Site Condition Report

Selby Energy Recovery Plant

Energy Ventures No1 Ltd

14th August 2025

Project No.: SOL_24_PO76_PCM

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Document Details	
Document Title	Site Condition Report
Document Subtitle	Selby Energy Recovery Plant
Project No.	SOL_24_PO76_PCM
Date	14th August 2025
Version	QMS_7.5.38_TEM – Template – Report Long Form – New Style (Perm) v5
Author	Charlie Holmes
Client Name	Energy Ventures No1 Ltd

Document History				
Version	Comments	Date	Author Initials	Reviewer Initials
I1	First Issue to the Environment Agency	14/08/2025	CH	EH

Signature Page

14th August 2025

Site Condition Report

Selby Energy Recovery Plant

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1. INTRODUCTION

1.1 Background

This document has been prepared by Sol Environment ("Sol") on behalf of the applicant, Energy Ventures No1 Ltd (EV1), in support of a new bespoke permit application as required by the *Environmental Permitting (England and Wales) Regulations 2016* for proposed activities at a newly constructed energy recovery plant at their site in Sherburn in Elmet, Leeds.

The facility is located at Aviation Road, Sherburn in Elmet, Leeds, LS25 6NF (Grid Reference: SE 51183 33256).

This document has been prepared in line with the current Environment Agency (EA) Guidance i.e. *Environmental permitting: H5 Site condition report (Environment Agency, 2013)*. This document represents the Application Site Condition Report (ASCR) and as such Sections 1 to 3 of the EA's Site Condition Report (SCR) Template, are provided below. This document is live and will be updated during the lifetime of the permit as appropriate.

1.2 Current Activities

The surrounding site is occupied by Kingspan Insulation Ltd, involved in the manufacture of insulation products. The area proposed for redevelopment is primarily made up of undeveloped grassland, with hardstanding to the west boundary which is used for carparking and service yards.

1.3 Proposed Permit Application

The proposed development is an energy generation facility which has been designed to recover energy from Refuse Derived Fuel (RDF) and mixed municipal waste feedstocks using combustion, specifically for the production of electricity.

The facility is designed to combust pre-prepared waste feedstocks for the production of heat to raise steam in a conventional tube boiler for subsequent utilisation in a steam turbine for the production of renewable electricity.

The plant has been designed to produce a gross electrical generation of 25MWe, with approximately 13MWe being exported to the National Grid and with 3MWe and 3MWth being exported to the neighbouring and co-located Kingspan facility via private wire.

The Installation has been designed to process a maximum of 240,000 tonnes per annum of pre-prepared RDF and mixed municipal waste feedstocks.

The main features of the proposed Installation are as follows:

- Fuel Reception Hall – for the delivery and reception of fuel feedstocks;
- Grate Combustion System – one incineration line for the thermal combustion of waste;
- Steam Boiler – for the production of high-pressure steam using heat recovered from the flue gases from the furnace;
- Air Cooled Condenser (ACC) – for the condensing of the exhaust steam;
- Steam Turbine Generator – comprising a steam turbine and generator for the conversion of steam into electricity; and

- Fuel Gas Treatment – consisting of Selective Non-Catalytic Reduction (SNCR) through urea injection, a dry scrubbing system incorporating sodium bicarbonate injection for acid gas neutralisation, activated carbon powder injection for absorption and removal of heavy metals, dioxins, VOCs and other harmful substances and a fabric filter for particulates removal.

The Installation will make an important contribution to regional waste management and local renewable energy generation and will provide a single treatment facility for materials that would otherwise be destined for landfill or foreign export.

The facility will be permitted by the Environment Agency as a Waste Incineration Activity and will be operated in accordance with the Environmental Permitting Regulations 2018 and Chapter IV of the Industrial Emissions Directive (IED).

The proposed process meets the definition of an Installation as defined by Section 5.1 'Incineration and Co-Incineration of Waste' paragraph A(1)(b) namely:

'The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour.'

Please see the installation boundary provided in *Appendix A – Site Plans*.

2. SITE DETAILS

The Site details are outlined in Table 2.1 below.

Table 2.1: Site Details

Name of applicant	Energy Ventures No1 Ltd
Activity Address	Aviation Road, Sherburn in Elmet, Leeds, LS25 6NF
National Grid Reference (NGR)	Centre of the main permitted area - SE 51183 33256
Document reference and dates for Site Condition Report at permit application and surrender	**Application** Site Condition Report **Variation** N/A **Surrender** N/A
Document references for site plans (including location and boundaries)	Appendix A: Site Plans Appendix B: Groundsure Report Appendix C: Ground Investigation Appendix D: Remediation Strategy

3. CONDITIONS OF LAND AT PERMIT ISSUE

3.1 Environmental Setting

Desk-based research of the local geology, hydrogeology, hydrology, and ecology was carried out to establish the potential for migration of contamination onto or away from the Site, and to assess the surface water and groundwater sensitivity of the surrounding area.

Information was obtained from multiple sources, namely:

- Environment Agency Flood Risk Map;
- Information provided by Groundsure Reports (Appendix B).
- Geological maps produced by the British Geological Survey (BGS) and the BGS Geology of Britain Viewer (http://maps.bgs.ac.uk/geologyviewer);
- MAGIC (http://magic.defra.gov.uk);
- BGS Borehole Record Viewer (http://www.bgs.ac.uk/data/boreholescans/home.html);
- 2016 REC Phase I Site Assessment (Appendix C);
- 2020 REC Phase II Site Investigation report (Appendix C); and
- 2020 EnSafe Remediation Strategy Report (Appendix C).

3.1.1 Location

The subject site is located within the grounds of the Kingspan Insulation Plant facility, northeast of Aviation Road. The site is accessed off Enterprise Way to the east. The site is situated within a primarily industrialised area, within an industrial park located south of the B1222.

The site occupies approximately 2.14ha and comprises a level grass field adjacent to the Kingspan to the factory to the north. The majority of the site is surfaced in grass with level topography with hardstanding on the west of the site including a tarmac road and car park.

A 'step' in the land is evident running east-west across the northern section of the site, where the culvert is located. A submerged culvert, known as Green Dyke, flows east-west across the north of the site and emerges into an open channel approximately 20m to the east.

Table 3.1: Site Setting

Direction	Description
North	Immediate Vicinity: Kingspan Insulation. Within 500m: Innova Kitchens, Industrial warehouses, Car park, Bishop Dyke, Bishopdyke Rd (B1222), Agricultural land. Beyond 500m: Residential properties, Agricultural land, British Gyspsum.
East	Immediate Vicinity: Drain, tree line and multi-purpose industrial warehouse. Within 500m: Drain (Green Dyke), Industrial warehouses (e.g Sherburn Metalwork, Crans wick Gourmet Bacon, The Generator Warehouse, Sainsbury's Distribution centre, Legal & General Modular Homes), Hurricane way, Hurricane Cl. Beyond 500m: Cromwell Polythene, Development on Lennerton Ln, Sewage works, Agricultural land, Warehouses (Sherburn Engineering, The Motorist), EGCJ Airfield, Residential dwellings.

South	Immediate Vicinity: Drain, Hardstanding storage area, Aitken's Sportsturf, Aviation Rd. Within 500m: Industrial and commercial warehousing (e.g. GR Electrical Services Limited, Fitness Motion, Securerail Limited, Stretton's Auto Services, The Great Bear), Associated car parks, Aviation Rd and Spitfire Way. Beyond 500m: Industrial warehousing (e.g. Clipper Ltd, Exec Logistics, Dale Teal Garage + Mobile Mechanic, Northern Plant and Machinery) and associated hardstanding for storage and parking, Air field, Open agricultural land, Railway tracks.
West	Immediate Vicinity: Aviation Rd. Within 500m: Industrial and commercial warehouses (e.g GR Electrical Services Limited, Tuff Waterproofing, David H Wright Joinery, Reynolds cs leeds, Brouns & Co), Car dealership (Sherburn Motors), Garage (Westminster Auto Spares, Metcalf Autos), Moxon Way, Bypass Park Estate Beyond 500m: Stream, Thicket, A162, Open agricultural land, Residential Town of Sherburn in Elmet, Bramley Park Ave.

3.1.2 Geology & Hydrogeology

The British Geological Survey (BGS) maps and GeoIndex indicate that the site is underlain by the geological sequence presented in Table 3.2.

Table 3.2: Summary of Geological and Hydrogeological Data

Geological Unit	Classification	Description	Aquifer Classification	Sensitivity
Superficial	Hemingbrough Glaciolacustrine Formation	Silts and Clays	Unproductive Strata	Low
Bedrock	Roxby Formation	Calcareous Mudstone	Secondary B Aquifer	Low - Moderate

3.1.2.1 Hydrogeology

The site is located upon a Secondary B Aquifer. There are 25 licensed discharges to groundwater within 2km of the site, 4 of which are active. The closest active discharge is located 1.2km north registered to Saint Gobain Construction Products UK Ltd for general use. There are no records of potable water abstractions within 2km.

The site is not located within a Source Protection Zone.

The WFD groundwater body onsite is the Wharfe Magnesian Limestone which has an overall poor rating from the EA.

3.1.2.2 Made Ground

The development is situated upon Made Ground site wide to a maximum depth of 1.50 mbgl. A Phase II investigation was carried out in 2020 identifying anthropogenic materials such as black combustion material, plastic, brick and ceramics. No other visual or olfactory contamination was identified.

The 2020 Phase II is presented in Appendix C.

3.1.2.3 Radon Potential

According to data issued by the British Geological Survey and Public Health England, the site is located in an area with a radon potential less than 3%.

3.1.2.4 Shrink Swell

The maximum shrink swell hazard rating identified on site is Low – ground conditions with medium plasticity.

3.1.2.5 Landslides

The maximum landslide hazard rating identified on the application site is very low.

3.1.2.6 Soluble Rocks

The maximum soluble rock hazard rating identified on the application site is low.

3.1.2.7 Compressed Ground

The maximum compressible ground hazard rating identified on the application site is moderate.

3.1.2.8 Collapsable Deposits

The maximum collapsible rocks hazard rating identified on the application site is very low.

3.1.2.9 Running Sands

The maximum running sand hazard rating identified on the application site is negligible.

For further details please see the Groundsure report in Appendix B.

3.1.3 Hydrology

Green Dyke is culverted flowing east-west across the northern section of the proposed development site; the dyke emerges into an open channel approximately 20m to the east.

Additionally a man-made detention pond for spillages is located approximately 42m northeast of the site.

The site is situated within the Upper Fox Drain Catchment of Sherburn STW (water body ID: GB104027063610) which was classified by the EA in 2019 as having:

- Ecological rating: Moderate;
- Chemical rating: Fail; and
- Overall rating: Moderate.

There are 6 surface water abstractions located within 2km. The closest active if which is located 649m west at a tributary of Mill Dyke Drain for the purposes of spray irrigation.

Please refer to the Groundsure report in Appendix B for further information.

3.1.4 Flood Risk

3.1.4.1 Rivers and the Sea

The site is situated within a Flood Zone 1 with a low probability of flooding suggesting a less than 0.1% (1 in 1000) chance of flooding from rivers or the sea.

3.1.4.2 Surface Water

The majority of the site sits within a very low risk of surface water flooding however there are pockets of Low, Medium and High risk located in the most southeastern corner and west of the site with Low risk areas in the centre.

The highest risk areas are represented by a 1 in 100 year (1%) chance of flooding each year. These are most likely located on areas of hardstanding where surface water can pool.

3.1.4.3 Groundwater

The site is predominantly situated with a Moderate – High risk of groundwater flooding with pockets of High risk in the southeastern corner and west of the site. Areas of moderate risk were identified in the centre-east, north and south-west of the site. This is based on a 1 in 100 year return period using a Digital Terrian Model (DTM).

3.1.5 Ecology

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

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

It is also stated that the following should be assessed within 2km of the Source:

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

The EA and Local Council websites and the Multi Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk/) were reviewed to obtain identify relevant designated sites.

There are two Local Wildlife Sites (LWS) within 2 km of the facility site. These are detailed in table 3.3 below.

Table 3.3: Sensitive Habitat Receptor Locations

Receptor	Primary Habitat	Approx. Location (Relative to Site)
H1. Pasture Opposite Gypsum Works LWS	Grassland	1.4 km north
H2. Ash Tree Dike and Ponds LWS	Open water and woodland	1.6 km south southwest

No other ecological or statutory receptors have been identified within the relevant screening distance of the site. However, the site is situated within the SSSI impact zone of Sherburn Willows (SSSI) which is situated approximately 2.4km south west of the site.

The proposed operation has no environmental emissions to land, controlled waters or atmosphere and therefore it is the conclusion of this assessment that there will be no direct or indirect effects on any of the statutory sites described above.

3.1.6 Other Sensitive Receptors

The nearest residential area is an estimated 400m north west of the site boundary on Bishopdyke Rd (B1222).

Given the distance of the nearest residential area and the sites predominantly industrial surroundings, the site is considered to be in a low sensitivity area in relation to potential air, dust and odour emissions. Full details of emission prevention can be found in the main permit application documentation. As Table 3.3 identifies, there are a number of human receptors such as local amenities and residential areas that may be of interest to this application. However, numerous operational measures of control and mitigation will be applied to ensure that all potential releases are prevented, therefore reducing the risk further.

Table 3.4: Sensitive Human Receptors

Human Receptor	Type	Distance
Kingspan Insulation	Industrial	Adjacent North
Aviation Road	Commercial and Industrial	Adjacent Southwest
Enterprise Way	Commercial and Industrial	93m West
Hurricane Way	Commercial and Industrial	191m East
Bishopdyke Road (B1222)	Commercial, Industrial and Residential	380m North
Residential dwellings	Residential	400m Northwest
Moxon Way	Commercial and Industrial	412m West
Bacon Factory Pond	Amenity	502m West
EGCJ Air Field	Commercial and Industrial	504m Southeast
Residential dwelling	Residential	519m Northeast
Sherburn-in-Elmet Train station	Amenity	589m Northwest
Moor Lane	Residential and Commercial	614m Northwest
Pond	Amenity	670m Northwest
Residential area of Sherburn-in-Elmet	Residential	683m West
Pond	Amenity	723m Northwest
Farm	Commercial	771m Northeast
Low Farm Energy Plant	Industrial	891m Southwest
British Gypsum	Industrial	953m North

Please refer to the Sensitive Human Receptor map in Appendix A – Site Plans.

3.2 Site Sensitivity

The site is considered to have low sensitivity in regards to groundwater as although there are groundwater abstraction within 2km and the site is situated upon a Secondary B aquifer, the bedrock aquifer is protected by superficial clay and silt deposits.

In regards to surface water, the site is considered to have a moderate sensitivity due to the onsite culverted watercourse.

3.3 Pollution History

3.3.1 Pollution Incidents

There are two recorded pollution incidents within 500m of the site. None were recorded on site. This is summarised in the table below.

Table 3.5: Pollution Incidents

Distance and Direction	Details	Pollutant	Impact
192m W	Date: 27/02/2012 Identification: 965331	Sewage Materials	Water: Category 2 (Significant) Land: Category 4 (No Impact) Air: Category 4 (No Impact
348m N	Date: 15/11/2002 Identification: 120958	Atmospheric Pollutants and Effects	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)

3.3.2 Potentially Contaminative Industrial Sites

There are currently 40 potential contaminative industrial sites within 250m of the site. Those within 50m of the site are summarised in the table below. Please see Appendix B – Groundsure Report for further information.

Table 3.6: Potentially Contaminative Industrial Sites

Company / Feature	Distance and Direction	Activity	Category
Walker Humphrey Ltd	63m E	Baking and Confectionery	Foodstuffs
Cranswick Gourmet Bacon	91m SE	Fish, Meat and Poultry Products	Foodstuffs
Strettons Auto Services	99m SW	Vehicle Repair, Testing and Servicing	Repair and Servicing
Thorpe Packaging	104m NE	Packaging	Industrial Products
Kingspan Insulation Solar Installation – Solar Photovoltaic s (BEIS)	105m NW	Energy Production	Industrial Features
Electricity Sub Station	106m NE	Electrical Features	Infrastructure and Facilities

The Generator Warehouse Company Ltd	108m E	Electrical Equipment Repair and Servicing	Repair and Servicing
Yorpower	108m E	Electrical Motors and Generators	Industrial Products

3.3.3 Landfills

No current or historical landfill sites have been identified within 500m of the site.

3.3.4 Discharge Consents

There are three active discharge consents to controlled waters within 500m of the site. The closest of these is located 232m west of the site at Kier Plant Depot for trade discharges and process effluent, effective since 1996.

3.3.5 Authorised or Permitted Processes

There are two active Part A (1) and five Part B Installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 within 500m of the site. These are detailed in the table below.

Table 3.7: Part A (1) Installations

Company / Feature	Distance and Direction	Details
CRANSWICK COUNTRY FOODS PLC	116m SE	Process: Treatment and processing of animal and vegetable raw materials and disposal of >50T/D non-hazardous waste involving physicochemical treatment Permit Number: FP3608BE
AB AGRI LIMITED	290m NW	Process: Animal vegetable and food; Treating raw materials for food >300T/D Permit Number: BW9824IC

Table 3.8: Part B Installations

Company / Feature	Distance and Direction	Details
Strettons Auto Services	68m SW	Process: Waste Oil Burner Status: New Legislation Applies Permit Type: Part B
Kingspan Insulation Ltd	144m N	Process: Di-isocyanate Processes Status: Current Permit Permit Type: Part B
Triesse Ltd	207m NE	Process: Timber Manufacture; Use of Bulk Cement Status: Current Permit Permit Type: Part B
Ultima Furnature System LTD	314m N	Process: Combustion of Waste Wood and Timber Manufacture Status: Current Permit

		Permit Type: Part B
Switch Mobility	384m SE	Process: Coating Processes Status: Current Permit Permit Type: Part B

3.3.6 Historical Land Uses and Associated Contaminants

3.3.6.1 On Site Historical Land Uses

A review of historical maps has been conducted to establish the sites historical land uses and associated contaminants. Historically, the site was in agricultural use before development as part of an airfield between 1950 – 1986 and subsequent development to the present day industrial use as part of the Kingspoan insulation facility. The risk of potential contamination is high from sources such as the airfield due to the military operations and fuel storage activities associated with it. The historical maps are located in Appendix B – Groundsure. Below provides a detailed description of these maps.

Table 3.9: On Site - Historical Land Uses

Year	Historical Land Use
1850	The earliest available maps recorded the site as being predominantly undeveloped agricultural land, with Green Dyke and a footpath running across the north of the site.
1892-1908	No significant changes. No mapping records are available between 1908 and 1950.
1950	The site is located within a large area of land, designated as an “Airfield”. No further detail is provided. Green Dyke is no longer shown on the site, believed culverted.
1958-1986	The airfield in which the site is situated is now described to be ‘disused’. The mapping records now become more detailed and a runway travels off site to the north and adjacent to a narrow taxi-lane for aircraft extending off site to the north and south east.
1989-Present	The site has been redeveloped to resemble its current layout.

3.3.6.2 Off-site Historical Land Uses

A review of historical maps has been conducted to establish the sites surrounding historical land uses. The sites surrounding historical land uses have been predominantly undeveloped agricultural land until around the 1950s when an airfield had been developed on and surrounding the site. The western surrounds saw an uptake in industrial buildings circa 1957. From this time the aforementioned airfield remained disused until approximately 1992 whereby the more immediate north and western surrounds had been redeveloped for industrial use. Since circa 1992 the adjacent works to the north had been developed which is now known as Kingspan Insulation Ltd. Circa 2010 significant industrial developments where made in the south and east, bringing the sites surroundings in line with the present day. The historical maps are located in Appendix B – Groundsure. Below provides a detailed description of these maps.

Table 3.10: Off Site - Historical Land Uses

Year	Historical Land Use
1850	The earliest available maps recorded the site as being predominantly undeveloped agricultural land, with a railway track 400m west. The town of Sherburn in Elmet was pre-established at this time.
1892-1908	Clay Pits and Brick Works are noted in the north-west and a hospital for infectious diseases is recorded around 200m east. No mapping records are available between 1908 and 1950.
1950	The site is located within and surrounded by a large area of land, designated as an "Airfield" which extends offsite beyond 750m south and east. An Engineering Works is noted approximately 480m north-east and a Railway Wagon Works an estimated 550m south-west.
1958-1987	The surrounding airfield is now described to be 'disused'. The mapping records now become more detailed and a runway travels off site to the north and south adjacent to a narrow taxi-lane for aircraft extending off site to the north and south east. The Works in the west are more developed.
1981-1986	A Works, a Mill and a Depot has been established around 400m north-west and Moor Lane Trading Estate had been established 100m west.
1992-1994	The airfield has been removed and a works is recorded adjacent to the north which is currently known as Kingspan Ltd.
2010	The surrounding area saw significant industrial developments most notably to the south-east, extending to around 500m.
2010-Present	No significant changes.

3.3.6.3 Potentially Contaminative Land Uses

The site has seen a mixture of agricultural and industrial historical land uses both on site and surrounding which are considered to be potentially contaminative land uses. The most significant risk potential of contamination is from sources such as the airfield due to the military operations and fuel storage activities associated with it. Below provides a detailed description of these potential sources and associated contaminants.

Table 3.11: Potentially Contaminative Land Uses

Activity	Contaminants
Onsite	
Airfield	Various contaminants including hydrocarbons, heavy metals, organic and inorganics
Offsite	
Airfield and potential unrecorded features and structures relating to RAF Airfield.	Various contaminants including hydrocarbons, heavy metals, organic and inorganics
Sherburn Enterprise Park.	Various contaminants including hydrocarbons, heavy metals, organic and inorganics
Moor Lane Trading Estate	Various contaminants including hydrocarbons, heavy metals, organic and inorganics
Industrial Building - Kingspan Ltd	Various contaminants including heavy metals, organic and inorganics and ground gas

Hospital for Infectious Diseases	Various contaminants including heavy metals, organic and inorganics and ground gas
Industrial Buildings – Manufacturing, maintenance and unidentified activities	Various contaminants including hydrocarbons, heavy metals, organic and inorganics

3.3.7 Historical Site Investigations

3.3.7.1 (REC 2016) – Phase I Geo-Environmental Site Assessment

A (REC - 2016) Phase I Geo-Environmental Site Assessment was conducted on site area adjacent to the north of the currently proposed site in 2016 which provided a preliminary investigation to classify the risk of potential land contamination. As this assessment was conducted on an adjacent land it is considered that the overall geology and historical land uses remain relevant for the development site.

The 2016 Phase I determined that the site has a moderate environmental risk rating due to the historical on site and surrounding land uses. The predominant risk of contamination being the onsite and surrounding historical airfield, as the associated activities may have resulted in localised organic contamination of the soil and shallow groundwater due to leaks and spillages.

A Phase II ground investigation was recommended in order to confirm findings of the initial conceptual site model. Further information is provided in Appendix C – Previous Site Investigations.

3.3.7.2 (REC 2020) – Phase II Geo-Environmental Site Investigation

A phase II geo-Environmental site investigation was conducted on site in 2020 which incorporated both the permit application area and the adjacent Kingspan Ltd building. The combined works comprised:

- 8 exploratory boreholes each with a maximum depth of 5.45mbgl.
- Soil sampling for in-field assessment and submission to i2 Analytical Ltd in-house Geotechnical Laboratory for chemical and geotechnical testing;
- Three gas and groundwater monitoring visits undertaken between 24th January and 17th March 2020, using an infra-red gas analyser and electronic dip meter;

The locations of the boreholes and trial pits were situated so as to provide wide site coverage.

The suite of chemical analysis was based upon potential contaminants of concern (CoCs) due to site history and soil samples were tested for asbestos, phenols, pH, metals, sulphate, cyanide, PAHs, TPH, monoaromatic oxygenate, Petroleum Hydrocarbons, soil organic matter and fraction organic carbon (FOC).

Please refer to the Phase II report provided in Appendix C of this report for detailed results of the fieldwork investigation. A brief summary of the baseline conditions at the site is provided below.

Ground Conditions

Made Ground was encountered at every location during the investigation to a maximum depth of 1.50 mbgl. Made Ground typically comprised gravelly clay with a fine to coarse component of mudstone, sandstone, coal, black combustion material (BCM), plastic brick and ceramic.

Superficial deposits comprising soft clay with sand and silt were identified underlying Made Ground across the site, to the maximum exploratory depth of 5 mBGL. No bedrock was recorded during the investigation.

Ground Gas

During the ground gas monitoring round the following concentrations of gas was observed:

- Methane all concentrations <0.1 % v/v;
- Carbon dioxide – between 0.1 - 2.0 % v/v; and
- Oxygen - between 17.5 – 20.5 % v/v.

Gas flows were recorded with a maximum stable flow rate of 4.4 l/hr. A preliminary gas risk assessment based on these results characterise the site as having no risk from ground gas hazards.

Soil Chemical Analysis Results

Soil chemical analysis revealed evidence of contamination indicated by elevated levels of beryllium and dibenzo (a, h) anthracene recorded above the respective screening values for commercial use at borehole WS107. The exceedance of beryllium and dibenzo (a, h) anthracene was identified within the localised Made Ground strata described as grey slightly clayey sandy gravel.

Furthermore, one of eight samples detected presence of chrysotile asbestos in the form of a cement fragment. Although the quantity of asbestos is below detection limits, the sites historical use as an airbase presents potential risk within the Made Ground. A summary of the baseline soil conditions is provided in the table below.

Table 3.12: Summary of Soil Analytical Results

Determinands	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Average Concentration (mg/kg)
Arsenic	2.5	12	7.1
Antimony	<1	2.3	1.5
Barium	38	440	296
Beryllium	0.12	12	2.4
Boron	0.3	2.7	1.5
Cadmium	<0.2	0.5	0.3
Chromium (VI)	<1.2	<1.2	<1.2
Lead	<1.0	48	25.6
Mercury [Inorganic]	<0.3	<0.3	<0.3
Nickel	4.1	30	20.3
Selenium	1	4.5	1.8
Copper	2.6	27	14
Zinc	15	160	72.6
Vanadium	7.6	100	36.8
Cyanide [Total]	<1	<1	<1

Asbestos	<0.001	<0.001	<0.001
Total Phenols	<1.0	<1.0	<1.0
Total PAH	0.80	5.9	1.51
TPH – Aliphatic (EC5 – EC44)	<10	<10	<10
TPH – Aromatic (EC5 – 44)	<10	90	34.25

For further details please refer to the Phase II Report in Appendix C.

Recommendations

The Phase II ground investigation report states that the exceedance of beryllium and dibenzo (a, h) anthracene appeared to be localised within the made ground strata described as grey slightly clayey sandy gravel with a slight hydrocarbon odour. Where this material is encountered during site works, especially at shallow depths, it is recommended that it should be removed to eliminate the contamination source. Alternatively where hardstanding is to be implemented this exposure pathway would be broken. Where soft standing is proposed, the report recommends that removal of contaminated soils or implementation of a clean cover system to a depth agreed with the Environmental Health Officer.

The report states that due to the presence of asbestos in the ground and the historical use of the site as an airbase, provision should be made for control measures to be in place during the construction phase of works. A watching brief accompanied by personal air monitoring should be undertaken during site works to ensure workers and site users are not put at risk during works.

3.3.7.3 Remediation Strategy

A Remediation Strategy was developed as a consequence of the 2020 Phase II investigation to address the issues arising from the presence of asbestos and elevated levels of beryllium and dibenzo (a, h) anthracene and in Made ground. The key points of the 2020 Remediation Strategy are presented below:

- Soft landscaping areas in the south of the site should be capped with a clean cover system;
- Should materials need to be removed offsite, this must be done in accordance with waste regulations and thus classified as hazardous/non-hazardous to comply with current legislation;
- Earthworks will likely be required for the development to achieve formation and finished levels. A Materials Management Plan (MMP) or exemption from environmental permitting will be required to support reuse of site won materials and where necessary imported materials; and
- To manage the presence of asbestos, a watching brief accompanied by personal air monitoring should be undertaken during site works.

Further details and specifications can be found in the Remediation Strategy 2020 in Appendix C of this document.

4. PERMITTED ACTIVITIES

4.1 Proposed Activities

Table 4.1:Permitted and Directly Associated Activities

Activity Listed in EP Regulations	Description of Specified Activity	Limits of Specified Activity	Specified Waste Management Operation
Section 5.1 'Incineration and Co-incineration of Waste' paragraph A(1)(b)	The incineration or co-incineration of non-hazardous waste in a waste incineration plant with a capacity exceeding 3 tonnes per hour.	The reception, storage and combustion of non-hazardous RDF and municipal waste feedstocks to produce steam for the generation of renewable electricity. Installation includes all ancillary activities including emissions abatement and electrical generation.	R1: Use principally as a fuel or other means to generate electricity. R13: Storage of waste pending the operations numbered R1.
Directly Associated Activities			
Electricity Generation	Generation of 25MWe (gross) electrical power using a steam turbine from energy recovered from the flue gas.	From receipt of steam to export of electricity for on-site use, export to the grid or use by Kingspan (private wire).	n/a
Back-up Generator	For providing emergency electrical power to the plant in the event of supply interruption.	From receipt of fuel to generation of electricity for on-site use.	n/a
Activity Listed in EP Regulations	Description of Specified Activity	Limits of Specified Activity	Specified Waste Management Operation
Section 5.1 'Incineration and Co-incineration of Waste' paragraph A(1)(b)	The incineration or co-incineration of non-hazardous waste in a waste incineration plant with a capacity exceeding 3 tonnes per hour.	The reception, storage and combustion of non-hazardous RDF and municipal waste feedstocks to produce steam for the generation of renewable electricity. Installation includes all ancillary activities including emissions abatement and electrical generation.	R1: Use principally as a fuel or other means to generate electricity. R13: Storage of waste pending the operations numbered R1.
Directly Associated Activities			
Electricity Generation	Generation of 25MWe (gross) electrical power using a steam turbine from energy recovered from the flue gas.	From receipt of steam to export of electricity for on-site use, export to the grid or use by Kingspan (private wire).	n/a
Back-up Generator	For providing emergency electrical power to the plant in the event of supply interruption.	From receipt of fuel to generation of electricity for on-site use.	n/a

4.2 Non-permitted Activities Undertaken

All activities will be undertaken under the approved permit.

4.3 Description of Process

The proposed process will employ a conventional technology, namely moving grate combustion as a means of recovering energy from waste feedstocks. Heat will be recovered via a boiler to raise steam and generate energy via a steam turbine.

The principal components of the process comprise the following:

- *Waste Acceptance and Reception:* Pre-prepared fuel will be delivered directly to the Fuel Reception Hall, either in baled or loose form. Walking floor HGV's will reverse into the unloading lane and unload directly into the reception bunker, during which a visual inspection will take place. Additionally, baled RDF may be delivered to site and stored externally in the baled waste storage area in order for the plant to carry on operating during extended public and national holiday periods. A bunker crane will be utilised to move, mix and feed the feedstock into the feeding hopper, which subsequently automatically calls for more RDF when required
- *Incineration:* The site will have a single incineration and combustion line comprising a reciprocating grate. RDF will be fed to the grate from the feed hopper. Primary combustion air is fed under the grate and secondary combustion air fed above the grate to ensure complete combustion. The reciprocating bars spread the RDF and cause it to travel down the grate at a controlled rate to ensure complete combustion.
- *Heat Recovery*: Heat is recovered from the hot flue gases produced in the combustion chamber via a steam boiler, producing 111 tonnes per hour of superheated steam at 44 bar pressure at 400^{o}C.
- *Electricity Generation:* The superheated steam then passes to a single condensing steam turbine-generator to generate gross electrical generation of 25MWe. Approximately 13MWe will be exported to the National Grid, 3MWe will be used by the plant as parasitic load and 2MWe will be exported to the neighbouring and co-located Kingspan facility via private connection. The remaining 6MWe will be available for a future hydrogen plant, which will be addressed via a separate permit application. There will also be 3MWth available for export to the neighbouring Kingspan facility.
- *Flue-Gas Cleaning:* Flue gas cleaning and pollution control consists of Selective Non-Catalytic Reduction (SNCR) through urea injection, a dry scrubbing system incorporating sodium bicarbonate injection for acid gas neutralisation, activated carbon powder injection for absorption and removal of heavy metals, dioxins, VOCs and other harmful substances and a fabric filter for particulates removal.
- *Residue Handling:* Bottom ash (IBA) from the end of the grate is quenched and conveyed to a bunker storage area where it is mixed with boiler ash prior to export offsite for recovery. APC residue is exported for disposal as hazardous waste.

4.4 Substances Used at the installation

A summary of the substances which may present a pollution risk can be seen in the table below.
All re-fuelling of site vehicles and mobile plant takes place upon impermeable concrete hardstanding.

Table 4.2: Summary of Potentially Polluting Substances

Material	Nature of Storage	Location	Fate
Refuse Derived Fuel and Municipal Waste	Stored internally within the reception bunker	Internal Fuel Storage Hall	Combusted
Industrial Heating Oil	Stored externally within bunded compound Tank size TBC	External	Used as start-up and support fuel
Lubrication, Hydraulic and Turbine Oils	Internal bunded tank Approximately 1,000 litre tank	Internal	Used within main plant
Urea	Stored externally within bunded compound Tank size TBC	External	Reacts with flue gas
Sodium Bicarbonate	Internal bunded silo Silo size TBC	Internal	Reacts with acid gases and discharged as APC residue
Activated Carbon	Internal bunded silo Silo size TBC	Internal	Reacts with acid gases and discharged as APC residue
Boiler Chemicals	Internal $1m^3$ IBCs	Internal	Used within the boiler plant
Water Treatment Chemicals	Internal bunded storage tanks Tank size TBC	Internal	Used within water treatment system
CEMS Calibration Gases	Stored within 50l cylinder	Internal	Used within the CEMS equipment

4.5 Waste

All waste accepted on site is subject to waste acceptance and rejection procedures and stored appropriately. A summary of accepted waste is provided below.

Table 4.3: Proposed EWC Codes and Types

Waste Code	Description
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 10	combustible waste (refuse derived fuel)
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	**MUNICIPAL WASTE AND SIMILAR MATERIALS FROM COMMERCE AND INDUSTRY**

20 03	**other municipal wastes**
20 03 01	other municipal wastes

4.6 Drainage System

Uncontaminated clean surface water runoff captured from roof drainage and external roadways / car parking areas will be discharged to the surface water drainage system (W1).

Any effluent arising from the process plant will be collected in an effluent collection tank and discharged via sewer (S1). All domestic foul effluent arisings will also be discharged via sewer.

All emissions to sewer will be monitored in line with the sites effluent discharge consent once granted.

In the event of a significant site fire, the facility has been designed to fully contain any firewater run-off. In the event of a fire within the bunker, any water from the suppression system will be contained within the bunker. The external baled area will be protected by a sealed drainage system and secondary containment which has also been designed to contain any firewater runoff. The firewater collected will be tankered off site for disposal.

4.7 Hardstanding

The site operational areas will be underlain by impermeable concrete hardstanding.

4.8 Tanks and Bunds

All storage tanks will be installed with secondary containment and be designed to comply with the necessary standards and pollution prevention guidance.

4.9 Potential for Fugitive Releases to Soil, Groundwater and Surface Water

The materials and substances used at the site are not considered to have significant potential to cause ground or groundwater contamination under general storage or operating procedures.

The following measures have been incorporated into the design of the activity to protect groundwater and soil from installation substances;

- The site will be situated on impermeable hardstanding;
- All waste activities take place internally, apart from baled RDF being stored externally;
- Emergency spill kits are available in the event of a spillage;
- There are no emissions to controlled water arising from the process; and
- Vehicles are covered when deliveries take place.

When operated in the manner described above the proposed operations will not introduce any sub surface or potentially polluting activities to the site.

Due to the protection measures mentioned above, the risk to soil and groundwater from the development is considered to be LOW as summarised in the Conceptual Site Model below.

4.10 Conceptual Site Model

A Conceptual Site Model is provided overleaf to assess the potential for environmental contamination using source pathway receptor model.

Table 4.4: Conceptual Site Model

Contaminant Source	Contaminants of Concern	Receptor	Exposure Pathway Present	Likelihood of Risk
Historical soil contamination within Made Ground associated with historical development on site	Specific contaminants associated with historical airfield and industrial land uses including: Heavy Metals, PAHs, TPHs, Phenols, Ground gases (CH_4 and CO_2) and Asbestos fibres in soils Ground investigation has noted elevated berrylium, PAH and asbestos	Construction Workers	Potential pathway during construction of the site, full PPE will be worn by workers during the construction phase to limit contact.	LOW – Use of control measures during construction work should minimise potential exposure. This will include appropriate PPE accompanied by an asbestos watching brief with background and personal air monitoring.
		Future Site Users	Areas of soft landscaping are present in the wider site area which could allow ingestion, dermal contact or inhalation of contaminants.	LOW – Hardstanding will cover the operational areas of the site and contamination levels over these areas are low. Additionally, a clean cover will be implemented in areas of soft landscaping.
		Groundwater	Leaching of contaminants by infiltrating rainfall is possible in areas of soft landscaping.	LOW – Isolated areas where contaminated material is identified will be covered by hardstanding to sever the pathway. Alternatively, contaminated material could be removed or a clean cover system be implemented.
		Surface Water	Areas of soft landscaping are present in the wider site area allowing dissolution of contaminants into surface water run-off.	LOW – Use of control measures during construction work under a CEMP should minimise potential exposure
Substances either stored on site, used or generated during processing	Polluting substances used or stored for the operation, including urea, Sodium Bicarbonate, water treatment chemicals or organics, PAH and heavy metals	Soil	All materials on site will be stored and processed on hardstanding, removing the potential for contamination of this receptor.	Negligible – All potentially polluting substances used at the facility are controlled by following strict risk assessment and guidance surrounding the storage, use and removal, thus reducing the risk. The operational areas of the site being covered in hard standing for all operational areas also greatly reduces the risk of contamination to the sensitive receptors.
		Surface Water	Site will operate sealed drainage system and upon impermeable hardstanding.	VERY LOW – The management and guidance surrounding storage and use of contaminants teamed with management of surface water run-off reduces this risk to low.
		Ground Water	There is no pathway present for this pollution to occur, all operational areas of	Negligible – Internal management systems and site design ensure no pathway present.

			the site are upon impermeable hardstanding with sealed drainage systems	
		Human Receptors	There is a pathway present for this pollution to occur, with the operation utilising potentially polluting substances.	Negligible.
		Ecological Receptors	There is a pathway present for this pollution to occur, with the operation utilising potentially polluting substances.	Negligible.

In addition, the site operates in accordance with the environmental management system. The management system includes visual inspections of:

- All storage areas, processing areas and hard standing will be physically inspected to detect any signs of deterioration, leaks or spillage. Any corrective action required is reported to and implemented by the Site Manager; and
- Equipment in all process areas as part of the company's planned/predictive maintenance programme.

Based on this assessment, the potential for the proposed site to impact on soil and groundwater underlying the installation is considered to be low.

Non-permitted activities undertaken at the Installation	Not applicable
Plan showing activity layout	Refer to Appendix A
Environmental Risk Assessment	See attached Main Application Document SOL_24_P076_PCM

APPENDIX A SITE PLANS

APPENDIX B GROUNDSURE REPORT

APPENDIX C PREVIOUS SITE INVESTIGATIONS

APPENDIX D REMIDIATION STRATEGY