treated in two package treatment plants, one from the site

offices and one from the security office, with the treated water to be discharged to surface water. The WwTP has been designed to treat the process water with the discharge to meet BAT-AELs.

A surface water risk assessment (report reference: K0419-AYE-R-ENV-00005) has been prepared for the discharge of treated effluent from the site.

[2.2.2] Accidents

There are a number of hazards that have been identified at the site:

- Incompatible wastes
- Security and vandalism
- Loss of containment
- Plant Failure
- Flooding
- Fire

Polluting substances proposed to be stored / may arise will comprise the following:

- Treatment Chemicals for water treatment plant
- Process water prior to treatment
- Emergency firefighting water

[2.2.2.1] Incompatible wastes

Strict waste acceptance criteria will be in place to ensure only baled plastic is accepted at the site. Any non-conforming waste will be either immediately rejected or quarantined prior to export off site to a suitably permitted facility.

[2.2.2.2] Security and vandalism

The site will have a number of security measures in place to limit the likelihood of arson or vandalism including:

- The site will operate 24 / 7 and therefore will always be manned excluding public holidays.
- Perimeter fencing is to be installed with a gated entrance.
- The PRF building will have lockable vehicle access doors and entrances.
- All areas in which operations will be undertaken during the hours of darkness and inside the site building have adequate artificial lighting.
- CCTV to be installed with full coverage external and internal. 360° cameras are to be installed within the PRF and 180° cameras to be installed externally. Thermal cameras are to be installed within the feedstock store.
- Monitored alarm system for the PRF building.

- Inspection and maintenance procedures to check for any unauthorised access and/or damage.
- All visitors to sign in via weighbridge office.

[2.2.2.3] Loss of containment

All tanks and storage have been designed and are to be installed in accordance with CIRIA guidance, “Containment systems for the prevention of pollution: secondary, tertiary and other measures for industrial and commercial premises” dated 2014 and associated regulations. Chemicals used in the process and in the WwTP are to be stored in bunded areas within the chemical store located within the eastern section of the PRF building. This will ensure rainwater will not fill the containment bunds.

All containers/tanks will be double skinned and capable of containing at least 110% of the volume of the largest tank.

Loss of containment could lead to spillage and leakage of potentially contaminating liquids.

To prevent loss of containment and minimise the risk and impact of releases the following measures therefore will be implemented:

- Storage tank/container will be constructed to the appropriate British Standard and bunded to contain at least 110% of the volume of the tank/container.
- Regular inspections of all storage tanks/containers for integrity and any signs of spillage.
- Immediate action to clear any spills using spill kits available in the PRF building
- Plant and equipment monitored via the SCADA control system will be subject to Plant failure procedures.
- Pipework will be placed above ground and sealed.
- In the event of a major spillage, which is causing or is likely to cause polluting emissions to the environment, immediate action will be taken to contain the spillage and prevent liquid from entering surface water or drains. Isolating chambers and penstock values will be in place to enable the surface water system to be isolated in the event of a pollution incident or fire. These will either be manually operated or connected to an automated spill detection system. The spillage will be cleared immediately and placed in containers for offsite disposal, and the Agency will be informed.

The site surface, drainage infrastructure, tanks and storage are to be subject to an inspection and maintenance programme. The inspection and any necessary maintenance required will be recorded. In the event that any damage breaches the integrity of the engineered containment so that it no longer meets the required standards, necessary remedial work will be completed immediately with a temporary solution, and a permanent solution will be implemented within 7 days. Any potential polluting substances subject to containment will be transferred or removed until containment has been rectified.

[2.2.2.4] Plant failure

The Environmental Management System (EMS) will contain a maintenance regime for all plant and equipment in accordance with manufacturers recommendations. Inspection and maintenance procedures are in place to ensure that all plant and equipment are operating as designed and are in

good repair. The machinery and equipment will be maintained in line with Enviroo's maintenance procedure.

All plant and equipment will receive annual Lifting Operations and Lifting Equipment Regulations (LOLER) and Provision and Use of Work Equipment Regulations (PUWER) inspections. Daily checks will be carried out on all mobile plant and any findings recorded in the site diary. All mobile and fixed plant servicing and maintenance will be carried out as per the manufacturer's instructions. Any defects that might harm the environment will be entered into the site incident management system.

The PRF process equipment is controlled by a Supervisory control and data acquisition (SCADA) control system which comprises networked data communications and graphical user interfaces for high-level supervision of machines and process. This includes sensors and other alarms such as programmable logic controls which interface with process plant machinery and WwTP. The SCADA control system provides alarm history and alarm configurations to inform maintenance and repairs of the equipment were identified and required.

In the event of plant or equipment failure all activities will be suspended until a temporary solution and/or permanent solution can be undertaken. Immediate repairs will be made for process critical plant and equipment where possible. In the event the activities require a prolonged period of suspension (over a working day) the contingency plan will be activated to effectively divert wastes from the site until such a time activities may commence on repair of the plant and equipment.

[2.2.2.5] Flooding

The Flood Map for Planning identifies that the site lies within a Flood Zone 3 which is defined as 'Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding'. The flood map for planning however identifies that the site benefits from flood defences and as such the probability of flooding is reduced. The most recent assessment of flood risk is contained within the Protos, Surface Water Management Plan (SWMP) dated 2023. The SWMP requires floor levels to be set at a minimum of 5.063 m AOD and access roads set no lower than 4.763 m AOD. The development platform level of the site is to be set at 6.45 m AOD above the prescribed levels. It should also be noted that it is proposed to raise finished floor levels of the PRF building 150mm above the surrounding hard standing to ensure that overland flow of water during storm events does not flood the building.

[2.2.2.6] Fire

A Fire Prevention Plan (FPP) (Report Ref: K0485-AYE-R-ENV-00007) has been prepared for the PRF which will form part of the EMS.

The FPP has been prepared in accordance with the Agency's guidance for FPPs and details the required mitigation and management methods to prevent a fire of combustible materials stored on site. The information contained within the FPP aims to meet the 3 main objectives of the EA FPP Guidance:

- Minimise the likelihood of a fire happening;
- Aim for a fire to be extinguished within 4 hours; and
- Minimise the spread of fire within the site and to neighbouring sites.

The site accepts only baled plastic waste which is combustible. Wastes after treatment requiring storage include reject plastic, labels, bottle caps and other incidental amounts of waste. The site proposes to install a comprehensive fire detection and fire suppression system within the PRF

building and feedstock storage area. A firewater tank and associated pumps would also be located to the east of the PRF building. The firewater tank would provide water supply to the automatic deluge system which is to be installed within the PRF building.

[2.2.3] Odour emissions

Plastic wastes are not malodorous. Plastic bottles may contain organic residues which could have the potential for odour. All incoming waste is subject to strict waste acceptance procedures.

Due to the design of the building structure, the enclosed processing activities and the nature of the waste feedstock materials stored and processed on site, there is very little potential for offsite odour emissions and impacts to arise from the site.

The waste plastic material is stored in waste storage bays within the feedstock store which comprises an enclosed building. Plastic bales are only to be stored for a maximum of 14 days prior to treatment but are usually processed continually.

The process water to be treated will contain high biological components as a result of the washing process. The treatment to be undertaken includes both physico-chemical and biological treatment. The Dissolved Air Flotation (DAF) water treatment process is a physical and chemical technology for the effective removal of biological solids from a wide range of industrial wastewaters to maintain environmental compliance and reduce trade effluent charges. Biological treatment will comprise of the membrane bioreactor (MBR).

The treatment is based on aerobic treatment which is utilised for the control of odour.

The main odour control of the WwTP is ensuring the WwTP is operating as designed and to ensure anaerobic conditions do not occur. During the DAF aeration process some solids will settle on the bottom of the tank which will require frequent removal. Careful management of pH and temperature will be required through the treatment process. Probes will enable continual monitoring of pH and temperature and allow correction where required.

Failure to adequately inspect and maintain plant and equipment is also a contributory cause to fugitive emissions, e.g. leaks from pumps or damage to enclosed containers.

The sludge storage tank may pose a risk of odour. The storage tank is fully enclosed. The sludge will be dewatered within 48 hours and the dry filter fake stored in an enclosed skip prior to transfer off-site.

As a result of the treatment technologies to be employed comprising aerobic treatment it is considered that the odour source from the WwTP will be limited subject to appropriate controls as detailed in the Odour Management Plan (OMP) (report reference: K0419-AYE-R-ENV-00004).

[2.2.4] Noise and Vibration

A Noise Impact Assessment (NIA) was undertaken by Noise and Vibration Consultants Ltd on 16th December 2025 (Report Ref: R20.1001/DRK).

The NIA was undertaken in accordance with the following British Standards:

- BS4142: 2014+A1: 2019 ‘Methods for rating and assessing industrial and commercial sound’.
- BS5228-1: 2009+A1: 2014 ‘Code of practice for noise and vibration control on construction and open sites’.

- World Health Organisation (WHO) Guidelines for Community Noise: April 1999.
- BS8233: 2014 'Guidance in sound insulation and noise reduction for buildings'.

The aim of the NIA was to provide information and advice on the following:

- Typical operating noise levels from the sites plant based on information from the Technology Providers.
- Typical background and residual sound levels at nearest sensitive receptors from noise monitoring data undertaken in November 2018 by Enzygo Environmental Consultants.
- Construction noise levels to demonstrate compliance with Condition 23 of existing planning permission for the Proposed Development (ref. 20/04396/FUL).
- Advise of any operations that are shown to exceed the appropriate and relevant noise criteria and where appropriate provide recommendations.

The NIA concluded that the proposed operation of the site would generate noise levels within relevant noise standards and guidance and existing planning consent noise condition limits at nearest sensitive receptors and therefore noise would be not significant.

Noise limits are applied in condition 25 of the Planning Permission 20/04396/FUL dated 12 May 2021. The condition states:

All operational noise emissions from the facility shall be controlled using individual plot boundary noise emissions limits to provide overall compliance with the following noise control objectives

Table 1 Noise Limits from Planning Permission

Noise sensitive receptor locations	Daytime noise levels Laeq(1hour) 0700 - 2300	Nighttime noise levels Laeq(5mins) 2300 - 0700
Holme Farm	52	41
Station Road - North of Kemira Road	48	41
Duke of Wellington	40	35
Ince Orchards	45	41
Redwoods Drive, Elton	51	37

Reason: To limit the impact on the residential and local amenity and in the interest of protecting local amenity and to protect future amenity of other Plots.

The process and goods in facility will be fitted within a purpose-built building having cladding to a minimum weighted sound reduction index Rw of 24dB.. In addition, the grinder used to flake the recycling plastic will be mounted with an acoustically treated enclosure.

A Noise and Vibration Management plan (NVMP) (Report Ref: K0419-AYE-R-ENV-00006) has been prepared and submitted with this application. The NVMP will form part of the sites Operating Techniques to control and manage noise.

[2.2.5] Fugitive Emissions of Dust, Litter, Pests and Pollutants

[2.2.5.1] Dust

The waste types to be accepted, limited to baled waste plastic are unlikely to produce fugitive dust emissions. Storage and treatment are undertaken in an enclosed building operated under negative pressure. All plastic bales are delivered directly into the feedstock store. The plastic recycling

process is to be undertaken within the PRF building. The doors are electrically operated fast acting roller shutter doors and are only opened for entry and exit.

The PRF process will produce fine product material rPET pellets and flake and has the potential to generate fugitive emissions to air of dust. The enclosed buildings are ventilated to provide a safe working environment. Processes that have the potential to create dust will be contained and extracted via designated air extraction systems.

During treatment the granulation process is undertaken with water. Water is introduced at the granulation stage which will limit liberation of small particulates. Any fines and particulates that arise from the treatment will be contained via air extraction systems to be installed. Particle size management via screening and granulation of oversized to 8 to 12 mm and final de-dusting of flake is undertaken using air jets and baghouse filter systems containing any potential emissions. Label removal is via wet attrition during the pre-wash preparation and sorting. Air is used to remove residual label material during the washing process. During the PET flake drying process when the PET flakes are to be dewatered in high-speed centrifugal spinner and thermal drying using fluid bed dryer to reduce moisture content air will be collected.

Two low nitrogen oxides natural gas fired steam generating boilers will provide onsite process heating, each with an individual net rated thermal input of 947 kWth.

A dust extraction system would also serve the entire housed treatment process comprising two separate purpose-built extraction and abatement systems, each comprising Local Exhaust Ventilation (LEV) (extracting air from the process areas), abatement system and a dispersion stack. The two LEVs with associated external emissions of ‘dust’ or ‘particulates’ are:

- LEV1 - ‘Sorema’ serving the mechanical dust ‘generation’ points of the shredder and sorting plant; and
- LEV2 - ‘All Controls’ a second system which includes the ‘rPET’ melt and evaporate from the screen changer process areas.

Both systems would minimise the emission of ‘dust’ or ‘particulates’ through the proposed abatement ‘baghouse filter’ system.

An Air Emissions Risk Assessment (AERA) was prepared by SLR Consulting Limited to assess the impact of potential significant emissions on local air quality and compare against the relevant Air Quality Standards and Environmental Assessment Levels. The AERA considered the potential risk of short-term and long-term impacts on both human and ecological receptors. The AERA assessed Nitrogen dioxide (NO_2) and Particulate Matter (PM_{10} and $PM_{2.5}$). The source and emission parameters modelled were LEV1, LEV2, boiler 1 and boiler 2.

The AERA quantified and assessed the potential air quality impacts associated with the emissions from the site using Agency approved techniques against published standards for the protection of human health and designated ecological sites. It found that the process contributions do not lead to any exceedances of the standards (long-term or short-term) for the protection of human health at any relevant exposure location outside of the site. The impact is considered to cause no likely significant effect at European site designations.

The EMS will contain a maintenance regime for all plant and equipment in accordance with manufacturers recommendations. Inspection and maintenance procedures are in place to ensure that all plant and equipment are operating as designed and are in good repair. The machinery and equipment will be maintained in line with Enviroo’s maintenance procedure. Daily checks will be carried out on all mobile plant and any findings recorded in the site diary. Any defects that might harm the environment will be entered into the site incident management system.

All buildings, equipment, plant and associated infrastructure will be inspected and maintained on a regular basis in accordance with the EMS. A leak detection and repair programme will be utilised to identify and mitigate any potential fugitive emissions.

Scheduled cleaning will be undertaken periodically, including hoovering dusts, litter picking, sweeping, and general tidying. The importance of housekeeping will be communicated out to all employees / contractors prior to starting work. Routine weekly site safety walks will be undertaken by each departmental manager, who will monitor and check housekeeping standards and report any defects. Records of Planned Preventative Management (PPM) and safety walks are retained on site.

[2.2.5.2] Pests

All waste storage and treatment are to be undertaken within a purpose-built building. The WwTP The wastewater treatment process will not be susceptible to pests due to the closed and contained nature of the process. The processing equipment will also be located within the processing building reducing the risk of attracting pests. Screened solids from the process will be stored in a skip prior to daily removal from the site which minimises the likelihood of attracting pests. In the unlikely event that birds, vermin or pests are identified on site, a specialist pest control contractor will be employed to undertake measures to remove the animals from the site.

[2.2.5.3] Litter

The waste types to be accepted is limited to baled waste plastic and therefore has limited potential for litter generation. Once the bales are separated this is undertaken within the proposed purpose built PRF building. The PRF process will produce fine product material rPET pellets and flake. Processes that have the potential to create dust are to be contained and extracted via designated air extraction systems.

As presented in Section 2.2.5.1 a comprehensive air extraction system is to be installed within the PRF building to contain and abate fugitive emissions of dust. LEV1 will be strategically positioned over and around the mechanical dust generation points of the shredder and sorting plant. LEV2 covers the screen changer process areas. The extracted air will be drawn into a centralised ducting system and passed through an abatement baghouse filter system prior to discharge to atmosphere. All potential litter will therefore be contained within the building and extracted via the air extraction system. The building will be closed at all times and ventilated to provide a safe working environment. Processes that have the potential to create dust and litter are therefore to be contained and extracted via designated air extraction systems.

Good housekeeping will also be employed including cleaning to minimise levels of any dust, fibre and loose material that may accumulate within the PRF building. This will be confirmed via daily inspections.

Litter netting is to be installed on the external boundary fencing to prevent any windblown litter leaving site. Scheduled cleaning will be undertaken periodically, including hoovering dusts, litter picking, sweeping, and general tidying. The importance of housekeeping will be communicated out to all employees / contractors prior to starting work.

[2.2.6] Point Source Emissions to Air

The PRF will have two-point source emissions to air comprising LEV1 and LEV2. Any process air discharged to atmosphere e.g. from the dust filtration units, would pass through a baghouse filter system to remove dust or particulates. There would also be two flues from the natural gas boilers used to heat the process water. The enclosed buildings are also ventilated to provide a safe working environment.

The following stack and emission points and associated emissions will be installed:

Source area	Stack Emission Point	Emission Parameter	Control Measure
Shredder and sorting plant	LEV1	Particulates	Baghouse filter system
'rPET' melt and evaporate from the screen changer process areas	LEV2	Particulates	Baghouse filter system

The following monitoring is proposed in accordance with Agency guidance and Air Quality Standards Regulations 2010.

The design and installation of the air extraction system is to be confirmed on construction of the building and appropriate liaison with a specialist contractor prior to the commencement of any activities at the site. An AERA has been undertaken to support this application and is provided at Appendix B. As discussed above, it concluded the process contributions do not lead to any exceedances of the standards for the protection of human health and is considered to cause no likely significant effects at European site designations.

[2.3] Potential Pathways

The transit mechanism for potential odour, noise and fugitive emission reaching potentially sensitive receptors is through the air. This will be determined by:

- The quantity of waste at source;
- The ability of waste to leave the treatment building;
- Wind direction and speed;
- Intervening obstacles; and,
- Exposure of receptor to waste.

[2.4] Potential Receptors

Receptors identified within 1km of the site are listed in Table 2. This assessment will reference the distance from the permit boundary to the sensitive receptor.

The probability of exposure is determined by the distance of the receptor to the site and the likelihood of the hazard reaching a receptor (e.g. frequency of prevailing wind in the direction). This stage of the assessment assumes that exposure has resulted from an uncontrolled emission i.e. without mitigation. The distance of these receptors to the site boundary, their direction relative to the site and the frequency the wind blows in the direction of the receptor is detailed in Table 2. The locations of most concern are those regularly or permanently occupied by human receptors. Human receptors and sensitive habitats within 1 km of the site have been identified and are shown on the Sensitive Receptors Plan (Drawing Ref: K0419.1.002).

As stated previously the site is located at Plot 13 of Protos Plastic Park. This covers an area of approximately 54 hectares with various waste and energy industries occupying plots. Adjacent plots comprise a glass bottle manufacturing plant, resource recovery facility and biomass facility. The

plastic park will comprise various plastic recycling and recovery facilities and a plastic to hydrogen facility.

Residential receptors are limited to residential properties located off Orchard Park Lane/Ash Road and residential Properties off Station Road / Ince Orchards which are located over 500 m from the PRF.

[2.5] Potentially Sensitive Habitats

A Habitats Regulations Assessment prepared by Avian Ecology dated 20 November 2020 and an ecological assessment prepared by Avian Ecology dated 20 November 2020 was prepared for the site. A 'Nature and Heritage Conservation Screen' (referenced: EPR/GP3925SF) was requested and provided by the Agency. The following potentially sensitive habits were identified in the Avian Ecology Assessments and the Agency conservation screening report.

Three Statutory Designated Sites were identified within 10km of the site. The Mersey Estuary is designated as a Special Protection Area (SPA), Sites of Special Scientific Interest (SSSI) and RAMSAR. This is located 1km to the north of the site. The Mersey Estuary is designated due to the riverine habitats and the bird species using the habitats. Midlands Meres and Mosses Phase 1 is designated as RAMSAR site and is located 9.2 km to the southeast. This is designated for its lowland open water and peatland habitats. Helsby Quarry Local Nature Reserve is located approximately 2.7 km to the southeast and includes a range of woodland and grassland habits and was previously a sandstone quarry. It is listed as a Regionally Important Geological Site. Dunsdale Hollow SSSI is located 4.4 km to the east and is designated for a rare type of birch and oak woodland. Frodsham and Helsby and Ince Marshes Local Wildlife Site (LWS) is located adjacent to the north boundary of the site.

The site is designated as protected habitat for deciduous woodland and coastal and floodplain grazing marsh as shown below in Figure 2. The site prior to development was occupied by neutral semi-improved species poor grassland, broadleaved plantation woodland, ditch, shrub, ephemeral/short perennial vegetation and tall ruderal vegetation.

Figure 2 Extract from Nature and Heritage conservation screening report – protected habitats. Red dot denotes centre of Site

An area of broadleaved plantation woodland located within the sites Planning Boundary is to be protected and managed in accordance with the Plot 13 Woodland Management Plan prepared by Ramball UK Limited (Report Ref: 1620006668-021 Version 1 dated 5 November 2021).

Figure 3 Extract from Woodland Management Plan

Protected species were identified in the drainage ditches to the north, south and east of the site and within a 100 m section that traverses the site. The protected species comprises a population of water voles and European Eels. The ditch traversing the site is required to be infilled as part of the development of the site. A mitigation method statement was prepared by Ramball UK limited (Report Ref: 1620006668-021 version 2 dated 5 November 2021) for the mitigation of water vole at the site. This included for the live trapping and translocation under licence of the water vole population to a ditch located approximately 800 m to the northwest of the site part of the Protos Ecology Mitigation Area discussed further below.

The protected habitats and local wildlife site are to be directly affected by the development of the land as part of the wider Protos Ince Marsh Recovery Park. Compensatory habitat has been provided for as part of the planning conditions which is underway north of the site. RSK prepared a Habitat Creation and Management Plan (HCMP) for a c. 49ha mitigation area associated with the development of the Ince Park at Ince Marshes (Report Ref: P660444/03/11/01 Rev 15 dated July 2021). The compensatory habitat area will be approximately 100 m to the west of the site at its closest point. The compensatory area was selected to provide a suitable habitat that would not be adversely impacted by the proposed activities. The impact of the site with regards to habitats are considered to have been undertaken as part of the planning process for the wider Protos Ince Marsh Recovery Park and for the planning applications submitted for the site.

A copy of the Habitats Regulations Assessment and Ecological Risk Assessment is provided at Appendix A and concludes that there are no likely significant effects from the proposed PRF.

Table 2 Receptors within 1km of the Site

No.	Receptor Description	Receptor Type	Direction from Site	Distance from Site (m)	Frequency Downwind (%)
1	Protos Ince Marsh Recovery Park Industrial Estate Adjacent plots. Including Standardkessel Baumgarte GmbH, Ince Park Renewables, Ince Park Biomass Energy Plant, CF Fertilisers UK.	Industrial / Commercial / Road	NW to ESE	10	5.39 to 18.67
2	Ince Marshes/Goldfinch Meadow	Surface Water / Recreational / Footpath	WNW to E	10	6.99 to 18.67
3	Farmland	Industrial / Commercial	NE to SE	220 to 535	2.52 to 10.09
4	Encirc Glass	Surface Water / Commercial / Industrial	S to WNW	230	1.36 to 10.04
5	Railway/Ince and Elton Train Station	Commercial / Recreational	SE to SW	630	1.35 to 2.52
6	Residential properties located off Orchard Park Lane/Ash Road	Residential / Recreational / Road	S to SW	750	1.36 to 2.47
7	Holme Farm/JH Willis & Son	Industrial / Commercial / Surface Water	NW	785	18.67
8	Manchester Ship Canal	Industrial / Commercial / Recreational / Surface Water	N to NNE	795	7.09 to 7.8
9	Waste Water Pumping Station	Industrial / Commercial	SSW	880	2.47
10	Mersey Estuary (Ramsar/SSSI/SPA)	Surface Water and sensitive habitat	N	880	7.09

No.	Receptor Description	Receptor Type	Direction from Site	Distance from Site (m)	Frequency Downwind (%)
11	Hoolpool Gutter	Surface Water	ENE to E	980	6.99 to 10.09
12	Surface water drainage network – Protos SWMP	Surface Water and sensitive habitats	E, N and S	10	1.36 to 7.09
13	Protos Habitat Mitigation Scheme	Sensitive habitats	W to E	100	2.22 to 18.67
14	On-site priority habitat – Woodland Management Plan	Sensitive Habitat	On-site – N	On-site	7.09
15	Marsh Lane	Road	NE to W	10	1.36 to 10.09
16	Ash Road	Road	SW	100	1.89
17	Residential Properties off Station Road / Ince Orchards	Residential	SW	990	1.89

[3] Risk Assessment and Accident Management Plans

[3.1] Risk Assessments

The specific risk assessments completed for Odour, Noise and Fugitive Emissions of Dust and litter are provided in Tables 3 to 5 below. In many cases there is an inter-relationship between these specific risk assessments and meteorological conditions and where relevant this has been identified. The pathway is determined by the location of the receptor relative to the site, the distance from the site boundary (m) and the frequency (likelihood) the prevailing wind will blow in the direction of the receptor (%) as determined by Windrose data.

[3.1.1] Mitigated Risk

The Mitigated Risk is the residual risk presented by the Hazard after control measures have been instigated.

[3.1.2] Environmental Accidents

The Agency guidance requires the completion of an Accidents Risk Assessment and Management Plan. This should assess potential hazards associated with the proposed activity not described in the sections above. An accident management plan is detailed in Table 6.

Table 3 Odour Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk / Reason	Risk Management	Mitigated Risk
	No.	Direc.	Dist. (m)	Freq.					
Odour through the Air from: Waste storage. PRF and WwTP	1	NW to ESE	10	5.39 to 18.67	High - close proximity to the site, frequently downwind	Medium - staff/users sensitive to odour.	Medium	Strict waste acceptance procedures are in place to ensure that no non-conforming materials are accepted which may contain malodorous waste. Regular olfactory monitoring will be conducted and will take account of meteorological conditions. Plastic bales will be stored within a separate building (feedstock store) with storage times limited to 14 days prior to treatment. All waste storage and treatment will be undertaken within enclosed buildings with the access doors remaining shut pending entry and exit for pedestrian and/or vehicular access. An OMP has been submitted with this application.	Low
	2	WNW to E	10	6.99 to 18.67	High - close proximity to the site, frequently downwind	Medium - users sensitive to odour. Surface water not sensitive to odour.	Medium		
	3	NE to SE	220 to 535	2.52 to 10.09	High - moderate proximity to the site, frequently downwind	Medium - staff/users sensitive to odour.	Medium		
	4	S to WNW	230	1.36 to 10.04	High - moderate proximity to the site, frequently downwind	Medium - staff/users sensitive to odour. Surface water not sensitive to odour.	Medium		
	5	SE to SW	630	1.35 to 2.52	Low - distant from the site, infrequently downwind	Medium - staff/users sensitive to odour.	Low		
	6	S to SW	750	1.36 to 2.47	Low - distant from the site, infrequently downwind	High - odour nuisance to residents	Medium		
	7	NW	785	18.67	Medium - distant from the site, frequently downwind odour.	Medium - staff/users sensitive to odour. Surface water not sensitive to odour.	Medium		
	8	N to NNE	795	7.09 to 7.8	Medium - distant from the site, moderately downwind	Medium - users sensitive to odour. Surface water not sensitive to odour.	Medium		
	9	SSW	880	2.47	Low - distant from site, infrequently downwind	Medium - staff sensitive to odour.	Low		
	10	N	880	7.09	Low - distant from the site, moderately downwind	Low - not a nuisance to habitats	Low		
	11	ENE to E	980	6.99 to 10.09	Medium - distant from site, frequently downwind	Low - surface water not sensitive to odour	Low		
	12	E, N and S	10	1.36 to 7.09	High - close proximity to the site, moderately downwind	Low - surface water and habitats not sensitive to odour	Medium		
	13	W to E	100	2.22 to 18.67	High - close proximity to the site, frequently downwind	Low - not a nuisance to habitats	Medium		
	14	On-site – N	On-site	7.09	High - close proximity to the site, moderately downwind	Low - not a nuisance to habitats	Medium		
	15	NE to W	10	1.36 to 10.09	High - close proximity to the site, frequently downwind	Medium - users sensitive to odour.	Medium		
	16	SW	100	1.89	Medium - close proximity to the site, infrequently downwind	Medium - users sensitive to odour.	Medium		
	17	SW	990	1.89	Low - distant from site, infrequently downwind	High - odour nuisance to residents	Medium		

Table 4 Noise and Vibration Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk / Reason	Risk Management	Mitigated Risk
	No.	Direc.	Dist. (m)	Freq.					
Noise through air and Vibration through ground from: Vehicle movements associated with the delivering and handling of waste on site. Site plant and equipment associated with the PRF and WwTP	1	NW to ESE	10	5.39 to 18.67	High - close proximity to the site, frequently downwind	Medium - staff/users sensitive to noise	Medium	The NIA applies noise limit criteria derived from measured background sound levels. The Process and Goods In facility will be fitted within a purpose-built building having cladding to a minimum weighted sound reduction index Rw of 24dB.. In addition, the grinder used to flake the recycling plastic will be mounted with an acoustically treated enclosure. On site speed limits will be enforced and internal site roads will be maintained to minimise noise / vibration. Appropriate maintenance of site vehicles in accordance with the manufacturers or supplier's instructions. Silencers will be used on vehicles. Should it prove necessary alternatives to reversing bleepers on site vehicles will also be considered. Avoid unnecessary revving of engines and switch off mobile plant and equipment when not required; A NVMP (Report Ref: K0419-AYE-R-ENV-00006) has been submitted with this application.	Low
	2	WNW to E	10	6.99 to 18.67	High - close proximity to the site, frequently downwind	Medium - users sensitive to noise. Surface water not sensitive to noise.	Medium		
	3	NE to SE	220 to 535	2.52 to 10.09	High - moderate proximity to the site, frequently downwind	Medium - staff sensitive to noise.	Medium		
	4	S to WNW	230	1.36 to 10.04	High - moderate proximity to the site, frequently downwind	Medium - staff sensitive to noise. Surface water not sensitive to noise.	Medium		
	5	SE to SW	630	1.35 to 2.52	Low - distant from the site, infrequently downwind	Medium - users sensitive to noise.	Low		
	6	S to SW	750	1.36 to 2.47	Low - distant from the site, infrequently downwind	High - noise nuisance to residents	Medium		
	7	NW	785	18.67	Medium - distant from the site, frequently downwind	Medium - staff sensitive to noise. Surface water not sensitive to noise.	Medium		
	8	N to NNE	795	7.09 to 7.8	Medium - distant from the site, moderately downwind	Medium - users sensitive to noise. Surface water not sensitive to noise.	Medium		
	9	SSW	880	2.47	Low - distant from site, infrequently downwind	Medium - staff sensitive to noise.	Low		
	10	N	880	7.09	Low - distant from the site, moderately downwind	Medium - potential to disturb wildlife. Surface water not sensitive to noise.	Low		
	11	ENE to E	980	6.99 to 10.09	Medium - distant from site, frequently downwind	Low - surface water not sensitive to noise.	Low		
	12	E, N and S	10	1.36 to 7.09	High - close proximity to the site, moderately downwind	Medium - potential to disturb wildlife. Surface water not sensitive to noise.	Medium		
	13	W to E	100	2.22 to 18.67	High - close proximity to the site, frequently downwind	Medium - potential to disturb wildlife.	Medium		
	14	On-site – N	On-site	7.09	High - close proximity to the site, moderately downwind	Medium - potential to disturb wildlife.	Medium		
	15	NE to W	10	1.36 to 10.09	High - close proximity to the site, frequently downwind	Medium - users sensitive to noise.	Medium		
	16	SW	100	1.89	Medium - close proximity to the site, infrequently downwind	Medium - users sensitive to noise.	Medium		

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk / Reason	Risk Management	Mitigated Risk
	No.	Direc.	Dist. (m)	Freq.					
	17	SW	990	1.89	Low - distant from site, infrequently downwind	High - noise nuisance to residents	Medium		

Table 5 Dust and Litter Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk / Reason	Risk Management	Mitigated Risk
	No.	Direc.	Dist. (m)	Freq.					
Dust, litter through air from: Vehicle movements. Waste storage. PRF and WwTP	1	NW to ESE	10	5.39 to 18.67	High - close proximity to the site, frequently downwind	Medium - staff/users sensitive to dust/litter.	Medium	On site vehicle speed limit enforced to ensure that vehicle movements do not generate excessive dust. Dampening of site roads/surfaces as necessary using a tanker during dry periods. All wastes will be accepted, treated and stored within a purpose-built enclosed building enclosed with fast acting roller shutter doors shut when not in use. Storage and treatment of the plastic bales and will be operated under negative pressure in separate buildings (feedstock storage area and PRF building). Any fines or dust produced as part of the treatment process within the PRF building will be contained within the air extraction system to be installed. Air jets and baghouse filter system will also be utilised during the screening, granulation and de-dusting process to contain any potential emissions. Processes that have the potential to create dust therefore are to be contained and extracted via designated air extraction systems. All plant will be regularly maintained in accordance with the manufacturer's instructions	Low
	2	WNW to E	10	6.99 to 18.67	High - close proximity to the site, frequently downwind	Medium - users sensitive to dust/litter and potential for dust accumulation on surface water	Medium		
	3	NE to SE	220 to 535	2.52 to 10.09	High - moderate proximity to the site, frequently downwind	Medium - staff/users sensitive to dust/litter.	Medium		
	4	S to WNW	230	1.36 to 10.04	High - moderate proximity to the site, frequently downwind	Medium - staff/users sensitive to dust/litter and potential for dust accumulation on surface water	Medium		
	5	SE to SW	630	1.35 to 2.52	Low - distant from the site, infrequently downwind	Medium - staff/users sensitive to dust/litter.	Low		
	6	S to SW	750	1.36 to 2.47	Low - distant from the site, infrequently downwind	High - dust and litter nuisance to residents	Medium		
	7	NW	785	18.67	Medium - distant from the site, frequently downwind	Medium - staff/users sensitive to dust/litter and potential for dust accumulation on surface water	Medium		
	8	N to NNE	795	7.09 to 7.8	Medium - distant from the site, moderately downwind	Medium - users sensitive to dust/litter and potential for dust accumulation on surface water	Medium		
	9	SSW	880	2.47	Low - distant from site, infrequently downwind	Medium - staff sensitive to dust/litter.	Low		
	10	N	880	7.09	Low - distant from the site, moderately downwind	Medium - potential for dust accumulation on sensitive vegetation and on surface water.	Low		
	11	ENE to E	980	6.99 to 10.09	Medium - distant from site, frequently downwind	Medium - potential for dust accumulation on surface water.	Medium		
	12	E, N and S	10	1.36 to 7.09	High - close proximity to the site, moderately downwind	Medium - potential for dust accumulation on sensitive vegetation and on surface water.	Medium		

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk / Reason	Risk Management	Mitigated Risk
	No.	Direc.	Dist. (m)	Freq.					
	13	W to E	100	2.22 to 18.67	High - close proximity to the site, frequently downwind	Medium - potential for dust accumulation on sensitive vegetation.	Medium	Any litter escaping the building will be collected on a daily basis. Daily inspections are to be undertaken of the building to ensure all waste is stored within their designated bays and containers. Any loose material within the building that has the potential of escaping will be cleared by the end of the working day.	
	14	On-site – N	On-site	7.09	High - close proximity to the site, moderately downwind	Medium - potential for dust accumulation on sensitive vegetation.	Medium		
	15	NE to W	10	1.36 to 10.09	High - close proximity to the site, frequently downwind	Medium - users sensitive to dust/litter.	Medium		
	16	SW	100	1.89	Medium - close proximity to the site, infrequently downwind	Medium - users sensitive to dust/litter.	Medium		
	17	SW	990	1.89	Low - distant from site, infrequently downwind	High - dust and litter nuisance to residents	Medium		

Table 6 Accident Management Plan

Hazard	Receptor	Pathway	Probability	Consequence	Overall Risk	Risk Management	Mitigated Risk
Liquid Pollutant Leak or damage to WwTP, chemical stores and/or tanks, fuel storage tank or site vehicles. Leak or damage to PRF or WwTP equipment.	Groundwater	Through ground	Low	High - pollution of groundwater	Medium	Fuels, lubricants and process water tanks will be stored in bunded areas with 110% capacity and/or tanks bunded to 110% in accordance with CIRIA C736. Site vehicles and plant will be subject to regular maintenance to ensure the risk of leaks of potentially harmful liquids are minimised; Waste management activities at the site will be carried out on an impermeable reinforced concrete slab with sealed drainage to a minimum depth of 340 mm. The entire perimeter of the slab is to be kerbed. All surface water will pass through stage 3 oil and grease interceptors and catch pits to limit siltation within the system. Isolating chambers and penstock values will be in place to enable the surface water system to be isolated in the event of a pollution incident or fire. Surface water will be discharged into the surface water ditch which runs around the north, east and southern boundary of the Site. Spill kits are located within the PRF building. In the event of the spillage of polluting materials, immediate action will be taken to contain the spillage; The Site surface, covered buildings, roofed areas, fixed / temporary bays and containers are visually inspected at least weekly to ensure continuing integrity and fitness for purpose. The inspection and any necessary maintenance required will be recorded.	Low
	Surface Water	Lateral	Low	High - pollution of surface water	Medium		
Fire Uncontrolled burning of residual wastes or site vehicles.	Groundwater	Through ground	Low	High - pollution of groundwater through firewater run-off or leaks from damaged equipment	Medium	Combustible wastes will be stored in accordance with the FPP has been submitted with this application. Procedures within the FPP for fire water containment including kerbing and sealed drainage. Site vehicles and plant subject to regular preventative maintenance in line with site EMS procedures; Fire control equipment will be on hand, with major incidents to be dealt with by the Fire Brigade in accordance with site EMS Procedures.	Low
	Receptors listed in Table 2 above	Airborne	Low	Medium - smoke / odour annoyance	Medium		

Hazard	Receptor	Pathway	Probability	Consequence	Overall Risk	Risk Management	Mitigated Risk
Explosion Compressed gas cylinders, combustion of fuel storage tank	Site staff	Airborne	Low	High - danger of serious injury	Medium	Fuel will be stored in separate area with appropriate controls to prevent fire or explosion (i.e. no smoking on site). Compressed gases not required and therefore present for operation of site. Site workshop located away from installation with appropriate controls in accordance with EMS procedures.	Low
	Groundwater	Through ground	Low	High - pollution of groundwater through leaks from damaged equipment	Medium		
Wastes storage Chemical reaction of incompatible wastes	Receptors listed in Table 2 above	Airborne	Low	Medium - odour annoyance or smoke from oxidising agents	Medium	Any potentially polluting substances will be appropriately stored.	Low
Vandalism Damage to site vehicles, fuel bowsers, plant and equipment (PRF and WwTP) air extraction system	Groundwater	Through ground	Low	High - pollution of groundwater through leaks from damaged equipment	Medium	Site security will prevent access by unauthorised persons. Vehicles will be kept overnight in a secure area with appropriate security measures.	Low
	Receptors listed in Table 2 above	Airborne	Low	Medium - odour annoyance	Medium		

Appendix A

Protos Plot 13 – Polyethene Terephtalate (PET) Plastics Recycling Facility

on behalf of AXIS PED

Information to Inform Habitats Regulations Assessment.

avianecology

Document Control	
Project Name:	Protos Plot 13 – Polyethylene Terephtalate (PET) Plastics Recycling Facility
Project Number:	AxisL-043-1334
Report Title	Information to inform Habitats Regulations Assessment

Issue	Date	Notes	Prepared	Reviewed
V1	04/11/2020	Draft	B Walker MSc MCIEEM	U Maginn MSc MCIEEM
V2	10/11/2020	Updated draft	B Walker MSc MCIEEM	U Maginn MSc MCIEEM
V3	20/11/2020	Final	B Walker MSc MCIEEM	U Maginn MSc MCIEEM

CONTENTS

1 INTRODUCTION

1.1.1 This report has been produced to inform a Habitat Regulations Assessment (HRA) which may, if accepted, be adopted by the Competent Authority (Cheshire West and Chester Council or CWACC) as its own in respect of the proposed plastics recycling facility on Plot 13 (the Site) within the wider Protos development area at Ince Marshes. Protos is a significant industrial development site with the planning permissions for industrial, commercial, waste, transport and energy uses. The report provides the competent authority (CWACC) with the necessary ecological information to inform a Habitats Regulations Assessment of the Proposed Development on the qualifying interests of European Designated Sites[1] in accordance with Article 63 of The Conservation of Habitats and Species Regulations 2019 (Amendment)(EU Exit).

1.1.2 This report should be read with reference to the Ince Plot 13 Ecological Assessment Report (Avian Ecology, 2020) and associated figures.

1.1.3 This report takes account of the European Court of Justice ruling (Case C323/17 also known as 'People over Wind') on Habitats Regulations Assessments and has, at the screening stage, excluded consideration of any mitigation measures when assessing the potential for likely significant effects (for Stage 1: Screening by the Competent Authority). Where it can be concluded that the proposed development, in the absence of mitigation, will not give rise to likely significant effects, the effect can be screened out of further consideration. Measures proposed which relate to general environmental or human health protection are where relevant, distinguished from those which provide specific mitigation of possible effects on European sites.

1.1.4 The conclusions contained within this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate.

1.1.5 Where potential *likely significant effects* (LSE) are identified as a result of the Proposed Development, mitigation measures are identified and further information has been provided to inform an Appropriate Assessment by the Competent Authority, as required.

2 INFORMATION TO INFORM THE ASSESSMENT

2.1 Project Information and Site Context

Description of the Project

2.1.1 The Proposed Development is shown on the *Site Location Plan* and *Proposed General Arrangement Plan* and comprises the construction and operation of a plastics recycling facility and associated infrastructure for the supply of food grade recycled PET (rPET) into the plastic manufacturing sector. The recycling of pre-sorted waste PET plastics into rPET pellets would reduce the volume of waste plastic and would also reduce reliance on the use of virgin hydrocarbon for the manufacture of plastics.

[1] European Sites (also known as Natura Sites) are interpreted under the Conservation of Habitats and Species Regulations 2019 (Amendment) (EU Exit) in England and Wales which provides for the protection of sites of international importance (including SACs and SPAs) identified under the EC Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (92/43/EEC) and the EC Directive on the Conservation of Wild Birds (2009/147/EC). For convenience, international sites of wetland importance, known as Ramsar sites identified under the Ramsar Convention 1979 as included in the definition of 'European Sites' for the purposes of assessment.

2.1.2 Plot 13 forms part of the wider Protos development area at Ince Marshes and was identified for a range of reuse, re-manufacture and production facilities. A reserved matters application for the development of four warehouse style units on Plot 13 was approved on the 9th February 2016, hence the principle of development on this Site has already been established. Whilst the configuration of the development of the Site is different to that currently approved both the proposed land use and nature of development is considered to be broadly the same as that currently approved[2].

2.1.3 Construction works are anticipated to last for up to 9 months. Works will be limited to specific hours 07.30 to 18.00 hrs Monday to Friday and 08.00 to 13.30hrs Saturday to Sunday, these hours would be secured by planning condition. Then operational facility will run seven days a week.

2.1.4 It is considered that the proposed works represent a 'Project' within the meaning of the Council Directive 92/43/EEC of the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) and the transposing regulations.

Site Description and Context

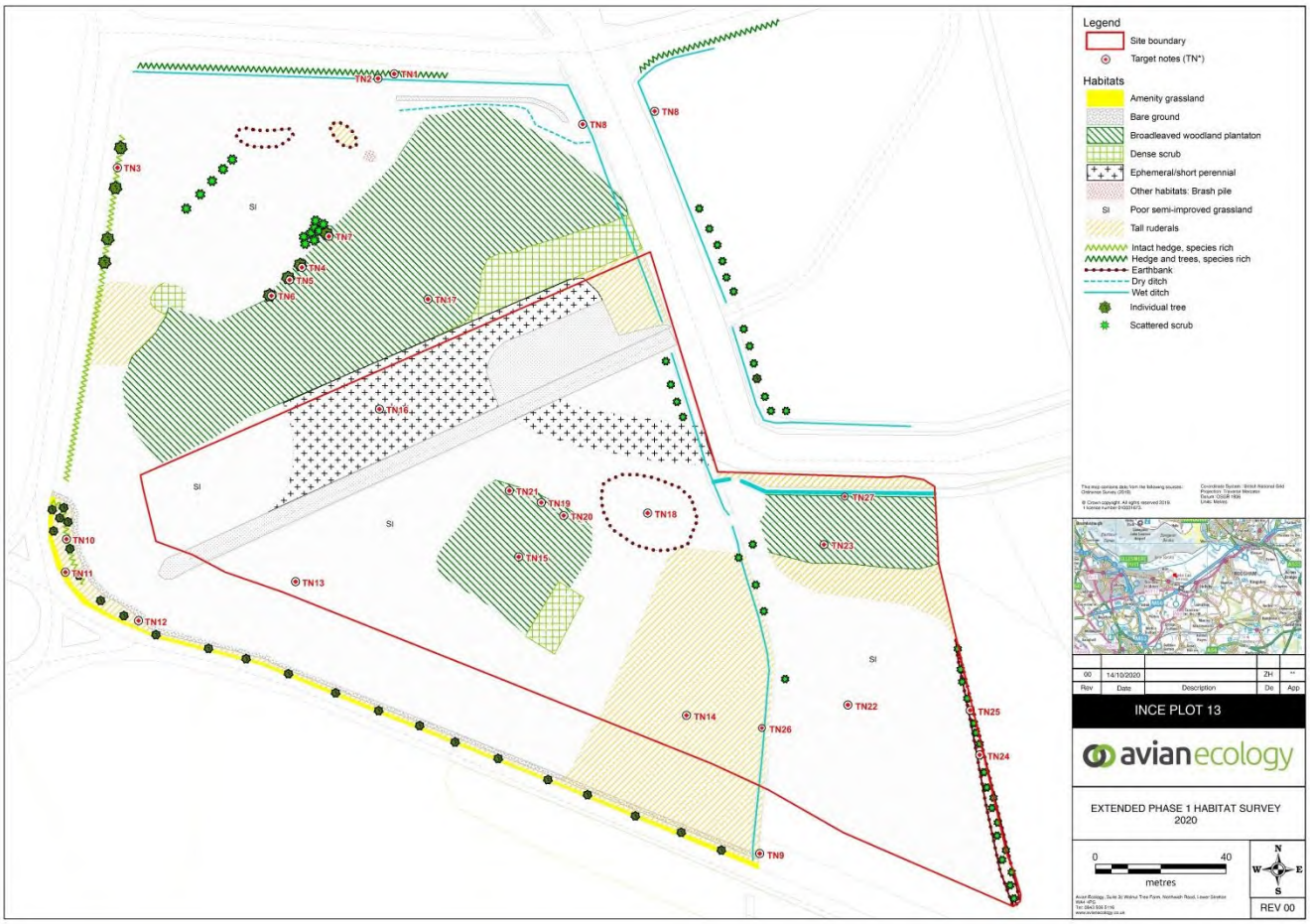
2.1.5 The Site and associated infrastructure (comprising the proposed development area within the redline boundary) occupies an area of approximately 2.2ha on land within Protos, Ince, Cheshire. Protos is a significant industrial development site encompassing over 100ha, with planning permissions for industrial, commercial, waste, transport and energy uses. The principal planning permission was granted in 2009 (planning permission reference APP/Z0645/A/07/2059609) and was referred to as Ince Resource Recovery Park. Associated with this consent is a range of ecological mitigation and habitat enhancement measures designed to encompass all of the development plots within the Protos area, including Plot 13.

2.1.6 The Site comprises bare ground, neutral semi-improved species-poor grassland, broad-leaved plantation woodland, ditches, scrub, embankments, ephemeral/short perennial and tall ruderal vegetation. Immediately surrounding land comprises further woodland, scrub, ditches, grassland and bare ground with a mix of large scale industrial infrastructure and currently undeveloped development plots within the wider Protos development area. Site habitats are illustrated in **Figure 1** below and more fully described in the Ecological Assessment Report (Avian Ecology 2020[3]).

[2] *Detailed Planning Application for the Development of a Resource Recovery Facility on Plot 13, Ince*: Planning Statement. Axis PED (November 2020)

[3] *Ince Plot 13 Polyethene Terephtalate (PET) Plastics Recycling Facility Ecological Assessment Report.* Avian Ecology (November 2020).

Figure 1: Habitats present on and around Site



2.1.7 The grassland across the main body of the Site is broadly split into two areas of predominantly species-poor semi-improved grassland, each varying somewhat in species composition. The grassland (TN13 and TN14) to the west of the ditch contains species including perennial ryegrass *Lolium perenne*, cock's-foot *Dactylys glomerata*, broad-leaved dock *Rumex obtusifolius*, ragwort *Jacobaea vulgaris*, creeping soft grass *Holcus mollis*, Timothy *Phleum pratense*, perennial sow-thistle *Sonchus arvensis*, creeping buttercup *Ranunculus repens* and red dead nettle *Lamium purpureum*.

2.1.8 The grassland east of the ditch at TN22 contained cock's-foot, false oat grass *Arrhenatherum elatius*, perennial rye grass, Yorkshire fog *Holcus lanatus*, tufted vetch *Vicia cracca*, common fleabane *Pulicaria dysenterica*, broad-leaved dock, ragwort, white clover *Trifolium repens*, soft rush *Juncus effusus*, goosefoot species *Chenopodeum sp*, creeping thistle *Cirsiumarvense*, hoary willowherb *Epilobium parviflorum* and common reed *Phragmites australis*.

2.1.9 Two small areas of plantation deciduous woodland are present; a copse in the centre of the Site (TN15) and another to the east (TN23). Tree species include white poplar *Populus alba*, elder *Sambucus nigra* and alder *Alnus glutinosa* with scrub species present including bramble *Rubus fruticosus agg.*. Three trees (TN19, 20 & 21) are highlighted as having low bat roost potential. The eastern woodland copse contains species such as ash *Fraxinus excelsior*, pedunculate oak *Quercus robur*, hawthorn *Crataegus monogyna* and hazel *Corylus avellana*.

2.1.10 Both dense and scattered scrub is situated within the Site, with species including hawthorn, elder, buddleia *Buddleja davidii*, bramble, willow *Salix sp*, sycamore and alder.

2.1.11 A drainage ditch extends to the north, south and east. The ditch running through the site from north to south (TN26), contained dense bankside and channel vegetation, dominated by common reed with other species present including duckweed *Lemnoideae sp*, hawthorn, bramble and Himalayan

balsam *Impatiens glandulifera*. A section of this ditch to the north was covered with fabric, as part of water vole exclusion works for an adjacent development. Further north of this, the channel becomes man made and varies in species composition, with vegetation becoming sparser as it turns towards the west.

2.1.12 Another ditch runs from east to west within the Site and wider area (TN27). This is different in composition to the other ditch TN26, as it is runs through the woodland. No in channel vegetation is present and bankside species are those associated with the woodland at TN23 including hawthorn, blackthorn *Prunus spinosa*, elder and bramble.

2.1.13 Tall ruderal vegetation is present within and around the Site. Tall ruderal species present includes common reed, soft rush *Juncus effusus*, rosebay willowherb *Chamerion angustifolium*, Himalayan balsam and common nettle. Tall ruderal habitats on Site are of limited botanical value due to the species-poor nature of the habitats overall. These habitats are common and widespread locally.

2.1.14 Two earth embankments are present, TN18 within the centre of the Site and TN25 on the eastern boundary. Both mounds support grassland and tall ruderal species.

2.1.15 Ephemeral and short perennial vegetation is present on previously gravelled, stone and tarmac ground, mainly located north of the Site (TN16). This is species poor and of limited botanical value, and predominantly contains colonising vegetation including mosses, frequent rosebay willowherb, ragwort, occasional teasel *Dipsacus fullonum*, broad leaved dock, greater plantain *Plantago major*, perennial sow thistle and red clover *Trifolium pratense*.

2.1.16 The local area includes further industrial and commercial developments, residential areas, agricultural and marshland.

2.2 European Sites

2.2.1 European sites referred to in this document are taken to include sites designated under the 'International Convention on Important Wetlands 1971', or Ramsar sites. Statutory designated sites within 10km of the Proposed Development are presented in **Table 2.1** and **Figure 2.**

Figure 2: European Sites within 5km and 10km of Plot 13

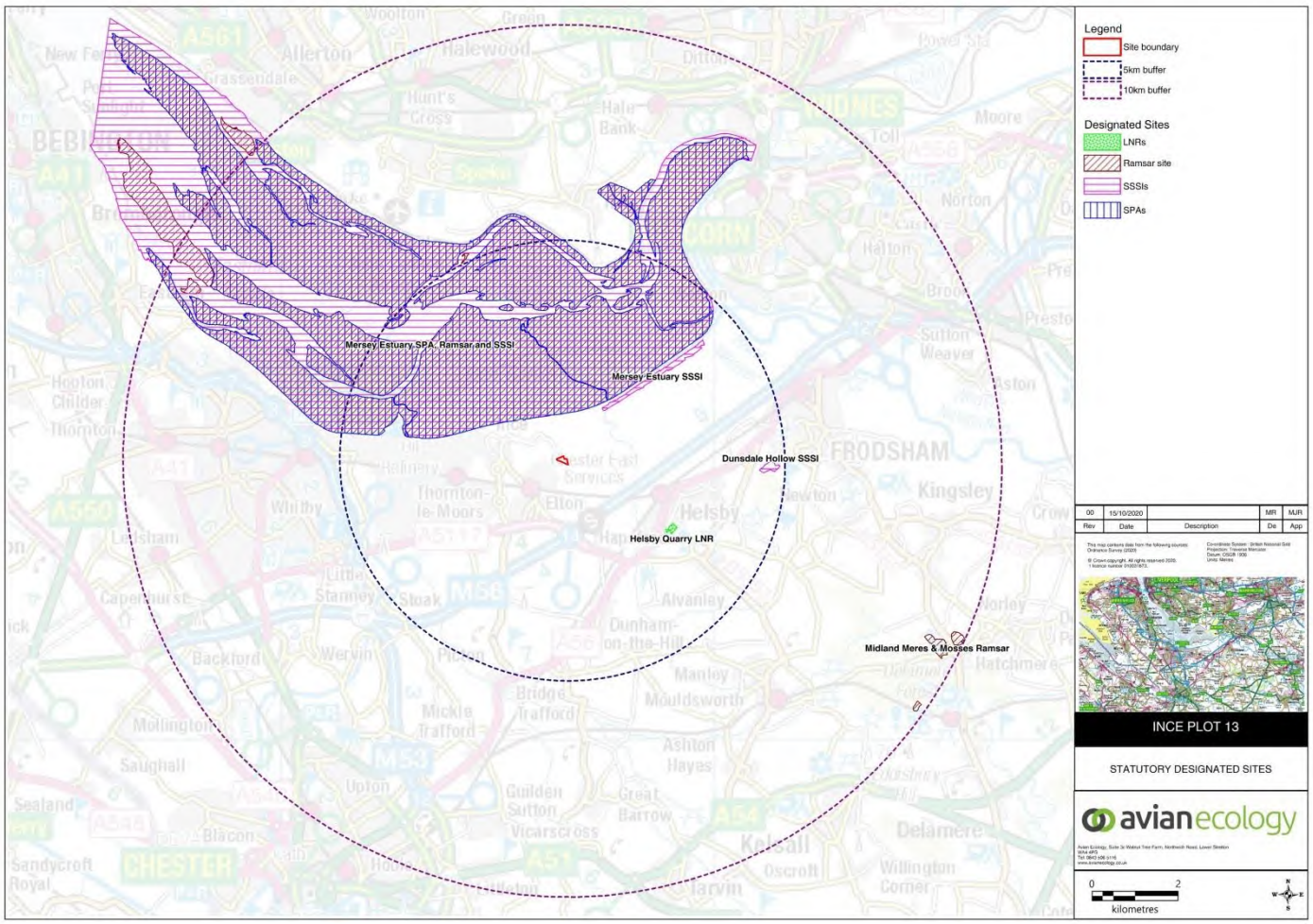


Table 2.1: European Designated Sites within 10km

Designated Site	Approximate distance and direction from Proposed Development	Description
Mersey Estuary SPA (also part of Mersey Estuary European Marine Site)	1km north	The site is comprised of a variety of riverine habitats including saltmarsh, intertidal sand & mudflats and boulder clay cliffs. This supports a large and internationally important number of waterfowl including ducks and waders in winter and migratory waders in spring and autumn. The site qualifies under article 4.1 of *the EC Directive 79/409 of the Conservation of Wild Birds Special Protection Area* as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season: **Golden Plover** *Pluvialis apricaria,* wintering. **Redshank** *Tringa totanus* - on passage; **Shelduck** *Tadorna tadorna* - breeding **Teal** *Anas crecca* **-** non-breeding. **Pintail** *Anas acuta* - non-breeding. **Dunlin** *Calidris alpina* - non-breeding **Black-tailed godwit** *Limosa limosa islandica* – wintering Waterbird assemblage .
Mersey Estuary Ramsar	1km north	**Ramsar criterion 5 - Bird assemblages of international importance** **Ramsar criterion 6 – species/populations occurring at levels of international importance.** *Species with peak counts in spring/autumn:* **Common shelduck** *Tadorna tadorna* **Black-tailed godwit** *Limosa limosa* **Common redshank** *Tringa totanus* *Species with peak counts in winter:* **Teal** *Anas crecca* **Northern pintail** *Anas acuta* **Dunlin** *Calidris alpina*
Midlands Meres and Mosses Phase 1 Ramsar	9.2km south east	A series of lowland open water and peatland sites, numerous rare species of plants and invertebrates and regularly supporting nationally important numbers of over-wintering cormorant *Phalacrocorax carbo,* gadwall *Anas strepera,* pochard *Aythya farina* and shoveller *Anas clypeata*. Ramsar criterion 2a supports a number of rare species of plants associated with wetlands

European Site Conservation Objectives

2.2.2 The most recently published Conservation Objectives for the Mersey Estuary SPA (V5 dated February 2019)[4] state as follows:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*
- *The population of each of the qualifying features, and,*
- *The distribution of the qualifying features within the site.*

2.3 Information on Qualifying Features

2.3.1 Information pertaining to the potential presence or otherwise of bird species which represent a qualifying feature for the above listed European sites, has been established through habitat survey and appraisal of current land management practices and a desk study review of species records, and ecological information provided for other developments within the Protos development area. Information on whether the Proposed Development and surrounding area is functionally linked to the European Sites has also been reviewed. Functionally linked land is defined in general terms as land outside the boundaries of a European site which is considered to be 'linked' due to being critical to or necessary for the ecological or behavioural functions of a qualifying feature for which the SAC/ SPA/ Ramsar site has been designated, i.e that it plays an important part in maintaining or restoring the favourable conservation status of a population of a qualifying species.

2.3.2 The Mersey Estuary is also designated as a Ramsar site and SSSI. An assessment of the potential effects upon these designation features has been considered alongside the SPA as the overlapping qualifying ornithological features of the Ramsar site and SSSI are considered to be consistent with those of the Mersey Estuary SPA.

Habitat Appraisal

2.3.3 As described in the Ecological Assessment and in Paragraphs 2.1.7-2.1.18, the Site comprises an area of mixed habitats and bare ground in an industrialising area. The Site is not considered to provide functionally linked habitat used by qualifying interest birds of the Mersey Estuary SPA/Ramsar due to the unsuitability of habitats present. In particular the Site lacks the open views and vegetation characteristics favoured by qualifying bird species (for example golden plover) which favour cropped vegetation/large arable fields, often close to the coast where they can forage for invertebrates. The trees and scrub on Site as well as surrounding large built developments serve to interrupt views, and foraging opportunities are limited due to the ground conditions present.

2.3.4 Ditches within and around the Site form part of a network of waterways across the local area, which eventually drain to the Estuary.

[4] http://publications.naturalengland.org.uk/publication/5790848037945344

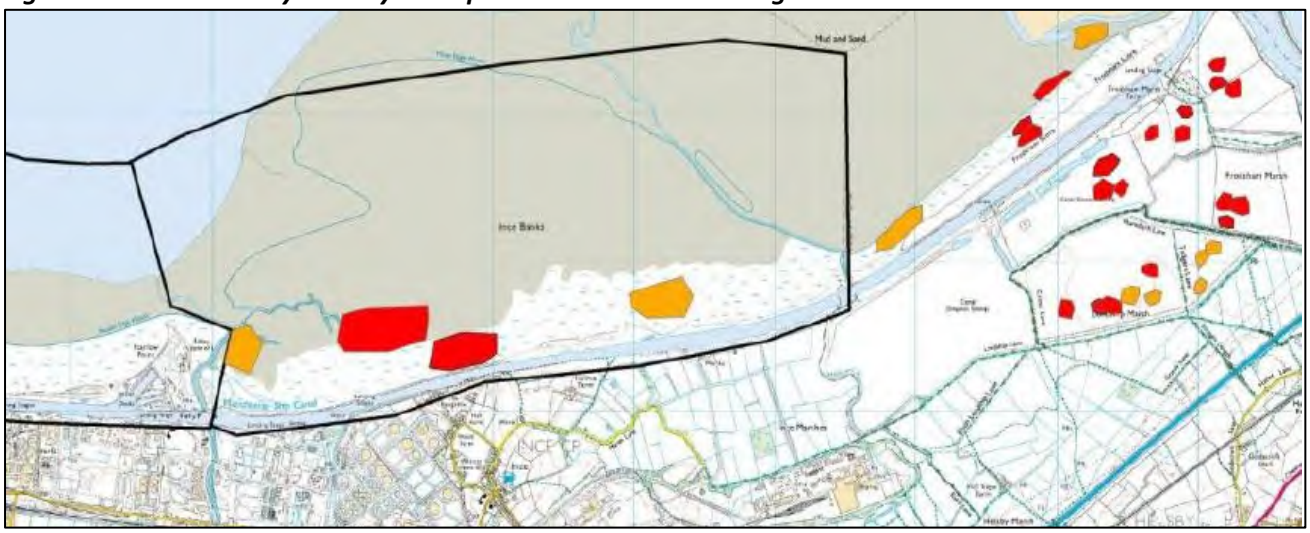
Desk Study Information on Qualifying Species

2.3.5 A literature review was also completed to identify any papers or research reports which may assist in determining the distribution of qualifying features and populations within the vicinity of the proposed development. This included the Natural England publication NECR173 edition 1 (2015) *Review and analysis of changes in water-bird use of the Mersey Estuary SPA, Mersey Narrows & North Wirral Foreshore SPA and Ribble & Alt Estuaries SPA*[5]

2.3.6 This report identified waterbird roosts and feeding sites in the Mersey Estuary SPA and identified which sites are of the most importance and whether significant use is being made by birds of non-count sector parts of the SPA and or supporting adjacent habitats that may not have been recorded in the past, for example, areas that are adjacent to the SPA, that are currently being significantly used or areas that were historically not known to be used by the target species within the SPA. The report was informed by the local WeBS counter network and other relevant groups and fifteen years of WeBS data and a review of the relevant EIA and research literature.

2.3.7 Within Annex 3 of the report (*Roost Locations at Sector Level*) the locations of known qualifying Mersey Estuary SPA species roost sites are provided, this includes roost locations within the SPA boundary and supporting land that may be potentially functionally linked outside of the site boundaries. **Figure 3** (below) provides a map of known wader (red) and wildfowl (orange) roost sites on the south–shore of the Mersey Estuary SPA/Ramsar site. The Site location in the context of wider land use is shown on **Figure 4**.

Figure 3: Known Mersey Estuary SPA Species Roosts Surrounding the Site



*Map A.3.9 taken from D.A. Still, N.A. Calbrade & C.A. Holt. (2015). *Review and analysis of changes in water-bird use of the Mersey Estuary SPA, Mersey Narrows & North Wirral Foreshore SPA and Ribble & Alt Estuaries SPA – Annex 3: Roost Locations at Sector Level.*.

2.3.8 **Figure 2** shows that no known waterbird roost sites were present on or surrounding the Site boundaries at the time on agricultural land located between the Mersey Estuary and the Application Site boundaries, with the closest known roost being a wildfowl roost located within the Mersey Estuary SPA/Ramsar boundary on raised saltmarsh habitat on Ince Banks, located approximately 1.2km north of the Site boundaries, with the nearest regular wading bird roosting location being also located within the SPA boundary on Ince Banks, approximately 1.7km north-west of the Site boundaries.

[5] http://publications.naturalengland.org.uk/publication/4713137133584384

Figure 4: Site context and surrounding land use

2.3.1 In addition to this report, results from bird surveys for other proposed developments and WeBS data were reviewed. Bird surveys were undertaken previously for the consented Protos development area in 2013/2014 (RSK 2014[6]). In addition British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) data for the Ince Marshes Field survey sector has been provided to Natural England in relation to the proposed gasification facility (Application Reference 18/04671/WAS available on the Cheshire West and Chester planning portal) in a letter dated 8th October 2019 to Cheshire West and Chester Council.

2.3.2 From a review of WeBS raw core count data provided by the BTO for the area referred to as Ince Marshes Field, this letter states:

"*In summary, in regard to the species for which the Mersey Estuary is designated, notable counts include peak counts of 300 and 340 Golden Plover (Pluvialis apricaria) in November 2016 and March 2018 respectively, with an absence in the other five months surveyed. It is assessed this likely indicates occasional use by a flock of these Annex I species as they move through the area, rather than any indication this represents core habitat for the species over-winter (considering the absence recorded December 2016, January 2017 and February 2017).*

Of the migratory species for which the Mersey Estuary SPA is designated for, there are no records of Redshank (Tringa tetanus), Ringed Plover (Charadrius hiaticula), Dunlin (Calidris alpine) and Northern Pintail (Anas acuta), and peak counts of 16 Shelduck (Tadorna tadorna) and 43 Teal (Anas crecca) both in March 2018."

[6] *Ince Resource Recovery Park – Winter Bird Survey 2013/2014* RSK Environment (2014)

2.3.3 Winter bird surveys were also undertaken during the winter of 2017/2018 in relation to Application Ref: 18/04894/FUL: UK Geoenergy Observatories Cheshire Energy Research Field Site (UK GEOS), relating to a series of borehole monitoring sites in the area. The surveys only recorded qualifying bird species at two locations, Sites F and K. Site K is located immediately adjacent to the Protos Mitigation Area A (shown in **Figure 6**) which is being enhanced specifically to benefit qualifying bird species, with wetland and other habitat creation measures.

Site Suitability for Qualifying Features of European Sites

2.3.4 The Site is not located within any European designated site and does not provide suitable habitat (functionally linked land) for qualifying interest bird species of the Mersey Estuary SPA/Ramsar and is not considered to be functionally-linked land with regard to the Mersey Estuary designations. The Site also does not have any functional linkage with the Midlands Meres and Mosses Ramsar, over 9km distant, due to the separation distance and habitats present which are unsuitable for the wetland plants and birds associated with the Ramsar sites.

3 POTENTIAL EFFECTS OF THE PROPOSED DEVELOPMENT

3.1 Identifying Potential Effects

3.1.1 The Proposed Development is not directly connected with, or necessary to, the conservation management objectives of any European designated site. Therefore, consideration of Likely Significant Effects (LSEs) is required. LSEs identify the possibility for the Proposed Development to have discernible effects on the qualifying interests of European designated sites or undermine its conservation objectives, but excluding trivial or inconsequential effects, either alone or in combination with other plans or projects.

3.1.2 The Proposed Development has been considered in relation to its potential effects on qualifying interests of European sites via:

- Habitat loss or change from land take and construction of the proposed facility, or either directly or indirectly via emissions, including indirect effects on functionally-linked secondary habitat for qualifying bird species; and,
- Disturbance or displacement of qualifying bird species, for example due to noise and visible activity.

3.1.3 These are considered in relation to the construction and operation of the Proposed Development, alone or in combination with other projects or plans. Decommissioning effects are not relevant in relation to this permanent consent application.

3.2 Habitat Loss or Change

3.2.1 The Proposed Development is not located within any European site. There is no potential for direct effects on habitats within any European site and the risk of direct habitat loss can therefore be screened out of the assessment.

3.2.2 Some of the qualifying bird interest species of the Mersey Estuary SPA/Ramsar utilise habitats outside of the SPA boundary and such habitats (also known as functionally linked land) can play an essential role in maintaining SPA bird populations. Proposals affecting these habitats and/or the birds/populations using them may therefore have the potential for likely significant effects on the European site itself.

3.2.3 The value of the Site itself for bird species which represent a qualifying feature of the Mersey Estuary SPA is considered to be negligible, due to unsuitable site conditions and habitat (see **Figure 1**), based on the ecology and habitat requirements of the qualifying bird species concerned. Therefore there will be no direct construction effects on functionally linked land used by passage/over-wintering birds and no loss of roosting/foraging habitat.

3.2.4 The operational facility would not have any additional effects on habitats considered to be functionally linked to the Mersey Estuary SPA/Ramsar. There would be no activities on the Site which would require an Environment Permit for emissions to air. Any process air discharged to atmosphere e.g. from dust filtration units, would pass through a bag filter to remove particulate. Wet air streams, such as those from the PET drying system, would be directed to a wet scrubber for abatement prior to discharge to atmosphere. As a result there will be *no likely significant effects* from airborne emissions.

3.2.5 As described above, the Site does not lie within or adjacent to a European site, nor does it provide functionally linked land. Effects from direct land take or habitat loss can be excluded from the assessment. The facility will not generate airborne emissions requiring an environmental permit and hence effects on air quality and, indirectly effects on SPA/Ramsar features or functionally linked habitats used by qualifying bird species, can also be excluded from the assessment.

3.2.6 It can therefore be concluded that the land take within the Site to accommodate the Proposed Development will be inconsequential in the context of the Conservation Objectives of the Mersey Estuary SPA and there would be *no likely significant effects* on functionally linked land or qualifying bird species.

3.2.7 Further consideration has been given to the potential for indirect habitat losses (and/or deterioration in habitat quality) on surrounding habitats utilised by qualifying bird species arising from surface water runoff and/or the escape of pollutants from the Proposed Development during both the construction and operational phase of the development, as discussed below.

Site Runoff and Surface Waters

3.2.8 The Midlands Meres and Mosses Phase 1 Ramsar lies over 9km from the Proposed Development and can be screened out from the assessment, by virtue of its large separation distance, absence of functionally linked habitat in the vicinity of the Site and lack of any potential for effects on mobile qualifying interest species associated with this designated site.

3.2.9 The network of ditches around the Site provides indirect connectivity with the Mersey Estuary SSSI/Ramsar/SPA and therefore the potential for these to form a pathway for effects from the Proposed Development has been assessed. The drainage network around the Ince marshes includes a series of man-made drains, created following the construction of the Manchester Ship Canal to increase its value for agriculture. The drainage system is described in the Surface Water Management Plan (SWMP) which has been prepared for the Protos Ince Marshes development, and updated in December 2018[7]. The SWMP notes that the Ince Marshes area together with Elton and areas south of the M56 totalling 729ha, are drained by a network of ditches flowing northward towards the Ince Marshes pumping station, which is operated and maintained by the Environment Agency. The Hornsmill Brook is located to the east of the Protos development area. This watercourse is at a higher elevation and its catchment is further to the south of M56 and discharges to the Estuary to the north, bypassing the Ship Canal and ditches. Environment Agency data indicate that the stretch of the brook had a chemical water quality of grade E (poor). Nitrate and phosphate levels were classed as grade 6 (very high and excessively high respectively).

[7] *This is Protos, Ince Marshes: Surface Water Management Plan 2018 Update*. WSP for Peel Environmental December 2018

3.2.10 The risk of polluted surface water runoff from the Proposed Development adversely affecting the Mersey Estuary or its qualifying interests is considered to be inconsequential, due to the limited extent of the development footprint and the separation distance from the Estuary, along with the complex network of intervening ditches and attenuation features, many of which have already been subject to consented construction works as part of the wider Protos development area. These drainage control and attenuation features would reasonably allow suspended sediment to settle out and pollution to be diluted to such an extent that any waterborne releases from the Proposed Development would be indiscernible. In addition, the very large degree of sediment exchange and flushing volumes associated with the tidal cycles of the Estuary would provide an extremely large dilution effect. Similarly, such indiscernible water quality effects would not adversely affect the species composition or foraging value of functionally linked habitat or the qualifying species using such habitat.

3.2.11 As a result, any construction-related surface water runoff from this relatively small Site (2.2ha in total) even if unmitigated, would be considered to have indiscernible and inconsequential effects on the designated features of the Estuary, or on functionally linked habitats.

3.2.12 Standard good practice pollution prevention and runoff control measures form part of legal and planning policy requirements to avoid pollution as part of the inherent design and consenting process and are not considered to be measures put in place specifically to avoid / reduce effects on the European Site.

3.2.13 As such it is reasonable to conclude that there would be *no likely significant effects* on European Sites and their qualifying interests in relation to effects on water quality (and hence indirectly on European Sites of qualifying interest species) from the construction phase of the Proposed Development.

3.2.14 On a precautionary basis, measures adopted to avoid or reduce water pollution, along with pre-existing committed drainage management and habitat mitigation measures associated with the wider Protos development area may be considered to be mitigating measures associated with the proposed development in line with current case law, including *People over Wind*. Therefore, for the purpose of this assessment, the provision of pollution prevention and runoff controls along with wider drainage management and attenuation, is considered separately under Mitigation (Section 4), with an assessment undertaken of the potential for *effects on the integrity* of European designated sites undertaken following the implementation of such mitigation measures.

3.2.15 In relation to potential operational effects the proposed development includes the provision of a water treatment facility that would be used to recirculate water used in the recycling process. The treatment facility is provided to reduce water use. However, as part of the treatment process some treated effluent would be discharged into the ditch network. The water would be discharged in accordance with water quality standards set by the Environment Agency within an Environmental Permit for the facility. Surface runoff would be attenuated, treated and controlled through the approved Protos wide SUDS management system in line with Environment Agency and Local Authority requirements. Domestic foul flows would be managed within a sealed septic tank unit for treatment offsite. As a result the proposed development would have no potential for discernible operational water quality effects on the Mersey Estuary SSSI/Ramsar/SPA or its qualifying interests (see also Section 4).

3.3 Disturbance or Displacement of Faunal Species

3.3.1 As previously highlighted, as the Midlands Meres and Mosses Phase 1 Ramsar lies over 9km from the Proposed Development and can be screened out from the assessment, by virtue of its large separation distance, absence of functionally linked habitat in the vicinity of the Site and lack of any potential for effects on mobile qualifying interest species.

3.3.2 The Site does not provide suitable habitat for qualifying bird species. It is located approximately 1km south of the Mersey Estuary SPA/Ramsar at its nearest point and lacks the open views and vegetation characteristics favoured by qualifying bird species (for example golden plover) which favour cropped vegetation/large arable fields, often close to the coast where they can forage for invertebrates. The trees and scrub on Site serve to interrupt views and foraging opportunities are limited due to ground conditions present.

3.3.3 Sources of noise and vehicle movements during construction are also distant from foraging and roosting areas, and are set against a background of existing construction, industrial operations and road traffic. Disturbance effects from noise and vehicular movements/human activity are not assessed as having any potential for likely significant effects.

3.3.4 Construction noise and activity will be over a temporary time period and noise generation would occur against a background of noise and activity associated with existing agricultural management, traffic along the road network including the M53 and other industrial operations/construction. The effects on noise and disturbance would attenuate rapidly with distance from the construction area; the potential for effects would be confined to habitat within approximately 500m, which has been shown not to be important for qualifying bird species from recent bird data records (D.A. Still, N.A. Calbrade & C.A. Holt. 2015).

3.3.5 A Noise Assessment of the Proposed Development (NVC Ltd. 2020)[8] has established typical site operating levels and modelled predicted noise contribution from the Proposed Development during maximum site operations at a number of sensitive receptors. Noise levels from the Site would range between 23dB and 35dB LAeq at the modelled receptors, some of which are a comparable distance to the Mersey Estuary. Based on measured background levels, noise levels at the nearest receptor are shown to produce a low impact, acceptable according to BS4142:2014.

3.3.6 Site rating noise levels were shown to be between 6dB and 24dB lower than background sound levels and therefore not significant.

3.3.7 Predicted noise levels are well within the planning consent noise condition limits set out in condition 34 of the Protos Development (formally known as Ince Resource Recovery Park and ref. 10/01488/FUL). The assessment therefore concludes that operating the Site would be acceptable and within all relevant guidance and standards for noise.

3.3.8 The Institute of Estuarine and Coastal Studies' *Waterbird Disturbance Mitigation Toolkit* and supporting research, is recognised as a key source of guidance for assessing effects of noise on estuarine birds. In the toolkit a sudden noise of 60dB is recognised as being as a moderate level disturbance stimulus; however, 55dB for constant or regular noise is recognised as a 'no effect' threshold. Based on the conclusions of the noise assessment described above the noise levels from the Proposed Development would classed as having 'no effect'.

3.3.9 The locations of functionally linked habitat used by qualifying bird species are relatively distant from the Site and with associated interruption to views and intervening built development, disturbance and displacement effects are considered to be inconsequential as a result of the Proposed Development. Potentially sensitive ecological receptors (bird species which are qualifying interest species of the Mersey Estuary SPA/Ramsar), are not considered to experience any likely significant noise/disturbance effects during the construction and operational phases.

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[8] *Proposed detailed Application for the Development of a Polyethylene Terephthalate (PET) Facility Plot 13* NVC Limited (2020)

3.4 Likely Impacts in Combination with other Plans and Projects

3.4.1 Information to inform Habitat Regulations Assessments relating to other developments has been reviewed in relation to land take/habitat loss and potential indirect effects from emissions. As part of the determination of the Protos development area planning application (approved by the Secretary of State, Ref. APP/ZO645/A/07/2059609), potential ecological impacts were assessed. It was concluded that, with appropriate mitigation measures in place, development would be acceptable in terms of ecological impacts. Planning permissions for the Protos area provided for ecological benefits through ecological mitigation areas, approximately 50ha across five areas 'A' to 'E' as shown in **Figure 6**. Post mitigation, the residual impacts of the Protos site are concluded as having long term positive impacts on both breeding and wintering birds, including qualifying interests of the Mersey Estuary SPA.

3.4.2 Documents relating to other planning applications have independently concluded that there would be no LSEs on any European sites, either alone or in combination with other projects or plans within the wider area. It is understood that this information has been accepted by the LPA and determined to be acceptable to inform a HRA.

3.4.3 In order to assess any other potential in-combination effects, consideration has been given to recently consented, in development or pending consent developments across the Protos Development Area/Ince Resource Recovery Park, including ,

- Application Ref: 19/03489/FUL: Energy Recovery and Hydrogen Production Facility. This site is located immediately north of the Application Site. This location was considered not to be functionally linked land, due to the existing screening around the Site in the form of trees and hedges and other built development. Air pollution and water quality effects were assessed as insignificant. Natural England subsequently confirmed no likely significant effects on the Mersey Estuary/Ramsar/SSSI in relation to this application.

- Application Ref: 18/04894/FUL: UK Geoenergy Observatories Cheshire Energy Research Field Site (UK GEOS). Assessment in relation to a series of monitoring boreholes. Of these, Site B lies north-west of the Application Site and close to the SPA boundary. This location was considered (and agreed in consultation with Natural England) not to be functionally linked land. This was due to the existing screening around the site in the form of trees and hedges and other built development. Air pollution effects were assessed as insignificant. Natural England subsequently confirmed no likely significant effects on the Mersey Estuary SPA/Ramsar/SSSI in relation to this application.

- Application Ref: 18/04671/WAS: Protos Plot 4 Progressive Energy Limited. This site lies immediately to the north of Plot 13. The HRA[9] for this development referenced wintering bird surveys undertaken in 2013/2014 (RSK 2014[10]) in relation to an application relating to the wider consented Protos development area (App. Ref 14/02277/S73) and provided bird data for an extensive area encompassing the Ince Resource Recovery Park area. Further information gathered in response to Natural England consultations included British Trust for Ornithology WeBS bird count data for 2016/2018, providing an up to date baseline for baseline for assessment. This HRA report also references the Habitat Creation and Ecology Management Plan (RSK, 2015) secured for the wider Protos development area or Ince Resource Recovery Park to mitigate for the loss of habitat used by bird species associated with the Estuary. Implementation of this Plan has been secured through a Section 106 agreement under application 14/02277/S73. Of the five proposed areas (A-E), Areas A and D

[9] *Protos Plot 4, Ince Cheshire, habitats Regulations Assessment Screening Report* Enzygo (September 2019)
[10] *Ince Resource Recovery Park – Winter Bird Survey 2013/2014* RSK Environment (2014)

have already been created. This Plan includes areas specifically designed to provide favourable wetland bird habitat including pond creation with islands to attract nesting waterfowl, shallow scrapes for waders, and winter stubble fields and low-intensity grazed fields for wintering foraging and roosting.

- Application Ref: 19/02566/FUL: Protos substations, Elton (Land Adjacent Area 12). This site lies approximately 400m south-east. The HRA[11] for this development concluded no LSE on functionally linked habitat or associated qualifying bird species, based on recent bird survey evidence (2017-2018) that did not record qualifying bird species in and around the area of proposed development. In line with consultation response from Natural England, the HRA for this development provided information for an Appropriate Assessment of potential effects from construction related runoff, via the network of ditches and small waterways leading to the Estuary, and provided mitigation in the form of standard good practice construction measures including pollution prevention and runoff control which, it was concluded, would ensure no adverse effects on the integrity of the Mersey Estuary SPA and Ramsar.

3.4.4 The HRAs for other developments, including the most recent neighbouring sites, conclude no likely significant effects either alone or in combination with other projects or plans, and where applicable, no adverse effects on the integrity of designated sites with mitigation measures in place.

3.4.5 The Proposed Development will not result in likely significant effects either alone or in combination with other projects or plans.

4 MITIGATION

4.1.1 The proposed development is assessed as having no likely significant effects in relation to potential disturbance/displacement of bird species associated with the Mersey Estuary SPA/Ramsar either within the designated site or using functionally linked land, in the absence of any mitigation measures.

4.1.2 As set out above this is also assessed to be the case in relation to waterborne emissions from the construction and operation phases, with surface water runoff and wastewater controls included as part of the design and consenting process for the facility irrespective of the presence of European sites. These measures will ensure that there will be no adverse effects on the integrity of European designated sites, either alone or in-combination with other plans or projects. However, as a precautionary approach and to current recent case law, the provision of pollution and disturbance control measures along with wider drainage management and attenuation has been considered here under mitigation.

4.1.3 Measures to be adopted as part of the Proposed Development will include standard good practice surface water runoff, foul water management and pollution control measures to protect receiving watercourses and downstream habitats and species, which includes the Mersey Estuary SPA/Ramsar. The construction and operation phase will also include standard measures to minimise noise and avoid transfer of construction-related pollutants (e.g. dust and contaminated waters) into immediately adjacent habitats in line with legislation, policy and Environment Agency requirements for permitting.

4.1.4 Typical measures during the construction phase would include:

[11] *Protos Substations, Elton Habitat Regulations Assessment Report*. Ramboll (October 2019)

- Use of properly maintained plant and compliance with the BS 5228: Part 1: *Noise Control on Construction and Open Sites;*
- Wheel washing facilities and road cleaning as needed to prevent the release of soil and silt off-Site and potentially into ditches by roads;
- Interceptor and temporary surface water management features such as silt fences or swales to attenuate and treat surface runoff before it reaches the ditch network;
- Location of stripped soils and temporary stockpiles at least 8m away from ditches;
- Fuels etc. stored on-Site only in suitable bunded and secure locations away from boundary ditches. Re-fuelling will take place only in designated locations on an impermeable base away from drains and ditches; and
- Spills kits will be available on site and staff will be suitably trained in their use.

4.1.5 These measures would be agreed and approved by the Planning Authority and Environment Agency and secured through Condition, most likely through the requirement for the submission and approval of a Construction Environmental Management Plan (CEMP).

Waterborne discharges

4.1.6 A water treatment facility forms part of the design comprising a package treatment plant which will be used to re-circulate water used in the recycling process. The treatment process removes suspended solids and the resulting sludge which contains the contaminants removed from the washing effluent would be disposed of to a suitable waste treatment facility. A proportion of treated effluent water would then be discharged to the receiving ditch in accordance with water quality standards set by the Environment Agency within an Environmental Permit for the facility. Surface water flows from hardstanding areas will pass through hydrocarbon interceptors and catch pits incorporated into the drainage design to limit siltation within the system. Isolating chambers / penstock valves would also be included within the surface water drainage system to enable flows from the Site to be isolated in the event of a major pollution incident / fire.

4.1.7 Surface water flows would discharge into a surface water ditch that flows around the northern, eastern and southern boundary of the Site. This ditch forms part of the strategic drainage network developed for the consented Protos development area. The approved Protos Surface Waste Management Plan (December 2018), includes provision for surface water flows from the Site. The surface water attenuation volumes provided for the plots, which includes Plot 13, are well in excess of the required volume to achieve greenfield runoff rates and also include an allowance for climate change.

4.1.8 As a result there would be no untreated liquid effluent entering the ditch network.

Protos Surface Water Management Plan

4.1.9 The context for the surface water at the Site has been informed by the Surface Water Management Plan (SWMP) [12] which has been prepared for the wider Protos Ince Marshes development and approved by Cheshire West and Chester Council. The SWMP includes a Drainage Strategy for the overall Protos development area, including Plot 13 (the Site) and which is supported by a Flood Risk Assessment (2014) associated with the successful approval of relevant variations to the planning conditions (Permission Ref: 10/01488/FUL). The SWMP includes for surface water drainage

[12] *This is Protos, Ince Marshes: Surface Water Management Plan 2018 Update*. WSP for Peel Environmental December 2018

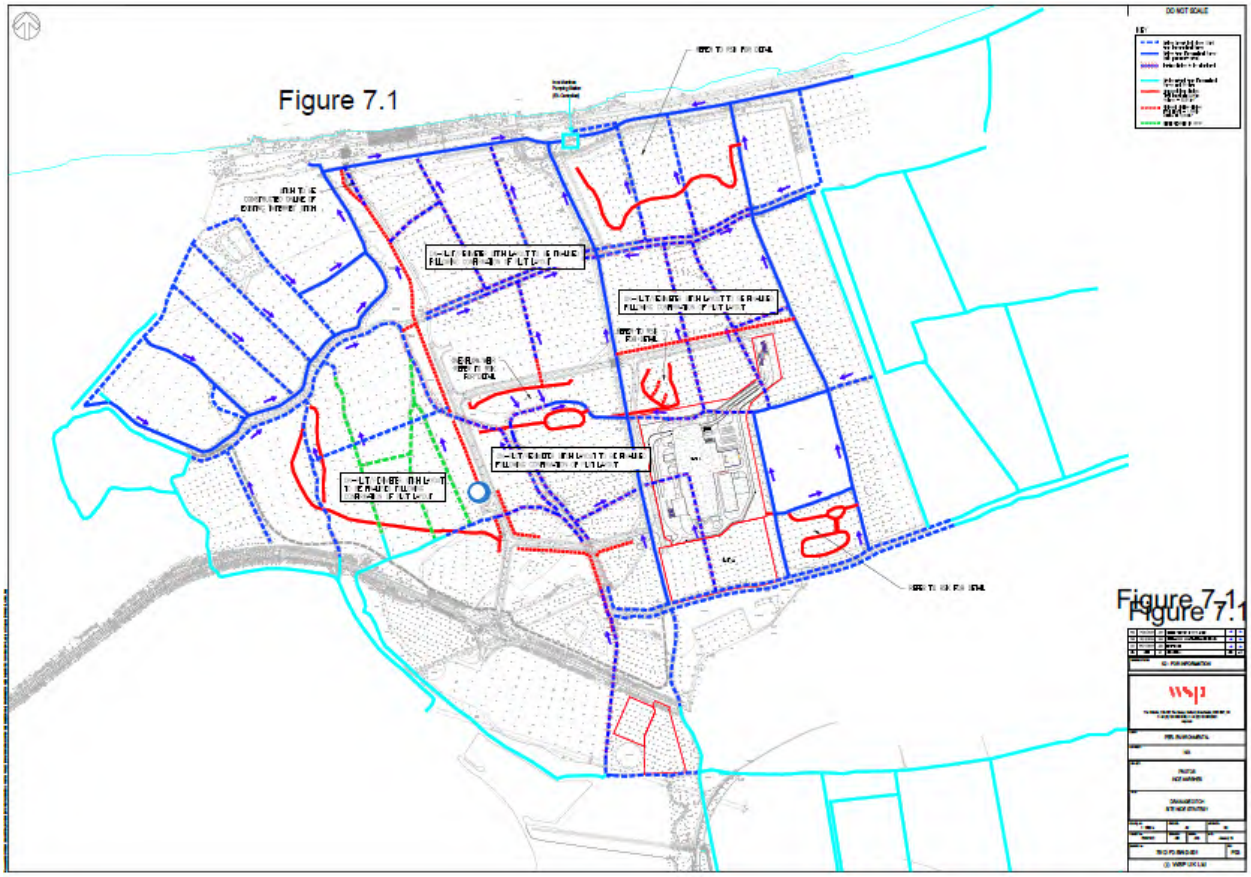
attenuation (provided in the earlier Aug 2011 SWMP for Protos), and includes the following measures which also apply to the current proposed Development at Plot 13:

- Proposed discharge rate has been reduced to or maintained at the existing greenfield runoff rate, so that development will not have a surface water impact or flooding implications to the surrounding areas.

- Proposed ponds and ditches will have more than enough storage volumes to accommodate surface water generated from the proposed hardstanding area in extreme events.

4.1.10 The existing ditch network and proposed additional ditches associated with the wider Protos development is provided in the SWMP as Figure 7.1 and reproduced below as **Figure 5**. In this Figure, blue lines indicated existing ditches/drains and red lines show proposed ditches.

Figure 5: Extract Figure 7.1 from SWMP



4.1.11 The SWMP and associated documents include provision for sufficient compensation volumes for both surface water runoff and flood storage such that water levels can be readily maintained by the current pumping regime. This includes ensuring that surface water generated as a result of the Proposed Development would be attenuated on site and discharged at a rate not exceeding the pre-development rate as set out under the existing consents.

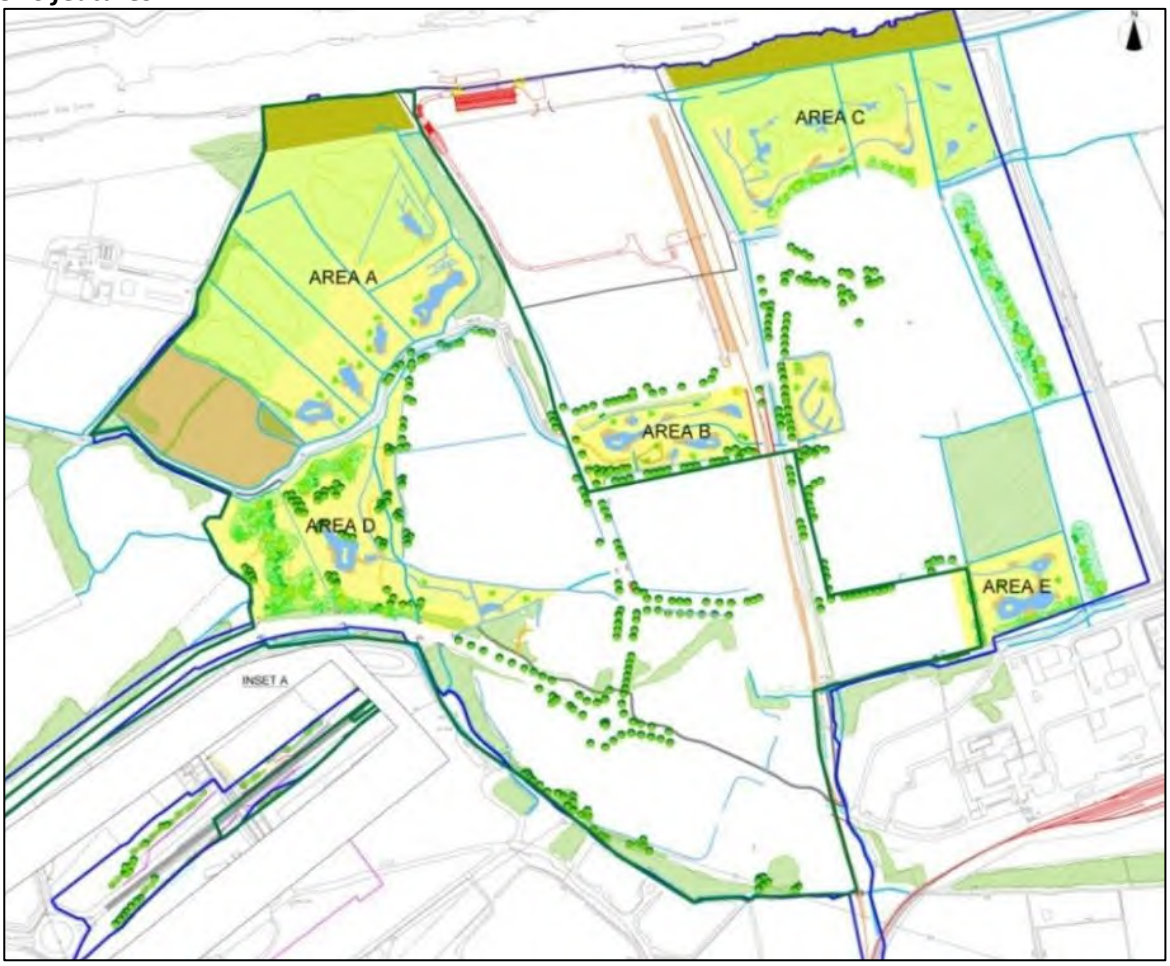
Protos Ecological Mitigation Scheme

4.1.12 A substantial amount of land has been set aside for ecological mitigation as part of the wider Protos scheme. The mitigation works incorporate flood storage and a Sustainable Drainage Scheme (SuDS) providing surface water attenuation and measures which would improve water quality discharged from any of the development plots. The mitigation scheme would provide habitat for water voles and birds, including waders, and other fauna. The Ecological Mitigation Areas are consented under

the Planning Permission ref. 10/01488/FUL and Deemed Permission ref: GDBC/001/00256C & 01.08.10.01/36C and illustrated in the SWMP (**Figure 6** below).

4.1.13 The Sustainable Drainage Scheme would ensure that all surface and foul water is adequately disposed of, without risk or adverse effect to the environment. Post mitigation, the residual impacts of the Protos development area (of which the land within Plot 13 forms a part) were concluded to provide long term positive impacts on both breeding and wintering birds, including qualifying interests of the Mersey Estuary SPA/Ramsar/SSSI.

***Figure 6: Extract Figure 2.1 from SWMP 2018 showing ecological mitigation areas which include SUDs features*.**



4.1.14 The on-Site good practice pollution prevention and runoff control measures as described, coupled with the wider measures set out in the SWMP will effectively ensure that the Proposed Development will have no potential for adverse effects on the integrity of the Mersey Estuary SPA/Ramsar.

Suitability of Mitigation

4.1.15 The mitigation has either already been, or can be, secured by suitably worded condition within the planning consent.

5 APPROPRIATE ASSESSMENT

5.1.1 No likely significant effects have been identified in relation to any European designated site or qualifying interests, however on a precautionary basis in the light of current case law the potential for effects in relation to surface water and foul water discharges and pollution control are addressed further here taking into account attenuation and treatment measures which have been described under mitigation in Section 4. These measures already form part of the overall design and consenting process. With their adoption, it can be concluded that, based on the best available scientific information there is no reasonable scientific doubt[13][14] that the Proposed Development will not adversely affect the integrity of any European Site or their qualifying interest, either alone or in combination with other plans or projects.

5.1.2 **Providing the implementation of consented pollution prevention and control measures, no adverse impacts upon habitats beyond the development site are predicted, and none are likely to adversely affect the integrity of any European designated site, either alone or in combination with other projects.**

Mersey Estuary SPA Conservation Objectives	**Assessment of effects on integrity in relation to Conservation Objectives**
• *The extent and distribution of the habitats of the qualifying features;* • *The structure and function of the habitats of the qualifying features;* • *The supporting processes on which the habitats of the qualifying features rely;* • *The population of each of the qualifying features; and* • *The distribution of the qualifying features within the site.*	Mitigation measures to control and manage surface water runoff and effluent from the Proposed Development will ensure that there is no potential to adversely affect the receiving waters of the Estuary and/or functionally linked land, or the qualifying species associated with them. The mitigation measures will ensure no damage or degradation of habitats within the SPA and/or functionally linked land and associated distribution of qualifying birds. The mitigation measures will ensure no waterborne pollution effects on the favourable conservation status of qualifying bird species and hence no effects on the integrity of the Mersey Estuary SPA/Ramsar/SSSI.

[13] Landelijke Vereniging tot Behoud van de Waddenzee and Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer en Visserij. Case C-127/02

[14] Request for a preliminary ruling under Article 267 TFEU from the High Court (Ireland), made by decision of 5 May 2017, received at the Court on 28 July 2017, in the proceedings Brian Holohan, Richard Guilfoyle, Noric Guilfoyle, Liam Donegan v An Bord Pleanála, intervening parties: National Parks and Wildlife Service (NPWS), 7.11.17

APPENDIX 1: PHOTOGRAPHS

	**Photograph 1:** View across Site showing grassland habitat
	**Photograph 2:** View across Site showing woodland – interrupting sightlines for qualifying interest bird species that prefer open vistas
	**Photograph 3:** View across Site to western woodland copse

	**Photograph 4:** Ditch within the site from north to south

Appendix B

Ince Marsh Plastic Recycling Facility

Air Emissions Risk Assessment (AERA)

Enviroo Holdings Limited

Prepared by:

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SLR Project No.: 403.065560.00001

17 November 2025

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Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0	17 November 2025	MM	LB	AD

Basis of Report

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Appendix C Model Files (electronic only)

1.0 Introduction

SLR Consulting Limited (SLR) has been instructed by Enviroo Holdings Limited to prepare an Air Emissions Risk Assessment (AERA) in support of an Environmental Permit (EP) application for a new plastic recycling facility near Marsh Lane, Ince, Elton, Cheshire West and Chester, CH2 4FL, centred around national grid reference x346500, y376400 (the 'Site').

1.1 The Proposed Operations

It is proposed that the Site will process 35,000 tonnes per annum of Polyethylene Terephthalate (PET).

Two low nitrogen oxides (NO_x) natural gas fired steam generating boilers will provide onsite process heating, each with an individual net rated thermal input of 947 kWth.

A 'dust' extraction management system would also serve the entire housed treatment process. The extraction management system would comprise two separate purpose-built extraction and abatement systems, each comprising Local Exhaust Ventilation (LEV) (extracting air from the process areas), abatement system and a dispersion stack. The two LEVs with associated external emissions of 'dust' or 'particulates' are:

- LEV1 - 'Soreme' serving the mechanical dust 'generation' points of the shredder and sorting plant; and
- LEV2 - 'All Controls' a second system which includes the 'rPET' melt and evaporate from the screen changer process areas.

Both systems would minimise the emission of 'dust' or 'particulates' through the proposed abatement 'baghouse filter' system.

1.2 Scope and Objective

The objective of the study is to assess the impact of potentially significant emissions on local air quality and compare against the relevant Air Quality Standards and Environmental Assessment Levels (EALs).

The AERA has considered the potential risk of short-term and long-term impacts on both human and ecological receptors.

Impacts have been assessed against relevant EALs for the protection of human health and against Critical Levels (C_{Le}) and Critical Loads (C_{Lo}) for the protection of vegetation and ecosystems. This assessment follows the Environment Agency's (EA) 'AERA guidance'[1].

The following pollutants have been assessed within this AERA:

- Nitrogen dioxide (NO_2); and
- Particulate Matter (PM) (PM_{10} and $PM_{2.5}$).

[1] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit.

2.0 Legislation and Relevant Guidance

The facility will be regulated under the Environmental Permitting Regulations (EPR) 2016, as amended[2]. The EPR prescribes emission limit values for certain pollutants to air from certain plant.

2.1 Environmental Permitting

Guidance Notes produced by the Department for Environment, Food and Rural Affairs (Defra) provide a framework for regulation of installations and additional technical guidance produced by the EA are used to provide the basis for permit conditions.

Of relevance to the assessment is the AERA guidance. The purpose of this guidance is to assist operators to assess risks to the environment and human health when applying for a permit under the EPR.

The EA also provides specific guidance for assessing impacts on ecological sites known as AQTAG.06[3].

2.2 National Air Quality Legislation and Guidance

A dual set of regulations, separately applicable to National and Local Government, are currently operable within the UK.

2.2.1 Air Quality Standards Regulations

The Air Quality Standards Regulations 2010[4] (AQSR) transpose both the EU Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation. The AQSR includes Limit Values which are legally binding ambient concentration thresholds which, however, are only applicable at specific locations (Schedule 1: AQSR)[5].

Following the UK's withdrawal from the EU, the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[6] was introduced to mirror revisions to supporting EU legislation.

The responsibility of achieving the AQSR (and European equivalent Directives) is a national obligation for Central Government who undertake assessments on an annual basis. Local Authorities have no statutory obligation to achieve the AQSR or the European equivalent Directives, unless otherwise instructed to assist Central Government under Ministerial Direction.

2.2.2 Air Quality Strategy

The latest Air Quality Strategy (AQS) for England was published in 2023[7]. The AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.

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[2] UK Statutory Instruments, 2016 No. 1154 The Environmental Permitting (England and Wales) Regulations 2016

[3] AQTAG06 – Technical Guidance on detailed modelling approach for an appropriate assessment for emissions to air. Environment Agency, March 2014.

[4] The Air Quality Standards Regulations (England) 2010, Statutory Instrument No 1001, The Stationary Office Limited.

[5] Schedule 1 of the 2010 AQSR provides the locations of the sampling points where the AQSR Limits Values can be assessed.

[6] The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, Statutory Instrument No. 1313, The Stationary Office Limited.

[7] Air Quality Strategy: Framework for Local Authority Delivery, Defra. April 2023.

The ambient Air Quality Objectives apply at locations where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period (referred to as 'relevant exposure').

Where any of the prescribed Air Quality Objectives are not likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action Plan (AQAP), which details measures the authority intends to introduce to deliver improvements in local air quality and achieve compliance. Defra has published technical guidance for use by local authorities in their Local Air Quality Management (LAQM) work[8]. This guidance, referred to as LAQM.TG22, has been used in the assessment where appropriate.

The EA, and designated relevant public authorities, must have regard to the AQS when exercising functions of a public nature that could affect the quality of air. The EA's role in relation to LAQM is as follows[9]:

> *"The Environment Agency is committed to ensuring that any industrial installation or waste operation we regulate will not contribute significantly to breaches of an AQS objective.*
>
> *It is a mandatory requirement of EPR legislation that we ensure that no single industrial installation or waste operation we regulate will be the sole cause of a breach of an EU air quality limit value. Additionally, we have committed that no installation or waste operation will contribute significantly to a breach of an EU air quality limit value."*

2.2.3 Environmental Assessment Levels

The EA has produced EALs to judge the acceptability of proposed emissions to air from industrial sites, and their relative contribution to the environment. EALs represent a pollutant concentration in ambient air at which no appreciable risks or minimal risks to human health are expected. The EALs provide additional values for pollutants from industrial operations not included within the AQSR or AQS.

2.3 Applied Air Quality Assessment Levels

With reference to the cited legislation, the collective Limit Values, Guidance and EALs are collectively referred to as Air Quality Assessment Levels (AQAL) in this report, as provided in Table 2-1.

'Dust' has been represented as PM. PM is classified in terms of its aerodynamic diameter; with PM_{10} relating to particles with an aerodynamic diameter of less than 10µm. Other smaller relevant fractions of particulate matter such as $PM_{2.5}$ (aerodynamic diameter of less than 2.5µm) are a sub-fraction of the PM_{10} fraction i.e. PM_{10} includes $PM_{2.5}$.

To maintain a conservative approach to the assessment of 'dust' and 'PM' and to compare against respective AQALs, it has been assumed that all emissions of PM are in the size fraction of PM_{10} and $PM_{2.5}$.

[8] Local Air Quality Management Technical Guidance (TG22), Published by Defra in partnership with the Scottish Government, Welsh Government and Department of Agriculture, Environment and Rural Affairs. May 2025.

[9] Regulating to Improve Air Quality. AQPG3, version 1, Environment Agency, 14 July 2008.

Table 2-1: Relevant AQALs

Pollutant	AQAL (µg/m^3)	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean (not to be exceeded on more than 18 occasions per annum)
PM_{10}	40	Annual mean
	50	24-hour mean (not to be exceeded on more than 35 occasions per annum)
$PM_{2.5}$	20	Annual mean

Table 2-2: Relevant Exposure

AQAL Averaging Period	AQALs Should Apply At	AQALs Should Not Apply At
Annual mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices or other places of work Hotels Gardens of residences Kerbside sites
24-hour mean	As above together with hotels and gardens or residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	As above together with hotels, gardens of residential properties, kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

2.4 Protection of Nature Conservation Sites

Sites of nature conservation importance at a European, national and local level are provided environmental protection with respect to air quality. Environmental Quality Standards exist for nature conservation sites known as 'Critical Levels' C_{Le} (for airborne concentrations) and 'Critical Loads' C_{Lo} (for deposition of nitrogen or acid forming compounds).

The AERA guidance requires that ecological habitats should be assessed against relevant standards if they are located within the following set distances from the Site:

- Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Ramsar sites within 10km of the Site; and
- Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNR), Local Nature Reserves (LNR), Local Wildlife Sites (LWS), Ancient Woodland (AW) and Sites of Importance for Nature Conservation (SINC) within 2km of the Site.

2.4.1 Critical Levels (CLe)

C_{Le} are a quantitative estimate of exposure to one or more airborne pollutants in gaseous form, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge. The relevant C_{Le} for the protection of vegetation and ecosystems are specified within the UK air quality regulations and AERA guidance, as transposed in Table 2-3.

Table 2-3: Relevant Critical Levels for the Protection of Vegetation and Ecosystems

Pollutant	Critical Level (µg/m^3)	Averaging Period
NO_x	30	Annual mean (all ecosystems)
	75	24-hour mean (all ecosystems)

2.4.2 Critical Loads (CLo)

C_{Lo} are a quantitative estimate of exposure to deposition of one or more pollutants, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge.

Deposition of nitrogen can cause eutrophication and acidification; the relevant C_{Lo} are presented in Section 5.3.

3.0 Assessment Methodology

The atmospheric dispersion modelling has been undertaken with due consideration to the EA's AERA guidance. The modelling approach is based upon the following stages:

- Review of installation specification and operational envelope to define emission sources, pollutant emission rates and characteristics;
- Identification of sensitive receptors;
- Compilation of the existing air quality baseline and review of local air quality;
- Prediction of process contribution through dispersion modelling; and
- Evaluation against relevant AQALs for both human and ecological receptors.

3.1 Considered Pollutants

In reference to the AERA guidance, the pollutant averaging periods presented in Table 3-1 have been considered.

Table 3-1: Modelled Pollutant Averaging Periods

Pollutant	Modelled Long-term	Modelled Short-term
NO_2	Annual mean	99.79th percentile of 1-hour means
PM_{10}	Annual mean	90.4th percentile of 24-hour means
$PM_{2.5}$	Annual mean	n/a

3.2 Quantification of Emissions

The source and emission parameters applied within the modelling are presented in Table 3-2 and Table 3-3. The locations of the stacks are presented in Figure 3-1.

Table 3-2: LEV Source Parameters

Emission Parameter	LEV1	LEV 2
Source Name	'All controls'	'Sorema'
Location (NGR)	x346514, y376423	x346509, y376424
Release height (above ground level) (m)	8	8
Stack diameter (m)	0.8	0.4
Actual Efflux velocity (m/s)	15	31
Actual Emission temperature	Ambient [a)]	Ambient [a)]
Actual flow (m^3/hr)	26,905	13,900
Emission Limit Value (mg/Nm^3)	10 [b)]	10 [b)]
Mass Emissions Rate (g/s)	0.07	0.036

Table notes:

a) The 'ambient' option within Aermod has been selected. This equates the emission temperature with the ambient temperature within the meteorological data file.

b) A conservative BAT-associated emission level (BAT-AEL) of 10 mg/Nm^3 'Dust' has been applied in reference to EU BREF 'waste treatment' Table 6.3: BAT-associated emission level (BAT-AEL) for channelled dust emissions to air from the mechanical treatment of waste.

Table 3-3: Boiler Source Parameters

Parameter	Boiler 1	Boilers 2
Boiler Type	CERTUSS Universal Steam Generator (1300)	CERTUSS Universal Steam Generator (1300)
Location (NGR)	x346523, y376419	x346524, y376418
Output (kW)	853 (1300 kg steam/hr)	853 (1300 kg steam/hr)
Net rated thermal input (kWth)	947	947
Stack Height (m)	25.319	25.319
Flow rate (m^3/s)	1,071	1,071
Stack Diameter (m)	0.350	0.350
Velocity (m/s)	3.09	3.09
Emission Temperature (°C)	120	120
Oxygen Content (%)	6.1	6.1
Moisture content (%)	10	10
Normalised Flow Rate (m^3/hr)	723	723
NO_x Concentration (mg/Nm^3)	100 a)	100 a)
NO_x Emission (g/s)	0.02	0.02

Table notes:

a) Limit value applied for 'new medium combustion plants other than engines and gas turbines' (273,15 K, 101,3 kPa and after correction for the water vapour content of the waste gases and at a standardised O_2 content of 3%.)

3.3 Model Setup

For this assessment the AERMOD model[10] has been applied; this model is widely used and accepted by the EA for undertaking such assessments and is considered a suitable model for this type of assessment.

3.3.1 Model Domain / Receptors

The modelling has been undertaken using a receptor grid across a map of the study area. Pollutant exposure isopleths are generated by interpolation between receptor points and superimposed onto the map. This method allows the maximum ground level concentration outside the Site boundary to be assessed.

A nested receptor grid extending 10km from the Site was applied as follows:

- 200m x 200m at 20m grid resolution;
- 500m x 500m at 50m grid resolution;
- 1000m x 1000m at 100m grid resolution;
- 2000m x 2000m at 200m grid resolution;
- 5000m x 5000m at 500m grid resolution; and

[10] Software used: Lakes AERMOD View, (Executable Aermod_24142).

- 10000m x 10000m at 1000m grid resolution.

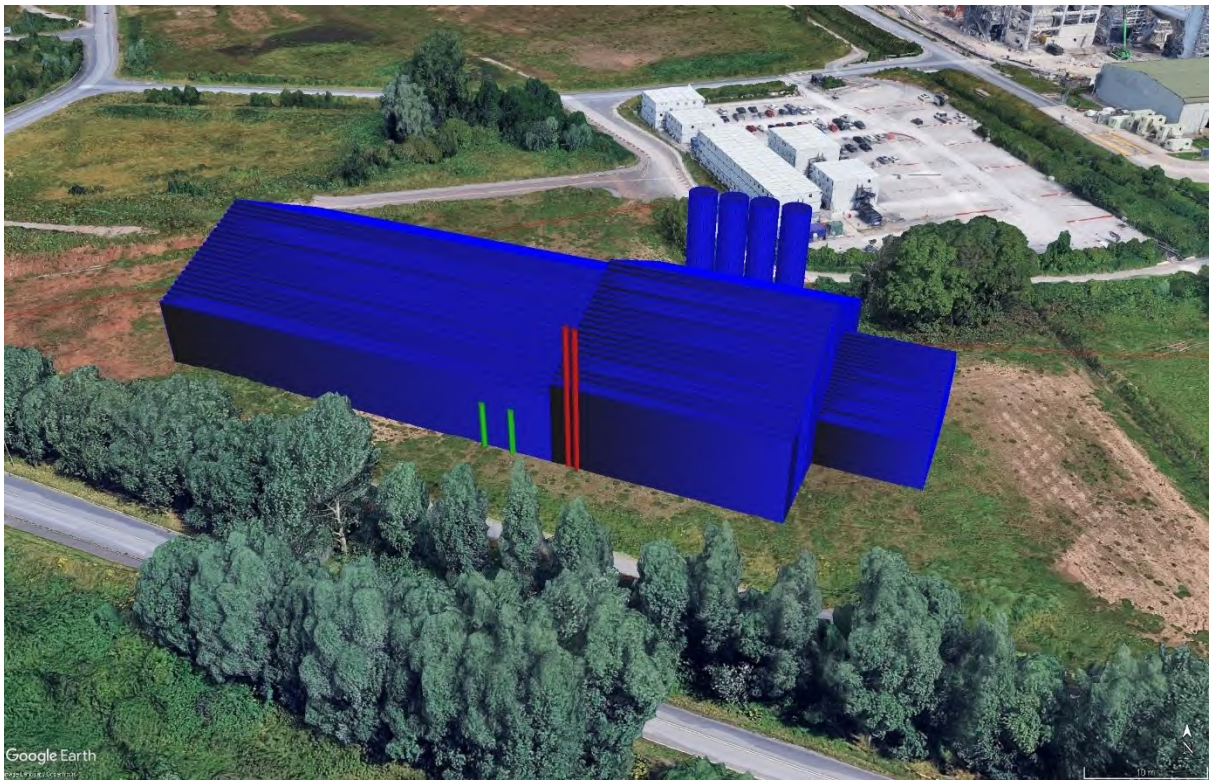
In addition, the modelling of discrete sensitive receptor locations (as described in Section 5.1.1) was undertaken to assess the impact at relevant exposure locations and to facilitate the discussion of results.

3.3.2 Building Downwash

Building downwash occurs when turbulence, induced by nearby structures, causes pollutants emitted from an elevated source to be displaced and dispersed rapidly towards the ground, resulting in elevated ground level concentrations. Building downwash has been considered for buildings that have a maximum height equivalent to at least 40% of the emission height and which are within a distance defined as five times the lesser of the height or maximum projected width of the building.

The integrated Building Profile Input Programme (BPIP) module within AERMOD was used to assess the potential impact of building downwash upon predicted dispersion characteristics. Structures input to the model are represented in Figure 3-1.

Figure 3-1: Modelled Buildings & Sources



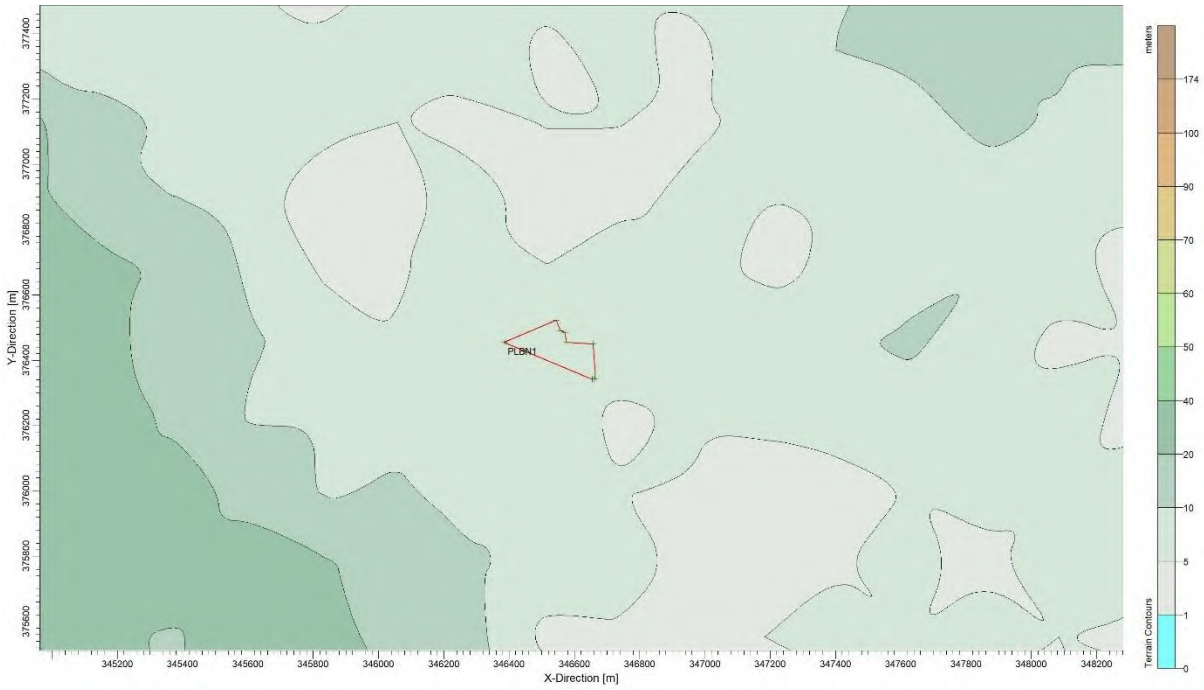
3.3.3 Topography

The presence of elevated terrain can affect the dispersion of pollutants and the resulting ground level concentration in a number of ways. Elevated terrain reduces the distance between the plume centre line and the ground level, thereby increasing ground level concentrations. Elevated terrain can also increase turbulence and, hence, plume mixing with the effect of increasing concentrations near to a source and reducing concentrations further away.

AERMOD utilises digital elevation data to determine the impact of topography on dispersion from a source. Topography was incorporated within the modelling using 30m resolution

Shuttle Radar Topography Mission (SRTM) terrain data files. Data was processed by the AERMAP function within AERMOD to calculate terrain heights, as presented in Figure 3-2.

Figure 3-2: Modelled Topography



3.3.4 Meteorological Data

The closest meteorological observation site that records all the parameters necessary for dispersion modelling is situated at 'Liverpool' approximately 6.4km northwest. The meteorological data 3-years hourly data for 2020-2022 (inclusive) was obtained in. met format from the data supplier and converted to the required surface and profile formats for use in AERMOD using AERMET View meteorological pre-processor.

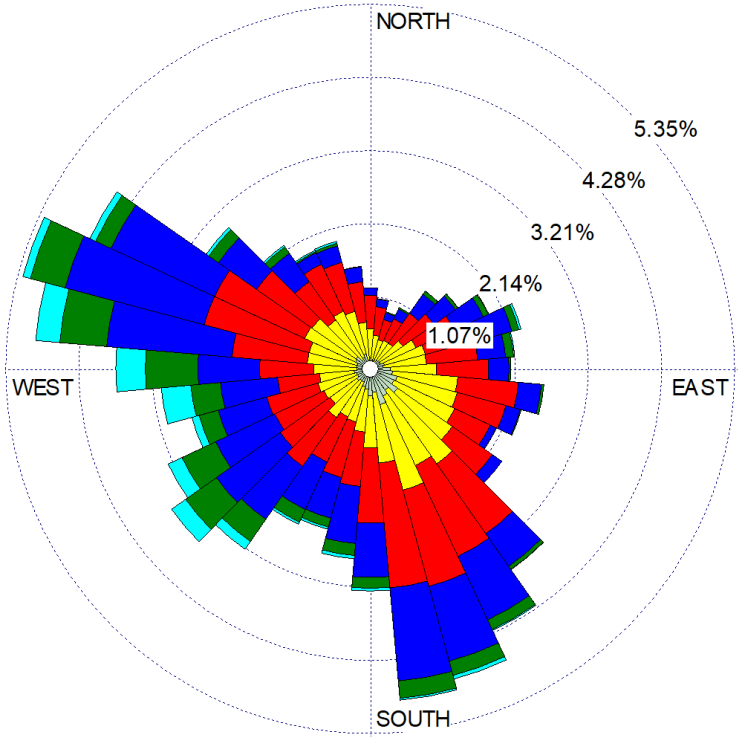
Details specific to the meteorological station location were used to define surface roughness, albedo and bowen ratio in the conversion as presented in Table 3-4. A windrose is presented in Figure 3-3. Prevailing winds are from the south and southwestern sectors.

Table 3-4: Applied Surface Characteristics

Zone (Start)	Zone (End)	Albedo	Bowen Ratio	Surface Roughness (m)
0	30	0.16	0.32	0.581
30	60	0.16	0.32	0.671
60	90	0.16	0.32	0.697
90	120	0.16	0.32	0.138
120	150	0.16	0.32	0.109
150	180	0.16	0.32	0.178
180	210	0.16	0.32	0.180
210	240	0.16	0.32	0.187
240	270	0.16	0.32	0.323

Zone (Start)	Zone (End)	Albedo	Bowen Ratio	Surface Roughness (m)
270	300	0.16	0.32	0.700
300	330	0.16	0.32	0.699
330	0	0.16	0.32	0.569

Figure 3-3: Windrose of Meteorological Data (Liverpool 2020-2022 Average)



3.3.5 Dispersion Model Uncertainty

Model validation studies[11] for AERMOD generally suggest that these dispersion models are for the vast majority of cases able to predict maximum short-term high percentiles concentrations well within a factor of two and the latest evaluation studies for AERMOD show the composite (geometric mean) ratio of predicted to observed short-term averages from 'test sites' (where real-time monitoring data is available to validate model performance), to be between 0.96 and 1.2.

[11] AERMOD: Latest Features and Evaluation Results, EPA-454/R-03-003, June 2003 (United States Environmental Protection Agency).

4.0 Approach to Assessment of Impact

4.1 Operational Envelope

The processing of the model outputs has assumed that the proposed recycling operations (and both extraction and abatement systems modelled) would be undertaken at maximum capacity, continuously for 24-hours-per-day and 365-days-per-year, reflecting a precautionary approach.

4.2 Treatment of Model Output

The assessment of impacts against the AQALs (as outlined in Sections 2.3 and 2.4) was undertaken utilising the model outputs as described in Table 4-1 below using suitable conversion factors as detailed in EA AERA guidance.

Table 4-1: Model Outputs

Averaging Period	Model Output – Process Contribution (PC)	Predicted Environmental Concentration (PEC)
1-hour max	99.79 percentile of 1-hour means (for NO_2 only)	PC + 2x annual mean background
24-hour max	90.4 percentile of 24-hour means (for PM_{10} only)	PC + annual mean background
Annual	Annual mean output	PC + annual mean background

4.3 Assessment of Impact and Significance

4.3.1 Human Receptors

To assess the potential impact on air quality, the results of the dispersion modelling have been presented in the form of tabulated concentrations at discrete receptor locations.

In accordance with the EA's AERA guidance, the impact is insignificant if:

- The long-term process contribution is <1% of the long term AQAL; and
- The short-term process contribution is <10% of the short term AQAL.

For process contributions that cannot be considered insignificant further assessment has been undertaken and the Predicted Environmental Concentration (PEC: PC + background pollutant concentration) determined for comparison as a percentage of the relevant AQAL.

According to EA guidance, no further assessment is needed if the PEC remains below the AQAL and BAT-AELs are met.

4.3.2 Ecological Receptors

4.3.2.1 Calculation of Contribution to Critical Levels

Modelled PCs have been directly assessed as a percentage of the C_{Le} relevant to this assessment, presented in Table 2-3.

4.3.2.2 Calculation of Contribution to Critical Loads

Deposition rates were calculated using empirical methods recommended by the EA AQTAG06[12]. Deposition flux was calculated using the following equation:

> Dry deposition flux (µg/m^2/s) = ground level concentration (µg/m^3) x deposition velocity (m/s)

The applied deposition velocities are as shown in Table 4-2.

Table 4-2: Applied Deposition Velocities

Chemical Species	Recommended deposition velocity (m/s)	
NO_2	Grassland	0.0015
	Woodland	0.0030

Critical Loads – Eutrophication

The C_{Lo} for nitrogen deposition (N) are recorded in units of kgN/ha/yr. The deposition PC is converted from µg/m^2/s to units of kgN/ha/year by multiplying the dry deposition flux by the standard conversion factor of 95.9.

Critical Loads – Acidification

The deposition PC is converted to units of equivalents (k_{eq}/ha/year), which is a measure of how acidifying the chemical species can be, by multiplying the deposition rate µg/m^2/s by the standard conversion factor of 6.84.

Calculation of PC as a Percentage of Acid Critical Load Function

The calculation of the PC of N to the acid C_{Lo} function has been carried out according to the guidance on Air Pollution Information System (APIS), which is as follows:

> *'The potential impacts of additional sulphur and/or nitrogen deposition from a source are partly determined by PEC, because only if PEC of nitrogen deposition is greater than CLminN will the additional nitrogen deposition from the source contribute to acidity. Consequently, if PEC is less that CLminN only the acidifying effects of sulphur from the process need to be considered:*
>
> *Where PEC N Deposition < CLminN*
>
> *PC as % CL function = (PC S deposition/CLmaxS)*100*
>
> *Where PEC is greater than CLminN (the majority of cases), the combined inputs of sulphur and nitrogen need to be considered. In such cases, the total acidity input should be calculated as a proportion of the CLmaxN.*
>
> *Where PEC N Deposition > CLminN*
>
> *PC as %CL function = ((PC of S+N deposition)/CLmaxN)*100'*

4.3.2.3 Significance of Effect on Ecological Receptors

In addition to the AERA guidance, the EA's Operational Instruction 66_12[13] details how the air quality impacts on ecological sites should be assessed. This guidance provides risk-

[12] Environment Agency, AQTAG06 – Technical Guidance on detailed modelling approach for an appropriate assessment for emissions to air, March 2014 version.

[13] EA Working Instruction 66_12 – Simple assessment of the impact of aerial emissions from new or expanding IPPC regulated industry for impacts on nature conservation.

based screening criteria to determine whether impacts will have ‘no likely significant effects’ for European sites, ‘no likely damage’ for SSSIs, or ‘no significant pollution’ for other sites, as follows:

- PC does not exceed 1% long-term C_{Le} and/or C_{Lo} or that the PEC does not exceed 70% long-term C_{Le} and/or C_{Lo} for European sites and SSSIs;
- PC does not exceed 10% short-term C_{Le} for European sites and SSSIs; and
- PC does not exceed 100% of the short-term or long-term C_{Le} and/or C_{Lo} at other sites.

5.0 Baseline Environment

5.1 Site Setting and Sensitive Receptors

The Site is within the Ince Marsh development park, Elton, centred around national grid reference x346500, y376400, with the nearest residential properties located 800m to the south.

5.1.1 Human Receptors

Table 5-1 and Figure 5-1 presents the human receptor locations which have been selected to inform relevant exposure. These receptors have been selected as the closest and worst-case receptors within the modelling domain.

The assessment has also been undertaken utilising a nested receptor grid (as detailed in Section 3.3.1) to allow potential short-term exposure to be assessed at all locations outside the 'Site boundary'.

Figure 5-1: Site Setting and Modelled Receptors

Table 5-1: Modelled Discrete Receptors – Human Receptors

Ref.	Description	NGR-x	NGR-y
RESI_1	Residential	345796	375763
RESI_2	Residential	345836	375766
RESI_3	Residential	345876	375767
RESI_4	Residential	345916	375763

Ref.	Description	NGR-x	NGR-y
RESI_5	Residential	345955	375759
RESI_6	Residential	345995	375752
RESI_7	Residential	346034	375743
RESI_8	Residential	346073	375734
RESI_9	Residential	346111	375724
RESI_10	Residential	346149	375711
RESI_11	Residential	346187	375699
RESI_12	Residential	346225	375687
COMM_1	Commercial / Industrial	346691	376565
COMM_2	Commercial / Industrial	346861	376355
COMM_3	Commercial / Industrial	346054	376309

5.1.2 Ecological Receptors

Ecological receptors within the screening distances from the Site boundary are presented in Table 5-2 and Figure 5-2.

Table 5-2: Designated Ecological Sites

Site	Designation	Sensitive Interest Features
Mersey Estuary	SSSI, SPA, Ramsar	Atlantic upper-mid & mid-low salt marshes
Midland Meres & Moses	Ramsar	Raised and blanket bogs

Figure 5-2: Modelled Designated Ecological Site Locations

5.2 Ambient Air Quality

5.2.1.1 Air Quality Management Areas

The Site and modelling domain are within the administrative area of Cheshire West and Chester Council (CWCC).

Up until 21st June 2024 there were four designated AQMAs in CWCC; three of these AQMAs were located in Chester City Centre, Whitby Road/Station Road and Frodsham and related to exceedances of the annual mean NO_2 AQAL due to road traffic emissions. All three of these AQMAs have since been revoked.

The fourth and remaining AQMA; Thornton-le-Moors, is located approximately 2.2km southwest of the Site, is declared due to exceedances of the 15-minute mean sulphur dioxide (SO_2) objective caused by industrial emissions. The Site does not emit SO_2 and therefore AQMAs have not been considered further for this assessment.

5.2.1.2 Automatic Air Quality Monitoring

From review of both local and national automatic monitoring networks, the nearest automatic monitor is 'Elton' automatic monitoring station. An industrial location, ~1.2km to the southeast of the Site. As this monitor only records SO_2 it has been excluded from the assessment.

The next closest monitoring stations are Helsby and Thornton-le-Moors. Recorded data is presented in the following tables, which indicate there were no exceedances of the relevant AQALs between 2022-2024.

Table 5-3: Automatic Air Quality Monitoring Data

Station ID	Monitoring Network	Site Classification	NGR-x	NGR-y	Distance from Site (km)
Helsby (HELSB)	Air Quality England	Urban Background	348489	375422	~2.1km
Thornton-le-Moors, Park Road (TLP)	Local Authority	Industrial	344103	374330	~3.1km

Table 5-4: HELSB Automatic Monitor Recorded Results (µg/m^3)

Pollutant	Exposure Period	2022	2023	2024
PM_{10}	Annual Mean	12	10	11
PM_{10}	24-Hour Means >50µg/m^3	0	0	0
$PM_{2.5}$	Annual Mean	7	6	6

Table 5-5: TLP Automatic Monitor Recorded Results (µg/m^3)

Pollutant	Exposure Period	2022	2023	2024
NO_2	Annual Mean	11	10.4	No data
	1-Hour Means >200µg/m^3	0	0	No data
PM_{10}	Annual Mean	12	11.9	No data
	24-Hour Means >50µg/m^3	0	0	No data
$PM_{2.5}$	Annual Mean	No data	No data	No data

5.2.1.3 Passive Diffusion Tube Monitoring

Passive NO_2 diffusion tube monitoring is currently undertaken by CWCC at numerous locations, in fulfilment of their statutory LAQM obligations.

The details and results of the monitoring locations closest to the Site (i.e. within 2km) are presented in Table 5-6 and Table 5-7 respectively, which indicate there were no exceedances of the relevant AQALs between 2022-2023[14].

Table 5-6: Passive Diffusion Tube Monitoring Sites: Details

Station ID	Site Classification	NGR-x	NGR-y	Distance from Site (km)
MUL	Roadside	346258	375321	1.1km

Table 5-7: Passive Diffusion Tube Monitoring Sites: Results

Site ID	2023 Data Capture %	Annual Mean NO_2 Concentration (µg/m^3)		
		2022	2023	2024
MUL	100	14.0	12.2	No data

[14] The empirical relationship given in LAQM.TG22 states that exceedances of the 1-hour mean AQAL for NO_2 is unlikely to occur where annual mean concentrations are <60µg/m^3. This indicates that an exceedance of the 1-hour mean AQAL was unlikely to have occurred at the above monitors for the period assessed.

5.2.2 Defra Mapped Background Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution which is routinely used to support LAQM requirements and air quality assessments. The data sets include annual average concentration estimates for NO_x, NO_2, PM_{10} and $PM_{2.5}$ using a reference year of 2021.

Defra mapped annual mean background concentrations for the above-described pollutants for the grid squares covering the Site and modelled human receptors are presented in Table 5-8. All of the mapped background concentrations presented are well below the respective annual mean AQALs.

Table 5-8: Defra Mapped Background Pollutant Concentrations

Grid Square (X, Y) (m)	Year	Annual Mean Concentration (µg/m³)			
		NO_x	NO_2	PM_{10}	$PM_{2.5}$
346500, 376500	2024	13.4	10.2	13.8	9.1
AQAL		***-***	***40***	***40***	***20***

5.2.3 Application of Baseline Data

Based on the data presented above Defra background map concentrations for the relevant grid square have been applied to all modelled human receptors.

5.3 Baseline Conditions at Ecological Receptors

The APIS support tool has been used to provide information on background pollutant concentrations, current deposition rates and C_{Lo} as presented in the tables below, based on values taken from the most appropriate APIS grid square to the modelled sources and most relevant habitat class for the potential area of interest.

Table 5-9: Baseline Conditions at Ecological Receptors – C_{Le}

Receptor	Habitat	NOx Annual Mean (µg/m³)	NOx 24-hour Mean (µg/m³) (A)
Mersey Estuary	Atlantic upper-mid & mid-low salt marshes	14.7	29.4
Midland Meres & Moses	Raised and blanket bogs	7.69	15.4
Table note: (A) Calculated from 2x the annual mean concentration.			

Table 5-10: Baseline Conditions at Ecological Receptors – Nutrient Nitrogen C_{Lo} and Current Loads

Receptor	Habitat	Critical Load Range (kg N/ha/yr)	Critical Load Applied in Assessment (kg N/ha/yr)	Current Load (kg N/ha/yr)
Mersey Estuary	Atlantic upper-mid & mid-low salt marshes	10-20	10	14.5

Receptor	Habitat	Critical Load Range (kg N/ha/yr)	Critical Load Applied in Assessment (kg N/ha/yr)	Current Load (kg N/ha/yr)
Midland Meres & Moses	Raised and blanket bogs	5-10	5	21.98

Table 5-11: Baseline Conditions at Ecological Receptors – Acid C_{Lo} Functions and Current Loads

Receptor	Habitat	Critical Load Function (k_{eq}/ha/yr)			Current Load (k_{eq}/ha/yr)
		CLmaxS	CLminN	CLmaxN	
Mersey Estuary	Calcareous grassland	4	1.071	5.071	1.77
Midland Meres & Moses	Raised and blanket bogs	0.231	0.321	0.552	1.7

6.0 Assessment Results

The results of the detailed dispersion modelling are presented in the following sections.

6.1 Impacts on Human Receptors

6.1.1 NO_2

Predicted annual mean NO_2 impacts at the modelled receptor locations are summarised in Table 6-1 (an isopleth plot is presented in Appendix B).

The maximum PC at all modelled sensitive receptors is below 1% of the AQAL. The AQAL of 40µg/m^3 is not exceeded at any of the receptor locations.

Table 6-1: Predicted NO_2 Annual Mean Impacts

Receptor	AQAL (µg/m^3)	PC (µg/m^3)	PC as % of AQAL
Maximum at Residential	40	<0.1	<0.1%

Predicted short-term impacts are summarised in Table 6-2. The maximum PC at all modelled sensitive receptors is below 10% of the AQAL. The AQAL of 200µg/m^3 is not exceeded at any of the receptor locations.

Table 6-2: Predicted NO_2 1-hour Mean (99.79%ile) Impacts (µg/m^3)

Receptor	AQAL (µg/m^3)	PC (µg/m^3)	PC as % of AQAL
Maximum Offsite	200	5.6	2.8%
Maximum at Residential	200	0.4	0.2%
Maximum at Commercial	200	1.6	0.8%

6.1.1 PM_{10}

Predicted annual mean PM_{10} impacts at the modelled receptor locations are summarised in Table 6-3 (an isopleth plot is presented in Appendix B).

The maximum PC at all modelled sensitive receptors is below 1% of the AQAL. The AQAL of 40µg/m^3 is not exceeded at any of the receptor locations.

Table 6-3: PM_{10} Annual Mean Concentrations (µg/m^3)

Receptor	AQAL (µg/m^3)	PC (µg/m^3)	PC as % of AQAL
Maximum at Residential	40	0.1	0.2%

Predicted short-term impacts are summarised in Table 6-4. The AQAL of 50µg/m^3 is not exceeded at any of the receptor locations.

Table 6-4: PM_{10} 24-hour Mean (90.41%ile) Concentrations (µg/m^3)

Receptor	AQAL	PC (µg/m^3)	PC as % of AQAL	Background	PEC (µg/m^3)	PEC as % of AQAL
Maximum Offsite	50	16.4	32.8%	10.5	26.9	53.8%
Maximum at Residential	50	0.2	0.4%	10.5	10.7	21.4%
Maximum at Commercial	50	2.0	4.0%	10.5	12.5	25.0%

6.1.2 $PM_{2.5}$

Predicted annual mean $PM_{2.5}$ impacts at the modelled receptor locations are summarised in Table 6-5.

The maximum PC at all modelled sensitive receptors is below 1% of the AQAL. The AQAL of 20µg/m^3 is not exceeded at any of the receptor locations.

Table 6-5: $PM_{2.5}$ Annual Mean Concentrations (µg/m^3)

Receptor	AQAL (µg/m^3)	PC (µg/m^3)	PC as % of EAL
Maximum at Residential	20	0.1	0.4%

6.2 Impacts on Ecological Receptors

6.2.1 Critical Levels

The results of the assessment of impacts on C_{Le} are presented in Table 6-6 below. The findings are as follows:

- The annual mean PC (NOx) is insignificant at less than 1% of the C_{Le}.
- The daily mean PC (NOx) is insignificant at less than 10% of the C_{Le}

Given the above, the impacts are considered to cause 'no likely significant effects'.

Table 6-6: Impact on NO_x Critical Levels (µg/m^3)

Site	Applied C_{Le}	PC	PC as % of C_{Le}
Mersey Estuary	30 (annual)	0.03	0.1%
	75 (daily)	0.3	0.4%
Midland Meres & Moses	30 (annual)	<0.01	<0.01%
	75 (daily)	0.01	0.01%

6.2.2 Critical Loads

The results of the assessment on C_{Lo} are presented in Table 6-7. The findings are that the PC's do not exceed 1% of the CLo at any of the ecological designations. Therefore, the impact is considered to cause 'no likely significant effects'.

Table 6-7: Impact on Nitrogen Critical Load (kg N/ha/yr)

Site	Applied C_{Lo}	PC	PC as % of C_{Lo}
Mersey Estuary	10	<0.01	0.03%
Midland Meres & Moses	5	<0.01	<0.01%

Table 6-8: Impact on Acid Critical Load Function (kg_{eq}/ha/yr)

Site	Applied C_{Lo}	PC	PC as % of C_{Lo}
Mersey Estuary	10	<0.01	<0.01%
Midland Meres & Moses	5	<0.01	<0.01%

7.0 Summary and Conclusions

This AERA has quantified and assessed the potential air quality impacts associated with emissions from the Site using EA approved techniques against published standards for the protection of human health and designated ecological sites.

The conclusions of the AERA are as follows:

- The process contributions do not lead to any exceedances of the standards (long-term or short-term) for the protection of human health at any relevant exposure location outside of the Site; and
- The impact is considered to cause ‘no likely significant effects’ at European site designations.

Appendix A Modelling Checklist

Ince Marsh Plastic Recycling Facility

Air Emissions Risk Assessment (AERA)

Enviroo Holdings Limited

SLR Project No.: 403.065560.00001

17 November 2025

Table A-1: Modelling Checklist

Item	Yes/No	Details / Reason for Omission
Location map	Yes	Figure 5-1
Site plan	Yes	Figure 3-1
Pollutants modelled and relevant EALs	Yes	Sections 2.3 and 2.4
Details of modelled scenarios	Yes	Section 4.1
Details of relevant ambient concentrations	Yes	Section 5.2
Model description and justification	Yes	Section 0
Special model treatment used	Yes	Section 4.2
Table of emission parameters used	Yes	Section 3.2
Details of modelled domain and receptors	Yes	Section 3.3.1
Details of meteorological data used	Yes	Section 3.3.4
Details of terrain treatment	Yes	Section 3.3.3
Details of building treatment	Yes	Section 3.3.2
Details of modelling deposition	Yes	Section 4.3.2
Model uncertainty and sensitivity	Yes	Section 3.3.5
Assessment of impacts	Yes	Section 6.0
Contour plots	Yes	Appendix B
Model input files	Yes	Appendix C

Appendix B Contour Plots

Ince Marsh Plastic Recycling Facility

Air Emissions Risk Assessment (AERA)

Enviroo Holdings Limited

SLR Project No.: 403.065560.00001

17 November 2025

Figure B-1: Process Contribution – Annual Average NO_2

Figure B-2: Process Contribution – 1 Hour (99.79%ile) Mean NOx

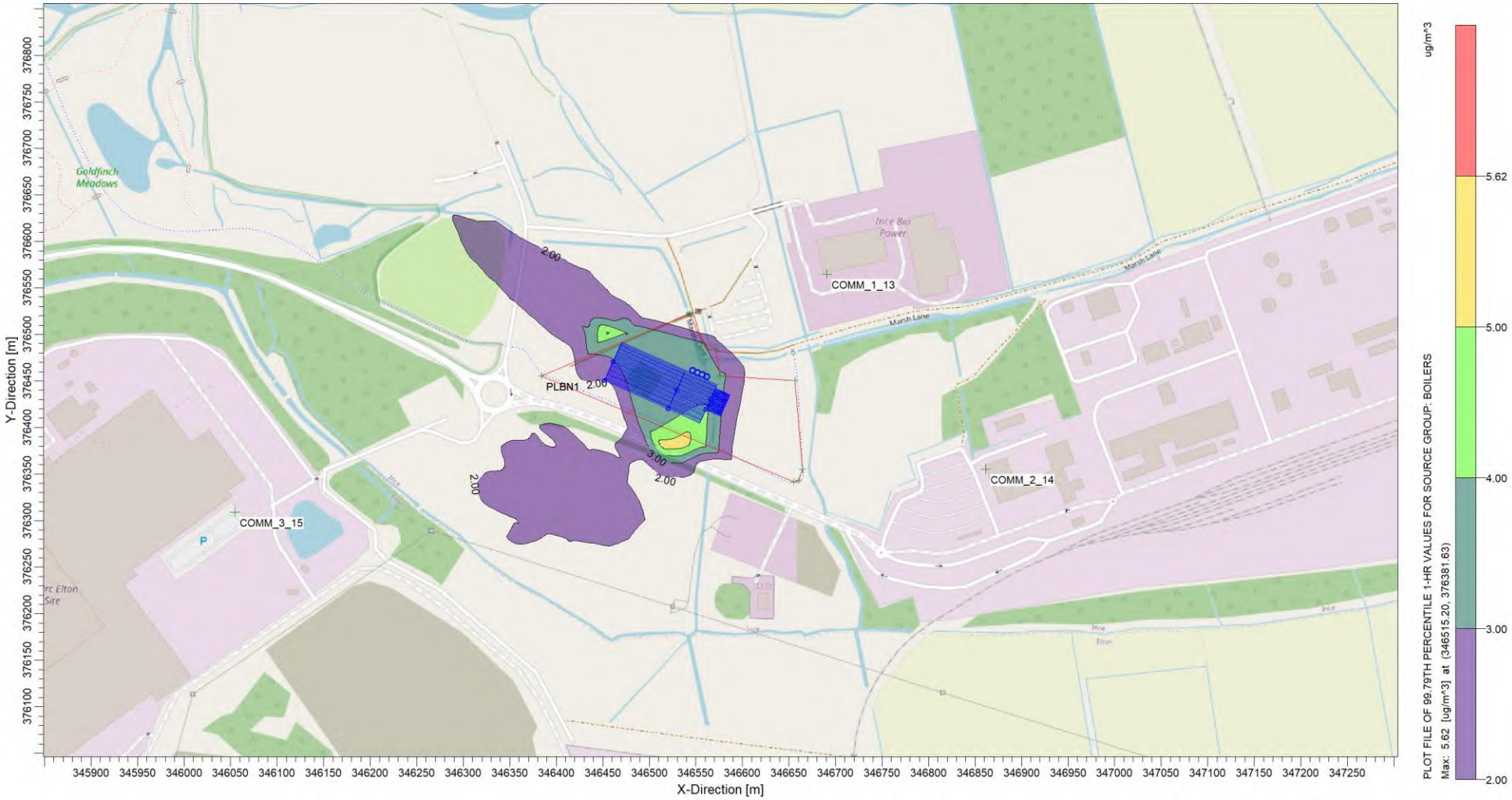


Figure B-3: Process Contribution – Annual Average PM_{10}

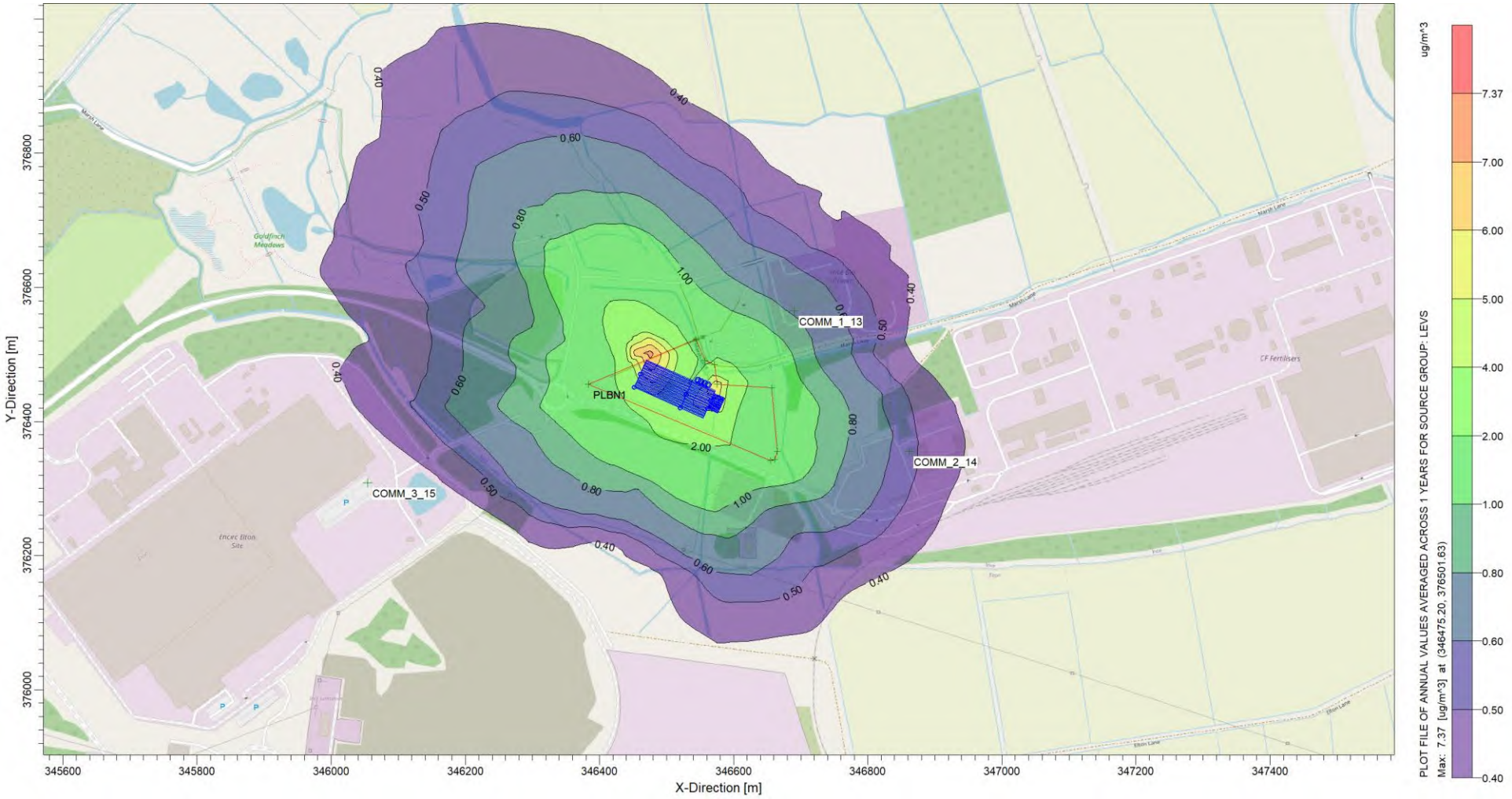
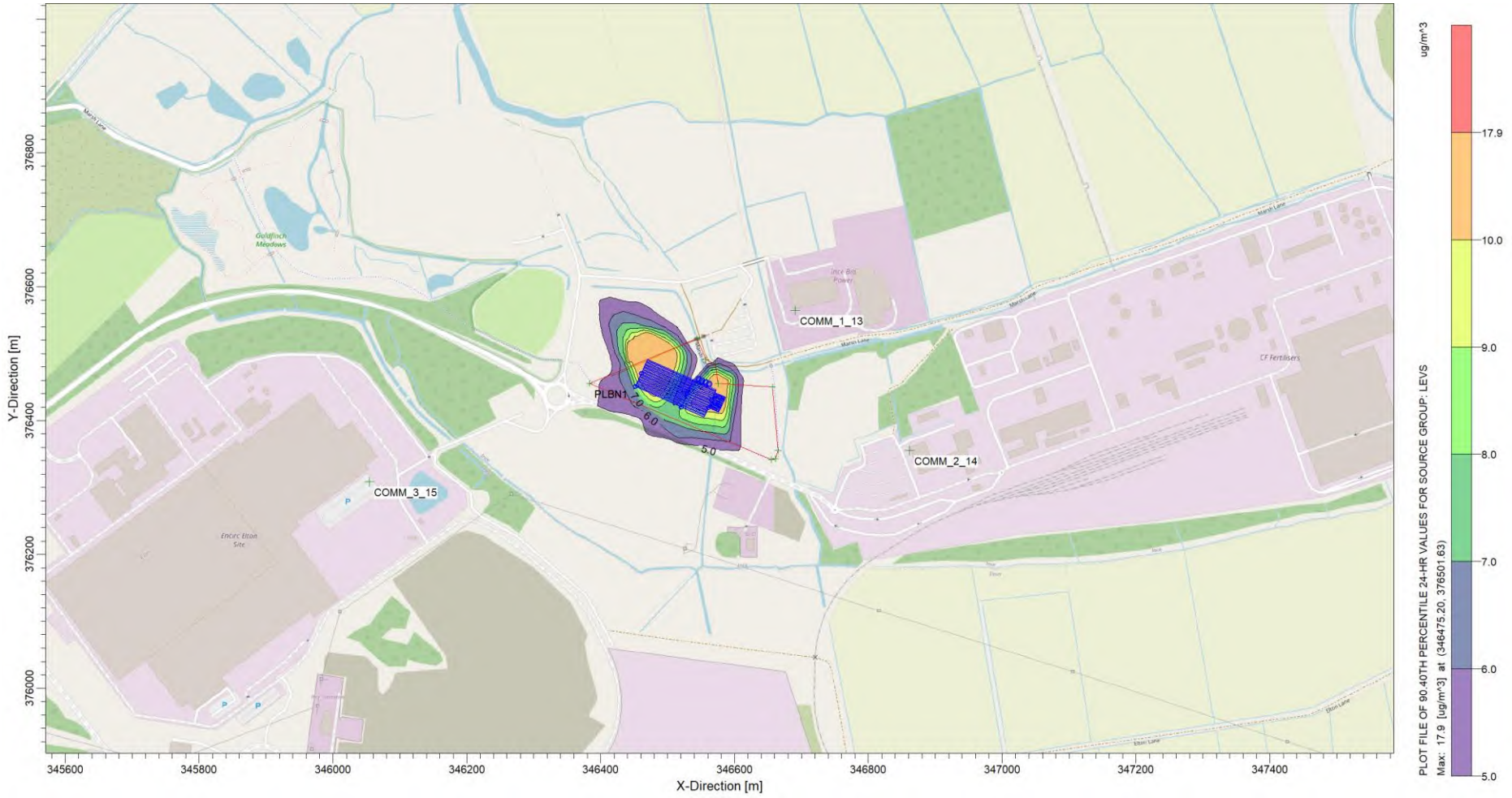


Figure B-4: Process Contribution – 24 Hour (90.4%ile) Mean PM_{10}



Appendix C Model Files (electronic only)

Ince Marsh Plastic Recycling Facility

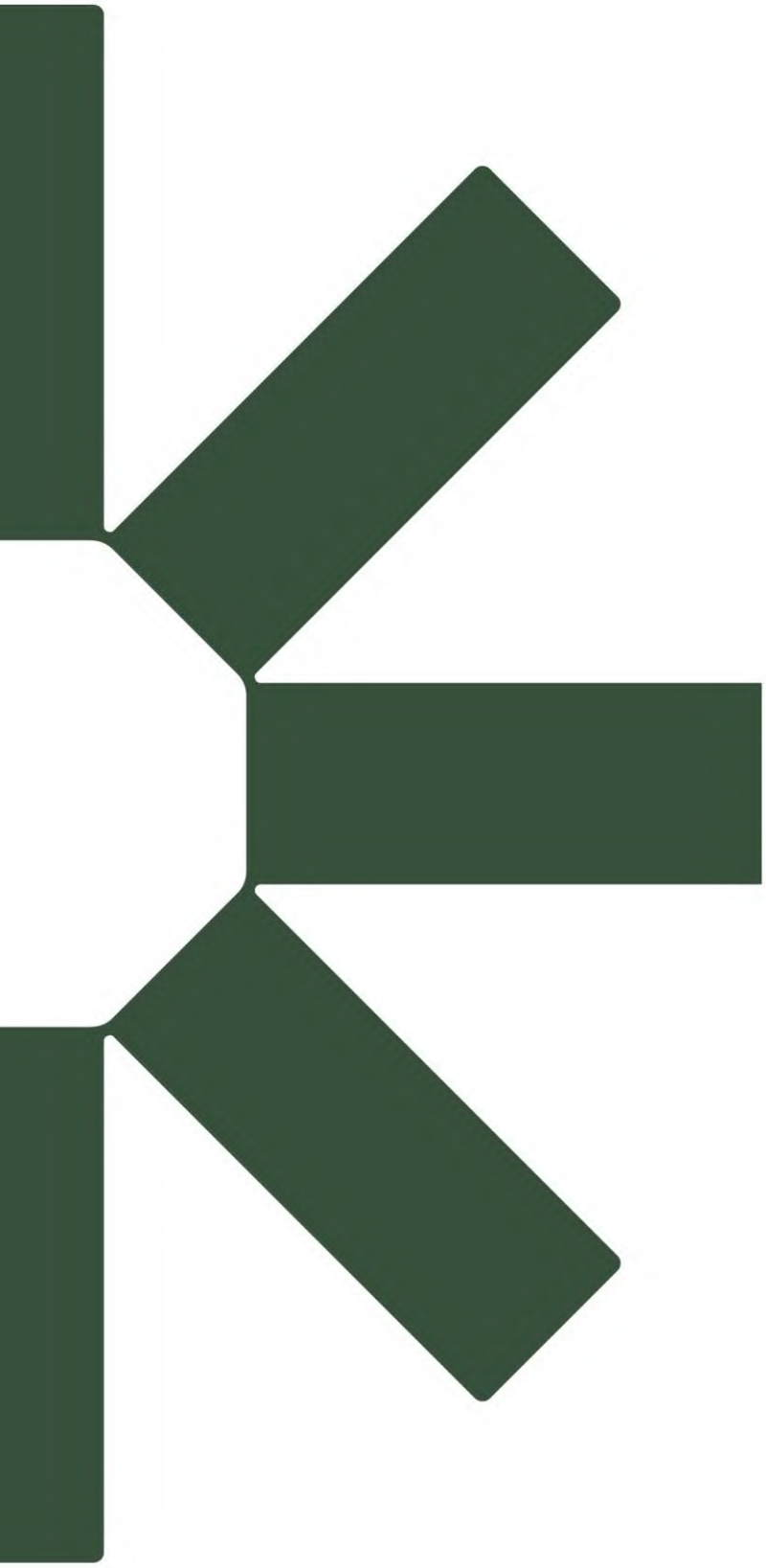
Air Emissions Risk Assessment (AERA)

Enviroo Holdings Limited

SLR Project No.: 403.065560.00001

17 November 2025

Submitted Model Files	Pollutants Modelled
INCE_v1_22	NO_2 as NOx and PM



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