ARCUS
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# RETFORD CIRCULAR ECONOMY PROJECT

# TECHNICAL APPENDIX 1.1
# ENVIRONMENTAL IMPACT ASSESSMENT
# SCOPING REPORT

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# 1 INTRODUCTION

## 1.1 Overview

This Environmental Impact Assessment (EIA) Scoping Report (the Report) has been prepared by Arcus Consultancy Services Ltd (Arcus) on behalf of Lound Hive Limited (the Applicant), part of Hive Aggregates and the Hive Energy Group. The Applicant is proposing to submit a planning application to Nottinghamshire County Council (NCC) in its capacity as Mineral Planning Authority (MPA) for the extraction of Pulverised Fuel Ash (PFA), a sustainable secondary aggregate and cement substitute, from former disposal lagoons near Lound, Retford, Nottinghamshire (the 'Proposed Development').

The application will be accompanied by an Environmental Statement (ES) prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (herein referred to as 'the EIA Regulations').

## 1.2 The Applicant

Lound Hive Limited, the Applicant, is a special purpose vehicle, set up for the Retford Circular Economy Project (the Project), including for submission of the aforementioned planning application. The Applicant forms part of Hive Aggregates, which itself forms part of the Hive Energy Group.

Founded in 2010, The Hive Energy Group has become established as one of the largest and most experienced UK solar developers, responsible for installing in excess of 300 MW of generating capacity across the country. The Hive Energy Group has since expanded to invest in and develop circular economy projects that will support climate change mitigation and recycling, amongst other things.

Within the Hive Energy Group, Hive Aggregates has been established to make beneficial use of industrial by-products and waste to create sustainable building products. This includes the Project, where it is proposed to recycle PFA waste into a sustainable cement substitute and other building products.

## 1.3 Site Description

It is proposed to extract PFA from former disposal lagoons, located 400 metres (m) east of Lound and 2 kilometres (km) north of the centre of Retford (the 'Site'). The main section of the Site is comprised of former PFA disposal lagoons (or the 'Extraction Area') that have been re-instated for agricultural use (low quality grazing land). The area to the north of the former lagoons and intersecting Lound Low Road is a predominantly concrete hardstanding area that would be the location for the 'Temporary Optimisation Site' where, amongst other things, the processing plant would be optimised for the use of biogas from the adjacent anaerobic digestion facility.. The area to the south of the former lagoons includes the Bellmoor Quarry industrial estate, where the proposed 'Main Processing Site' would be located. A more detailed breakdown and description of the Site is provided below.

The Site can be characterised as three connected areas:

- Extraction Area – former ash lagoons (approximate area 106.1 ha) – Area A
- Temporary Optimisation Site – previously developed land north of Lound Low Road (approximate area 2.6 ha) – Area B
- Main Processing Site – Bellmoor Quarry industrial estate (approximate area 7.7 ha) – Area C

A site layout plan, Figure 1, is included in Appendix A confirming the boundaries of the site areas.

Area A – Extraction Area

The former ash lagoons site is raised with vegetated banks around its perimeter and largely comprises grassland for grazing, though this is of relatively poor quality. The area has historically been subject to a significant amount of sand and gravel extraction and is therefore not alien to extractive industries, with Areas B and C having been used until recently for the processing and export of won resources and remaining in industrial use to this day.

The area is split between 'lowlands' to the east (7.5 – 11 m AOD) and 'high fields' to the centre and west (17 – 19 m AOD). The Site is also well screened owing to a combination of topography and existing vegetation, including tree planting and hedgerows along its perimeter and woodland blocks and hedgerows in the surrounding area.

The area is relatively isolated, with the village of Lound located approximately 500 m to the north and the village of Sutton-Cum-Lound located approximately 400 m to the north west. The town of Retford is located approximately 1.5 km to the south. The closest residential properties comprise the farmhouse and two other properties associated with Sutton Grange Farm, located immediately to the north of the Site: Bellmoor Farm located approximately 100 m to the west; and two dwellings associated with the Wetlands Fishery on the opposite side of Lound Low Road to the north. There are no other known residential properties within 500 m, although this will be reviewed as part of the environmental assessments carried out for the planning application.

Area B – Temporary Optimisation Site

This area comprises vacant previously developed land and open storage areas adjoining an existing combined heat and power (CHP) and anaerobic digestion (AD) plant north of Low Farm, accessed via Lound Low Road, beyond which a working farmyard is situated. The land is situated in close proximity to other uses including the aforementioned concrete works to the north, Wetlands Lakes fishing lake to the south west, A.P.E. and Prime8 educational and outdoor facilities, and the Wetlands Animal Park.

Area C – Main Processing Site

Area C is accessed from the A638 via a dedicated priority turn junction and is in use for concrete manufacturing and other industrial uses. The site address belies its former use in association with sand and gravel extraction. It currently accommodates a number of industrial uses, including a stonemason and concrete batching plant, and is therefore in daily operational use. The A638 access is shared with the Idle Valley Nature Reserve visitor centre. Bellmoor Lake lies nearby to the east and beyond this is a sewage treatment works. The industrial areas along Randall Way in the northern part of Retford are located approximately 450 m to the south east of the Site. The east coast mainline railway passes by to the south at around 350 m at its nearest point.

## 1.4 Purpose of the Scoping Report

The EIA Regulations state at regulation 15(2a) that a request for a Scoping Opinion should contain[1]:

*"(a) a plan sufficient to identify the land;*

*(b) a description of the Proposed Development, including its location and technical capacity;*

[1] Her Majesty's Stationery Office (HMSO) (2017) The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 [online]. Available at: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk) The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk) [Accessed: 15th August 2022]

*(c) an explanation of the likely significant effects of the development on the environment; and*

*(d) such other information or representations as the person making the request may wish to provide or make."*

While primarily aimed at the developers of nationally significant infrastructure projects under the Planning Act 2008, the guidance highlighted in Planning Inspectorate Advice Note 7 Environmental Impact Assessment: Screening, and Scoping and Preliminary Environmental Information has also been taken into account in the preparation of this Scoping Report.

Accordingly, this Scoping Report presents:

- A plan sufficient to identify the land - the site location figure (Figure 1);
- A description of the Development (section 3); and
- An explanation of the likely significant effects of the Development on the environment (the Likely Environmental Effects sub-section of technical sections 5 to 14 of this Scoping Report).

This Scoping Report has also been prepared with a view to inviting early consultation comments on the approach to the EIA and the content of the Environmental Statement (ES). It provides information on the key issues anticipated and outlines the methodologies proposed for the various technical assessments.

This Scoping Report outlines issues anticipated, in the opinion of the authors, to be not significant, which therefore do not require assessment as part of the EIA, though they may be subject to separate reporting to support the planning application. These issues are proposed to be "scoped out" of the EIA and where this is proposed it is made clear in this report.

Comments received in response to this Scoping Report will inform the evolution of the site design, the EIA methodology and the Development programme. How responses have been addressed will be reported in the Consultation chapter and other relevant technical chapters of the ES.

# 2 ENVIRONMENTAL IMPACT ASSESSMENT

## 2.1 EIA Regulations

The Proposed Development falls within Schedule 1 of the EIA Regulations, under Part 19 1.13 'Quarries and open-cast mining where the surface of the site exceeds 25 hectares', and therefore EIA is required and the application will be accompanied by an ES.

Iterative Design and Rochdale Envelope

The development design will evolve throughout the EIA process. An iterative design process will be utilised, whereby site-specific constraints and design criteria will be collated to guide the location of the Proposed Development's infrastructure. If necessary, parts of the Site may not be developed on in order to avoid, reduce or remove significant adverse effects.

The iterative design process will take account of comments made during consultation, including in response to this Scoping Report. The ES will describe how the design of the Proposed Development has been influenced by such comments.

Where required in order to maintain flexibility in the development design, the ES may use the 'Rochdale Envelope' approach to allow the Proposed Development to be consented as described by ranges of parameter values, rather than fixed parameter values. These parameters will be defined in the Project Description chapter of the ES. These parameters will be considered in detail by technical authors in the ES to ensure that the realistic worst-case effects of the Proposed Development are assessed for each potential receptor.

# 3 THE DEVELOPMENT

## 3.1 Description of the Development

The Proposed Development comprises the extraction and export of PFA contained in former disposal lagoons at the Site. Associated with this would be bulk earthworks, dewatering and soil storage, ponds and excavations, hard surfacing, buildings and structures, plant, conveyors, utility connections, roadways, parking, drainage, and restoration including planting.

The Proposed Development is likely to comprise a number of phases. For EIA scoping purposes these can be summarised as follows:

- Phase 0 – Optimisation and Site Establishment – establishment of a Temporary Optimisation Site, located at Area B and extracting up to around 15,000 tonnes per annum (tpa) for a temporary period of up to approximately 24 months, but likely closer to 6 months. Phase 0 would also see the establishment of the processing area to serve the first phase of the Main Extraction.
- Phases 1 onwards – Main Extraction (approximately 300,000 tpa for around 23 years) – this will comprise a series of phases. Each phase will comprise topsoil and overburden stripping and storage, dewatering and drainage, PFA extraction, conveyors, processing area, and restoration. The processing area will therefore move as extraction progresses across the whole site.
- The description of the Proposed Development is continuing to be refined and will be confirmed in the planning application.

### *3.1.1 Construction*

Standard good practice methods would be employed during the construction stage and the Proposed Development would not result in the production of any significant waste, pollution or nuisance, or increase the risk of accidents or hazardous effects.

Construction timescale and durations

It is anticipated that construction activities to enable the extraction, processing and export of PFA would require around 3-6 months. The works would include the following:

- Site preparation, including the removal of vegetation where necessary across the Site, though predominantly in Area A;
- Erection of fencing and gates;
- Construction of the haul road(s) predominantly within Area A;
- Erection of plant, buildings and limited areas of hardstanding;
- Implementation of a drainage system within the Extraction Area located within Area A and within Areas B and C as necessary.

It is notable that the construction works are fairly limited as some of the required infrastructure already exists within Areas B and C, due largely to the legacy of quarrying at the Site. This includes the existing highway access and cleared areas of hardstanding.

Construction Activities

The small volumes of construction traffic would vary throughout the construction programme depending on the requirements of each construction phase.

It is proposed that further detail relating to the construction is included in a Construction Environmental Management Plan ('CEMP'), to be prepared by the contractor(s) employed to construct each aspect of the Proposed Development and secured by a condition attached to any grant of planning permission.

Construction activities would be confined to the hours of 07:00 to 19:00 on weekdays and 07:00 to 13:00 on Saturdays, with no working on Sundays or Bank Holidays. In some circumstances (for example concrete pouring), it may be necessary to work outside of these hours and, in these circumstances, permission would be sought from NCC. It is anticipated that this mechanism is secured by a condition attached to any grant of planning permission.

Construction laydown areas for materials and the construction site compound(s) would be located within the Site.

At normal times during the construction phase, there is anticipated to be no more than around 10 two-way Heavy Goods Vehicle (HGV) trips per average day (20 in total). There may be more when any concrete pouring is required.

### *3.1.2 Operation*

Once operational, the Proposed Development would be focussed on a simple process of:

- Extraction,
- Screening and crushing,
- Processing; and
- Export by road.

#### *3.1.2.1 Part 1: Extraction*

Mobile excavators or motor scrapers (or similar) would be used to extract the PFA from the ground. Soil would be removed from the extraction zone prior to extraction and stored appropriately within the Site for later re-use during restoration.

Soil Management

Topsoil will be stored and managed effectively within the Site for later re-use during the restoration. This will be in accordance with the Defra Soil Strategy for England[2] and Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[3]. Further details will be provided to support the planning application.

#### *3.1.2.2 Part 2: Screening and crushing*

Screening plant would be used to screen the PFA within Area A to the required grade by separating out lumps of material into smaller particles. During excavation mobile screeners are likely to be located near the excavation location.

Oversized material will be processed by the screens until the required grade is achieved. The oversized material will be used beneficially in restoration of the Site if it does not reach the required grade following screening, to achieve the desired landform. For more compacted material, a crusher/shredder may also be required prior to screening. It is envisaged that the crusher/shredder would be located near to the mobile screens.

#### *3.1.2.3 Part 3: Processing*

Pre-Processing Areas would be implemented and moved as extraction progresses across the Site, with three separate areas provided over the life of the extraction phase. Each Pre-Processing Area would be dug into the lagoon bank to provide for stability, each comprising a concrete pad or hardstanding, set at approximately 1.5 - 2.0 m above

[2] The Department for Environment, Food and Rural Affairs (2009). Safeguarding Our Soils. A Strategy for England. [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69261/pb13297-soil-strategy-090910.pdf [Accessed: 15th August 2022]

[3] The Department for Environment, Food and Rural Affairs. (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. [online]. Available at: Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (publishing.service.gov.uk) [Accessed: 15th August 2022].

Groundwater. Each pad would cover an area of approximately 3,000 - 6,000 m2. It is notable that PFA would be transported from the Extraction Area by covered conveyor to the Main Processing Site within Area C, or by tipper trucks, for example, at the start of operation or during maintenance periods. During the temporary optimisation period detailed below, material would be transported to Area B using tipper trucks. There would also be the option to utilise vehicles to transport the PFA to the Processing Site atArea C, as a maintenance/haul road would be constructed along the route of the conveyor.

The structure and key components of the Main Processing Site will include the following:

- Material storage buildings;
- Conveyors, including a gantry over the site access road;
- Drying plants, cyclones and storage silos;
- Internal access roads and hardstanding;
- Offices, canteen and laboratories – housed in 6x containers or cabins;
- Combined heat and power ('CHP') plant;
- Staff car park;
- Yard and storage area; and
- Weighbridge.

The PFA would firstly be placed in the material storage building where it would be stockpiled, run through a further screen and periodically turned by an excavator (or similar) to further reduce moisture content. There may also be fans blowing air over the material and a heated floor, to further reduce moisture content.

Once moisture is shed to the required level, the PFA will be loaded into a hopper by a mobile excavator (within the building), from which it would be fed into a rotary screen to separate the materials. The PFA will then be screened and fed into a covered conveyor, which will feed into a dryer. The dried material would then be blown along pipes into storage silos.

Temporary Optimisation works

Temporary Optimisation works would initially commence in the farmyard within Area B to the north of the Extraction Area prior to the full processing infrastructure being implemented. The optimisation would be undertaken for a period of up to 24 months, but more likely 6 months, and will process up to 30,000 tonnes of material only.

Vehicles will export the material using Chainbridge Lane to the north of Area B of the Site. The optimisation period would end when the up to 30,000 tonnes has been processed, with operations then switching to the Main Processing Site.

The extraction of PFA for the optimisation period would be carried out using excavators, motor scrapers (or similar) and tipper trucks. Excavated materials will be transported to the Temporary Optimisation Site by tipper truck. The plant and equipment required would include the following:

- Single drying plant line (30,000 tpa capacity);
- Pre-processing and storage building;
- Feed conveyor from building to plant;
- Silo; and
- Welfare, office and lab portacabin.

It is envisaged that the optimisation would make use of an existing weighbridge and the existing CHP unit on adjacent land for electricity and heat supplies. Alternatively, gas would be delivered by tanker or the plant would be connected to a mains supply.

*3.1.2.4 Part 4: Export*

PFA would be loaded into 30 tonne articulated wagons/powder tankers hereafter referred to as 'HGVs' that would be filled using pipework or straight from the material storage building for conditioned PFA. The HGVs would pass over a weighbridge on arrival and before departure from the Site and, if necessary, on departure a wheel wash and/or jet wash would be utilised to clean vehicles.

The washing of every vehicle is not likely to be required as other measures would be implemented to prevent HGVs becoming dirty, such as maintenance of clean road surfaces within the access areas. HGVs would not be allowed to leave the Site if they are found to be overweight or, on inspection, would distribute dirt/debris on the public highway. As a further management measure, all vehicles would be covered/enclosed to prevent material falling onto the public highway or other areas.

The proposed Main Processing Site in Area C benefits from an existing access point as it has direct access onto the A638, which previously served Bellmore Quarry, where wheel washing will be of particular importance for any vehicles utilising this area for access and egress. A designated route for HGVs to reach the strategic road network (the A1) would be used, whereby during normal operation all HGVs travelling from Area C will use the route north or south along the A638, and all HGVs travelling from Area B will use Chainbridge Lane and the interconnecting roads travelling west from the proposed Temporary Optimisation Works site proce at Area B. These routes would be used unless they are not available for any reason (such as a temporary road closures) and where it is appropriate to use a different route for local deliveries.

It is estimated that the Proposed Development would generate around 36 HGV trips per day (37 in / 37 out), which equates to around 3-4 trips per hour.

Operational staff

It is estimated that the Proposed Development would generate up to around 20-30 permanent jobs. The Proposed Development will include site offices and welfare facilities for operational staff.

Hours of operation

The operating hours for extraction and HGV exports would be limited to the following:

- 07:00 and 19:00 Monday to Friday; and
- 07:00 to 13:00 Saturday, and
- No extraction activities or imports are proposed for Sundays or Bank Holidays.

The processing plant would operate 24 hours per day in order to allow for efficient running of the plant items and in order to process sufficient amounts of PFA to meet the approximate required operational tonnage of 300,000 tonnes per annum. Staffing levels would likely be reduced and limited to maintenance and security functions outside of the main operating hours.

### *3.1.3 Phasing*

It is proposed to extract the PFA in a phased approach. It is envisaged that a progressive restoration will follow extraction as part of the operational stage, utilising a combination of site-won overburden and soils (comprising materials obtained from the surface and retaining banks of the PFA lagoon) and, if necessary, imported inert restoration materials.

The areas would then be capped with the previously stripped and stored topsoil.

At this stage it is proposed that the restoration scheme would comprise a mixture of biodiversity led land-use and agriculture, including wet meadow, reed beds, waterbodies, and pasture. The wet meadow and reed bed habitats have been proposed following early

consultation with the Nottinghamshire Wildlife Trust ('NWT') and Natural England, and aim to replicate some of the historical habitats of the Idle valley. Other habitat types or features may be required to compensate for changes to existing habitats and/or as part of protected species licensing requirements. Further consultation with NWT and Natural England, amongst others, will take place to further inform these proposals.

An outline restoration plan will be developed to accompany the planning application and will be assessed within the ES.

Areas B and C are previously developed, benefit from good access, and would likely be capable of serving future employment uses. Therefore, these areas are not expressly the subject of the restoration proposals. It is anticipated that conditions would govern the removal of plant items from these locations.

# 4 POLICY AND LEGISLATIVE CONTEXT

This Section of the Report identifies the key policy documents of relevance to the Proposed Development which will be considered throughout the preparation of the EIA Report, including key planning guidance, renewable energy policy and other material planning considerations.

The documents identified within this Section will be considered in further detail during the preparation of the subsequent planning application for the Proposed Development. It is proposed that a Planning Statement accompanies the EIA Report.

## 4.1 National Policy Context

### *4.1.1 National Planning Policy Framework*

The National Planning Policy Framework (NPPF) (Department for Communities and Local Government) (DCLG) was revised on 20 July 2021 by the Ministry of Housing, Communities & Local Government, setting out the Government's planning policies for England and how these are expected to be applied. The NPPF is a material consideration in planning decisions and will be reviewed in full in the Planning Statement accompanying the planning application.

Section 17, Facilitating the sustainable use of minerals, paragraph 209 states that it is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs.

Paragraph 210, part b) states that:

"Planning policies should so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously".

Secondary aggregates being defined as "aggregates from industrial wastes such as glass (cullet), incinerator bottom ash, coal derived fly ash, railway ballast, fine ceramic waste (pitcher), and scrap tyres; and industrial and minerals by-products, notably waste from china clay, coal and slate extraction and spent foundry sand. These can also include hydraulically bound materials."

Paragraph 211, part b) goes on to state that:

*"When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy. In considering proposals for mineral extraction, minerals planning authorities should ensure that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites within a locality."*

### *4.1.2 National Planning Policy for Waste*

The National Planning Policy for Waste published on 16 October 2014 by the Department for Communities and Local Government contains the Government's detailed waste planning policies and is a material consideration in the determination of planning applications by waste planning authorities. The Government's approach to waste management is underpinned by waste hierarchy which places prevention, reuse and recycling and recovery, sequentially, as the most desirable outcomes for waste management, and with disposal as an undesired outcome.

Paragraph 8 states that new non-waste development should not prejudice existing waste management facilities nor the implementation of the waste hierarchy and should maximise opportunities for reuse and recovery of waste during construction and operation.

### *4.1.3 National Planning Practice Guidance*

Planning Practice Guidance (PPG) published by the Ministry of Housing Communities & Local Government supports the NPPF and consolidated and revised a large number of practice guidance documents by providing detailed guidance on various aspects of planning including Climate Change, Flood Risk, Land affected by Contamination, and Waste. Since its initial publication, the PPG has been the subject of a number of updates and the Guidance outlined in the PPG will be considered in preparing the planning application and reserved matters applications for the Proposed Development.

## 4.2 Non-Planning Policy of Relevance

A number of national strategies and policies support the need case for the Proposed Development and may be material considerations in the decision on the planning application. A summary of these is provided below, and will be expanded on in the Environmental Statement and the Planning Statement.

### *4.2.1 UK Net Zero Strategy*

The 'Net Zero Strategy: Build Back Greener' published in October 2021 sets out the approach for reducing emissions and supporting the transition to a low carbon economy in order to achieve the UK Government's legally binding net zero emission commitments by 2050. A key component of the strategy is to encourage the adoption of circular economy practices whereby resources utilisation and productivity is maximised. This includes schemes for end of life recycling of goods and materials, for reuse as lower carbon inputs for new products. The Net Zero Strategy identifies the Resources and Waste Strategy (2018) as a key document to support the transition to a circular economy.

### *4.2.2 Resources and waste strategy for England*

The Resources and Waste Strategy 'Our Waste, Our Resources: A Strategy For England' (RWS) was published in 2018 and acts as a guide for future Government policy in relation to resource management. Its core goal is to double resource productivity and eliminate avoidable waste by 2050, and in doing so it seeks to minimise the damage waste causes to the natural environment. Chapter 3 focuses on measures to improve resource recovery from waste. Section 3.2.4 clearly sets out the Government's support for businesses, operators and consumers involved in the process of converting end of life materials into commercially viable products. Chapter 8 sets out the indicators used to measure progress on the RWS, which include reduction in raw materials consumed, carbon emissions saved, and landfill diverted. The RWS monitoring progress report second edition published in November 2021 records the progress towards the objectives and amendments made to the measuring indicators with the first edition published in August 2020. The second edition explains that the suite of indicators tracked will continue to evolve with future releases.

### *4.2.3 25 Year Environment Plan*

The UK Government published 'A Green Future: Our 25 Year Plan to Improve the Environment' in 2018 which seeks to deliver measurable improvements to the UK's natural environment. The content of Section 4 – 'increasing resource efficiency and reducing waste' is drawn from the RWS showing that resource management and protecting the environment is treated holistically at a national level.

### *4.2.4 Clean Growth Strategy*

The Clean Growth Strategy published in 2017 sets out the Government's proposals for achieving economic growth while simultaneously reducing emissions and pollutants that result from economic activity. Chapter 4 identifies economic sectors where clean growth can be achieved. Within this section the UK Government commits to encouraging resource efficiency, preventing waste and supporting innovation and processes for reusing and recycling waste. The UK will work to zero avoidable waste by 2050; Zero avoidable waste equates to "eliminating all waste where it is technologically, environmentally and economically practicable to do so and working to support innovation in new materials, products and processes that extend the range of materials covered by this categorisation." By providing specific case studies of good practice across the UK, the Strategy acknowledges the reduction in emissions and economic benefits provided by waste recovery in the product supply chain.

## 4.3 Local Planning Policy

The statutory development plan comprises the following development plan documents:

- The current Local Plan: Bassetlaw District Local Development Framework: Core Strategy and Development Management Policies DPD (2011)[4];
- The Bassetlaw Proposals Map (2005). This document shows the Site of Special Scientific Interest (SSSI) designation which borders the Site to the south and east, but also confirms that a small area of a Local Wildlife Site ('LWS') forms a narrow corridor between the south western field of Area A and the rest of Area A;
- The emerging Bassetlaw Local Plan: Bassetlaw Local Plan 2020-2037[5];
- The Nottinghamshire Minerals Local Plan Proposals Map (2021). This includes the Site within a Mineral Safeguarding and Consultation area for sand and gravel, although it should be noted that sand and gravel has previously been extracted;
- Nottinghamshire: Minerals Local Plan (2021)[6]; and
- Sutton Cum Lound: Neighbourhood Plan 2016-2031[7].

### *4.3.1 Bassetlaw District Local Development Framework (2011-2028)*

The Local Plan sets out the overall vision, objectives and spatial strategy and polices for Bassetlaw over the period to 2028. The key planning policies relevant to the Proposed Development include:

- Policy CS8 – Rural Service Centres: Development within a Rural Service Centre must be of scale that is appropriate to the size and role of the settlement;
- Policy DM3 – General Development in the Countryside: The Council supports the re-use of previously developed land that will not create significant environmental or highway safety concerns;
- Policy DM4 – Design and Character: The development will need to make clear links with the existing and surrounding settlement. In addition, the development should be of appropriate scale to the existing settlement and surrounding area with appropriate landscaping and boundary treatments;
- Policy DM8 – The Historic Environment: Proposed developments that fail to preserve or enhance the setting of a heritage asset will not be supported by the Council. As

[4] Bassetlaw District Local Development Framework: Core Strategy and Development Management Policies DPD (2011). Accessed Online: What is the core strategy? | Bassetlaw District Council [Accessed: 15th August 2022]

[5] Bassetlaw Local Plan: Publication Version (2021). Accessed Online: Bassetlaw Local Plan 2020-2037: Publication Version August 2021 | Bassetla… [Accessed: 15th August 2022]

[6] Bassetlaw Local Plan: Publication Version (2021). Accessed Online: Adopted Minerals Local Plan | Nottinghamshire County Council [Accessed: 15th August 2022]

[7] Sutton Cum Lound: Neighbourhood Plan (2016). Accessed Online: Sutton cum Lound Neighbourhood Plan (Review) (bassetlaw.gov.uk) [Accessed: 15th August 2022]

such, proposals are expected to be in line with conservation area appraisals, archaeological reports and other relevant studies;
- Policy DM9 – Green Infrastructure; Biodiversity & Geodiversity; Landscape; Open Space and Sports Facilities: This Policy expects development proposals to support the delivery, protection and enhancement of multi-functional Green Infrastructure, with replacement provision to be provided if development will result in the loss of existing green infrastructure. Similarly, developments are expected to restore or enhance habitat and species to prevent the loss of features of recognised importance such as Sites of Special Scientific Interest and Local Wildlife Sites. Moreover, it is expected that the design of the development will be sensitive to their landscape setting and enhance the distinctive qualities of the landscape character policy zone in which they would be situated, as identified in the Bassetlaw Landscape Character Assessment;
- Policy DM11 – Developer Contributions and Infrastructure Provision: Policy DM11 states that applications will be expected to demonstrate that necessary infrastructure such as flood mitigation measures will be in place of, or can be provided in tandem with the development;
- Policy DM12 – Flood Risk, Sewage and Drainage: Flood Risk Assessments are required for all developments in flood risk and all new developments will be required to incorporate Sustainable Drainage Systems with details of adoption, ongoing maintenance and management; and
- Policy DM13 – Sustainable Transport: The Policy requires developments to be consistent with and contribute to the implementation of, the Nottingham Local Transport Plan.

### *4.3.2 Bassetlaw Local Plan 2020-2037: Publication Version: August 2021*

The Bassetlaw Local Plan 2020-2037: Publication Version: August 2021 is the draft Bassetlaw Local Plan which is currently undergoing consultation and review before it is submitted to the Secretary of State for independent examination. It should also be noted that this Local Plan should be read in conjunction with the Bassetlaw Local Plan 2020-2038: Publication Version Second Addendum, May 2022 and the Bassetlaw Local Plan 2020-2038: Publication Version Addendum, January 2022. The Local Plan will help guide development in Bassetlaw over the plan period from 2020 – 2036, and includes the following policies relevant to the Proposed Development:

- Policy ST35 – Design Quality;
- Policy ST37 – Landscape Character;
- Policy ST40 – Biodiversity and Geodiversity;
- Policy 41 – Trees, woodlands and hedgerows;
- Policy ST42 – The Historic Environment;
- Policy 43 – Designated and Non-Designated Heritage Assets;
- Policy 48 – Protecting Amenity;
- Policy ST50 – Reducing Carbon Emissions, Climate Change Mitigation and Adaptation;
- Policy ST52 – Flood Risk and Drainage;
- Policy ST53 – Protecting Water Quality and Management;
- Policy ST54 – Transport Infrastructure and Improvement Schemes; and
- Policy ST58 – Provision and Delivery of Infrastructure.

### *4.3.3 Nottinghamshire Minerals Local Plan (2021-2036)*

The Nottinghamshire Minerals Local Plan (2021-2036) covers the period to 2036 and sets out how much mineral Nottinghamshire is likely to need, site specific allocations to meet identified demand, and a range of planning policies against which future minerals development will be assessed. The policies with potential relevance to the Proposed Development are as follows:

- Policy SP1 – Minerals Provision: The Council will allow the development of suitable land for extraction on non-allocated sites where a need can be demonstrated and avoidance measures have been taken to limit impacts from the Proposed Development;
- Policy SP3 – Climate Change: The Policy states that all mineral development should be designed and operated to help reduce greenhouse gas emissions in order to help move towards achieving a low-carbon economy;
- Policy SP5 – The Built, Historic and Natural Environment: Policy SP5 states that a high standard of environmental protection will be required from all mineral development proposals, including that of air quality, nature conservation and other detailed criteria related to the policy;
- Policy MP5 – Secondary and Recycled Aggregates: The council will support proposals that increases the supply of secondary and/or recycled aggregates, where demonstrated that no significant impacts will result from the development;
- Policy DM1 – Protecting Local Amenity: Mineral Developments will be supported where adverse impacts such as noise, air emissions and other detailed criteria outlined in the policy can be avoided or mitigated to an acceptable level;
- Policy DM2 – Water Resources and Flood Risk: This policy supports mineral developments where there are no unacceptable impacts on surface water quality and flows, or groundwater quality and levels at the site. In addition, support will be provided where it can be demonstrated that there will be no unacceptable impacts on flood flows and storage capacity at the site. Moreover, the policy states that developments should include Sustainable Drainage Systems;
- Policy DM3 – Agricultural Land and Soil Quality: Policy DM3 states that measures must be taken to ensure that soil quality will be adequately protected and maintained through the development process. Furthermore, mineral developments located on the best agricultural land will be supported if the proposal will not affect the long-term potential of the land;
- Policy DM4 – Protection and Enhancement of Biodiversity and Geodiversity: Mineral Developments will be supported where they are unlikely to negatively impact on a Site of Special Scientific Interest, Local Wildlife Sites or within priority species and habitats, unless the need for and benefits of the development clearly outweigh the impacts;
- Policy DM5 – Landscape Character: The council will support mineral developments that demonstrate they will not adversely impact on the character and distinctiveness of the landscape. When unacceptable impacts on the landscape are present, mitigation measures can be provided to permit development;
- Policy DM6 – Historic Environment: Mineral developments will be supported where it can be demonstrated that there will not be any harm to the significance of a designated or non-designated heritage asset. Developments impacting on heritage assets can be permitted only when the public benefit outweighs the level of harm lost or mitigation measures are incorporated into the development;
- Policy DM7 – Public Access: This policy supports minerals development that will not have an unacceptable impact on the existing rights of way. When this is not possible, satisfactory proposals consisting of temporary or permanent diversions must be provided;
- Policy DM9 – Highways Safety and Vehicle Movements/Routeing: This policy requires that the highway network can satisfactorily and safely accommodate the vehicle movements for mineral developments, and not cause an unacceptable impact on the environment;
- Policy DM12 – Restoration, aftercare and after-use: Mineral Developments must include an appropriate scheme for restoration, after care and long term use in order to enable long term enhancement of the environment that, through the delivery of

local objectives that are in keeping with the character and setting of the local area; and
- Policy DM16 – Associated Industrial Development: Associated industrial development on or adjacent to extraction sites will be required to demonstrate that they are related and linked to the site.

### *4.3.4 Sutton Cum Lound: Neighbourhood Plan: Final Version 2016-2031 (Reviewed March 2021)*

The Sutton cum Lound Neighbourhood Plan was prepared by the Neighbourhood Plan Steering Group made up of residents and councillors from Sutton cum Lound Parish Council. It is part of the development plan and covers the whole of the Parish of Sutton cum Lound and sets out policies for the Neighbourhood Plan Area for the period to 2031. The policies with potential relevance to the Proposed Development are as follows:

- Policy 8 – Improving Green Infrastructure: This policy supports improvements to green infrastructure, and developments are expected to enhance existing public rights of way affected by the development; and
- Policy 9 – Highway Safety: It is required that developments and its access arrangements are designed to improve pedestrian and highway safety in the immediate vicinity of the site.

## 4.4 Policy within the Environmental Statement

A Planning Policy section is not required within the EIA Report by the EIA Regulations. The purpose of an EIA is not to assess the compliance with the Development Plan, but rather to assess and protect the environment by ensuring the decision maker, in this case the Council, when deciding to grant planning permission for a Development, does so in the full knowledge of the likely significant effects, and takes this into account in the decision-making process.

A planning policy chapter identifying the key policy documents of relevance to the Development will not be included in the EIA Report. The policy context will be set out in full in the Planning Statement that will accompany any subsequent planning application.

Local and national policy, where relevant to the assessment of likely significant effects, will be set out in the technical chapters of the EIA Report. For example, where policy identifies that an environmental aspect, such as a particular habitat or landscape receptor is of particular value, this corresponding policy will be taken into account, typically in consideration of its sensitivity to change, when assessing the significance of effects. This is different to assessing the compliance of the Proposed Development with policies that set out how decisions on development consent should be made.

## 4.5 Planning History

The Site has an extensive planning history of industrial scale mineral extraction pre-dating the Council's record keeping of town planning applications. The earliest recorded permission is dated 1947 for sand and gravel extraction and subsequent permission in 1952 and 1957.

In 1962 the Central Electricity Generating Board were granted planning permission to restore exhausted gravel workings at Bellmoor quarry. It is notable that Bellmoor Quarry comprised what is now large parts of the Site.

Planning permission (Reference: N/47/131) was granted for sand and gravel extraction to the north east towards Chainbridge Lane, including the northern tip of the Site. Condition 4 required backfilling either with fly ash "as per the heads of agreement between the applicants and the Central Electricity Generating Board dated 8 October 1962" or other such materials as may be agreed by the LPA.

High-level lagoons were created between the 1970s and 1990s until the PFA pipeline system from Cottam power station failed and was not reinstated. The Council's records from this time are archived. It is understood that restoration of the low-level areas also continued for some time in the 1990s, as undertaken between Powergen and Tarmac. A Minerals review under the Environment Act may have incorporated much of the area south of Chainbridge Lane into one permission at that time.

A search of Nottinghamshire County Council's online planning register identified the following planning history, detailed in Table 4.1.

***Table 4.1: Planning History of the Site from Nottinghamshire County Council***

| Address | Ref. | Description | Decision |
|---|---|---|---|
| Land at Botany Bay, Retford | SC/3827 | Scoping request for sand and gravel quarry, establishment of new plant site (with establishment of use of ancillary facilities including a new site access off the A638) and restoration to a combination of agricultural and water based nature conservation after-uses. | n/a |
| College Farm, Barnby Moor, Northwest of Retford (adjacent to the proposed redline boundary) | SC/3620 | Scoping opinion relating to a proposed scheme for the development of a new sand and gravel quarry. | n/a |
| Land at College Farm, Barnby Moor, Retford (adjacent to the proposed redline boundary) | SC/3537 | Scoping opinion for new sand and gravel quarry. | n/a |
| Lound Quarry, Tiln North, Chainbridge Lane, Lound, Retford | PL1593 | Extension of sand & gravel extraction & retention of existing processing plant & ancillary facilities. | Granted 9 Feb 2004 |
| Regional Office, Bellmoor Retford | PL0947 | Vary Condition 5 of P/P N/47/10, To retain office block as regional office, plus office extension & car park (Retrospective). | Granted 20 Apr 2000 |
| Land Adjoining Quarry Plant Off A638, Bellmoor Quarry, Retford | PL0836 | Proposed variation of condition 2 of planning permission 1/1/95/62 to allow permanent retention of access road. | Granted 28 Oct 1998 |
| Land off Chainbridge Lane, Lound, Near Retford | PL0137 | Proposal Application to vary conditions permitted under consent No's N/47/105 & 1/29/83/4D in respect of sand and gravel workings & restoration. | Granted 17 Apr 1996 |
| Bellmoor Quarry, Bellmoor, Near Retford | PL0110 | Construct access road from existing quarry plant to A638 highway. | Granted 26 Jan 1996 |
| Chainbridge Lane, Lound | PL0087 | Revised method of working and restoration for existing sand and gravel pit and set aside conditions 4,5,7,13 of consent No N/47/105. | Granted 16 Oct 1994 |
| Land at Tiln South, Near Retford | PL0072 | Extraction of sand and gravel and phased restoration to agriculture, forestry and water. | Granted 23 Dec 1994 |
| Bellmoor Quarry, Great North Road, Retford | F/0450 | Prefabricated extension to existing single storey office block & associated car parking. | Granted |

| | | | |
|---|---|---|---|
| | | | 2 Sep 2005 |
| Bellmoor Quarry, Retford | F/0205 | Extraction of sand & gravel, and transport by dumper to existing processing plant at Bellmoor quarry. | Granted 3 Aug 2004 |
| Land to the south of College Farm, East of Great North Road, Barnby Moor, Retford | ES/3925 | Sand and Gravel extraction. Backfill with imported silt and restoration to agriculture and biodiversity, including the construction of a temporary road access. | Withdrawn |
| Land at College Farm, Great North Road, Barnby Moor, Retford | ES/3793 | Sand and gravel extraction, backfill with imported silt and restoration to agriculture and biodiversity. Including construction of a new access road. | Withdrawn |

A search of Bassetlaw District Council's online planning application register identified the following planning history, detailed in Table 4.2.

***Table 4.2: Planning History of the Site from Bassetlaw District Council***

| Address | Ref. | Description | Decision |
|---|---|---|---|
| Sutton Grange, Lound Low Road, Sutton Cum Lound, Retford, Nottinghamshire, DN22 8SB | 20/01559/FUL | Installation of an Additional Tank for the Storage of Liquid Fertiliser. | Granted 26 Feb 2021 |
| Anaerobic Digestion Plant, Land West Of Sutton Grange, Lound Low Road, Sutton Cum Lound, Nottinghamshire | 19/00587/VOC | Vary Condition 4 (Landscaping Scheme) of P.A. 13/00782/FUL to Omit the Proposed Planting to the North of the AD Facility - Retrospective (part) Application For Erection of A 1.2 MW Anaerobic Digester For The Production of Renewable Energy, Amendments to Approved Scheme 47/11/0001. | Granted 22 Jul 2019 |
| Land For Solar Farm Use, Lound Low Road, Sutton Cum Lound, Nottinghamshire | 17/01585/SCR | EIA Scoping opinion for: Land For Solar Farm Use Lound Low Road Sutton Cum Lound Nottinghamshire. | No EIA Development |
| Land At Bellmoor Grassland, Sutton Cum Lound, Retford | 13/01126/FUL | Installation of 4.88 MW Solar Farm and Associated Infrastructure . | Granted 11 Dec 2013 (never implemented) |
| Land West Of Sutton Grange, Lound Low Road, Sutton Cum Lound, Nottinghamshire | 13/00782/FUL | Retrospective (part) Application For Erection of a 1.2 MW Anaerobic Digester For The Production of Renewable Energy, Amendments to Approved Scheme 47/11/00019. | Granted 10 Oct 2013 |
| Land West Of Sutton Grange, Lound Low Road, Sutton Cum Lound, Nottinghamshire | 47/11/00019 | Construction of a 1.2 MW anaerobic digester for the production of renewable energy. | Granted 10 May 2012 |
| Land Rear Of 26 Town Street, Sutton Cum Lound, Retford, Nottinghamshire | 47/11/00011 | Outline application for a detached dwelling. | Granted 25 Oct 2011 |
| Tarmac Ltd, Bellmoor Quarry, Great North Road, Sutton Cum | 47/10/00009 | Extension of existing offices and car parking, retention of existing storage/amenity buildings, creation of | Granted 19 Jul 2010 |

| | | | |
|---|---|---|---|
| Lound, Retford, Nottinghamshire | | additional areas of hardstanding and use of land as a highways contracting vehicle and plant operating facility. | |
| Land At Bellmoor Quarry, North Road, Retford | 47/05/00010 | Erect extension to existing single storey office block and associated car parking. | Not approved<br>2 Sep 2005 |
| Lound Quarry, Chainbridge Lane, Lound, Retford, Nottinghamshire | 29/02/00012 | Extension of sand and gravel extraction and retention of existing processing plant and ancilliary facilities. | Granted 9 Feb 2004 |
| UK Coal Ltd, Lound, Mattersey And Everton, Retford, Nottinghamshire | 31/02/00024 | Seismic survey to map geological structure of reserves for Harworth Colliery. | No objection |
| Land At, Lound, Retford, Nottinghamshire | 29/98/00013 | Discharge of condition 63.<br>(no related information to identify the original application this condition relates to was available on the register.) | Granted<br>5 Oct 1998 |
| Sutton and Lound Quarry, Chainbridge Lane, Lound, Nottinghamshire | 29/97/00002 | Approve conditions relating to sand and gravel workings. | Granted<br>2 Aug 1997 |
| Sutton Grange, Lound Low Road, Sutton, Retford, Nottinghamshire | 47/94/00003 | Erect bungalow and construct new access. | Granted<br>13 May 1994 |
| Sutton Grange, Lound Low Road, Sutton, Retford, Nottinghamshire | 47/93/00005 | Erect new dwelling to be occupied by an agricultural worker. | Granted<br>16 Dec 1993 |
| Land At Bellmoor Quarry, Sutton Cum Lound, Retford, Nottinghamshire | 47/80/00007 | Reclaim disused gravel workings. | Not available. Assumed to be 1980. |

# 5 ENVIRONMENTAL IMPACT ASSESSMENT

## 5.1 Proposed Scope of the EIA

Following evaluation of the baseline environmental information for the Site and surrounding area, and considering the potential environmental effects of the Proposed Development, the EIA will include assessment of the potential effects in the following topics:

- Landscape and visual;
- Ecology and ornithology;
- Hydrology, hydrogeology flood risk and ground conditions;
- Cultural Heritage and archaeology;
- Noise;
- Air quality; and
- Traffic and transport.

Each topic will also consider the potential for cumulative effects and interactions, and the significance of these. Each chapter shall be prepared by a competent expert in the relevant field, and an appendix shall be including detailing the author and relevant experience/suitability to produce the chapter.

Figure 2 in Appendix A illustrates the potential environmental constraints within the site boundary and within a 1km boundary.

### *5.1.1 Non-Significant Issues to be Scoped Out*

The EIA Regulations state that only likely significant effects need to be considered within the ES; therefore, if an effect will not be significant, it can be scoped out of assessment. Based on this, it is proposed that the effects detailed in the following sections will be scoped out of the EIA.

#### *5.1.1.1 Waste*

Minimal waste will be generated on site by the extraction activities. A small volume of waste will be generated from the screening process. This waste is likely to comprise inert, uncontaminated material which is likely to be beneficially incorporated within the restoration of the Site.

At this stage, the exact quantities and types of waste are unknown. It is expected that they could include:

- Excavated material;
- Welfare facility waste;
- Packaging;
- Waste chemicals, fuels and oils;
- Waste metals;
- Waste water from dewatering;
- Waste water from cleaning activities; and
- General construction waste (paper, wood, etc.).

Excavated material in the form of topsoil and overburden is to be placed in suitable storage bunds for use in restoration. A scheme of progressive restoration will be incorporated following the extraction phases, utilising a combination of site-won overburden and soils, including that located within the lagoon banks, and imported inert restoration materials.

There is not expected to be excessive waste residues from on-site processes due to the quality of the PFA present and the drying processes to be incorporated.

A Site Waste Management Plan (SWMP) will detail how waste streams are to be managed, following the Waste Hierarchy of prevention, reuse, recycle, recover and as a last resort,

disposal to landfill. The SWMP will be agreed and implemented prior to construction commencing on site. There is not anticipated to be any significant effects on local or regional waste management sites. Therefore, it is not considered necessary for waste to be assessed further within the EIA and is scoped out of further assessment.

#### *5.1.1.2 Major Accidents and Disasters*

The description of the Proposed Development in the ES will provide sufficient information to allow the key environmental issues identified to be adequately assessed. The risk and consequences of accidental events, such as the potential for fuel spillages and how the risk of such events would be low and would be minimised, will be detailed within a Construction Environmental Management Plan (CEMP) to be produced by the appointed contractor. The site operations proposed are not considered to be unusual or outside of the remit of standard quarrying operation. All site operating procedures will be undertaken in line with the Construction Design and Management regulations (2015), with competent duty holders appointed to oversee health and safety at the relevant design stages and during site operations.

The Proposed Development will not be particularly susceptible to any major accidents or disasters outside the Proposed Development, such as earthquakes or terrorist attacks, as there are no major stores of hazardous or flammable substances proposed. Significant effects associated with major accidents and disasters are not anticipated, and therefore the assessment of these is scoped out of the ES.

#### *5.1.1.3 Human Health*

The human health risks as a result of the Proposed Development are considered to be limited due to the Proposed Development being a relatively simple process as an extraction facility using largely mobile plant. However, it is acknowledged that some environmental topics (air quality, noise and transport) will have some potential to result in effects on human receptors, although these are not expected to be significant. Potential human health impacts will be considered as part of these technical chapters, using appropriate guidance, legislation and standards. It is therefore considered that a separate human health assessment can be scoped out of the EIA.

#### *5.1.1.4 Socio-Economics*

The Proposed Development will require approximately 25 on-site staff for the 25-year operational period. While job creation may result in a beneficial effect on the local and regional economy this is not considered to result in significant effects. There are not any significant tourist attractions in close proximity to the Site. A socio-economics assessment has therefore been scoped out of the EIA.

#### *5.1.1.5 Sustainability and Climate Change*

A sustainability and carbon review will be undertaken for the proposal and included in the application as an appended report. The review will calculate a whole life GHG footprint for the Proposed Development. The footprint sources that will be considered include GHG emissions:

- Embodied in the material used in the construction of the Proposed Development;
- From traffic movements during construction of the Proposed Development;
- From energy consumed by the operation of the Proposed Development; and
- From transport associated with the operation of the Proposed Development and export of PFA.

The results of the review will be outlined in the introductory chapters of the ES and will focus on the wider sustainability credentials of PFA including the significant reduction of

carbon when compared to using traditional cement and its contribution to resource efficiency, and a more circular economy in comparison to alternative primary and secondary sources. The Proposed Development's interaction and vulnerability to climate change predictions will also be covered within the technical chapters of the ES where relevant. It is therefore not proposed to include a standalone climate change and sustainability chapter within the ES.

## 5.2 EIA Process and Methodology

Each of the technical assessments in the ES will follow a systematic approach, with the principal steps being:

- Description of baseline conditions;
- Prediction of likely effects including cumulative effects;
- Assessment of likely effects;
- Identification of appropriate mitigation measures, including design changes; and
- Assessment of residual (likely) environmental effects.

Each technical chapter of the ES will be broadly structured as follows and where this differs it will be stated in the relevant section of this Scoping Report:

- Introduction;
- Assessment methodology and significance criteria;
- Baseline conditions;
- Development design mitigation;
- Assessment of likely effects;
- Mitigation measures and residual effects;
- Cumulative effects assessment;
- Summary of likely effects; and
- Statement of significance.

The EIA assessment will be based on a number of related activities, as follows:

- Consultation with statutory and non-statutory consultees throughout the application process;
- Consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
- Consideration of technical standards for the development of significance criteria;
- Review of secondary information, previous environmental studies and publicly-available information and databases;
- Physical surveys and monitoring;
- Desk-top studies;
- Computer modelling; where relevant
- Reference to current legislation and guidance; and
- Expert opinion.

### *5.2.1 Baseline Description*

In order to evaluate the likely environmental effects, information relating to the existing environmental conditions will be collected through field and desktop research. These are known as the baseline conditions. The baseline also extends into the future (the future baseline), although predictions of this can involve potentially large uncertainties. As a result, in most cases the future baseline is assumed to remain unchanged throughout the operation of the Proposed Development. Where this is not the case, this is stated.

The baseline will be used to assess the sensitivity of receptors on and near the Site and what changes may take place during the construction, operation and decommissioning of the Proposed Development and the effects, if any, that these changes may have on these receptors.

Within each technical assessment, the methods of data collection will be discussed with the relevant consultees. Data will also be collected from public records and other archive sources and where appropriate, field surveys will be carried out (in some cases these surveys have already begun). The timing of the work and the study areas proposed are outlined within each assessment section.

### *5.2.2 Prediction and assessment of Likely Effects*

The prediction of likely effects covers the three phases of the Proposed Development: construction (including pre-construction), operation and decommissioning. During each phase different environmental effects are likely to arise.

Each technical assessment covers:

- Direct and indirect effects;
- Short, medium and long term effects;
- Permanent and temporary effects;
- Likelihood of an effect occurring (i.e., very likely, likely, or unlikely); and
- Cumulative effects.

Following identification of likely environmental effects, changes to baseline conditions will be predicted, allowing an assessment of the environmental impact of these changes.

### *5.2.3 Mitigation*

Where applicable, each technical chapter will propose measures to avoid, prevent or reduce and if possible, offset any likely significant adverse effects identified. These are termed mitigation measures and are designed to reduce or if possible, eliminate, significant adverse effects. Such measures may include the consideration of alternatives; physical design evolutions such as movement or reduction in scale; and operational and management measures.

This strategy of avoidance, prevention, reduction and offsetting is a hierarchical one which seeks:

- First to avoid likely effects;
- Then to reduce those which remain; and
- Lastly, where no other measures are possible, to propose compensatory measures.

#### *5.2.3.1 Embedded Mitigation*

Where possible, mitigation measures will be embedded into the overall design strategy rather than "added on" to the proposals. By being flexible with the design, the project design will respond to the findings of consultation and EIA work, and mitigate accordingly, as the Proposed Development progresses.

### *5.2.4 Residual Effects*

The assessment process will conclude with an examination of residual effects after mitigation has been applied, i.e., the overall predicted (likely) effects of the Proposed Development.

### *5.2.5 Cumulative Effect Assessment*

In accordance with the EIA Regulations, the ES will also give consideration to 'cumulative effects'. By definition, these are effects that result from incremental changes caused by past, present or reasonably foreseeable future actions together with the Proposed Development. For the cumulative assessment, two types of effect will be considered:

- The combined effect of individual effects, for example noise, airborne dust or traffic on a single receptor; and
- The combined effects of several developments that may on an individual basis be insignificant but, cumulatively, have a significant effect, such as landscape and visual effects. This will consider the Proposed Development together with other developments that are proposed but not operational at the time of the assessment.

The former will be included in a separate ES chapter, Interaction and Accumulation of Effects.

The latter will be dealt with within each technical chapter and the intended scope of each cumulative assessment is set out in the relevant technical sections of this Scoping Report. Unless otherwise agreed, developments whose applications for consent have not yet been submitted at the time of finalising the ES are unlikely to be included in the cumulative assessments given the large degree of uncertainties over the likelihood of an application being submitted and the final design.

## 5.3 Site Selection and Consideration of Alternatives

Schedule 4, Paragraph 2 of the EIA Regulations sets out the information required for inclusion in the ES regarding the description of reasonable alternatives, as follows:

*"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

The ES will therefore include a detailed section presenting the reasonable alternatives considered by the Applicant in respect of the location of the Proposed Development, its scale and design and the implications of a "do nothing" scenario.

There is a demand for the resource that is available at the Site, the resource availability elsewhere is limited and the process for extracting the resource is well established. The main alternatives considered, therefore, will be the details of the layout of the Proposed Development within the Site and any mitigation of potential environmental effects.

## 5.4 Structure of the Environmental Statement

The proposed structure for the ES is set out in Table 5.1.

***Table 5.1 Proposed structure of the Environmental Statement***

| **Non-Technical Summary** | |
|---|---|
| Chapter 1 | Introduction |
| Chapter 2 | Environmental Impact Assessment |
| Chapter 3 | Consultation |
| Chapter 4 | Site Selection and Consideration of Alternatives |
| Chapter 5 | Project Description and Development Design |
| Chapter 6 | Legislative and Planning Policy Context |
| Chapter 7 | Landscape and Visual Impact Assessment |
| Chapter 8 | Ecology and Ornithology |
| Chapter 10 | Hydrology, Hydrogeology and Flood Risk |
| Chapter 11 | Ground Conditions and Contamination |
| Chapter 12 | Cultural Heritage and Archaeology |

| | |
|---|---|
| Chapter 13 | Noise |
| Chapter 14 | Air Quality |
| Chapter 15 | Interaction and Accumulation of Effects |
| Chapter 16 | Conclusions |
| Supporting Figures and Drawings<br>Technical Appendices (e.g., baseline survey reports), Non-Technical Summary (NTS), Carbon report , Competency summary | |

# 6 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

## 6.1 Introduction

This section of the Report sets out the proposed methodology and approach to be applied in the production of the Landscape and Visual Impact Assessment (LVIA) to accompany the application for the Proposed Development and presents the suggested scope of the LVIA in terms of those landscape and visual receptors to be scoped in and scoped out of the assessment process based on a preliminary assessment of relevant receptors to the Proposed Development.

The purpose of the LVIA is to identify and record the potential significant effects that the Proposed Development may have on physical elements of the landscape; landscape character; areas that have been designated for their scenic or landscape-related qualities; and views from various locations such as settlements, routes, and other sensitive locations. The potential cumulative effects that may arise from the addition of the Proposed Development to other developments are also considered.

The LVIA will consider the potential effects of the Proposed Development during the following development stages:

- Construction of the Proposed Development; and
- Operation of the Proposed Development.
- Restoration of the Proposed Development

## 6.2 Study Area

The Study Area comprises the former PFA disposal lagoons on land located 2 km north of Retford and to the south of Lound, East Midlands and the wider setting of the Site. Both the Site and the Study Area fall within the administrative boundaries of Nottinghamshire County Council the responsible minerals planning authority, and Bassetlaw District Council. The Study Area proposed for the LVIA of the Proposed Development will cover a radius of 2 km from the Site boundary in all directions as shown. This is considered to be the maximum radius within which significant landscape and/or visual effects could arise given the nature and scale of the Proposed Development being considered.

## 6.3 Assessment Methodology

### *6.3.1 Relevant Legislation and Guidelines*

The LVIA will adopt the methodology in accordance with 'Guidelines for Landscape and Visual Impact Assessment: Third Edition' (Landscape Institute and IEMA, 2013)[8] ('GLVIA3') as the key source of guidance for the LVIA.

Other sources of guidance that will be used and referenced in the LVIA include the following:

- Countryside Agency and SNH (2002), Landscape Character Assessment: Guidance for England and Scotland;
- Countryside Agency and SNH (2004), Topic Paper 6. Techniques and Criteria for Judging Capacity and Sensitivity;
- Technical Guidance Note 06/19 Visual Representation of Development Proposals. Landscape Institute (2019)[9]

[8] Landscape Institute and Institute of Environmental Management and Assessment (2013), Guidelines for Landscape and Visual Impact Assessment: Third Edition.

[9] Landscape Institute (2019). Technical Guidance Note 06/19 Visual Representation of Development Proposals.

- Technical Guidance Note 02/19 Residential Visual Amenity Assessment (RVAA), Landscape Institute (2019)[10]
- Technical Guidance Note 02/21 Assessing landscape value outside national designations (2012)[11]

### *6.3.2 Level of Effect & Criteria*

Essentially, the level of landscape and visual effect (and whether this is significant) is determined through consideration of the 'sensitivity' of:

- The landscape element, assemblage of elements, key characteristics or character type or area under consideration bearing in mind quality and value; or
- The visual receptor; and the 'magnitude of change' posed by the Proposed Development, in this case the minerals working and associated infrastructure, its operation for a period of 20 years, and subsequent decommissioning.

The process involves design and re-assessment of any remaining, residual significant adverse effects that could not otherwise be mitigated or 'designed out'. Landscape or visual sensitivity is ranked from high, medium, low to negligible and the magnitude of change is similarly ranked from large, medium, small to negligible as indicated in Table 6.1. The type of effect is also considered and may be direct or indirect, temporary or permanent, cumulative, and positive, neutral or negative. The landscape and visual assessment involves a combination of both quantitative and subjective assessment and wherever possible has sought to gain a consensus of professional opinion through consultation, peer review and the adoption of a systematic, impartial, and professional approach.

In accordance with the EIA Regulations, it is essential to determine whether the predicted effects are likely to be 'significant'. Significant landscape and visual effects, in the assessor's opinion, resulting from the Proposed Development would be all those effects that normally result in a 'substantial', a 'moderate / substantial', or 'moderate' effect with any exceptions being clearly explained (refer to Table 5.1 below). The landscape and visual assessment unavoidably involves a combination of both quantitative and qualitative assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations, and are shaded in light grey in Table 6.1.

***Table 6.1: Evaluation of Landscape and Visual Effects***

| | | **Sensitivity (value / importance)** | | | |
|---|---|---|---|---|---|
| | | **High** | **Medium** | **Low** | **Negligible** |
| Magnitude of change | Large | Major | Moderate – Major | Minor – Moderate | Negligible |
| | Medium | Moderate – Major | Moderate | Minor | Negligible |
| | Small | Minor – Moderate | Minor | Negligible – Minor | Negligible |
| | Negligible | Negligible | Negligible | Negligible | Negligible |

[10] Landscape Institute (2019). Technical Guidance Note 02/19 Residential Visual Amenity Assessment.

[11] Landscape Institute (2021). Technical Guidance Note 02/21 Assessing landscape value outside national designations.

### *6.3.3 Cumulative Assessment*

The Cumulative LVIA (CLVIA) will assess the cumulative effects of the Proposed Development in combination with other development. A search will be undertaken using publicly available online data sources and information on planning authority planning portals of all cumulative sites within a 10 km radius of the Proposed Development site (twice the radius as for the Development in isolation) and all developments likely to impact landscape and visual receptors will be considered. The search will include:

- Existing, constructed and/or operational development;
- Development under construction;
- Consented but not yet constructed development;
- Development for which a valid planning application has been submitted; and
- Development which has been refused planning permission and which is subject of an Appeal.

The assessment of effects will consider two scenarios:

- Scenario 1 whereby the effects of the addition of the Proposed Development to all operational and consented development within the study area is assessed. Scenario 1 assumes that all consented development will be built; and
- Scenario 2 whereby the effects of the addition of the Proposed Development to all operational and consented development and development for which there is a valid planning application within the Study Area is assessed. Scenario 2 assumes that all consented development will be built and development in planning will be consented and built.

The CLVIA will consider the following types of cumulative effect on landscape and visual receptors:

- In-combination effects whereby the Proposed Development is present within the same landscape character area as cumulative sites or is seen in the same field of view as other developments;
- In-succession effects whereby the Proposed Development is present in a different landscape character area to cumulative sites or where it is only visible with cumulative developments from a viewpoint by moving one's head; and
- Sequential effects whereby the Proposed Development is visible in addition to one or more cumulative developments along a transport or recreational route.

### *6.3.4 Information Sources*

A number of different sources of information will be used to help understand the site and its surrounding context as follows:

- East Midlands Regional Landscape Character Assessment;
- Bassetlaw District Council Landscape Character Assessment;
- Natural England Landscape Character Descriptions
- OS mapping at 1:50,000, 1:25,000 and 1:10,000;
- Aerial Photography; and
- Google Earth, Street View and Maps.

### *6.3.5 Zone of Theoretical Visibility*

A Zone of Theoretical Visibility (ZTV) will be used to identify which landscape and visual receptors require consideration in the assessment, and which can be scoped out at the LVIA stage because they are unlikely to be significantly affected. The Conceptual Working Scheme of the Proposed Development is subject to change at this stage with the ZTV to be evaluated at the fixed-design stage.

## 6.4 Baseline Conditions & Key Sensitivities

The broad principles and core approach to the Landscape and Visual Impact Assessment (LVIA) will be undertaken in accordance with best practice 'Guidelines for Landscape and Visual Impact Assessment: Third Edition' (Landscape Institute and IEMA, 2013)[12] ('GLVIA3') and whilst this third edition has been produced to reflect the expanded range of good practice that now exists, it also encourages landscape professionals to recognise the need for an approach that is proportionate to the scale of the project that is being assessed and the nature of its likely effects.

GLVIA3 places a strong emphasis on the clarity of assessment where it falls within the requirements of an EIA and notes that the assessment should be tailored to the particular circumstances in each case where

*"The emphasis should be on the identification of likely significant environmental effects, including those that are positive and negative, direct and indirect, long, medium and short term, and reversible and irreversible, as well as cumulative effects."*

GLVIA3 also advises that the LVIA must clearly distinguish between the assessment of landscape effects, dealing with changes to the landscape as a resource, and the assessment of visual effects, dealing with changes in views and visual amenity. The LVIA will therefore assess the likely significant environmental effects of the Proposed Development upon the landscape resource, and upon views and visual amenity (the visual resource).

More specific guidance within GLVIA also draws the landscape practitioner to focus on the purpose of the LVIA which is to identify and record the likely significant environmental effects that the Proposed Development may have on:

- the physical elements of the landscape; landscape character; areas that have been designated for their scenic or landscape-related qualities;
- the views from various locations such as settlements, routes, hilltops and other sensitive locations; and
- the cumulative effects that may arise from the addition of the Proposed Development in conjunction with other relevant development.

The LVIA will establish the baseline landscape and visual conditions when reviewed alongside the description of the Proposed development. The identification and appraisal of the baseline situation will therefore consider a potential range of possible interactions between the following stages of the Proposed Development:

- Construction;
- Operation:
- Part 1: Extraction
- Part 2: Screening and Crushing
- Part 3: Processing
- Part 4: Export
- Restoration.

The National Character Areas (NCA) map (Natural England) divides England into 159 National Character Areas and the Site falls within NCA 39[13], Humberhead Levels. This national level assessment provides a contextual overview of the character of the wider landscape, however for the purpose of the LVIA a greater degree of focus will be given to the regional and local landscape character assessment since the emphasis must be on a reasonable approach which is proportionate to the scale and nature of the Development.

[12] Landscape Institute and Institute of Environmental Management and Assessment (2013), Guidelines for Landscape and Visual Impact Assessment: Third Edition.

[13] Natural England (2014) National Character Area Profile 39: Humberhead Level. Available at NCA Profile: 39 Humberhead Levels - NE339 (naturalengland.org.uk) (Accessed 02/09/21)

### 6.4.1 Regional Landscape Character

The East Midlands Regional Landscape Character Assessment (EMRLCA) (2010)[14] identifies 11 groups and 31 Regional Landscape Character Types (RLCTs). The Site is located across two character areas within the EMRLCA:

- 3A: Floodplain Valleys; and
- 3B: Sandland Farmlands.

### 6.4.2 Local Landscape Character

The Bassetlaw District Landscape Character Assessment (BDLCA) (2009)[15] notes that the Bassetlaw District covers five National Character Areas (NCAs) as defined by Natural England, namely; Southern Magnesian Limestone [30], Humberhead Levels [39], Northern Lincolnshire Edge with Coversands [45], Trent and Belvoir Vales [48] and Sherwood [49] and each of these five areas form a separate landscape chapter within the BDLCA:

- Sherwood;
- Magnesian Limestone Ridge;
- Idle Lowlands;
- Mid Nottinghamshire Farmlands; and
- Trent Wetlands.

These five areas are then sub-divided into Landscape Description Units [LDUs], which are then further sub-divided into manageable survey units known as Landscape Character Parcels (LCPs). The Site is located across two policy areas within BDLCA, specifically the 'Idle Lowlands' Regional Character Area (RCA):

- Idle Lowlands Policy Zone IL07: Lound; and
- Idle Lowlands Policy Zone IL10: Ranskill.

### 6.4.3 Landscape Planning Designations

The Site is not subject to any specific landscape-related statutory or non-statutory designations at a national or local scale. It does however share an adjacent boundary with the Sutton and Lound Gravel Pits SSSI and is in close proximity to the Local Wildlife Sites (LWS) of Sutton and Lound, Tiln North and the Conservation Lake and Tiln Wood Track. The Chesterfield Canal SSSI is also located to the east of the Site.

The Site is not part of or does not support any Local Landscape Designations within its boundary. The Study Area does not include any Local Landscape Designations within its boundary.

### 6.4.4 Registered Parks & Gardens

Within the Study Area there is one Registered Park and Garden, 'Babworth Hall', which is Grade II listed and located approximately 2.98km to the south.

### 6.4.5 Heritage Designations

There are no listed buildings within the Site boundary. The Study Area includes listed buildings, and the closest when measured from the centre of the Site are:

- 'Gate Piers and Gates to Sutton Manor Grounds', which are Grade II listed and located approximately 1.2km to the west;
- 'Church of St. Bartholomew', which is Grade I listed also located approximately 1.2km to the west; and

[14] LDA Design (2010) East Midlands Regional Landscape Character Assessment

[15] Bassetlaw District Council (2009) Landscape Character Assessment – Bassetlaw, Nottinghamshire

- 'Yew Tree Farmhouse', which is Grade II listed and located approximately 1.7km to the north.

The Site is not covered by any conservation area designation within its boundary. The Study Area includes conservation areas, and closest when measured from the centre of the Site are:

- Lound Village Conservation Area, located approximately 1.4km to the north; and
- Retford Conservation Area, located approximately 3.8km to the south.

### *6.4.6 Visual Amenity*

The visual assessment will draw from the ZTV, site visits and viewpoint analysis and assesses the potential visual effects on views and visual amenity likely to be experienced by receptors (people) within the landscape as follows:

- Views from residential properties and settlements;
- Views from designated / valued landscapes;
- Views experienced while travelling through the landscape (recreational road users, walkers, horse riders, cyclists for example); and
- Views from tourist and recreational destinations.
- Visual effects would be experienced by the people who live and work in the area, along with those enjoying recreational activities in this area or simply passing through. Whilst it is people who are the actual receptors of visual effects, it is the places they may occupy, and from which the Proposed Development may be seen, that are listed below.

#### *6.4.6.1 Settlements and Residential Properties*

The Site is located in a predominantly rural landscape in which settlement is limited to a number of small villages as well as a fairly scant distribution of farmsteads and residential properties due to the floodplain location of the River Idle. This pattern of settlement shows how to the west there are the smaller villages of Torworth and Barnby Moor located along the A638, in contrast to the larger villages of Hayton and Clarborough to the east, which follow the course of the A620. The main settlements identified in the Study Area where visibility may be experienced across or towards the Site are:

- Hayton, a village located approximately 3.5km to the east of the Site;
- Sutton cum Lound, a village located approximately 1.2km to the west of the Site;
- Lound, a small village located approximately 0.9km to the north of the Site; and
- Retford, a town located approximately 3.6km to the south of the Site.

The main residential properties identified in the Study Area where visibility may be experienced either across or towards the Site are:

- Low Farm, located to the north of the Site off Low Lound Road;
- Markfield Farm, located to the south east of the Site off Smeath Lane;
- Whitehouse Farm to the south of the Site at Tiln; and
- Bellmoor Farm and Bellmoor Cottage, located to the west of the Site.

#### *6.4.6.2 Recreational Routes*

The broad terrain of the Site and Study Area is mainly attributed to the River Idle floodplain and where visibility towards the Site could be experienced along its length from a number of recreational routes. Internal views are also likely to be experienced across the Site from the PROW which crosses through its centre as a footpath (Ref: Sutton FP1) and then continues north as a bridleway (Ref: Sutton BW4). This PROW extends from the SSSI site at Sutton and Lound Gravel Pits in the south towards Low Lound Road in the north. The main PROW where visibility may be experienced across or towards the Site are:

- Bridleway (Ref: Haydon BW28) located approximately 200m to the south and extending in an easterly direction towards Tiln;
- Footpath (Ref: East Retford FP19) also located approximately 200m to the south of the Site and extending in a westerly direction towards the Breedon Retford Ready Mix Concrete Plant;
- Footpath (Ref: Retford FP18) located to the south of the Site where it closely follows the course of the River Idle; and
- BOAT7: that follows the route of Chainbridge Lane to the north of the Site and passes alongside Sutton Grange.

#### *6.4.6.3 Outdoor Sport and Recreation*

Visibility of the Proposed Development may be experienced from people engaged in outdoor sport or recreation and these include:

- The Cuckoo Way Long Distance Path, located approximately 2.5km to the south west where it follows the course of the Chesterfield Canal and 3.4km to the east, where it passes to the west of Clarborough and Hayton;
- Idle Valley Nature Reserve, located approximately 1.7km to the south;
- Chesterfield Canal located approximately 2.5km to the south west and 3.4km to the east; and
- Kings Park, Bassetlaw Museum and the Majestic Theatre within Retford Town Centre.

#### *6.4.6.4 Transport Routes*

The main transport routes, links within the Study Area include:

- The East Coast Main Line, located approximately 2km to the west that passes through Retford and serves Doncaster from Kings Cross;
- Main road links include the A638 Great North Road, located approximately 3km to the west of the Site that passes between Retford and Bawtry, via Ranskill; and
- The A1, located approximately 4.8km to the west of the Site.

### 6.5 Viewpoint Selection

A preliminary viewpoint list is shown in Table 6.2 below. The locations of the viewpoints are shown on Figure 3 in Appendix A. The final list will be established through fieldwork and the scoping process and in agreement with the planning authority.

The preliminary viewpoints were selected to represent sensitive visual receptors with the potential to undergo significant effects. They were also selected to represent landscape receptors and with consideration of the potential for cumulative effects to arise.

- Residential properties in close proximity to the Site;
- People who live and work in the area;
- Visitors to the area for a specific reason (for instance, visitors to tourist or recreational attractions); and
- People who pass through the area (on foot, by bike, by car or by train).
- Where there are options A – C presented for viewpoint locations, these will be confirmed during the site assessment.

***Table 6.2: Preliminary Viewpoint Locations***

| VP No. | Viewpoint Name | Easting | Northing | Viewpoint Description |
|---|---|---|---|---|
| 1A | VP1A: Bridleway BW4 (North) | 468568 | 384969 | Viewpoint looking south from the junction of Low Lound Road with the agricultural landscape in the foreground. |

| | | | | |
|---|---|---|---|---|
| 1B | VP1B: Bridleway BW4 (Central) | 468720 | 384670 | Viewpoint looking south from the bridleway where it sits directly adjacent to the open water body with Bellmoor Farm (non-designated heritage asset) in the foreground. |
| 1C | VP1C: Bridleway BW4 (South) | 468917 | 384282 | Viewpoint looking south from the bridleway where it sits directly adjacent to the northern Site boundary. |
| 2A | VP2A: Lound Low Road BOAT 7 (West) | 469113 | 385150 | Viewpoint looking east from the BOAT where it joins with Town Street. |
| 2B | VP2B: Lound Low Road BOAT 7 (Central) | 469673 | 385232 | Viewpoint looking east from the BOAT where it joins with Town Street. |
| 2C | VP2C: Lound Low Road BOAT 7 (Central) | 470064 | 385490 | Viewpoint looking north from the bridleway. |
| 3A | VP3A: Bridleway BW28 (Central) | 469335 | 383438 | Viewpoint looking north from the bridleway. |
| 3B | VP3B: Bridleway BW28 (Central) | 469747 | 383602 | Viewpoint looking north from the bridleway. |
| 4A | VP4A: Footpath FP18 (East) | 472421 | 384165 | Viewpoint looking west from the footpath at the edge of the settlement of Hayton. |
| 4B | VP4B: Footpath FP18 (Central) | 471645 | 384113 | Viewpoint looking west from the footpath. |
| 4C | VP4C: Footpath FP18 (West) | 470450 | 384141 | Viewpoint looking west from the footpath where it arrives at the distinctive hamlet of Tiln. |
| 5 | VP05: Sutton Cum Lound | 468088 | 384677 | Viewpoint looking east from the edge of the settlement. |
| 6 | VP06: Lound Conservation Area | 469211 | 386055 | Viewpoint looking south from the edge of the settlement. |
| 7 | VP07: Sutton Lane | 468141 | 383553 | Viewpoint looking east from the highway through gaps in the hedgerow. |
| 8 | VP08: Chain Bridge Lane | 470913 | 385750 | Viewpoint looking south west from the lane across an expansive and localised large scale field system. |
| 9 | VP09: Idle Valley Nature Reserve | 468986 | 382991 | Viewpoint looking north from the visitor car park. |

## 6.6 Summary of Scoped In and Out Surveys and Effects

***Table 6.3: Summary of aspects scoped in and out of the EIA process.***

| Receptor Type | Scoped In | Scoped Out |
|---|---|---|
| Landscape character | Landscape Character and designations within 2 km of the Proposed Development. A preliminary assessment will accompany the LVIA to ascertain which landscape character receptors are assessed in detail.<br>Cumulative landscape effects. | Landscape Character and designations outwith 2 km of the Proposed Development.<br>Those LCTs outwith the ZTV, and within 2 km of the Proposed Development.<br>Those landscape designations which have limited / fragmented visibility of the Proposed Development, which would result in non-significant in direct landscape effects on the designated landscape. |
| Visual | Effects on representative viewpoints selected to illustrate the view from recreational routes / locations and residential areas.<br>Effects on properties and settlements.<br>Sequential effects on the local road network and public rights of way.<br>Cumulative visual effects. | Effects on visual receptors with limited or no visibility of the Proposed Development. A preliminary assessment will accompany the LVIA to ascertain which visual receptors are assessed in detail. |

## 6.7 Key Questions for the Council / Consultees

- Do you have any comments on the proposed LVIA methodology?
- Are you aware of any relevant policies or guidance documents not specifically mentioned in this section of the Report?
- Are you in agreement with the proposed Study Area within a 2 km radius, and a Cumulative Study Area of 10 km radius?
- Are you in agreement with the proposed Viewpoint Locations shown in Table 5.2? Are there any additional viewpoints we could consider?
- Do you have any comments or suggestions on the approach to cumulative landscape and visual assessment?

# 7 ECOLOGY AND ORNITHOLOGY

## 7.1 Introduction

The ecology and ornithology chapter of the ES will assess the likely impact of the Proposed Development upon ecological and ornithological features within and surrounding the Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

## 7.2 Preliminary Baseline Conditions

The preliminary baseline conditions presented here are based on a desk study and ongoing ecology and ornithology field surveys.

Natural England's Multi Agency Geographic Information for the Countryside[16] (MAGIC) website was consulted to obtain information about local and national statutory designated sites. Nottinghamshire Biological and Geological Records Centre (NBGR) was consulted for local records of features of ecological interest within 2 km of the Site, which included non-statutory designated Local Wildlife Sites (LWS) and notable and protected species. This information was reviewed to help identify potential constraints for the Proposed Development and to inform the survey scope.

### *7.2.1 Designated Sites*

There no National Site Network sites within 10 km of the Site. The nearest such site is Birklands and Bilhaugh Special Protection Area (SPA), approximately 15 km south-southwest, and there is considered no realistic pathway for effects over this distance.

There are two national statutory designated site within 2 km of the Site, Sutton and Lound Gravel Pits SSSI and Retford Cemetry Local Nature Reserve (LNR) as well as six non-statutory LWS. Further details about the designated sites are provided in Table 6.1.

***Table 6.1: Designated sites and their proximity to the Site.***

| Site | Status | Minimum Distance and Direction (km) from the Site | Description/Reason for Designation |
|---|---|---|---|
| **Statutory designated sites** | | | |
| Sutton and Lound Gravel Pits | SSSI | Directly adjacent to the south and north-east of the Site[17] | Extensive areas of open water lagoons that support a variety of breeding, wintering and passage birds. Also supports a nationally important population of wintering gadwall. Adjacent to the lagoons lies areas of open grassland, acidic scrub and willow dominated woodland. The site is one of the most important localities for passage and over-wintering wildfowl in the East Midlands. |

[16] Multi Agency Geographic Information for Countryside (MAGIC) [Online] Available at: MAGIC (defra.gov.uk) [Accessed May 2022]

[17] Note that part of the SSSI boundary overlaps with the Site; therefore, some works associated with the Development may have a direct effect on habitats within the SSSI.

| Site | Status | Minimum Distance and Direction (km) from the Site | Description/Reason for Designation |
|---|---|---|---|
| Retford Cemetery | LNR | 1.8 km south-east of the most southern part of the Site. | Victorian cemetery believed to be the only working cemetery declared a Local Nature Reserve. There is a variety of native and non-native mature trees and grassland with wildflowers. The site is of county importance for bats and has both species of pipistrelle, noctule, brown long-eared and Daubenton's bats. |
| **Non-statutory designated sites** | | | |
| Sutton and Lound | LWS | Within the Site | The site comprises sand and gravel pits covering approximately 450 ha. This also includes part of the Sutton and Lound SSSI. The River Idle borders the site along the eastern boundary. The site contains a variety of habitats, including large areas of open water, tall ruderal vegetation, grassland, secondary and relict woodland, scrub and marshes. The site supports a range of breeding and wintering wetland birds. |
| Tiln Wood Track | LWS | 0.9 km south | This track forms part of a public bridleway, situated on sandy soils running through a mature pine plantation. High botanical value. |
| Idle Valley Nature Centre Pond | LWS | 1 km south | Designated for its botanical and invertebrate interest. Species include dingy skipper (Erynnis tages), brown argus (Aricia agestis), common blue (Polyommatus icarus), purple hairstreak (Neozephyrus quercus), small copper (Lycaena phlaeas) and small heath (Coenonympha pamphilus). |
| Tiln North and the Conservation Lake | LWS | 1.1 km east | Several gravel pits, designated for their ornithological interest. |
| Bolham Wood | LWS | 1.3 km south | A small deciduous, ancient woodland situated on a steep south-facing slope above the river Idle. |
| Chesterfield Canal (Shireoaks to Welham) | LWS | 1.6 km south-west | Chesterfield canal supports a variety of notable fauna and aquatic flora. |

### *7.2.2 Surveys/Site Visit Findings*

Surveys are being carried out to provide an ecological and ornithological baseline against which to assess the potential effects of the Proposed Development.

Some surveys are ongoing, but the following sections provide a broad overview of results up to April 2022.

#### *7.2.2.1 Extended Phase 1 Habitat Survey*

The Site is predominantly comprised of improved and poor semi-improved grassland fields, separated by fencing, dense scrub and scattered scrub/trees. Large extents of semi-natural broad-leaved woodland are located at the western, southern, eastern and north-western boundary, with plantation woodland in the north of the Site. Other habitats include amenity grassland, tall ruderal vegetation, bare ground, an intact species-poor hedge and waterbodies. Several buildings were located in the north of the Site.

During subsequent ecology surveys at the Site, Himalayan balsam was located in the south-west of the Site, and small numbers of common orchid species were found in grassland habitats within the Site.

#### *7.2.2.2 Great Crested Newt*

Following Habitat Suitability Index (HSI) assessment, an eDNA survey was carried out at 17 waterbodies; one on site and 16 offsite, within 250 m of the Site boundary.

The desk study included a record of great crested newts released in 2007: "60 newts introduced by a Consultant [sic] to ponds behind Nottinghamshire Wildlife Trust reserve off Chainbridge Lane".

No further details are available and contacts at NWT are not aware of the event. As such, it is assumed that the release was too far from the Site and did not spread, or the population no longer survives.

Based on the available evidence, great crested newt is considered absent from the Site and immediate surrounds (up to 250 m buffer) at the time of the assessment.

#### *7.2.2.3 Reptiles*

A reptile survey following standard methods[18] was carried out between May and July 2021.

A total of 212 refugia were placed in suitable reptile habitat within the Site, primarily located in the grassland strips around the Site boundary.

A low population of grass snake has been identified, with a peak count of four adults. The presence of juvenile grass snake suggests this species breeds within or close to the Site. Observations were concentrated in the north of the Site, with small numbers recorded from grassland/woodland boundary elsewhere within the Site.

No further reptile surveys are planned to inform the assessment.

#### *7.2.2.4 Bats*

Due to the location and nature of the Site, and the habitats present, the trees and boundary vegetation within the Site is considered of high suitability for bats, although it should be noted that the vast majority of the Site comprises grazing land.

As per Bat Conservation Trust (BCT) guidance[19], surveys include two walked transects per month (April–October) and use of six automated bat detectors, deployed for five or more consecutive nights per month (April–October).

Due to the size of the Site, the walked transect includes two separate routes surveyed concurrently.

A search for Potential Roost Features (PRFs) was carried out concurrently with the Phase 1 Habitat survey in February, and incidentally during subsequent visits to the Site Several

[18] Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife.

[19] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edition. Bat Conservation Trust, London

potential roost features were noted in the north of the Site. The woodland areas on site were assessed for habitat suitability only; however further survey work to focus on the potential for individual tree roosts is planned for Autumn/Winter 2022 to inform the Proposed Development.

Transect surveys recorded eight taxa (further detail provided in Table 6.2). Five taxa were identified to species level: common pipistrelle, soprano pipistrelle (Pipistrellus pygmaeus), noctule (Nyctalus noctula), brown long-eared bat (Plecotus auritus), Nathusius pipistrelle (Pipistrellus nathusii), and Daubenton's bat (Myotis daubentonii). The remaining two taxa were only identifiable to genus: unidentified Nyctalus species and unidentified Myotis species.

***Table 6.2: Bat transect Survey Results***

| Survey Season and Transect | Common pipistrelle | Soprano pipistrelle | Noctule | Daubleton's | Myotis sp. | Brown-long eared | | Nyctalus sp. | Nathusius' pipistrelle | Number of Bat Passes |
|---|---|---|---|---|---|---|---|---|---|---|
| 26.04.2021 N | 8 | 9 | 2 | 3 | 2 | 0 | | 0 | 0 | 24 |
| 26.04.2021 S | 8 | 5 | 3 | 1 | 1 | 0 | | 0 | 0 | 18 |
| 30.04.2021 N | 2 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 2 |
| 30.04.2021 S | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| 22.05.2021 N | 0 | 1 | 1 | 0 | 0 | 0 | | 0 | 0 | 2 |
| 22.05.2021 S | 13 | 12 | 0 | 0 | 1 | 0 | | 0 | 0 | 25 |
| 28.05.2021 N | 5 | 8 | 0 | 0 | 5 | 1 | | 0 | 0 | 19 |
| 28.05.2021 S | 6 | 3 | 1 | 0 | 0 | 0 | | 0 | 0 | 10 |
| 14.06.2021 N | 3 | 2 | 4 | 0 | 0 | 0 | | 0 | 0 | 9 |
| 14.06.2021 S | 3 | 10 | 2 | 0 | 2 | 0 | | 0 | 0 | 17 |
| 22.06.2021 N | 1 | 1 | 8 | 0 | 0 | 0 | | 0 | 0 | 10 |
| 22.06.2021 S | 14 | 8 | 4 | 0 | 0 | 0 | | 0 | 0 | 26 |
| 12.07.2021 N | 11 | 8 | 2 | 0 | 0 | 0 | | 0 | 0 | 21 |
| 12.07.2021 S | 7 | 3 | 3 | 0 | 0 | 0 | | 0 | 0 | 13 |
| 23.07.2021 N | 4 | 5 | 3 | 0 | 0 | 0 | | 0 | 0 | 12 |
| 23.07.2021 S | 11 | 6 | 0 | 0 | 1 | 0 | | 0 | 0 | 18 |
| 18.08.2021 N | 22 | 3 | 4 | 1 | 1 | 0 | | 0 | 0 | 31 |
| 18.08.2021 S | 7 | 7 | 3 | 0 | 0 | 0 | | 0 | 0 | 17 |
| 23.08.2021 N | 12 | 7 | 2 | 0 | 0 | 0 | | 0 | 0 | 21 |
| 23.08.2021 S | 1 | 7 | 8 | 0 | 0 | 0 | | 0 | 0 | 16 |
| 19.09.2021 N | 3 | 7 | 2 | 0 | 0 | 0 | | 1 | 0 | 13 |
| 19.09.2021 S | 10 | 3 | 0 | 0 | 1 | 0 | | 1 | 0 | 15 |
| 23.09.2021 N | 2 | 7 | 1 | 0 | 0 | 0 | | 0 | 1 | 11 |
| 23.09.2021 S | 2 | 2 | 3 | 0 | 0 | 0 | | 0 | 0 | 7 |

| Survey Season and Transect | Common pipistrelle | Soprano pipistrelle | Noctule | Daubleton's | Myotis sp. | Brown-long eared | | Nyctalus sp. | Nathusius' pipistrelle | Number of Bat Passes |
|---|---|---|---|---|---|---|---|---|---|---|
| 11.10.2021 N Dawn | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| 11.10.2021 S Dawn | 0 | 1 | 0 | 0 | 0 | 0 | | 0 | 0 | 1 |
| 11.10.2021 N Dusk | 0 | 3 | 0 | 0 | 1 | 0 | | 0 | 0 | 4 |
| 11.10.2021 S Dusk | 3 | 1 | 0 | 0 | 0 | 0 | | 0 | 0 | 4 |
| 19.10.2021 N | 4 | 0 | 2 | 0 | 0 | 0 | | 0 | 1 | 7 |
| 19.10.2021 S | 3 | 4 | 0 | 0 | 0 | 0 | | 0 | 0 | 7 |
| Total | 165 | 133 | 58 | 5 | 15 | 1 | | 2 | 2 | 380 |

*7.2.2.5 Remote Monitoring*

Ten taxa were identified during the remote monitoring surveys (Table 6.3). Seven taxa were identified to species level: noctule, Leisler's bat, serotine, Nathusius' pipistrelle, brown long-eared bat, common pipistrelle and soprano pipistrelle. The remaining three taxa were only identifiable to genus: unidentified Myotis, Pipistrellus and Nyctalus species.

***Table 6.3. Number of AnaBat Files per Taxon and Monitoring Dates***

| Survey Month | Monitoring Location | Myotis sp. | Nyctalus sp. | Leisler | Noctule | Nathusius pipistrelle | Common pipistrelle | Soprano pipistrelle | Pipistrellus sp. | Brown long-eared bat | Serotine | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| April | 1 | 12 | 100 | 41 | 8 | 1 | 156 | 39 | 4 | 0 | 0 | 361 |
| | 2 | 18 | 4 | 6 | 8 | 3 | 2895 | 141 | 191 | 0 | 0 | 3266 |
| | 3 | 22 | 18 | 1 | 18 | 5 | 2097 | 1884 | 112 | 0 | 0 | 4157 |
| | 4 | 6 | 2 | 0 | 6 | 2 | 10 | 33 | 0 | 1 | 0 | 60 |
| | 5 | 30 | 7 | 0 | 1 | 1 | 821 | 95 | 0 | 0 | 0 | 955 |
| | 6 | 23 | 2 | 1 | 10 | 0 | 108 | 51 | 0 | 0 | 0 | 195 |
| May | 1 | 30 | 60 | 2 | 37 | 5 | 1232 | 392 | 23 | 4 | 1 | 1785 |
| | 2 | 57 | 27 | 11 | 22 | 6 | 1257 | 299 | 56 | 1 | 0 | 1736 |

| Survey Month | Monitoring Location | Myotis sp. | Nyctalus sp. | Leisler | Noctule | Nathusius pipistrelle | Common pipistrelle | Soprano pipistrelle | Pipistrellus sp. | Brown long-eared bat | Serotine | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 212 | 47 | 1 | 45 | 33 | 7321 | 3602 | 505 | 0 | 0 | 11766 |
| | 4 | 10 | 0 | 4 | 11 | 0 | 91 | 137 | 0 | 0 | 0 | 253 |
| | 5 | 100 | 12 | 0 | 18 | 0 | 6100 | 2188 | 0 | 2 | 0 | 8420 |
| | 6 | 31 | 4 | 2 | 21 | 21 | 2113 | 504 | 0 | 0 | 0 | 2697 |
| June | 1 | 10 | 17 | 1 | 8 | 3 | 476 | 87 | 12 | 0 | 0 | 614 |
| | 2 | 23 | 30 | 5 | 63 | 1 | 2013 | 129 | 49 | 0 | 0 | 2313 |
| | 3 | 151 | 98 | 1 | 75 | 2 | 1714 | 756 | 225 | 0 | 0 | 3022 |
| | 4 | 14 | 5 | 0 | 31 | 0 | 53 | 41 | 0 | 0 | 0 | 144 |
| | 5 | 43 | 672 | 659 | 1509 | 8 | 719 | 553 | 0 | 2 | 0 | 4165 |
| | 6 | 22 | 0 | 0 | 0 | 3 | 1008 | 347 | 0 | 0 | 0 | 1380 |
| July | 1 | 97 | 140 | 4 | 73 | 12 | 1467 | 373 | 39 | 1 | 0 | 2206 |
| | 2 | 608 | 155 | 87 | 335 | 37 | 5229 | 2767 | 25 | 0 | 0 | 9243 |
| | 3 | 67 | 142 | 92 | 328 | 0 | 810 | 421 | 0 | 3 | 0 | 1863 |
| | 4 | 18 | 1 | 0 | 5 | 0 | 70 | 80 | 0 | 2 | 0 | 176 |
| | 5 | 11 | 122 | 136 | 450 | 7 | 1270 | 532 | 0 | 1 | 0 | 2529 |
| | 6 | 88 | 0 | 0 | 0 | 2 | 5372 | 4954 | 0 | 0 | 0 | 10416 |
| August | 1 | 47 | 92 | 2 | 31 | 0 | 607 | 143 | 6 | 0 | 0 | 928 |
| | 2 | 423 | 64 | 204 | 71 | 32 | 5227 | 5687 | 3 | 0 | 0 | 11711 |
| | 3 | 617 | 35 | 42 | 8 | 14 | 4656 | 4929 | 0 | 5 | 0 | 10306 |
| | 4 | 29 | 5 | 11 | 92 | 0 | 309 | 200 | 0 | 0 | 0 | 646 |
| | 5 | 892 | 249 | 91 | 843 | 0 | 2086 | 1738 | 0 | 1 | 0 | 5900 |
| | 6* | - | - | - | - | - | - | - | - | - | - | - |
| September | 1 | 239 | 8 | 0 | 5 | 6 | 155 | 118 | 4 | 1 | 0 | 536 |
| | 2 | 8 | 3 | 1 | 3 | 0 | 83 | 121 | 0 | 0 | 0 | 219 |

| Survey Month | Monitoring Location | Myotis sp. | Nyctalus sp. | Leisler | Noctule | Nathusius pipistrelle | Common pipistrelle | Soprano pipistrelle | Pipistrellus sp. | Brown long-eared bat | Serotine | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 164 | 0 | 0 | 3 | 7 | 1816 | 1869 | 251 | 0 | 0 | 4110 |
| | 4 | 11 | 4 | 9 | 7 | 0 | 278 | 104 | 0 | 0 | 0 | 413 |
| | 5 | 450 | 145 | 55 | 324 | 4 | 2190 | 1486 | 0 | 0 | 0 | 4654 |
| | 6* | - | - | - | - | - | - | - | - | - | - | - |
| October | 1 | 14 | 2 | 0 | 7 | 5 | 67 | 30 | 1 | 0 | 0 | 126 |
| | 2 | 4 | 3 | 0 | 4 | 0 | 3 | 13 | 0 | 0 | 0 | 27 |
| | 3 | 60 | 0 | 0 | 0 | 4 | 619 | 210 | 72 | 0 | 0 | 965 |
| | 4* | - | - | - | - | - | - | - | - | - | - | - |
| | 5 | 9 | 1 | 0 | 5 | 0 | 625 | 149 | 0 | 0 | 0 | 789 |
| | 6* | - | - | - | - | - | - | - | - | - | - | - |

#### *7.2.2.6 Summary*

High activity levels have been recorded during these surveys, with a peak of 116 common pipistrelle bats per hour at location 6 in July. In addition, a wide range of bat species have been recorded, indicating the site has favourable habitat for these taxa. Further surveys are scheduled for Autumn/Winter 2022 to focus on potential roost features that may be present within the woodland areas.

#### *7.2.2.7 Badgers*

A walkover survey was completed in April 2021 to identify possible badger evidence within the Site and immediate surrounds, including setts, prints, latrines or evidence of foraging activity. A further walkover was completed in January 2022 to identify any changes in distribution and provide a more recent baseline for the assessment.

Fourteen camera traps were installed within the Site during June 2021 to further investigate the presence of badger (and other large mammals) and use of the Site, for example, to identify regular commuting routes.

Due to the confidential nature of the data, survey results are not presented herein but are available on request from Natural England, Nottinghamshire Wildlife Trust and Local Planning Authority.

#### *7.2.2.8 Water Vole and Otter*

Water vole surveys were carried out in June and August 2021, according to standard guidance[20], to identify evidence of water vole. The surveys included potentially suitable ditches and waterbodies within and adjacent to the Site. Evidence of otter were searched for during the surveys.

No evidence of water vole or otter was recorded during the surveys.

The most recent records of water vole returned by the desk study were in 2012 and, anecdotally, NWT noted the presence of mink on the reserve and that water vole is considered likely to be absent from the area.

NWT noted that otter is occasionally observed in the wider area, but typically further north in the reserve. The desk study returned records from 2014 and 2017 to the southwest and west of the Site, respectively.

No further water vole or otter surveys are planned to inform the assessment.

#### *7.2.2.9 Birds*

Winter Bird Surveys (WBS) were completed between October 2020 and mid-March 2021, with two surveys per month (excluding March, which included one WBS) carried out using the "look-see" method. The WBS Area included the Site and 500 m buffer.

A six-visit survey of breeding birds (SBB) was completed between mid-March and mid-July 2021. The survey used an adapted version of the Common Bird Census (CBC) method[21], but adhering to new survey guidance released in spring 2021[22]. The SBB Area included the Site and 250 m buffer.

Overall, relatively few birds were recorded within the Site itself, likely due to the high grazing pressure and the short grass habitats present. The wider area supports a large and varied bird assemblage throughout the year. For the assessment, results will be summarised identifying peak counts within the Site and potential zone of influence for the Proposed Development, and will include figures to show spatial distribution of the observations. During the WBS, these included:

- Wildfowl were present throughout, although within the Site species were mostly limited to greylag and Canada geese. Small numbers of other species were recorded within the Site when it partially flooded during February 2021 but were otherwise only recorded overflying overflying the Site, transiting between waterbodies in the wider reserve and gravel pit network. Numerous species were recorded on adjacent waterbodies in moderate numbers (typically less than 100 individuals).
- Lapwing was recorded flying over the Site on occasion, but there were no observations of wader species foraging within the Site. Woodcock was recorded within wooded and scrub habitats around the Site boundaries.
- Flocks of widespread gull species were recorded foraging within the Site during some surveys, and small numbers were regularly observed overflying the area.
- Marsh harrier was recorded transiting over the Site during several surveys.
- Passerine species were typical of the area and habitats available, including winter thrushes, meadow pipit, lesser redpoll.

[20] Dean, M (2021) Water Vole Field Signs and Habitat Assessments: A Practical Guide to Water Vole Surveys Pelagic Publishing, Exeter, UK

[21] Marchant, J. (1983) Common Birds Census Instructions. British Trust for Ornithology, Thetford.

[22] Bird Survey & Assessment Steering Group. (2021). Bird Survey Guidelines for assessing ecological impacts, v.0.1.0. Bird Survey Guidelines | for ecological impact assessment [Accessed: 09/07/2021]

During the SBB, a typical selection of species was recorded for the geographic area and habitats present:

- Very few, if any birds bred within the pasture areas of the Site.
- Species of conservation concern holding territory within the scrubby and woodland habitats within the Site include: willow warbler, starling, song thrush, mistle thrush, dunnock, linnet and reed bunting.
- Overall, due to the presence of the reserve and the mosaic of habitats available, the wider area holds a large and diverse assemblage of breeding birds.

During the winter of 2021-22, opportunistic WBS were planned to coincide with periods of high rainfall that could cause flooding within areas of the Site and identify peak counts when habitats were most suitable for waterbirds. Two visits were carried out, but no flooding was recorded and bird numbers were generally lower than the previous winter.

No further bird surveys are planned to inform the assessment.

#### *7.2.2.10 Other species*

Hare has been recorded within the Site incidentally during the other survey efforts.

An apparent polecat-ferret hybrid was observed during a SBB visit. The NWT subsequently provided two further records of polecat in the wider area, dated from 2014, and the desk study included a record from 2018, to the southwest of Site.

The improved grassland, scrub and tall ruderal habitats within the Site are likely support a range of common and widespread invertebrate species. The relatively undisturbed character of some habitats, particularly the ponds and the woodland bordering the floodplain of the River Idle, may support a more diverse assemblage of invertebrates. The desk study returned six records for dingy skipper butterfly and four records of small heath butterfly, recorded within the Idle Valley nature reserve, southeast of the Site. No invertebrate surveys are planned to inform the assessment.

Rabbit, fox, mink, grey squirrel and roe deer have been recorded during the surveys.

### *7.2.3 Future Baseline*

Due to the nature of the Proposed Development and the extended timescales of associated works, adverse effects could last for many years and the ecological baseline may change. Consideration will be given to potential changes and, where necessary, a monitoring protocol and reactive mitigation will be proposed where there is uncertainty regarding the receptors that may be present.

## 7.3 Consultation

Consultation has been carried out with Natural England, Nottinghamshire Wildlife Trust and Nottinghamshire County Council. The aim of the consultation has been to ensure the suitability of the survey efforts, identify key receptors for assessment, and to help identify effects to be considered and priorities for restoration efforts.

## 7.4 Likely Impacts/Effects

The following broad ecological impacts will be considered within the assessment. For each impact there are examples of potential effects (which may be negative or positive); however, this is not intended as an exhaustive list. Potential effects may be specific to individual feature/s, and a full review of effects for inclusion in the assessment will be carried out on completion of the surveys.

Habitat changes:

- Direct loss or modification of breeding, foraging and/or sheltering habitat through construction of the Proposed Development.
- Restoration of habitats following extraction of PFA within each phase will create and/or improve resources for ecological features.

Disturbance:

- Noise disturbance to key ecological receptors such as nesting birds or bat roosts, both within the Site and surrounding area, could displace features from the area and/or decrease survival or breeding success.
- Light disturbance to ecological receptors, such as foraging bats or badgers, may disrupt activity or displace features from the area with potential adverse effects on survival or breeding success.
- Visual disturbance, particularly to diurnal ornithological receptors, may displace features from the area or lead to reduced survival due to disrupted foraging or increased predation risk.

Environmental effects:

- Dust caused by works and/or transport within the Site could have adverse effects, for example decreasing floristic diversity or coating habitat features and reducing foraging opportunities for ecological interests.
- Vibration may displace some receptors, such as reptiles, or could have adverse effects on habitat features, such as damaging tree roots.
- Compromised water quality may have adverse effects both within the Site and beyond the Site boundary, for example, by causing direct mortality of features or loss of foraging resources.

Legal compliance:

- The presence of European Protected Species (EPS) may necessitate specific mitigation or licensing to avoid effects, some of which may constitute a legal offence.
- The Wildlife and Countryside Act 1981 offers legal protection for some species found within the Site and specific mitigation may be required to avoid effects.
- The Protection of Badgers Act 1992 offers legal protection against killing, injuring and taking badgers.

## 7.5 Relevant Legislation, Policy and Guidance

- The ecological assessment will be carried out in accordance with the requirements set out in the following legislation and guidelines.

### *7.5.1 Legislation*

- Directive 2009/147/EC on the Conservation of Wild Birds ('Birds Directive')[23];
- Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) ('Habitats Directive')[24];
- The Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitat Regulations')[25];
- The Wildlife and Countryside Act 1981 (as amended)[26];
- The Natural Environment and Rural Communities (NERC) Act 2006[27];

[23] The Bird Directive. Available from: The Birds Directive - Environment - European Commission (europa.eu)

[24] European Parliament (1992) Directive 92/43/EEC [Online] Available at: https://eur-lex.europa.eu/legal content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN

[25] The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 [Online] Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111179512/contents

[26] The Wildlife and Countryside Act 1981 (as amended). Available from: Wildlife and Countryside Act 1981 (legislation.gov.uk)

[27] The Natural Environment and Rural Communities (NERC) Act 2006 Available from: https://www.legislation.gov.uk/ukpga/2006/16/contents

- Environmental Impact Assessment Directive 2014/52/EU[28]; and
- UK Post-2010 Biodiversity Framework (2012)[29].

### *7.5.2 National Planning Policy Framework and Guidance*

- National Planning Policy Framework (NPPF)[30]; and
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Chartered Institute of Ecology and Environmental Management (CIEEM), 2019)[31].

### *7.5.3 Local Policy, Additional Resources and Guidance*

- Nottinghamshire Minerals Local Plan[32];
- Nottinghamshire Biodiversity Action Plan (BAP)[33];
- Birds of Conservation Concern (BoCC) 5: the population status of birds in the United Kingdom, Channel Islands and Isle of Man[34].

## 7.6 Assessment Methodology

The approach taken to the assessment of ecological and ornithological effects will follow the CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland. These guidelines set out the process for assessment through the following stages:

- Evaluation of the importance of features identified during the Desk Study and Baseline Surveys – those considered to be Important Ecological Features (IEFs) are scoped into the assessment, while those considered to be of local importance or not present are scoped out;
- Identification and characterisation of potential effects on IEFs;
- Assessment of potential effects on IEFs, both from the Proposed Development alone and in combination with other developments in the surrounding area (cumulative effects);
- Identification of measures required to avoid and mitigate (reduce) adverse effects; and
- Assessment of the significance of any residual effects after mitigation.

The Ecology and ornithology ES chapter will form the ecological assessment, including effects on both ecology and ornithology receptors. The ES chapter will be supported by Technical Appendices detailing the desk study results, consultation, survey methodologies and results (including figures, tables, photographs, maps, and appendices, where relevant). Where necessary, the chapter and Technical Appendices will be supported by Confidential Annexes containing sensitive information that should not be presented in the public domain in order to prevent harm to protected species.

28 European Parliament (2014) Directive 2014/52/EU [Online] Available from: EUR-Lex - 32014L0052 - EN - EUR-Lex (europa.eu)

29 Four Countries' Biodiversity Group (2010) UK Post-2010 Biodiversity Framework [Online] Available from: UK Post-2010 Biodiversity Framework (jncc.gov.uk)

30 National Planning Policy Framework (2021) [Online] Available from: https://www.gov.uk/government/publications/national-planning-policy-framework--2

31 CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

32 Nottinghamshire County Council (2021) Nottinghamshire Minerals Local Plan, adopted March 2021. Available online at: Adopted Minerals Local Plan | Nottinghamshire County Council

33 Available online at: Local Biodiversity Action Plan – Nottinghamshire Biodiversity Action Group (nottsbag.org.uk)

34 Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114, 723–747.

The chapter will include measures to mitigate likely adverse effects, either by sensitive design or applied techniques, and will outline measures to enhance biodiversity, as well as the requirement for associated monitoring and adaptive management.

### *7.6.1 Proposed Desk-based Assessment*

A desk-based assessment was conducted to gather any relevant, pre-existing information relating to the Proposed Development site. Good EIA practice includes identification of any statutory and non-statutory designated sites of nature conservation interest within a potential zone of influence of the Proposed Development, as well as collation of historical species records in the area. This has been completed.

These records will inform on-going survey efforts and provide a historical and regional context for the assessment. In the first instance, records of notable and protected species were obtained from the Nottinghamshire Biological and Geological Records Centre (NBGR). Data from the British Trust for Ornithology's Wetland Bird Survey (WeBS) will be purchased to inform the assessment and provide context to the results of the bird surveys. In light of initial requests and survey results, further information and data requests may be made to other sources, such as specialist species recorders.

### *7.6.2 Determining Value*

The baseline conditions, including the importance of environmental features on or near to the Site, or the sensitivity of potentially affected IEFs, are assessed in line with best practice guidance, legislation, statutory designations and professional judgement.

Ecological and ornithological features can be important for a variety of reasons, and may relate, for example, to rarity, the extent to which they are threatened throughout their range, or to their rate of decline. The level of importance of features identified during the Desk Study and Baseline Surveys will be determined with reference to CIEEM guidance, and include a consideration of relevant legislation, conservation status, population size and distribution and the level of Site use. Some examples of nature conservation value of the ecological interests are provided in Table 6.3.

It is anticipated that features matching the criteria for Local, or higher, importance level will be included in the EIA. Features of Less than Local importance will be scoped out of the assessment; however, where relevant, safeguards necessary to ensure legal compliance (i.e., protection of nesting common bird species) will be included.

***Table 6.3: Approach to determining value of ecological receptors***

| Importance level | Examples |
|---|---|
| International | The regular presence[35] within or around the Site of a qualifying feature of an existing or proposed statutory site of international ornithological importance, i.e., SPA or Ramsar site, with potential connectivity to the Site. Generally, species recorded in numbers representing more than 1 % of the cited SPA population, are included, with an element of professional judgement.<br>An internationally designated site (e.g., a Special Area of Conservation (SAC)) or a site meeting criterion for international designations. This includes candidate SACs/SPAs.<br>Species in internationally important numbers (>1 % of biogeographic populations). SAC qualifying species connected to a SAC. |
| National (England) | The regular presence within or around the Site of a designated feature of a statutory site of national importance, i.e., SSSI, with potential connectivity to the |

[35] Here defined as present within or near the Site during 50 %, or more, or surveys visits within a given season. This may exclude birds seen flying over the Site, if there is no apparent connection with their presence and the habitats within or near the Site.

| Importance level | Examples |
|---|---|
| | site, or the regular presence of a group of species which form part of a designated assemblage feature of a SSSI.<br>Exceptional population of reptile(s) confirmed present within the Site or notable presence of European Protected Species I.E., maternity/hibernation roost for rare bat species such as, Barbastelle bat.<br>Large areas of priority habitats[36] or habitats listed on Annex I of the Habitats Directive and smaller areas of such habitats that are essential to maintain the viability of the habitat. |
| Regional (County) | Species listed on Annex I of the Birds Directive, or breeding species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), that are present within or around the Site infrequently or in low numbers (regionally or locally important numbers), but could use the Site more regularly post-construction.<br>Moderate population of reptile(s) confirmed present within the Site or notable presence of European Protected Species, i.e., maternity/hibernation roost for more common bat species such as Common/Soprano Pipistrelle bat.<br>Local Nature Reserve (LNR). |
| Local | A locally important population of a bird species of conservation concern[37], or other species of conservation interest, e.g., Nottinghamshire BAP14, that regularly occurs within or around the Site.<br>Local Wildlife Sites (LWS) or equivalents that may be designated according to criteria at the local authority level.<br>Areas of semi-natural woodland smaller than 0.25 ha.<br>Areas of habitat or species considered to appreciably enrich the ecological resource within the local context. |
| Less than Local | All other bird species that are widespread and common and of low conservation concern (e.g. included on the BoCC green list) and which are not present in locally important (or greater) numbers.<br>Usually widespread and common habitats and non-avian species. Features falling below local value are not considered in detail in the assessment process unless they have policy implications for the Proposed Development, e.g., legally protected species. |

### *7.6.3 Characterisation of Potential Effects*

In line with the CIEEM EcIA guidance31 consideration is given to the following characteristics when identifying potential effects of the Proposed Development on ornithological features:

- Nature of effect: whether it is positive (beneficial) to features, e.g. by increasing species diversity or extending habitat, or negative (detrimental), e.g. by loss of, or displacement from, suitable habitat;
- Extent: the spatial or geographical area over which the effect may occur;
- Magnitude: the size, amount, intensity, and volume of the effect;
- Duration: the duration of an effect as defined in relation to ornithological characteristics (such as a species' life cycle) as well as human timeframes. It should also be noted that the duration of an activity may differ from the duration of the resulting effect; e.g. if short-term construction activities cause disturbance to

[36] Section 41, Natural Environment and Rural Communities (NERC) Act 2006

[37] Here defined as any species listed on one or more of the following: Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), Annex I or the Birds Directive, Section 41 of the NERC Act (2006) and/or Red- or Amber-listed Birds of Conservation Concern (Eaton, et al. 2015).

breeding birds, there may be long-term implications from failure to reproduce that season;
- Frequency: the number of times an activity occurs may influence the resulting effect; and
- Timing: this may result in an impact on an ecological feature if it coincides with critical life stages or seasons (e.g. the breeding season).
- The criteria for assessing the magnitude of a potential effect are defined as follows:
- High: A fundamental change to the baseline condition of the IEF, leading to total loss or major alteration of the relevant population;
- Medium: A material change to the baseline condition of the IEF, leading to partial loss or alteration of the relevant population;
- Low: A slight, detectable, alteration of the baseline condition of the IEF; and
- Negligible: A barely distinguishable change from baseline conditions.
- It is considered that a magnitude level of medium or higher could have a likely significant effect on an IEF.

### *7.6.4 Determining Significance*

Prevailing CIEEM guidance[31] avoids and discourages use of the matrix approach to determining significance, and describes only two categories: 'significant' or 'not significant'.

According to the CIEEM guidance, for the purpose of EcIA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general.

Where potential connectivity with an SAC, SPA or Ramsar site has been identified, significant effects on species are assessed in the context of potential effects on the conservation status of that particular SAC, SPA or Ramsar site population, as this is considered to be the most appropriate scale for assessment. In this assessment, any effects on ornithological or ecological features that could threaten the integrity of a statutory site, or the favourable conservation status of a bird population, is considered to be significant. Where this is not the case, effects are considered to be not significant.

### *7.6.5 Assessment of Cumulative Effects*

The purpose of a cumulative effect assessment is to identify effects that might not be significant on their own, but become significant when considered in combination with effects from other plans or developments. A search radius of 10 km from the Proposed Development site boundary will be applied for the cumulative effects assessment and all developments likely to impact ecological receptors will be considered.

## 7.7 Ecology Summary

The Ecology and Ornithology chapter of the ES will be based on prevailing CIEEM guidance, and informed by robust survey data and a comprehensive desk study, and is a key consideration for the EIA.

As trees are planned to be removed from site, further bat surveys will be required to determine presence of potential roost features within the woodland on site. The majority of habitats within the Site have limited suitability to support notable invertebrate species, with the arable land being subject to decades of intensive farming, over enrichment and pesticide application. The woodland around the edge of the Site was originally considered to be retained, therefore no survey effort was undertaken. Follow-up surveys focussing on saprophytic invertebrates and other woodland species will need to be undertaken. No further surveys are planned to identify the baseline condition at the Site, with the data collected to-date considered sufficient to inform a robust assessment.

It is anticipated that the assessment will recommend ongoing monitoring throughout the construction phase, reactive and adaptable mitigation where necessary, and a restoration scheme that offers wide and long-term benefits for biodiversity.

## 7.8 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Are consultees content with the proposed methodology and scope of the ecology and ornithology assessment?
- Does the Council or other consultees have any information that would be useful in the preparation of the assessment?

# 8 HYDROLOGY, HYDROGEOLOGY, FLOOD RISK AND GROUND CONDITIONS

## 8.1 Introduction

The hydrology, hydrogeology, flood risk and ground conditions chapter of the ES will assess the likely impact of the Proposed Development upon the hydrological environment within and surrounding the Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

## 8.2 Preliminary Baseline Conditions

### *8.2.1 Surface Hydrology*

Ordnance Survey raster 1:25,000 mapping shows there are no mapped watercourses within the Site boundary, with the nearest Water Framework Directive (WFD) classified watercourse being the River Idle located immediately to the east of the Site boundary and flows from south to north[38]. The wider area is extensively drained with several lagoons, waterbodies and canals, with two drains present onsite, one to the south-west, the other to the north. The Site is shown to be located within the operational boundary of an Internal Drainage Board (IDB) - the Isle of Axholme and North Nottinghamshire Water Level Management Board[39].

The Environment Agency 'Catchment Data Explorer' shows the south of the site lies within the 'Idle (from Maun/Poulter to Tiln)' waterbody catchment (ID GB104028058091) with a classification of Moderate ecological status. The waterbody is required to meet Good status by 2027, however, it is currently failing. This is due to the water quality as phosphate on macrophytes has been found at monitoring points. It lies within the Idle and Torne management catchment within the wider Humber catchment. The north of the site lies within the 'Idle (from Tiln to Ryton) waterbody catchment (ID GB104028058092) with a classification of Moderate ecological status.

### *8.2.2 Hydrogeology*

The Environment Agency 'Catchment Data Explorer' shows the Site is within the wider Humber groundwater body. The Humber groundwater body has an overall status of Poor. Reasons for this status include poor nutrient management, poor livestock management, groundwater abstraction and groundwater resource impacts.

Information provided by the Environment Agency available on DEFRA's Magic Map viewer shows the site does not lie within a Drinking Water Safeguard Zone for Groundwater. The site, however, does lie within a Zone III total catchment Source Protection Zone.

The DEFRA Magic Map confirms that underlying the site is a Principal bedrock aquifer and Secondary A superficial aquifer. The groundwater vulnerability classification is stated as Medium – High.

The BGS Geoindex 1:625,000 Hydrogeology map shows the entire site lies within a 'Highly productive aquifer' which is described as 'principal sandstone aquifer up to 600 m thick and yielding up to 125 L/s'. Quality is reported as 'good but hard and becomes saline beneath confining Mercia Mudstone'. The direction of groundwater flow within the area is not known.

[38] Environment Agency (2021) Catchment Data Explorer [Online] Available at: England | Catchment Data Explorer (Accessed 06/04/2022)

[39] ADA Representing Drainage Water Level and Flood Risk Management Authorities (2014-2021) Internal Drainage Boards Map. Available at: Internal Drainage Boards Map - Association of Drainage Authorities (ada.org.uk) (Accessed 06/04/2022)

### 8.2.3 Ground Conditions

The Site consists of former PFA disposal lagoons which have been reinstated to poor quality grazing land for pastoral farming, with a thin layer of topsoil overlying the PFA averaging 0.3m thickness for most of the Site[40]. The superficial deposits were only present intermittently during ground investigations.

An intrusive ground investigation by SLR Consulting found the underlying conditions to consist of topsoil, PFA and sandstone of the Chester Formation. Occasional bands of sand and gravel were observed overlying the sandstone which was considered to be unworked River Terrace Deposits. The site was drilled to a maximum depth of 18m bgl, with the depth determined by proving at least 1m of underlying Chester Formation. The sandstone was observed at depths between 2.45m bgl and 16.1m bgl, with shallower bedrock present to the east of the Site, with a decrease in PFA thickness.

The Site is split between 'lowlands' to the east (7.5 – 11m AOD) and 'high fields' to the centre and west (17 – 19m AOD). There is significant variation in PFA thickness between 'high fields' and 'lowlands' with an average PFA thickness of 13.4m and 3.6m respectively. Groundwater was encountered across the Site at typically 8-10m bgl in the 'high fields' and 2-3m bgl in the 'lowlands'. Groundwater levels indicated that the water table within the PFA is similar to the surrounding aquifer suggesting hydraulic continuity. SLR also advised following the ground investigation[41] that the underlying Chester Formation is recorded to depths of at least 137m bgl. Both the Chester Formation and River Terrace deposits have high intergranular flows, with regional testing producing typical permeabilities of 0.73 - 5.5 m/day and 0.078 - 5.2 m/day respectively. PFA deposits typically record permeabilities of between 8.6x10-8- 0.17 m/day. Testing regarding possible contamination in the PFA groundwater above Environmental Quality Standards (EQS) will be required.

The British Geological Survey (BGS) Geoindex maps[42] indicate the Site to be underlain by sand and gravel River Terrace deposits across most of the Site, with alluvium comprised of clay, silt, sand and gravel to the north-east. As the River Terrace deposits have been worked, they are not present extensively onsite[43]. The superficial deposits are underlain by pebbly sandstone of the Chester Formation. Alternative names for the Chester Formation include the Bunter Sandstone Formation and Bunter Pebble Beds.

### 8.2.4 Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

The site is situated within an area of rural agricultural land and is generally flat and low-lying. The site is raised with vegetated banks and largely comprises improved grassland, which is used as poor-quality grazing land, with broadleaved woodland at the site boundary. Groundwater dependent communities have not been identified as part of the ecology Phase 1 walkover, with the habitats of the area summarised in Section 7. If groundwater dewatering is included as part of the Proposed Development, impacts to any GWDTEs will be assessed as part of the assessment of change to hydrogeological conditions.

### 8.2.5 Designated Hydrological Receptors

The statutory designated sites relating to water within the wider 10 km Study Area, identified through the use DEFRA Magic Map datasets. The statutory designations that are considered hydrologically connected to the Proposed Development are listed in Table 8.1.

[40] SLR Consulting (2021) Lound PFA Ground Investigation Report, Version No 2, SLR Ref 416.11943.00001

[41] SLR Consulting (2021) Lound PFA Tip – Groundwater Abstraction Due Diligence, SLR Ref 422-11943-00002

[42] BGS (undated) GeoIndex Onshore [Online] Available at: GeoIndex - British Geological Survey (bgs.ac.uk) (Accessed 06/09/2021)

[43] SLR Consulting (2021) Lound PFA Ground Investigation Report, Version No 2, SLR Ref 416.11943.00001

Statutory designations which were identified within the 10 km Study Area but were deemed not hydrologically connected to the Proposed Development are listed in Table 8.2.

***Table 8.1: Statutory Designated Sites hydrologically connected to the Proposed Development (within 10 km)***

| Designated Site | Distance from Proposed Development Area A | Qualifying Interest | Hydrological Connection to Proposed Development |
|---|---|---|---|
| Sutton and Lound Gravel Pits SSSI | Onsite – This constitutes a small lagoon embankment that excludes the SSSI designation features. The land ownership boundaries are currently being reviewed with a view to being removed. | Aggregations of non-breeding birds (Gadwall, Anas stepera, variety of passage species) and assemblages of breeding birds | Designation located onsite. |
| River Idle Washlands SSSI | Approx. 7.9 km north | Assemblages of breeding birds (Lowland damp grasslands), aggregations of non-breeding birds (Bewick's swan), floodplain fen (lowland) and lowland wet neutral grassland | Located downstream of the Development, on banks of River Idle. |
| Misson Line Bank SSSI | Approx. 9.8 km north | Eutrophic lakes, lowland fens, lowland mixed deciduous woodland and standing waters | Located downstream of the Development, on banks of River Idle. |

***Table 8.2: Statutory Designated Sites not hydrologically connected to the Proposed Development (within 10km)***

| Designated Site | Distance from Proposed Development Area A | Qualifying Interest | Hydrological Connection to Proposed Development |
|---|---|---|---|
| Chesterfield Canal SSSI | Approx. 2.3 km east | Standing open water and canals | Hydrologically disconnected by River Idle |
| Mattersey Hill Marsh SSSI | Approx. 2.8 km north-west | Lowland wetland including basin fen, valley fen, floodplain fen, waterfringe gen, spring/flush fen and raised bog lagg | Located upstream of the Proposed Development. |
| Clarborough Tunnel SSSI | Approx. 4.5 km south-east | Lowland calcareous grassland | Hydrologically disconnected by River Idle |
| Castle Hill Wood SSSI | Approx. 5.0 km south-east | Lowland mixed deciduous woodland | Located upstream and hydrologically disconnected by River Idle |

| Designated Site | Distance from Proposed Development Area A | Qualifying Interest | Hydrological Connection to Proposed Development |
|---|---|---|---|
| Scrooby Top Quarry SSSI | Approx. 5.4 km north-west | Non-Marine Permian Triassic | Located upstream of the Proposed Development. |
| Barrowhill Sandpit SSSI | Approx. 6 km north | Lowland dry acid grassland | Located upstream of the Proposed Development. |
| Gamston & Eaton Woods & Roadside Verges SSSI | Approx. 6.5 km south-east | Lowland neutral grassland and lowland mixed deciduous woodland | Located upstream and hydrologically disconnected by River Idle |
| Clumber Park SSSI | Approx. 6.9 km south-west | Assemblages of breeding birds (lowland open waters and their margins, woodland), Invert. assemblage (heartwood decay, bark and sapwood decay, fungal fruiting body), lowland dry acid grassland, lowland dry heath, lowland neutral grassland, lowland wetland and wet woodland | Located upstream of the Proposed Development. |
| Treswell Wood SSSI | Approx. 7.5 km south-east | Lowland mixed deciduous woodland | Located upstream and hydrologically disconnected by River Idle |
| Ashton's Meadow SSSI | Approx. 9.5 km south-east | Lowland neutral grassland | Located upstream and hydrologically disconnected by River Idle |

### *8.2.6 Private and Public Water Supplies*

Consultation has been undertaken with Bassetlaw District Council requesting information on Private Water Supplies (PWS) within 2 km of the Proposed Development.

Anglian Water were also consulted regarding both private and public water supplies. While Anglian Water cannot provide information on private abstractors, they were able to confirm that two sources identified on the DEFRA Magic Map source protection zone map are Anglian Water Public Water Supply sources - Everton and Retford boreholes. They have identified a third as likely belonging to Severn Trent Water. Further consultation will be undertaken with Anglian Water regarding groundwater levels at these sources, and with Severn Trent Water.

Consultation with the EA commenced 28th April 2021, when enquiries were submitted regarding the proposed resource assessment at the Site and extraction of PFA. The EA noted that a proposed water management plan would be required with details of any groundwater pumping and water discharge. If water discharge activities were to occur an environmental permit would be required. They also noted that the Idle and Torne catchment is currently closed for new consumptive abstractions. The EA also noted that lowering of ground levels could increase flood risk at the Site within the current flood zone 2 and therefore a flood risk assessment is required. The EA did note on 24th June 2021 that if an area being dewatered is rainwater, then no abstraction license is required, however, if it is surface water or groundwater an abstraction license is required.

Bassetlaw District Council was consulted by Arcus on 16th July 2021 regarding any records they may have of private water supplies within 2 km of the Site boundary. The Council's consultant drainage engineer responded that there were no private water supplies in the area. They also suggested verifying this information with Anglian Water and contacting the EA regarding any extraction licenses in the area.

Anglian Water was consulted by Arcus on the 14th September 2021 regarding any records they may have of private or public water supplies within 2 km of the Site boundary. A response from the Abstraction Licensing Manager in the Water Resources department stated that they could not provide information on private abstractors. They did confirm that there are two Anglian Water Public Water Supply sources, Everton and Retford, in the surrounding area. They advised that another public abstraction in the area likely belonged to Severn Trent Water. They also advised accessing publicly available data from the EA through Arc GIS called 'Water Resources Help for Trading'.

### *8.2.7 Flooding*

In relation to flooding, the Environment Agency Flood Map[44] indicates the south and west of the Site is located within Flood Zone (FZ) 1 where there is a 'low' probability of fluvial and tidal flooding (land with less than a 1:1,000 annual probability of river or tidal flooding). However, the north and west of the Site is located within a FZ2 where there is a 'medium' probability of flooding (land with a 1:100 to 1:1,000 annual probability of river flooding or a 1:200 to 1:1,000 annual probability of tidal flooding).

A standalone Flood Risk Assessment (FRA) is to be provided as an Appendix to the ES and assess the flood risk to the Site from a a range of flooding sources and the risk of any increase in flood risk elsewhere.

A request for information was submitted to the EA by Arcus on the 7th June 2021. The EA responded with a flood risk data package and relevant floodplain heights. These included modelling for 1:100, 1:150 and 1:200-year flood events. However, this has been followed up by Arcus as the response was only applicable to the north of the Site and does not account for climate change.

Modelled data provided by the Environment Agency (EA) for the north of the Site shows that the 1:100 year flood outlines (the design return period) does not impact this area, however, this does not include the required uplift for climate change. Available data of the 1:150 and 1:200 year events show the Site is not impacted by flood waters, with such events assessed as a proxy for the 1:100-year climate change event. Further consultation has been undertaken with the EA regarding accessing data for the entire Site and also updating the data for climate change.

## 8.3 Likely Environmental Effects

### *8.3.1 Scoped In Effects*

- Assessment of potential effects on the following receptors will be scoped in:
- Chemical pollution and sedimentation of surface water receptors as a result of construction and operational phases;
- Impacts relating to migration of pollutants from contaminated land to sensitive receptors, as the Site has previously been developed as PFA lagoon disposal site and contaminated land will be encountered;

[44] UK Government (2022) Flood Map for Planning [Online] Available at: https://flood-map-for-planning.service.gov.uk/ (Accessed 06/04/2022)

- Impediments to near-surface water and drainage to all watercourses as a result of construction, potential dewatering and presence of linear infrastructure such as access tracks;
- Changes to water quality, quantity and continuity of the underlying aquifers and public and private water supplies as a result of construction and operation of the proposed development, including any dewatering activities;
- Impediments to flow and pollution of any identified GWDTEs as a result of construction or operation;
- Acidification of watercourses as a result of construction works and related tree felling;
- Increased run-off and flood risk as a result of increased hardstanding and compaction of superficial deposits and soils; and
- Cumulative effects if the potential effects arising from the Development are in combination with other relevant development projects within the wider area.

### *8.3.2 Scoped Out Effects*

Assessment of potential effects on the following receptors will be scoped out:

- Designated receptors not hydrologically connected to the Proposed Development as there is no potential for effects on these receptors; and
- Pollution and sedimentation effects on the water environment at distances greater than 10 km and it is proposed that receptors beyond this distance are scoped out.

## 8.4 Assessment Methodology

### *8.4.1 Relevant Legislation and Guidelines*

The hydrology and hydrogeology assessment of the Proposed Development will be undertaken in accordance with:

- Water Resources Act 1991[45]
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[46];
- Safeguarding our Soils: A Strategy for England[47];
- The Land Drainage Act 1991[48];
- The Environmental Protection Act 1990[49];
- The Construction Industry Research and Information Association (CIRIA) (2015), Environmental Good Practice on Site (C741)[50];
- CIRIA (2001), Control of Water Pollution from Construction Sites (C532)[51]; and
- CIRIA (2015), The SuDS Manual (C753)[52].

Relevant guidance provided by the Environment Agency (EA) include:

[45] UK Government (1991) Water Resources Act [online] Available at: https://www.legislation.gov.uk/ukpga/1991/57/section/107(Accessed 09/09/2021)
[46] UK Government (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations. [online] Available at: The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (legislation.gov.uk) (Accessed 07/09/2021).
[47] Safeguarding our Soils: A Strategy for England. DEFRA (2011). [online] Available at: https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england (Accessed 07/09/2021).
[48] The Land Drainage Act 1991 [online] Available at: https://www.legislation.gov.uk/ukpga/1991/59/contents(Accessed 07/09/2021).
49 The Environmental Protection Act 1990 [online] Available at: http://www.legislation.gov.uk/ukpga/1990/43/contents (Accessed 07/09/2021).
[50] CIRIA (2015) Environmental Good Practice on Site [Online] Available at: (Accessed 07/09/2021)
[51] CIRIA (2001), Control of Water Pollution from Construction Sites (C532) [Online] Available at: https://www.ciria.org/ProductExcerpts/C532.aspx (Accessed 07/09/2021)
[52] CIRIA (2015) The SuDS Manual (C753) [Online] Available at: TBYB c753 (ciria.org) (Accessed 07/09/2021)

- Discharges to surface water and groundwater: environmental permits[53]; and
- Apply for a water abstraction and impoundment license[54].

### *8.4.2 Proposed Consultation*

Consultation regarding the Proposed Development with consultees has already begun prior to this scoping report. Consultation has already occurred with the Environment Agency (EA) regarding extraction of PFA and flood modelling; with Bassetlaw District Council regarding records of Private Water Supplies; and Anglian Water regarding private and public water supply records.

As part of the contaminated land assessment, the Council's Land Contamination officer has been contacted to identify any relevant information relating to the site and surrounding area.

### *8.4.3 Proposed Desk Based Assessment*

The desk-based assessment includes:

- Identification of watercourses, surface water catchments and springs;
- Identification of underlying hydrogeology and connectivity to the Proposed Development;
- Assessment of topography and slope to inform drainage patterns;
- Collation of data provided through consultation, including details on public and private water supply sources;
- Review of historical and recent ground investigation information, including geological logs, groundwater level monitoring, hydrogeological testing and any interpretative reporting;
- Assessment of flood risk data and mapping; and
- Assessment of potential for the presence of GWDTEs.
- The following sources of information will be used to inform the desk-based assessment:
- The Ordnance Survey (OS) 1:50,000 (Digital);
- OS 1:25,000 Map (Digital);
- National River Flow Archive (NRFA)[55];
- Flood Map for Planning[56]
- Meteorological Office Rainfall Data[57];
- Environment Agency Catchment Data Explorer[58];
- DEFRA Magic Map 2021[59];
- Available factual and interpretative reporting on ground conditions at the site; and
- British Geological Survey (BGS) GeoIndex onshore geology viewer[60].

[53] UK Government (2021) Discharges to surface water and groundwater: environmental permits [online] Available at: Discharges to surface water and groundwater: environmental permits - GOV.UK (www.gov.uk) (Accessed 09/09/2021)
[54] UK Government (2021) Apply for a water abstraction or impoundment license [online] Available at: Apply for a water abstraction or impounding licence - GOV.UK (www.gov.uk) (Accessed 09/09/2021)
[55] Centre for Ecology and Hydrology (undated) National River Flow Archive [Online] Available at: http://nrfa.ceh.ac.uk/ (Accessed 07/09/2021)
[56] UK Government(2021) Flood Map for Planning [Online] Available at: https://flood-map-for-planning.service.gov.uk/ (Accessed 06/09/2021)
[57] Met Office (undated) Climate Data [Online] Available at: http://www.metoffice.gov.uk/public/weather/climate (Accessed 07/09/2021)
[58] Environment Agency (2021) Catchment Data Explorer [Online] Available at: https://environment.data.gov.uk/catchment-planning/ (Accessed 06/09/2021)
[59] DEFRA (2021) Magic Map [Online] Available at: https://magic.defra.gov.uk/ (Accessed 06/09/2021)
[60] BGS (undated) GeoIndex Onshore [Online] Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html (Accessed 06/09/2021)

For the purposes of the contaminated land assessment, a standalone desk based study (Preliminary Land Quality Assessment) will be carried out to inform any land quality assessment.

### *8.4.4 Proposed Surveys/Site Visits*

A site walkover was undertaken on the 21st July 2021 and covered features both onsite within the Core Study Area and hydrologically connected features in the surrounding area. Onsite any existing infrastructure and artificial drains were noted, including the topography and drainage of the Site. The walkover also included the River Idle and its tributaries and the several surface water features to the east and west of the Site, including Belmore Lake.

### *8.4.5 EIA Methodology*

Consultation, desk studies and data requests will be continued to inform the baseline for the assessment. The site walkover will focus on the key receptors identified through the desk study, such as surface water receptors, groundwater, private and public water supplies, and designated receptors.

Arcus will obtain hydrology and geology data, including the following aspects:

- Review of published data and maps;
- Consultation with the Environment Agency (EA), Anglian Water, Severn Trent Water and Bassetlaw District Council;
- Identification of solid and surface geologies, including review of available reports on ground conditions at the site;
- Identification of surface water features, catchments and hydrological receptors;
- Preparation of a catchment plan;
- Identification of data on public and private abstractions and supplies;
- Identification of other similar developments within 10 km; and
- Collation of flood plain information, water quality data and groundwater vulnerability information.
- Arcus will provide a chapter within the ES assessing potential effects on hydrology and hydrogeology resources. The assessment and chapter will describe the potential effects of the Proposed Development including:
- Details of consultation undertaken;
- Assessment methodologies for construction and decommissioning phases;
- Hydrological/hydrogeological walkover survey to visually appraise the hydrological regime;
- Assessment of the construction, operational and decommissioning phases of the project to establish the effect on the hydrological and hydrogeological resource;
- Identify mitigation measures, where necessary;
- Identify any residual effects following mitigation;
- Cumulative assessment with other developments within 10 km of the Site Boundary;
- Production of a succinct flood risk assessment section within the impact assessment to meet the requirements of PPS 15: Planning and Flood Risk; and
- Statement of significance in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017[61].

Arcus will also produce a Water Construction Environmental Management Plan (WCEMP) to be included as part of the embedded development design. The WCEMP will comprise methods of work which are established and effective measures that the Developer will be committed to throughout the Proposed Development consent. Accordingly, the assessment of significance of effects of the Proposed Development will be considered with the inclusion

[61] Town and Country Planning (Environmental Impact Assessment) Regulations 2017 [Online] Available at: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk) (Accessed 06/04/2022)

of the WCEMP. Mitigation measures in order to protect the water environment will be outlined in the WCEMP.

Felling is anticipated and should any be required, felling of Forestry will be assessed in terms of increased surface water run-off, in accordance with the Forestry Commission UK Forestry Standard'[62].

SuDS and drainage discharges will be applied for through an application to Nottinghamshire County Council and Bassetlaw District Council following consultation.

Should any Private Water Supplies be identified within the PWS 2km Study Area a standalone Private Water Supplies Risk Assessment will be produced to append the ES chapter. The assessment will be based on a source-pathway-receptor methodology, which identifies the receptor (i.e., the property) and its private water supply location, the source of water feeding the private water supply and the pathways in which water travels to the private water supply location.

### *8.4.6 Contaminated Land Assessment Methodology*

It has been determined that a Soils, Geology and Land Contamination chapter is required as part of the Environmental Statement which will be completed by SLR Consulting. In support of this a Preliminary Land Quality Assessment (PLQRA) will be undertaken, which will assess if there is any significant subsurface contamination on or adjacent to the Site.

The desk-based assessment will include:

- Consultation with the Council Land Contamination Officer and review of any land quality information;
- Review of an Environmental Search Report;
- Review of a Coal Authority Report;
- Review of historical maps to determine previous land uses;
- Review of geological, hydrogeological, topographical and groundwater vulnerability online mapping;
- Identification of presence of environmentally designated sites;
- Review of the permit status of the Site; and
- Identification of anecdotal information detailing the history of the Site.

The PLQRA will also include a walkover survey which aims to identify topographic, vegetation and surface water features. It will include identification of Site and surrounding land uses and an inspection of any buildings or drainage features present.

Following this, SLR will develop a Conceptual Site Model (CSM) to identify potential contamination sources, receptors or pathways. The CSM will be used to undertake a PLQR to assess the significance of contamination. The PLQRA will be amended to the Soils, Geology and Land Contamination chapter. This chapter will assess potential effects of the Development during its phases in relation to contamination.

### *8.4.7 Significance Criteria*

The significance of the potential effects of the Proposed Development has been classified by professional consideration of the sensitivity of the receptor and the magnitude of the potential effect.

The sensitivity of the baseline conditions, including the importance of environmental features on or near to the Site or the sensitivity of potentially affected receptors, will be

[62] Forestry Commission (2017) The UK Forestry Standard [Online] Available at: The UK Forestry Standard (publishing.service.gov.uk) (06/04/2022)

assessed in line with best practice guidance, legislation, statutory designations and / or professional judgement.

The magnitude of potential effects will be identified through consideration of the Proposed Development, the degree of change to baseline conditions predicted as a result of the Proposed Development, the duration and reversibility of an effect and professional judgement, best practice guidance and legislation.

The sensitivity of the asset and the magnitude of the predicted effects will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects. Table 8.3 summarises guideline criteria for assessing the significance of effects

***Table 8.3: Framework for Assessment of the Significance of Effects***

| **Magnitude of Effect** | **Sensitivity of Resource or Receptor** | | | | |
|---|---|---|---|---|---|
| | **Very High** | **High** | **Medium** | **Low** | **Negligible** |
| High | Major | Major | Moderate | Moderate | Minor |
| Medium | Major | Moderate | Moderate | Minor | Negligible |
| Low | Moderate | Moderate | Minor | Negligible | Negligible |
| Negligible | Minor | Minor | Negligible | Negligible | Negligible |

Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations, and are shaded in light grey in the above table.

### *8.4.8 Flood Risk Assessment Methodology*

The classification of receptors in the context of flood risk relates to the land use vulnerability classification within the National Planning Policy Framework (NPPF) and land uses potentially affected by the Proposed Development. Potential receptors relative to the FRA will therefore be assessed as future occupiers or users of the Proposed Development and occupiers or users of surrounding land which could be affected by the changes to flood risk vulnerability associated with the Proposed Development. As such the vulnerability of the receptors is to be defined independently of the source of flood risk.

The NPPF considers the vulnerability of different land uses as a result of the potential impacts of flooding at given development type. Both the flood risk from and to the Proposed Development will be considered.

The FRA will address the effect of the Proposed Development on flood risk for the following sources:

- Fluvial;
- Pluvial;
- Tidal;
- Groundwater; and
- Reservoirs.

## 8.5 Assessment of Cumulative Effects

A cumulative effect is considered to be an additional effect on hydrological resources (within the same hydrological catchment) arising from the Proposed Development in addition to the combination of other developments likely to affect the hydrological environment.

At distances greater than 10 km, it is considered that schemes are unlikely to contribute to a cumulative hydrological effect due to attenuation and dilution over distance of potentially polluting chemicals. Therefore, for the purposes of the assessment of potential cumulative

effects on the immediate catchment and hydrological regime, only proposed developments, which require large scale construction / excavation, within approximately 10 km of the Proposed Development have been considered.

## 8.6 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Are consultees content with the proposed methodology and scope of the hydrology and hydrogeology assessment?
- Does the Council, Environment Agency or other consultees have any information that would be useful in the preparation of the hydrology and hydrogeology assessment?

# 9 CULTURAL HERITAGE AND ARCHAEOLOGY

## 9.1 Introduction

The cultural heritage and archaeology chapter of the ES will assess the likely effect of the Proposed Development upon the historic environment and heritage assets within and surrounding the Proposed Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is readily available.

The cultural heritage and archaeology assessment in the ES will consider direct, indirect and cumulative effects upon the following receptors:

- Designated heritage assets - World Heritage Sites, Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, Registered Battlefields and Conservation Areas.
- Non-designated assets - monuments, archaeological sites, buildings, places and landscapes which do not meet the criteria for a designated asset but require consideration under planning policy due to their heritage significance.

## 9.2 Preliminary Baseline Conditions

There are no designated heritage assets within the Proposed Development site.

A preliminary review of designated heritage assets within 1 km of the Proposed Development has identified the potential sensitive receptors as detailed in Table 9.1.

***Table 9.1: Designated Heritage Assets within 1 km.***

| Designation | Grade | NHLE | Asset Name |
|---|---|---|---|
| Listed Building | II | 1239185 | Alpha House and outbuilding |
| Listed Building | II | 1239186 | The Hall |
| Listed Building | II | 1239187 | Yew Tree Farmhouse |
| Listed Building | I | 1239776 | Church of St Bartholomew |
| Listed Building | II | 1239883 | Gate piers and gates to Sutton Manor Grounds |
| Listed Building | II | 1421770 | Lound war memorial |
| Conservation Area | N/A | N/A | Lound |

In addition, c. 1.1 km to the south of the Proposed Development lies the Grade II Registered Park and Garden of Babworth Hall (NHLE 1001078). Due to the proximity of the Development to this asset the Park and Garden will be included within the assessment.

Non-designated heritage assets will be reviewed as part of the EIA.

## 9.3 Likely Environmental Effects

The following impacts are those likely to occur as a result of the Proposed Development.

Direct effects: principally physical impacts, such as the partial or total loss of a heritage asset (both designated and non-designated). These effects are permanent and irreversible, and are most likely to occur during the construction phase of the Proposed Development.

Indirect effects: principally impacts to setting, significance, character and appreciation of a heritage asset. These effects can include the fragmentation of the historic landscape,

interruption or loss of key designed views, loss of screening and changes in noise and air quality.

## 9.4 Assessment Methodology

### *9.4.1 Relevant Heritage Legislation, Policy and Guidance*

The assessment will be conducted with reference to the relevant statutory and planning frameworks for cultural heritage. In addition to those mentioned in the Planning and Policy Section, the following legislation is pertinent to heritage:

#### *9.4.1.1 Legislation*

- Ancient Monuments and Archaeological Areas Act (1979)[63]
- National Heritage Act 1983[64]
- Planning (Listed Buildings and Conservation Areas) Act 1990[65]
- Hedgerow Regulations 2002 (As Amended)[66]

#### *9.4.1.2 Policy*

- National Planning Policy Framework (NPPF) 2021[67]
- Nottinghamshire Minerals Local Plan, adopted March 2021[68].
- Consideration of the forthcoming Bassetlaw Local Plan 2020-2037, may also be required following consultation.

#### *9.4.1.3 Guidance:*

It is proposed that any assessment be undertaken with consideration to current best practice and in line with, but not limited to, the following:

- Chartered Institute for Archaeologists (CIfA) (2020) Standard and Guidance for Desk-based Assessment[69];
- Chartered Institute for Archaeologists (CIfA) (2020) Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment[70];
- English Heritage (2008) Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment[71];

[63] Ancient Monuments and Archaeological Areas Act (1979) [Online] Ancient Monuments and Archaeological Areas Act 1979 (legislation.gov.uk) (Accessed 20/09/2021)
[64] National Heritage Act (1983) [Online] National Heritage Act 1983 (legislation.gov.uk) (Accessed 20/09/2021)
[65] Planning (Listed Buildings and Conservation Areas) Act 1990 [Online] Planning (Listed Buildings and Conservation Areas) Act 1990 (legislation.gov.uk) (Accessed 20/09/2021)
[66] Nottinghamshire Minerals Local Plan [Online] Adopted Minerals Local Plan | Nottinghamshire County Council (Accessed 20/09/2021)
[67] National Planning Policy Framework [Online] National Planning Policy Framework (publishing.service.gov.uk) (Accessed 20/09/2021)
[68] Nottinghamshire Minerals Local Plan [Online] Adopted Minerals Local Plan | Nottinghamshire County Council (Accessed 20/09/2021)
[69] CIfA (2020) Standard and Guidance for Desk-based Assessment [Online] CIfAS&GDBA_4.pdf (archaeologists.net) (Accessed 20/09/2021)
[70] CIfA (2020) Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment [Online] CIfAS&GCommissioning_2.pdf (archaeologists.net) (Accessed 20/09/2021)
[71] English Heritage (2008) Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment [Online] Conservation Principles, Policies and Guidance (historicengland.org.uk) (Accessed 20/09/2021)

- Historic England (2015) Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment[72];
- Historic England (revised 2017) Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets[73];
- Historic England (2016) Preserving Archaeological Remains Decision-taking for Sites under Development[74]; and
- NPPF DCLG Planning Practice Guidance: Conserving and Enhancing the Historic Environment (2014: updated 2019)[75].

### *9.4.2 Desk-Based Assessment and Proposed Surveys/Site Visits*

A Desk-Based Assessment (DBA) of cultural heritage records will be compiled to establish the baseline against which the direct impact assessment will be carried out. Supported by consultation with statutory and non-statutory authorities the assessment will include a comprehensive desk-based review of data gathered from the following sources:

- National Heritage List for England (NHLE);
- Local authority Historic Environment Records (HER);
- Portable Antiquities Scheme (PAS);
- Archaeological Data Service (ADS) for heritage data including grey literature reports archaeological journals, and the Excavation Index for England;
- Conservation Area Character Appraisals;
- Regional and national research framework assessments and strategies;
- Published and grey literature archaeological journals and monographs;
- Cartographic sources, including Ordnance Survey Map; and
- Aerial and satellite photographic sources.

A study area of 1 km radius from the Site will be used to collect data to inform on the archaeological potential of the Site, and inform the baseline assessment at EIA.

The DBA will be augmented by a walkover survey in order to:

- Assess and validate documentary data collected;
- Identify the extent and condition of any visible archaeological remains; and
- Determine whether previously unrecorded historic features are visible.

Photographs of key heritage assets, and viewpoints, taken during this survey will be incorporated into the desk-based assessment.

### *9.4.3 EIA Methodology*

Annex 2 of the NPPF defines cultural heritage significance as 'the value of a heritage asset to this and future generations because of its heritage interest'. The NPPF identifies that 'heritage interest' may be archaeological, architectural, artistic or historic. The NPPF also identifies that heritage significance can be derived from the asset itself, and that setting can contribute to an asset's heritage significance.

[72] Historic England (2015) Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment [Online] Managing Significance in Decision-Taking in the Historic Environment (historicengland.org.uk) (Accessed 20/09/2021)

[73] Historic England (revised 2017) Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets [Online] The Setting of Heritage Assets (historicengland.org.uk) (Accessed 20/09/2021)

[74] Historic England (2016) Preserving Archaeological Remains Decision-taking for Sites under Development [Online] https://historicengland.org.uk/images-books/publications/preserving-archaeological-remains/heag100a-preserving-archaeological-remains/ (Accessed 20/09/2021)

[75] NPPF DCLG Planning Practice Guidance: Conserving and Enhancing the Historic Environment (2014: updated 2019) [Online] Historic environment - GOV.UK (www.gov.uk) (Accessed 20/09/2021)

By understanding the significance of a heritage asset and which features, fabric or setting contribute to or detract from its significance, it is possible to identify the effect

The Archaeological Desk-Based Assessment (DBA) would establish the baseline conditions, and be supported and a validated by a site visit and walkover survey. These surveys will also seek to establish archaeological potential and to validate the baseline conditions and to assist in the assessment of indirect effects. Given the known historical quarrying activity across much of the Site, and the resultant loss of archaeological interest, the archaeological assessment will be proportionate and much of the Site is likely to be de-scoped.

In addition, the Environmental Statement will seek to:

- Assess the potential effects of the Proposed Development upon the baseline conditions;
- Characterise and inform the setting assessment of those heritage receptors identified as susceptible to change.
- Provide an assessment of the significance of the effects taking into account the sensitivity of the Proposed Development (and selected features beyond), the magnitude of potential effects (both direct and indirect) and the likelihood of such effects occurring; and
- Identify the means to mitigate and where possible avoid, any potential effects occurring, as well as the assessment of the residual effects which may exist after mitigation.

The archaeology and cultural heritage assessment will include proposals for mitigation of any identified impacts where necessary.

#### *9.4.3.1 Direct Effects*

Known archaeology, as identified during the desk-based assessment will be avoided during site design, where possible. The assessment of physical effects will consider direct effects where sites or potential sites / buried archaeology are in danger of being disturbed or destroyed during the construction phase of the Proposed Development.

An assessment will be made of the potential indirect effects upon heritage assets and their setting including historic landscapes.

The assessment will proceed from a consideration of the 'sensitivity' of a cultural heritage feature against the 'magnitude' of any potential change, to arrive at the 'significance' of the effect (see section 8.4.3.3).

#### *9.4.3.2 Indirect Effects*

The assessment of indirect effects considers changes in setting which have the potential to affect heritage assets. For the purposes of evaluating indirect effects upon the setting of heritage assets, designation status and proximity to the Proposed Development will determine whether further assessment is required. For the purposes of this document, designated heritage assets include World Heritage Sites, Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, Registered Battlefields and Conservation Areas.

All nationally designated heritage assets that are within the 1 km Study Area, will be assessed as part of the EIA. The final list of assets requiring assessment will be agreed during consultation.

To aid the assessment of indirect effects, reference will be made to the extent of the potential visual impact as determined through the LVIA. Specifically, several LVIA viewpoints will provide visual representations of effects upon heritage assets.

The assessment of indirect effects upon the setting of undesignated archaeology and cultural heritage assets is broadly based upon its designation status or lack thereof.

Undesignated sites are often of low sensitivity and therefore will not receive a significant indirect effect as defined by the EIA Regulations. As such, they can be scoped out of the EIA at this stage unless specific assets are requested during consultation.

*9.4.3.3 Significance Criteria*

The assessment will proceed from a consideration of the sensitivity of a cultural heritage feature against the magnitude of any potential effect, to arrive at the significance of the effect.

Sensitivity for the purposes of this assessment will be linked directly with designation status, or importance, as shown in Table 9.2. However, following the NPPF (paragraph 194.) consideration will be given to non-designated archaeological remains, including sites recorded in the Historic Environment Record, and the lack of formal designation does not automatically equate to low significance.

***Table 9.2 Sensitivity of Cultural Heritage Features***

| Level of Sensitivity | Designation Status |
|---|---|
| Very High | World Heritage Sites, which are internationally important. |
| High | Scheduled Monuments, Grade I & II* Listed Buildings, Registered Battlefields, Registered Historic Parks and Gardens, which are considered to be nationally important. |
| Medium | Grade II Listed Buildings, Conservation Areas, and regionally important archaeological features and areas (as defined in the Historic Environment Record). |
| Low | Sites and features noted as locally important in the Historic Environment Record. Other, non-designated features of heritage significance. |
| Negligible | Badly preserved / damaged or very common archaeological features / buildings of little or no value at local or other scale. |

Magnitude is a measure of the nature of the predicted effect. It has been broken down for direct and indirect effects, as shown in Table 9.3. For the purposes of visual assessment, the degree of visibility as well as proximity to the Proposed Development (within the Zone of Theoretical Visibility) will be taken as important attributes likely to cause a change in setting (and hence the contribution setting makes to an asset's significance).

***Table 9.3 Magnitude***

| Level of Magnitude | Definition |
|---|---|
| Very High | Complete loss of the asset, blocking or severance of key visual or other aspect of setting, resulting in the reduction in the contribution that the setting makes to the significance of the asset of such magnitude that the asset itself suffers a major loss of significance. |
| High | Major physical damage to or significant alteration to a site, building or other feature.<br>Extensive change (e.g., loss of dominance, intrusion on key view or sightline) to the setting of a Scheduled Monument, Listed Building or other feature registered as nationally important, which may lead to a major reduction in the contribution of that setting to the significance of the heritage asset itself leading to a loss of significance for the asset itself. |
| Medium | Damage or alteration to a site, building or other feature. Encroachment on an area considered to have a high archaeological potential.<br>Change in setting (e.g., intrusion on designed sight-lines and vistas) to monuments / buildings and other features, which may lead to a moderate |

| Level of Magnitude | Definition |
|---|---|
| | reduction in the contribution of that setting to the significance of the heritage asset leading to a loss of significance for the asset itself. |
| Low | Minor damage or alteration to a site, building or other feature. Encroachment on an area where it is considered that low archaeological potential exists.<br>Minor change in setting (e.g., above historic skylines or in designed vistas) of Monuments, Listed Buildings, sites and other features, which may lead to a small reduction in the contribution the setting makes to the significance of the heritage asset leading to a minor or negligible loss of significance. |
| Negligible | No physical effect.<br>Slight or no change in setting, with no or very limited change in the contribution that setting makes to the significance of the asset. No or negligible loss of significance of the asset itself. |

The significance of any potential effect can be arrived at by matching sensitivity against magnitude as shown in Table 9.4.

***Table 9.4 Significance of Predicted Effects***

| Magnitude | Sensitivity | | | | |
|---|---|---|---|---|---|
| | **Very High** | **High** | **Medium** | **Low** | **Negligible** |
| Very High | Major | Major | Major/ Moderate | Moderate/ Minor | Minor |
| High | Major | Major | Moderate | Minor | Negligible |
| Medium | Major/ Moderate | Moderate | Moderate/ Minor | Minor | Negligible |
| Low | Moderate/Minor | Minor | Minor | Negligible | Negligible |
| Negligible | Minor/ Negligible | Negligible | Negligible | Negligible | Negligible |

The assessments will begin with a brief description of the asset, its designation status, its significance (in terms of its archaeological, architectural, artistic and/or historic interest), and a description of its setting. Consideration will be given to what contribution that this setting makes to the significance of the asset itself.

The assessment will then consider, using professional judgement, the extent to which the identified setting is changed by the Proposed Development, and then proceed to consider whether the Proposed Development will impact on the attributes of setting which contribute to the significance of the cultural heritage asset it relates to. The effect thus finally assessed is whether any identified change in the contribution made by the setting to the significance of the asset is of such magnitude that the significance of the asset is itself changed (diminished).

Potential effects that are assessed as "minor" or "not significant" are both considered to be "not significant" in terms of the EIA Regulations.

As noted previously, the assessment will take an approach in which potential changes (direct or indirect) occasioned by the Proposed Development are considered in relation to their effect (if any) on the special interests in a heritage asset, and whether any effect on those interests change (reduce) the significance of the asset itself. In considering and effect

on setting, simple intervisibility with the Proposed Development is not necessarily considered to be harmful. Where considered appropriate (i.e. where there is a potential that the visual presence of the Proposed Development may change or affect an attribute, including visual setting, that contributes to an asset's significance), consideration will be given to the effect that Proposed Development will have on views towards the asset which include the Proposed Development ("in combination" views), as well as in views towards the Proposed Development from the asset (where such views are considered an important contributor to the significance of that asset).

Interviewing development and natural features such as woodland, can provide visual screening to the cultural heritage features and, where appropriate, this will be taken into account in the detailed assessments of specific features.

It should also be noted that the matrix-based approach will be used in conjunction with professional judgement.

## 9.5 Assessment of Cumulative Effects

An assessment will also be made of potential cumulative effects that may arise from the addition of the Proposed Development to a baseline including similar development types. For purposes of the assessment of cultural heritage cumulative effects, only mineral developments within 5 km of the Proposed Development will be considered.

# 10 NOISE AND VIBRATION

## 10.1 Introduction

The noise and vibration chapter of the ES will assess the likely impact of the Proposed Development upon noise sensitive receptors surrounding the Proposed Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

## 10.2 Preliminary Baseline Conditions

Whilst there are industrial activities being undertaken within close proximity to the Site near to the northern and southern extents near to Areas B and C that will be assessed as part of the baseline the prevailing baseline noise climate around the Site is expected tobe relatively quiet due to the remote location. Existing road traffic noise is expected to be negligible as there are no major link roads or motorways in the area. The closest main trunk road is the A1 which is located approximately 5 km west of the Site.

The closest dwellings to the Site are located at Bellmoor Farm, Sutton Grange Farm and the Wetlands fisheries. These properties are all approximately 100 m from the Site. The village of Lound is located approximately 500 m north of the main site and approximately 300 m west of the northern processing area which is accessed from Chainbridge Lane. The village of Sutton-Cum-Lound is located 400 m to the north west of the site. A place of worship; Church of St Bartholomew is located 900 m north in the village of Lound. The Church is a Grade 1 listed building. The nearest town is Retford which is approximately 1.5 km south of the site.

The identified NSRs are listed in Table 10.1, excluding ecological receptors. NSRs marked with an asterisk will be assessed for direct noise impacts. The remaining receptors only have the potential to be subject to indirect effects such as noise increases due to HGV traffic.

***Table 10.1 Receptor Summary***

| Site Name | Distance and Direction from Proposed Development | Description |
|---|---|---|
| Retford | 1.5 km South | Residential Dwellings |
| Church of St Bartholomew | 900 m North | Grade 1 listed building – Direct |
| Lound Village | 500 m North | Residential Dwellings |
| Sutton-Cum-Lound* | 400 m North West | Residential Dwellings |
| Sutton Grange Farm* | 100 m North | Residential Dwellings |
| Bellmoor Farm* | 100 m West | Residential Dwellings |
| Wetlands Fisheries* | 100 m North | Residential Dwellings |
| Bellmoor Cottage | 100 m West | Residential Dwellings |

| Site Name | Distance and Direction from Proposed Development | Description |
|---|---|---|
| Retford | 1.5 km South | Residential Dwellings |
| Church of St Bartholomew | 900 m North | Grade 1 listed building – Direct |
| Lound Village | 500 m North | Residential Dwellings |
| A.P.E.* | 20 m North | Educational / outdoor facility |
| Prime 8* | 20 m North | Educational / outdoor facility |
| Foot paths* | Various, include path bisecting the site | Effects on footpath users |

## 10.3 Likely Environmental Effects

The primary noise sources on site will be noise from plant and machinery associated with the extraction of the PFA. Therefore, the Proposed Development is not expected to generate any significant construction noise or vibration. With the above points taken into account, the assessment methodology will assess the impacts associated with operational extraction activities only.

The closest receptors are located at a distance from the development site where vibration would typically be imperceptible. Depending on the routing of operational traffic associated with the development, there is the potential for heavy vehicle movements causing increases in vibration at receptors close to the roads in question. However, where the existing road surfaces are maintained in good condition, groundborne vibration effects are unlikely. On this basis, assessment of operational vibration is not considered necessary.

The noise effects associated with the Proposed Development that will require detailed assessment are:

- Operational noise during PFA/mineral extraction at initial trial area;
- Operational noise during PFA/mineral extraction at main processing areas;
- Noise from HGV haulage movements and construction traffic on existing roads; and
- Noise impacts due to site restoration.

## 10.4 Assessment Methodology

The Noise and Vibration impact assessments will be carried out in accordance with all relevant national and local policy and guidance. Additional consideration will be given to any local guidance that relates to operational noise impacts in the context of the Proposed Development.

In outline, the noise and vibration chapter will seek to:

- Quantify prevailing baseline noise conditions around the Site by means of a noise measurement survey;
- Identify Noise Sensitive Receptors (NSRs);
- Calibrate a noise model of the site and surrounding area using measured ambient noise level data;
- Predict operational noise using specialist noise prediction software;

- Compare noise predictions against existing baseline noise levels and all relevant noise criteria;
- Assess initial and future noise impacts at NSRs;
- Determine the significance of effects without mitigation;
- Identify mitigation where required;
- Assess the significance of residual noise impacts.

If significant increases in traffic are anticipated on local roads due to the Proposed Development, a quantitative assessment of the changes in the traffic flow will be undertaken.

A noise assessment on Ecological receptors will also be undertaken due to the Proposed Development's close proximity to Sites of Special Scientific Interest (SSSI) within Bassetlaw District.

### *10.4.1 Relevant Legislation and Guidelines*

This Scoping Report sets out the planning policy context for the Proposed Development. The Noise and Vibration assessment will be carried out in accordance with the requirements set out in the following legislation and guidelines:

- National Planning Policy Framework 2019
- Noise Policy Statement for England;
- Planning Practice Guidance;
- The Guidance on the Planning for Mineral Extraction: Ministry of Housing, Communities & Local Government, October 2014;
- British Standard 4142: 2014+A.1:2019 Methods for rating and assessing industrial and commercial sound;
- British Standard 5228: 2009 + A1: 2014 Code of practice for noise and vibration control on construction and open sites;
- Calculation of Road Traffic Noise 1988;
- Design Manual for Roads and Bridges, 2019 and
- Institute of Environmental Management and Assessment Guidelines for Environmental Noise Impact Assessment, 2014.

Relevant Local planning policy documents are:

- Nottinghamshire Adopted Minerals Local Plan
- Bassetlaw District Council Adopted Core Strategy, December 2011

The Guidance on the Planning for Mineral Extraction: Ministry of Housing, Communities & Local Government, October 2014

*'Those making mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste, should carry out a noise impact assessment, which should identify all sources of noise and, for each source, take account of the noise emission, its characteristics, the proposed operating locations, procedures, schedules and duration of work for the life of the operation, and its likely impact on the surrounding neighbourhood.*

Proposals for the control or mitigation of noise emissions should:

- consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties and sensitive environmental sites;
- assess the existing acoustic environment around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;
- estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;
- identify proposals to minimise, mitigate or remove noise emissions at source;

- monitor the resulting noise to check compliance with any proposed or imposed conditions.

Mineral planning authorities should take account of the prevailing acoustic environment and in doing so consider whether or not noise from the proposed operations would:

- give rise to a significant adverse effect;
- give rise to an adverse effect; and
- enable a good standard of amenity to be achieved.

Nottinghamshire Adopted Minerals Local Plan

- Policy DM1: Protecting Local Amenity Paragraph 5.12, 5.16, 5.102

British Standard 4142: 2014+A.1:2019 Methods for rating and assessing industrial and commercial sound

BS 4142 describes methods for rating and assessing sound of an industrial and / or commercial nature. The methods described in the standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes, upon which sound is incident. The procedure contained in BS 4142 assesses the significance of sound, which depends upon the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs or will occur.

British Standard 5228: 2009 + A1: 2014 Code of practice for noise and vibration control on construction and open sites

BS 5228 Part 1: Noise; sets out methodologies for predicting noise levels from construction and related activities. Data on sound levels is provided for a wide variety of site activities and mobile equipment used on construction and open sites. BS 5228 provides two informative methods for assessing the significance of construction noise effects using noise change: 'The ABC Method' and 'The 5 dB(A) Change Method'.

Design Manual for Roads and Bridges, 2019

The Design Manual for Roads and Bridges (DMRB) provides methods for quantifying the noise and vibration impacts generated by changes in road traffic.

Institute of Environmental Management and Assessment Guidelines for Environmental Noise Impact Assessment, 2014

The IEMA Guidelines for Environmental Noise Impact Assessment address the key principles of noise impact assessment and are applicable where noise effects are likely to occur. The guidelines provide specific guidance for noise impact assessment as part of the EIA process.

### *10.4.2 Proposed Desk Based Assessment*

A desk based assessment will be undertaken to gather any relevant, pre-existing information relating to the Proposed Development site. Plant data and manufacturer's data will be reviewed in order to quantify operational noise sources. This information will then be used to inform the operational noise calculations and modelling.

### *10.4.3 Proposed Surveys/Site Visits*

A noise and vibration survey will be carried out to in order to obtain sufficient data to inform the Noise and Vibration chapter of the EIA.

Noise measurements are proposed to be undertaken at a total of 10 locations representative of the nearest NSRs. Unattended noise surveys for a minimum period of 24 hours will be carried out at three locations representative of the residential NSRSs to be

assessed for direct effects. If noise measurements cannot be undertaken at the NSRs listed in the table then proxy locations will be identified, and where possible, their suitability discussed with Nottinghamshire County Council. Additional short-term daytime noise measurements will also be carried out at seven locations in order to supplement the data set with regards to footpaths, ecological receptors etc. The noise surveys will obtain ambient (LAeq,T), background (LA90,T) and maximum (LAmax,F) sound levels.

There should be no requirement for further site visits after the baseline noise surveys have been completed.

***Table 10.2 Proposed Noise monitoring Locations***

| Location No. | Site Name | Receptor Description |
|---|---|---|
| 1 | Low farm/ Sutton Grange | Residential Dwellings |
| 2 | Wetlands Fisheries | Residential/Commercial |
| 3 | Bellmoor Farm | Residential Dwellings |
| 4 | Sutton-Cum-Lound south | Residential Dwellings |
| 5 | Footpath at south boundary | Ecological receptors |
| 6 | Houses next to A638 | Residential Dwellings |
| 7 | Footpath north of main processing area | Ecological receptors |
| 8 | Footpath within nature reserve | Ecological receptors |
| 9 | River Idle Footpath | Ecological receptors |
| 10 | East Lound | Residential Dwellings |

### *10.4.4Assessment of Construction Noise*

Any potential noise impacts during the lifetime of the Proposed Development are expected to arise from operational activities therefore there will be no assessment of construction noise.

### *10.4.5Assessment of Operational Noise*

The assessment of operational noise associated with PFA extraction will be based on noise predictions utilising the methodology set out in BS 5228-1. The significance of effects will be assessed against the noise limits recommended in the 'The Guidance on the Planning for Mineral Extraction' (the Government guidance).

The significance of increases in operational noise associated with traffic, and HGV movements in particular, will be assessed according to DMRB methodology.

### *10.4.6Assessment of Decommissioning Noise*

The effects of noise during decommissioning of the Proposed Development are likely to be similar to those during construction. However, both the magnitude and duration of such effects are likely to be less than those during construction. It is therefore proposed to scope out decommissioning noise.

### *10.4.7 Assessment of Restoration Noise*

Restoration activities are likely to be undertaken using similar plant and machinery as used during the operational phase of the Proposed Development. The assessment of restoration noise will be assessed in the same way for the PFA extraction.

### *10.4.8 Assessment of Cumulative Effects*

The assessment of cumulative effects will consider all nearby committed developments. In particular, noise from the nearby recently consented Tiln Solar Farm will be considered.

Due to the relatively quiet nature of the operational noise from solar farms it is expected that cumulative effects will not exacerbate noise impacts from the Proposed Development when considered cumulatively.

# 11 AIR QUALITY

## 11.1 Introduction

The air quality chapter of the ES will assess the likely impact of the Proposed Development upon sensitive receptors surrounding the Proposed Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

## 11.2 Preliminary Baseline Conditions

The closest dwellings to the Site are located at Bellmoor Farm, Sutton Grange Farm and the Wetlands fisheries. These properties are all approximately 100m from the Site. The village of Lound is located approximately 500m north of the site and Sutton-Cum-Lound is located 400m to the northwest. A place of worship; Church of St Bartholomew is located 900m north in the village of Lound. The Church is a Grade 1 listed building. The nearest town is Retford which is approximately 1.5km south of the site. Table 11.1 provides a summary of the potentially sensitive receptors near the site.

The 2019 DEFRA Background Mapping data for the site indicates a pollutant concentration of 8.75µg/m3 for NO2, 15.04µg/m3 for PM10 and 8.99µg/m3 for PM2.5.

It is expected that the prevailing baseline air quality pollutant concentrations around the Site will be relatively low due to the remote location. Pollution from existing road traffic is expected to be low as there are no major link roads or motorways in the area. The closest main road is the A1 which is located approximately 5km west of the Site.

***Table 11.1 Receptor Summary***

| Site Name | Distance and Direction from Proposed Development | Description |
|---|---|---|
| Retford | 1.5km South | Residential Dwellings |
| Church of St Bartholomew | 900m North | Grade 1 listed building – Direct |
| Lound Village | 500m North | Residential Dwellings |
| Sutton-Cum-Lound | 400m Northwest | Residential Dwellings |
| Sutton Grange Farm | 100m North | Residential Dwellings |
| Bellmoor Farm | 100m West | Residential Dwellings |
| Wetlands Fisheries | 100m North | Residential Dwellings |
| Bellmoor Cottage | 100m West | Residential Dwellings |
| A.P.E. | 20m North | Educational / outdoor facility |
| Prime 8 | 20m North | Educational / outdoor facility |
| Foot paths | Various, include path bisecting the site | Effects on footpath users |

| Site Name | Distance and Direction from Proposed Development | Description |
|---|---|---|
| Retford | 1.5km South | Residential Dwellings |
| Church of St Bartholomew | 900m North | Grade 1 listed building – Direct |
| Lound Village | 500m North | Residential Dwellings |
| Sutton and Lound Gravel Pits SSSI | Immediately east | Effects on ecology |

## 11.3 Likely Environmental Effects

The primary air quality emissions and dust sources on site will be from plant on site, extraction of the PFA and vehicles moving the PFA from the site.

## 11.4 Assessment Methodology

In the UK, DEFRA provides guidance on the most appropriate methods to estimate pollutant concentrations for use in Local Air Quality Management (LAQM). DEFRA regularly updates its Technical Guidance, with the latest LAQM Technical Guidance (TG16) published in April 2016. The methodology in LAQM.TG16. directs air quality professionals to a number of tools published by DEFRA to predict and manage air quality. For example, it is necessary to use the updated NOx to NO2 calculator to derive NO2 concentrations from the NOx outputs from Breeze Roads modelling.

In order to determine the extent to which air quality issues will affect the development of the site, the study will consider the following:

- Any air quality measurements carried out in the area near the Proposed Development; and
- The most recent Air Quality Review and Assessment Reports from the Local Authority.

Breeze Roads Modelling of Pollutant Concentrations from HGV Movements

Dispersion modelling will be undertaken using Breeze Roads to determine air quality concentrations at sensitive receptors near the site. Breeze Roads is an air dispersion modelling software suite that predicts air quality impacts of carbon monoxide (CO), nitrogen dioxide, particulate matter (PM), and other inert pollutant concentrations from moving and idling motor vehicles at or alongside roadways and roadway intersections.

Breeze Roads can be used in conjunction with the MOBILE5, EMFAC emission models or other emissions data, to demonstrate compliance with the UK's National Air Quality Strategy. Breeze Roads predicts air pollutant concentrations near highways and arterial streets due to emissions from motor vehicles operating under free-flow conditions and idling vehicles. In addition, 1-hour and running 8-hour averages of CO or 24-hour and annual block averages of PM10 can be calculated.

Model Set-up Parameters

The most recent Emissions Factor Toolkit (EFT, version 11.0, November 2021) issued by DEFRA was used to derive emissions rates (in grams per kilometre) for vehicle movements along roads incorporated into the model.

Briefly, the changes between v10.1 and 11.0 are as follows:

- EFT 11.0 allows users to define Input Years up to 2050.
  2031 - 2050 outputs are limited to England (not London) only.

Emissions outputs for the years 2031-2050 are provided in support of climate assessments and appraisals only. Where emissions are to be used after 2030 to inform air quality assessments, the appropriate caveats around the limitations of the analysis must be included to accompany the assessment.
- Updated fleet splits for England (not London) to extend the fleet data for Motorway, Urban and Rural Road types out to 2050;
- Engine efficiency adjustment factors have been provided by DfT/NH and applied to exhaust CO2 emission outputs up to 2050; and
- Engine efficiency adjustment factors have been provided by DfT/NH and applied to exhaust CO2 emission outputs up to 2050; and
- When CO2 pollutant output is selected, an additional output is now provided. The 'Output CO2 Summary' sheet provides a summary of direct CO2 emissions from tailpipe and indirect CO2e emissions associated with the charging of the batteries of electric and plug-in hybrid cars and LGVs, in tonnes/annum. N.B. link length is now a mandatory input requirement when outputting CO2 emissions.

It is noted that the default fleet projections in EFT v11.0 are based on fleet growth assumptions which were current before the Covid-19 outbreak in the UK. In consequence, default fleet outputs from the tool do not reflect short- or longer-term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns.

Dust from Operation

During the operation phase, there will be a number of activities undertaken that have the potential to generate and/or re-suspend dust and PM10/PM2.5. In order to evaluate the magnitude and extent of potential adverse impacts likely to result from the Proposed Development, it has been assumed that the following activities could be responsible for the emission of dust:

- Handling, storing, stockpiling and disposing of materials, including potential spillages;
- Ground disturbance and exhaust emissions associated with the operation of site plant;
- Laying of hard surfaces and landscaping;
- Site clearance and preparation; and
- Construction and fabrication processes.

The magnitude of the potential impacts of a mineral extraction site on air quality is mainly determined by its size, the range of activities undertaken across the site, the proximity of the site to sensitive receptors, the prevailing wind direction, the complexity of terrain and any barriers between the sources and receptors. A qualitative assessment of the potential impacts during operation will be undertaken using information in guidance documents produced by the Building Research Establishment[76] and the guidance produced by the Institute of Air Quality Management[77].

### *11.4.1 Relevant Legislation and Guidelines*

- The European Parliament and the Council of the European Union (2008) Directive 2008/50/EC of the European Parliament and of the Council
- The Air Quality Standards Regulations 2010
- Part IV of the Environment Act 1995
- Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007) DEFRA
- National Planning Policy Framework Air Quality - Air Quality available online at https://www.gov.uk/guidance/air-quality--3
- DEFRA, 2018, Local Air Quality Management Technical Guidance (TG16)

[76] BRE, 2003. Control of Dust from Construction and Demolition Activities

[77] IAQM. 2016. Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1.

- The Guidance on the Planning for Mineral Extraction: Ministry of Housing, Communities & Local Government, October 2014;
- Town and Country Planning (Environmental Impact Assessment) Regulations 2017 SI 2017/571, as amended by SI 2018/695 and SI 2020/505
- Institute of Air Quality Management (2017) v 1.1 Land-Use Planning & Development Control: Planning for Air Quality
- Institute of Air Quality Management (2014), Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management (V1.1)
- Institute of Air Quality Management (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1

Relevant Local planning policy documents are:

- Nottinghamshire Adopted Minerals Local Plan
- Bassetlaw District Council Adopted Core Strategy, December 2011

## 11.5 Proposed Desk Based Assessment

A desk-based assessment will be undertaken to gather any relevant, pre-existing information relating to the Proposed Development site and its immediate environs. This information will then be used to inform the assessment.

Any potential air quality and dust impacts during the lifetime of the Proposed Development are primarily expected to arise from operational activities. Therefore, there will be no air quality assessment of construction.

### *11.5.1 Air Quality Assessment for Assessment*

The assessment of air quality and dust associated with PFA extraction will be based on the methodology set out in section 11.4 of this document.

The significance of effects will be assessed against the National Air Quality Objectives set out in Institute of Air Quality Management (2014), Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management (V1.1), IAQM. Guidance on the Assessment of Mineral Dust Impacts for Planning 2016 v1.1 and Institute of Air Quality Management (2017) v 1.1 Land-Use Planning & Development Control: Planning for Air Quality.

## 11.6 Assessment of Cumulative Effects

The assessment of cumulative effects will consider all nearby committed developments. In particular, vehicle movements from the nearby recently consented Tiln Solar Farm will be considered.

# 12 TRAFFIC AND TRANSPORTATION

## 12.1 Introduction

The Traffic and Transportation chapter of the ES will consider the effects of vehicle movements to and from the Site associated with construction, operation and decommissioning phases of the Proposed Development. Vehicle movements to the Site will likely consist of heavy goods vehicles (HGVs), light goods vehicles (LGVs) and cars, except for, potentially, a small number of large items of processing plant which will be classified as Abnormal Indivisible Load (AILs) during the construction phase. All AIL's will be delivered to the Site under escort in accordance with permits issued by the Local Roads Authority.

This section of the Report defines the proposed methodology and approach to undertaken for the traffic and transport assessment that will be included within the ES.

This EIA will identify potential effects from increased road traffic arising from the construction, operation and decommissioning of the Proposed Development. The significance of these effects will be assessed against recognised guidelines. Where required, appropriate mitigation measures will be proposed to reduce these effects.

## 12.2 Study Area

The Study Area has been defined by the public road network in the vicinity of the Proposed Development and potential delivery corridors to be used during construction. These take into account the local and strategic road network, sources of labour and the potential sources of construction materials, specifically stone and concrete from local quarries. The A683, A614 and Daneshill Road are all anticipated to be included in the study area.

Vehicular access to the southern main processing areawill likely be from the existing purpose-built industrial access onto the A638, which previously served Bellmore Quarry. This existing access junction is already well formed, with a right turn ghost island facility and has adequate visibility splays in either direction and therefore no upgrade is required.

Access to the Temporary Optimisation Site will be via an existing junction onto Lound Low Road and is considered suitable to accommodate the quantum of traffic anticipated.

At this stage of the planning process, a Principal Contractor for the Site has not been identified, and information relating to the origins of general construction traffic trips is not available. As such, it has been necessary to make assumptions relating to the routing of construction traffic. It is assumed that the majority of vehicles will approach the Site from the north via the A638 and listed below:

- Traffic is assumed to exit the A1(M) Junction 34 (Blyth Interchange) onto the A614 northbound;
- Continue on the A614 northbound and at its junction with the A638, turn right onto the A638 southbound;
- Continue on the A638 southbound for approximately 11 km towards the Site access junction; and
- Turn left into the Site.

All construction vehicles departing the Site are expected to use the same route as on approach.

With regards to operational traffic, the distribution of traffic is not static and indeed depends on the market being served at the time of operation, however it is anticipated the market being served will be the whole of the UK and therefore would likely mirror the use of the construction route.

For access to the Temporary Optimisation Site, the very small number of construction vehicles and operational traffic will access the processing area from the A638 via Daneshill Road, Chainbridge Lane and Lound Low Road.

## 12.3 Assessment Methodology

#### *12.3.1.1 Legislation, Policy and Guidance*

The assessment will follow guidance contained in the following planning policy documents:

'Guidelines for the Environmental Impact of Road Traffic[78] ("The IEMA Guidelines", 1993)

Methodology for Assessing Traffic and Transport

The assessment methodology will be based on 'the IEMA Guidelines'. A screening process, using two broad rules from these guidelines, will be employed to identify roads on which potential significant effects may occur. These are:

- Roads where traffic is predicted to increase by more than 30% as a result of the Proposed Development, or where the number of HGVs is predicted to increase by more than 30% must be assessed; and
- Roads in specifically sensitive areas where overall traffic flow or HGVs are predicted to increase by more than 10% must be assessed.

Where the predicted increase is lower than the threshold, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessment is not warranted.

It is worth noting that on roads where existing traffic levels are generally low (e.g., rural roads and some unclassified roads), any increase in traffic flow may result in a predicted increase that would be higher than the guideline thresholds. In these situations, it is important to consider any increase in terms of overall traffic flow in relation to the capacity of the road before making a conclusion in EIA terms.

Any change in traffic flow which is greater than the thresholds set out in the guidelines would be subject to further analysis to establish if the increased traffic flow is within the capacity of the road. In instances where traffic flow is higher than the IEMA (1993) guideline thresholds but within the capacity limits of the road and the potential magnitude on receptors is minor or negligible, this increase would generally be considered to be not significant. It is acknowledged that capacities can be reduced by local conditions that cannot be accounted for within the relevant guidance such as temporary road works or road failure.

In addition to the aforementioned guidance, the Traffic and Transport Chapter will take into account the following statutory guidance documents:

- National Planning Policy Framework (NPPF) 2021[79]
- Guidance on Transport Assessment (Department for Transport, 2007)[80].

It is not proposed to submit a formal Transport Assessment (TA) to accompany the planning application for the Proposed Development, as TAs principally relate to developments that generate a significant permanent increase in traffic as a direct

[78] Institute of Environmental Assessment (1993) Guidelines for the Environmental Assessment of Road Traffic. Available at: GN 1 Guidelines for the environmental assessment of road traffic, Institute of Environmental Assessment - Publication Index | NBS (thenbs.com) [Accessed 06/09/2021].

[79] National Planning Policy Framework (2021) [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf [Accessed 06/09/2021].

[80] Guidance on Transport Assessment (2007). Available at: aah-cruising (nottinghamshire.gov.uk) Accessed [06/09/2021].

consequence of function (e.g., retail parks). Traffic associated with the Proposed Development is below the required threshold for a formal TA. Nevertheless, a capacity assessment will be undertaken for the access junction to demonstrate that it will operate well within capacity and accommodate the development proposals.

#### *12.3.1.2 Sensitivity of Receptor*

The sensitivity of receptors will be determined based on the value of the affected resource and the extent of the area that might be affected by the Proposed Development. The receptor sensitivity is summarised as follows:

- High sensitivity refers to receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, retirement homes, residential roads without pedestrian or cyclist facilities, and accident black spots;
- Medium sensitivity refers to traffic flow sensitive receptors: congested junctions, community centres, parks, businesses with roadside frontage, recreation facilities;
- Low sensitivity refers to receptors with some sensitivity to traffic flows: public open spaces, nature conservation areas, listed buildings, tourist attractions, and residential roads with adequate footway provision, places of worship; and
- Negligible sensitivity refers to receptors with very low sensitivity to traffic flows; receptors that are sufficiently distant from the affected roads and junctions.

#### *12.3.1.3 Magnitude of Change*

The magnitude of change related to the increase in traffic is a function of the existing traffic volumes on the surrounding highway network, the percentage increase associated with the Proposed Development and the changes in the type of traffic.

This approach is intended for the assessment of environmental effects of road traffic associated with major new developments giving rise to traffic generation, as opposed to short-term construction. In the absence of alternative guidance and, as the traffic generation during the operational phase is very low, these guidelines will be applied to assess the short-term construction phase of the Proposed Development.

Table 12.1 shows the criteria to be employed to determine the magnitude of change related to the increase in traffic. The absolute increase refers to the change in number of vehicles per hour while the percentage increase refers to the change in number of vehicles per hour expressed as a percentage of the base traffic flows.

***Table 12.1: Magnitude of the Change Thresholds***

| **Percentage increase (%) (Vehicles per hour of base traffic flows)** | **Absolute increase (Vehicles per hour)** | | | |
|---|---|---|---|---|
| | < 30 | 30 - 60 | 60 - 90 | > 90 |
| < 5 | Negligible | Negligible | Negligible | Negligible |
| 5 – 10 | Negligible | Low | Low | Low |
| 10 – 20 | Low | Low | Medium | Medium |
| 20 – 30 | Medium | Medium | High | High |
| > 30 | High | High | High | High |

#### *12.3.1.4 Significance of Effect*

The significance of effect will be determined by considering both the sensitivity of the receptors and magnitude of change as shown in Table 12.2. The receptors will be identified as the physical resource or user group that would potentially be affected by the Proposed Development, e.g., human being(s) and the transport network.

***Table 12.2: Framework for Assessment of the Significance of Effects***

| **Magnitude of Change** | **Sensitivity of Receptor** | | | | |
|---|---|---|---|---|---|
| | Very High | High | Medium | Low | Negligible |
| High | Major | Major | Moderate | Moderate | Minor |
| Medium | Major | Moderate | Moderate | Minor | Negligible |
| Low | Moderate | Moderate | Minor | Negligible | Negligible |
| Negligible | Minor | Minor | Negligible | Negligible | Negligible |

Where the predicted increase in traffic flows is lower than the thresholds, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessments are not warranted. Peak traffic flows will be identified to assess a worst-case scenario.

On routes where traffic is predicted to increase above the thresholds identified in the screening process further assessment may be warranted. This further assessment will consider the potential for receptors to receive impacts relating to the effects.

Cumulative Effects

In accordance with guidance, the assessment will consider the potential for any significant cumulative effects that may occur in combination with other consented, and/or in planning, traffic-generating developments that exist within the study area. Consultation will be undertaken with relevant authorities to establish where significant cumulative effects may occur, and with which developments.

## 12.4 Baseline Conditions

Baseline traffic flow conditions will be established from publicly available information such as from the DfT website and traffic counts which have already been undertaken, on the construction traffic route as detailed in Section 12.2. The baseline traffic flows will inform the analysis to determine the impact of the development proposals on the road network.

The latest available DfT data is for the year 2020, however due to significant uncertainty of travel patterns as a result of the Coronavirus Pandemic, we proposed to undertake traffic surveys later in the year to inform this assessment.

## 12.5 Potential Effects Assessment

Construction Phase

The construction aspects of the overall Proposed Development are limited because some of the required infrastructure already exists, due largely to the legacy of quarrying at the Site. This includes that there is an existing highway access and cleared areas of hardstanding at the processing sites. It is anticipated that construction activities to enable the extraction, processing, and export of PFA would require around 3-6 months.

During normal times during the construction phase, it is anticipated that there will be no more than around 10 two-way HGV movements per average day. There may be more when any concrete pouring is required.

The footprint for the northern trial processing area is anticipated to be minimal and negligible and below recognised thresholds of significance in terms of existing traffic flow levels on routes within the vicinity of the Development. The plant and equipment required at the trial processing site would be as follows:

- Single drying plant line (30,000 tonne capacity)
- Storage building;
- Silo;
- Welfare, office and laboratory portacabin.

The likely effects for traffic and transport associated with of the construction phase which will be assessed as part of the EIA is outlined below, although given the scale of the development, the impact of construction traffic is unlikely to have significant effects at nearby receptors.

- Traffic Generation;
- Hazardous Loads;
- Accidents and Safety;
- Driver Delay;
- Pedestrian Amenity;
- Severance;
- Air Quality; and
- Noise and Vibration.
- Operational Phase

The Proposed Development comprises the extraction and export of up to 300,000 tonnes per annum, with the requirement for approximately 25 on site staff in any 24-hour period.

The operating hours for extraction and HGV exports would be limited to the following:

- 07:00 and 19:00 Monday to Friday; and
- 07:00 to 13:00 Saturday, with no HGV movements on Sundays or Bank Holidays.

Vehicle movements during the operation of the Proposed Development will consist of the export of material from the Site primarily via 30 tonne powder tankers/tipper lorries. It is assumed the extraction and HGV exports would occur over a 271 day working year, so in terms of tonnage this equates to approximately 1107 tonnes extracted per working day. It is estimated that this would generate around 74 two-way HGV trips per day (37 in / 37 out), which equates to around 6-8 two-way trips per hour.

As part of the overall traffic management plan for the Proposed Development, it is anticipated that traffic associated will be limited to the off-peak periods in order to minimise the impact on existing road users.

Operational traffic is expected to be minimal and negligible in terms of existing (and peak) traffic flow levels on routes within the vicinity of the Proposed Development. Therefore, it is proposed that the assessment of operational traffic be scoped out of the EIA assessment. It is not proposed to submit a formal Transport Assessment (TA) to accompany the planning application for the Proposed Development nor undertake detailed junction assessment of the main junctions with the study area as it is unlikely that the operational traffic, would exceed 30 two-way PCUs in the peak hours. However, the traffic impact of the development will be considered in a Transport Statement if trips are to remain below the 30 PCU two-way threshold and if peak trips are to be avoided. The Transport Statement will include capacity assessment for the proposed access junctions to demonstrate that it will operate well within capacity and accommodate the development traffic when the site is fully functional.

#### *12.5.1.1 Decommissioning/Restoration Phase*

Traffic associated with the decommissioning/restoration phase of the Proposed Development will likely be the same or less than that experienced during construction. It is anticipated that the Proposed Development will be operational for 22 to 25 years. It is not possible to accurately forecast baseline traffic flow levels 22 – 25 years into the future. For the above reasons, further work will be undertaken at the time of decommissioning/restoration to determine if significant transport effects might be experienced.

## 12.6 Key Questions for Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q12.1: Are Consultees content with the proposed methodology and scope of the traffic and transport assessment?
- Q12.2: Are Consultees content to scope out operational and decommissioning traffic from further assessment?
- Q12.3: Are you aware of any relevant policies or guidance documents not specifically mentioned in this section of the Report?

# 13 SUMMARY

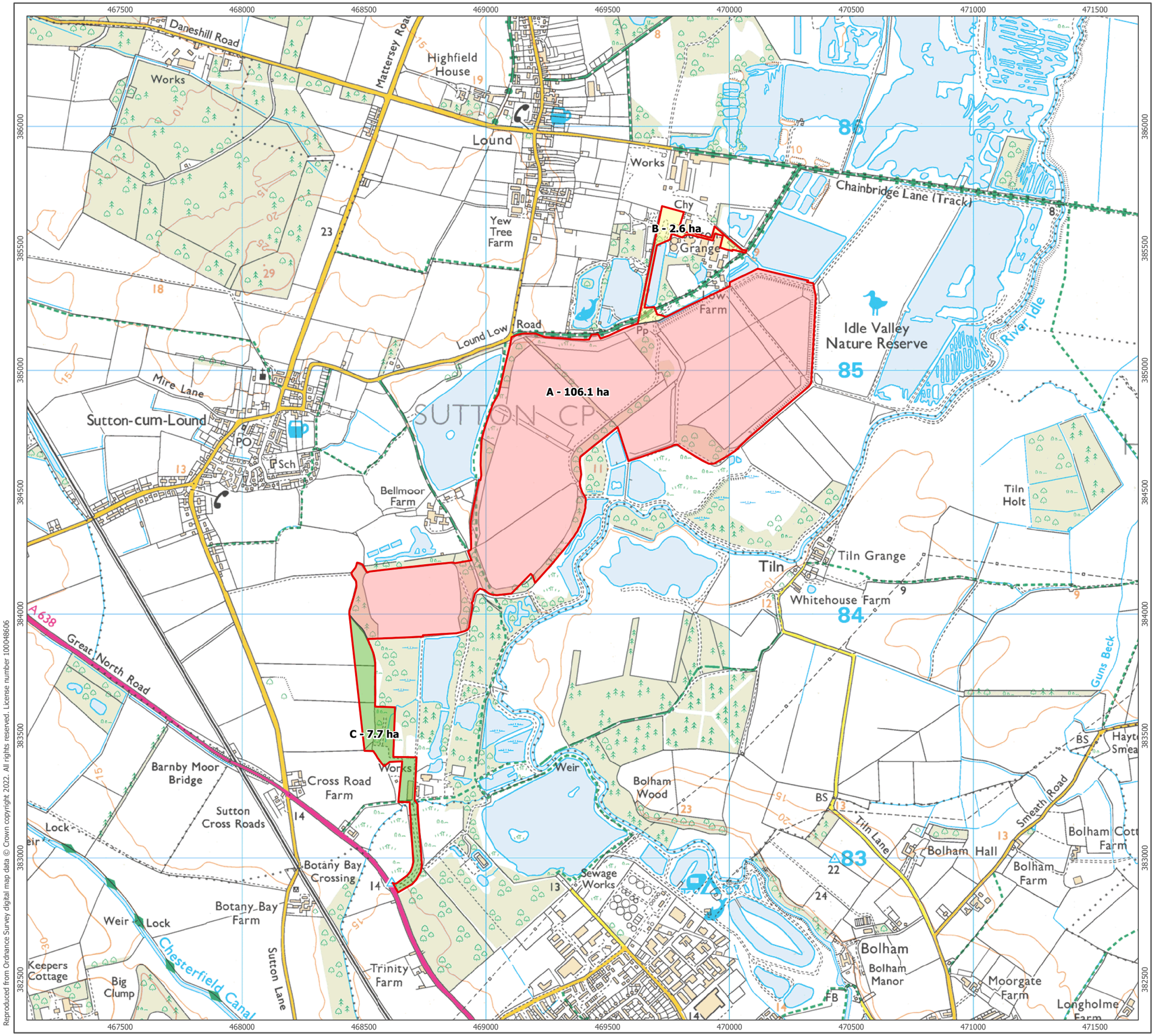
This EIA Scoping Report has identified the potential for significant effects to arise from the Proposed Development (as outlined in Section 5). The following technical specialist assessments are proposed as part of the EIA:

- Landscape and Visual Impact Assessment;
- Ecology and Ornithology;
- Hydrology, Hydrogeology, Flood Risk and Ground Conditions;
- Ground Conditions and Contamination;
- Cultural Heritage and Archaeology;
- Noise;
- Air Quality and
- Traffic and Transportation

The detailed assessments for each of these topics will be undertaken in accordance with standard guidance and best practice and reported within the ES that accompanies the planning application. Where significant effects are identified, mitigation measures will be described to reduce residual effects.

This EIA Scoping Report is submitted to Bassetlaw District Council with a formal request for a Scoping Opinion in accordance with Regulation 15 of the EIA Regulations.

# 14 APPENDIX A: FIGURES






Y:\GIS\Environment\4092 Lound Ash Extraction\4092 Lound Ash Extraction.aprx\4092-REP-023 Fig01 Site Plan

ARCUS

- Site Boundary
- A - Former Ash Lagoons
- B - Temporary Optimisation Site
- C - Bellmoor Quarry Industrial Estate

1:15,000 Scale @ A3

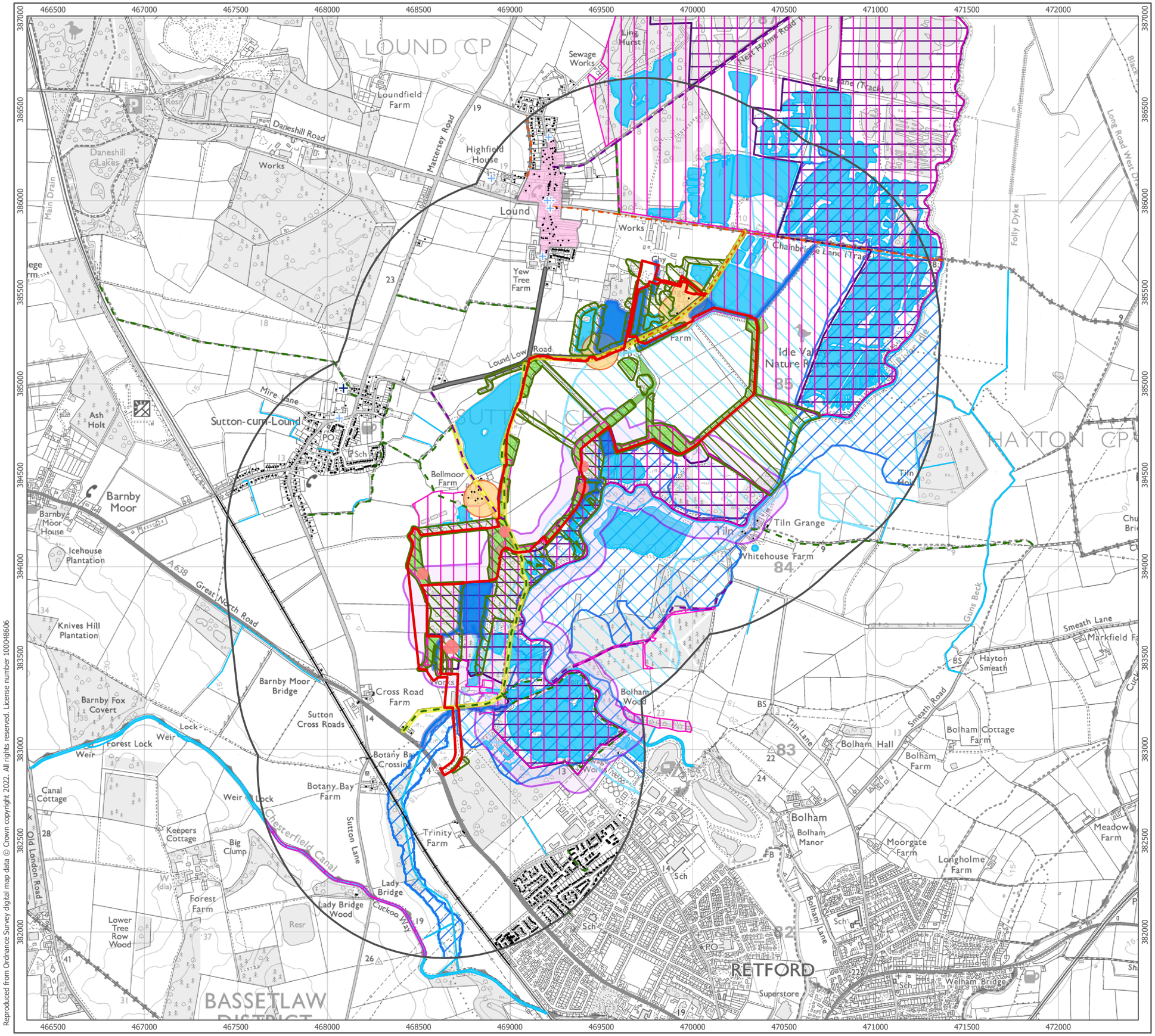
0 250 500 m

NORTH

| | |
|---|---|
| Produced By: EB | Ref: 4092-REP-023 |
| Checked By: ML | Date: 12/09/2022 |

**Site Plan**
Figure 1

**Lound Ash Extraction**
**EIA Scoping Report**






Y:\GIS\Environment\4092 Lound Ash Extraction\4092 Lound Ash Extraction.aprx\4092-REP-013 Fig02 Constraints Plan

ARCUS

- Site Boundary
- 1 km Search Area
- 10 m Buffer of Public Right of Way
- 10 m Buffer of Woodland
- 10 m Buffer of Waterfeature
- 10 m Buffer of Road
- 100 m Buffer of Residential Dwelling
- 100 m Buffer of SSSI
- Ecologically Sensitive Area
- Local Wildlife Site
- Site of Special Scientific Interest
- Conservation Area
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Other tall herb and fern - ruderal
- Flood Zone 2
- Flood Zone 3
- Surface Water
- Surface Water
- Railway
- Footpath
- Bridleway
- Byway Open to All Traffic
- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Residential Dwelling

1:20,000 Scale @ A3

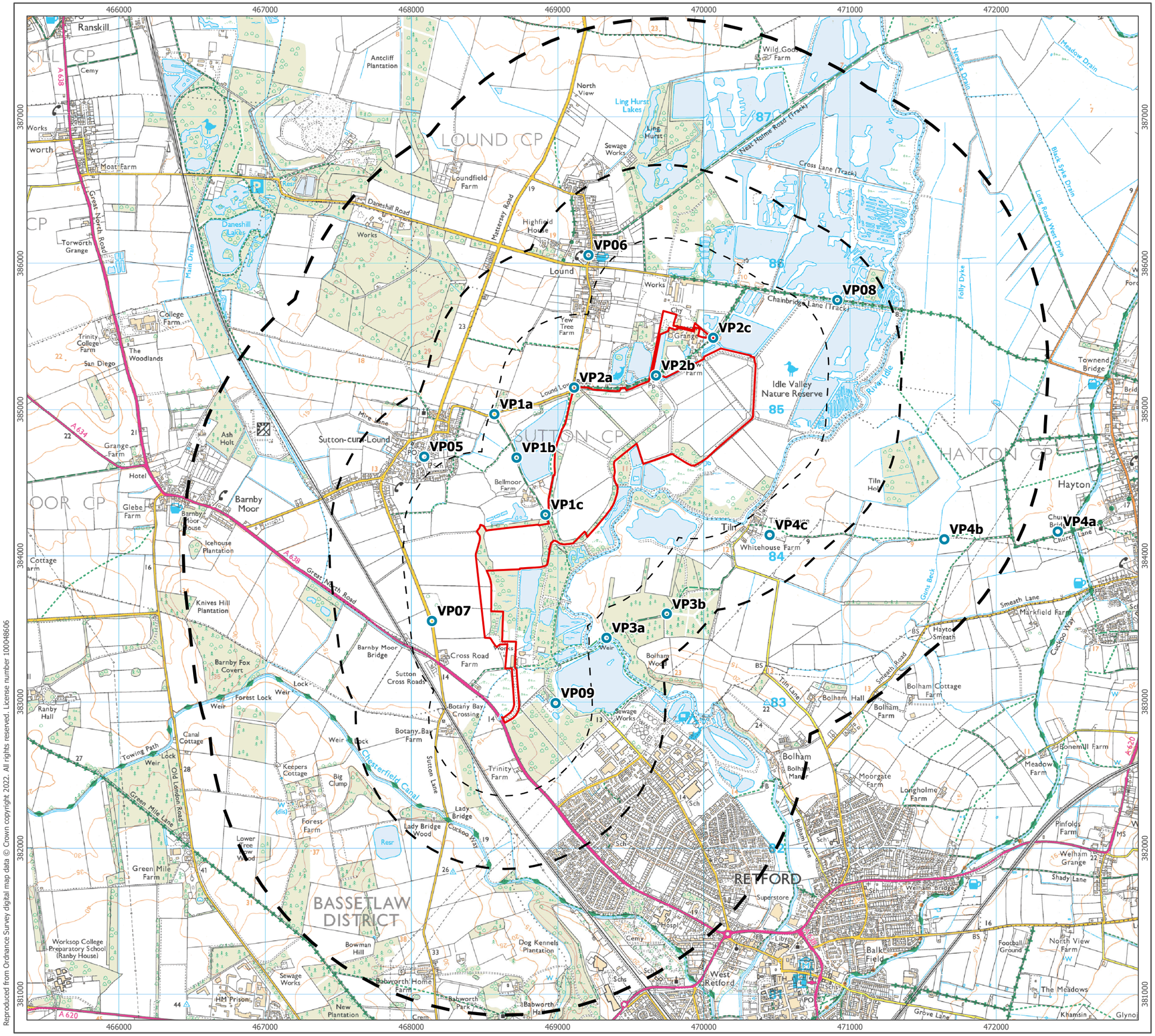
0 0.5 1 km

NORTH

| | |
|---|---|
| Produced By: EB | Ref: 4092-REP-013 |
| Checked By: SC | Date: 12/09/2022 |

**Constraints Plan**
Figure 2

**Lound Ash Extraction**
**EIA Scoping Report**






Y:\GIS\Landscape\Projects\4092 Lound Ash Extraction\4092 Lound Ash Extraction.aprx\4092-REP-028 Fig03 Viewpoint Location

ARCUS

- Site Boundary
- Viewpoint Location
- 500m Study Area
- 1km Study Area
- 2km Study Area

1:25,000 Scale @ A3

0 0.5 1 km

NORTH

| | |
|---|---|
| Produced By: WM | Ref: 4092-REP-028 |
| Checked By: WW | Date: 15/10/2021 |

**Viewpoint Location**
Figure 3

**Lound Ash Extraction**
**EIA Scoping Report**