Environmental Permit Application

Barrow Green Hydrogen

Barrow Green Hydrogen Limited

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1.0 INTRODUCTION

SLR Consulting Limited (SLR) has been instructed to prepare an environmental permit application for the proposed Barrow Green Hydrogen Project to be located on land at Meeting Industrial Estate, Barrow-in-Furness, LA14 4TL (hereafter referred to as 'the Site').

1.1 Site Location

The Site is centred on National Grid Reference (NGR) SD 19436 72080. Barrow-in-Furness town centre lies 3km to the south-east. The Site sits in an industrial estate with residential areas located to the east, a solar farm and agricultural fields to the west with the Walney Channel beyond. The closest residential properties are approximately 110m to the east of the Site. The nearest designated habitat site is 330m west of the Site (Morecambe Bay Special Area of Conservation and Special Marine Protection Area and the Duddon Estuary Ramsar, Site of Special Scientific Interest and Special Marine Protection Area).

1.2 Site History

The site area was an undeveloped field in 2003 before being adopted as a part of the Meetings Industrial Estate. The proposed site occupies approximately 2ha on the Meetings Industrial Estate, Barrow. The north-east of the site is currently occupied by hardstanding used as a car park; the central area of the site includes a deposit of hardcore and rubble from previous works. In 2011 outline planning permission was granted for a datacentre and reserved matters were subsequently approved in 2013. Whilst the development was never built, some of the consented works commenced, namely earthworks, resulting in the rubble stockpile occupying the Site at the time of writing, and the creation of the attenuation pond to the west of the site.

2.0 NON-TECHNICAL SUMMARY

The Barrow Green Hydrogen project is an electrolytic hydrogen production plant to be operated by Barrow Green Hydrogen Ltd (BGH). The plant will have a capacity to produce up to 12,816kg of hydrogen per day. The core of the facility will be 6 no. containerized 5MW Proton Exchange Membrane (PEM) electrolysers. The electrolysers will draw up to 30MW of electricity and will be powered by 100% renewable electricity either from behind-the-meter local sources or imports via a dedicated grid connection.

The Site will operate as a stand-alone 'black box' providing hydrogen to feed the Kimberly Clark paper mill (EA permit ref. EPR/BJ7611IY) to the north via a buried pipeline. The pipeline will be installed and operated by a third party however who will take on the responsibility for it under an O&M contract. Pre-application discussions with the Environment Agency determined that the operation of the pipeline by a third party severs any technical connection between the two facilities and therefore the BGH project and Kimberley Clark paper mill are not considered to comprise a multi-operator installation.

The process design is based around modular electrolyser units each of which will include a dedicated stack, and most of the balance of plant equipment. The 6 units will each be able to operate independently. The units require a potable water feed, power, and nitrogen supply to the units to operate. The unit produces oxygen as a by-product from electrolysis. There will also be a low strength liquid effluent produced as a by-product of the water demineralisation system.

The electrolyser core stack system will produce hydrogen at 40 bar and 40°C. This will be further processed by a Hydrogen Purification System which consists of a deoxo-dryer to purify the hydrogen by virtually removing all the oxygen and water. After purification and drying,

hydrogen will be chilled and stored within 9 low pressure buffer tanks. Prior to supply off-site to Kimberly Clark, the pressure will be regulated to 2bar and the flow metered via a pressure regulation and metering skid.

A simplified block flow diagram of the production system and the various interfaces is presented below in Figure 1. The Site Layout and Environmental Permit Boundary are shown on Drawing 02.

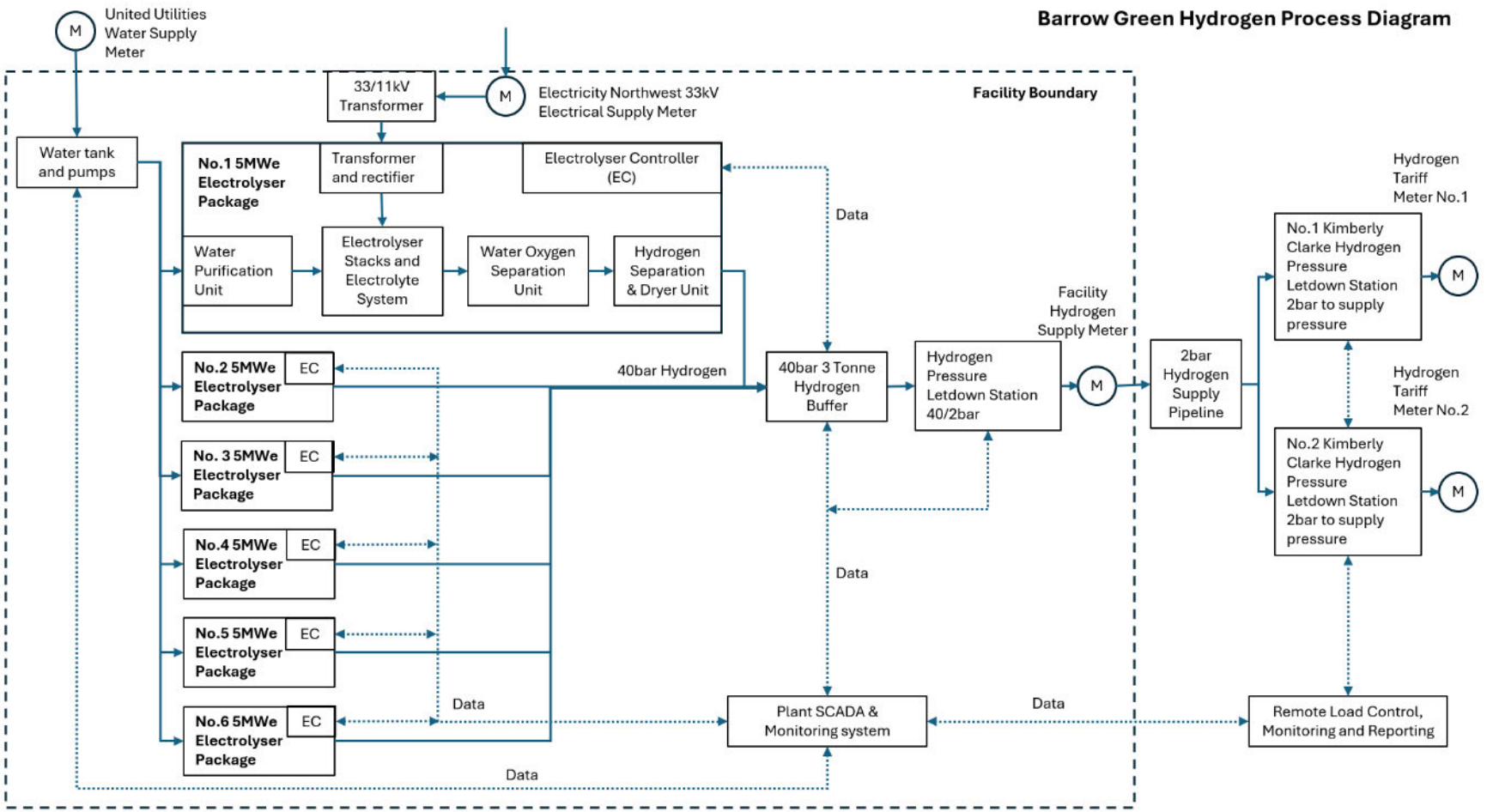


Figure 1 – Simplified Process Flow Diagram

2.1 Summary of the Regulated Facility

BGH will undertake the following 'installation' activity listed in Part 2 of the Environmental Permitting (England and Wales) Regulation 2016 (as amended) (EPR 2016):

- Chapter 4, Section 4.2, Part A(1) – Producing inorganic chemicals such as… hydrogen.

Activities which are directly associated to this listed activity can be summarised as follows:

- Water demineralisation plant – including production of demineralised waste to consumption in the electrolysis process, including generation and discharge of reverse osmosis effluent;
- Storage of gaseous hydrogen;
- Hydrogen purification and compression;
- Venting of oxygen and hydrogen to atmosphere;
- Surface water collection and discharge; and
- Operation of electrolyte and gas cooling systems.

2.2 What is Being Applied For?

BGH is applying for an environmental permit which will regulate those listed and directly associated activities as described in Section 2.1. BGH require a bespoke environmental permit as the operation is not exempt or eligible for a SR2009 No 2 standard rules environmental permit for a low impact installation.

2.3 Pre-Application Discussions with the Environment Agency

Enhanced pre-application advice was sought from the Environment Agency (EA) to inform the application. BGH, SLR and the EA met on 24th July 2025. A copy of the minutes from the meeting and the EA's pre-application advice received can be found within Appendix A.

2.4 Application Contents

2.4.1 Application Forms

Application forms and associated appendices have been completed and are enclosed in Appendix B of this application.

2.4.2 Site and Process Description

A detailed process description of the regulated activities and the control philosophy is provided in Section 3.0 along with the infrastructure which will be in place to prevent and, where this is not possible, minimise impacts upon the environment.

Along with Sections 4.0 to 6.0, this Section demonstrates how the requirements of the following EA guidance documents will be met:

- EA - Hydrogen production by electrolysis of water: emerging techniques (28th March 2024); and
- EA – How to comply with your environmental permit. additional guidance for: the inorganic chemicals sector – Sector Guidance Note S4.03 (March 2009).

2.4.3 Management

In Section 4.0, a description of the systems and procedures which will be employed to manage the activities and compliance with the environmental permit's conditions is provided.

2.4.4 Resource Efficiency

Section 5.0 of this application document covers resource efficiency, demonstrating that the consumption of energy / raw materials / water, waste generation and emissions to the environment will be avoided, minimised and recovered where possible.

2.4.5 Best Available Techniques (BAT) Assessment

A BAT Assessment is presented in Section 7.0. The BAT Assessment describes how the Site will be designed and operated in accordance with relevant BAT reference documents.

2.4.6 Surface Water Pollution Risk Assessment

As discussed in Section 3.14, there is a proposed discharge of process wastewater from the water purification plant serving each electrolyser. Given this, a Surface Water Pollution Risk Assessment (often referred to as an H1 assessment) has been prepared in accordance with the requirements of EA Surface Water Pollution Risk Assessment for your Environmental Permit guidance. The risk assessment carries out screening tests on pollutants contained within the discharge to assess whether they pose a risk to the environment.

The risk assessment, which is presented in Appendix C finds that all contaminants were considered not to be significant in terms of risk of an exceedance of Environmental Quality Standards in the downstream receiving water course or potential to significantly deteriorate the downstream receiving water quality.

2.4.7 Amenity and Accidents Risk Assessment

The Amenity Risk Assessment considers odour, fugitive emissions, dust, releases to water, litter, mud, birds, vermin and insects and accidents. The assessment concludes that with the implementation of the risk management measures described, potential hazards from the proposed development are not likely to be significant.

The Environmental Risk Assessment is enclosed in Appendix D.

2.4.8 Accident Risk Assessment & Management Plan

The Accident Risk Assessment & Management Plan is a qualitative assessment of the potential environmental risk associated with potential abnormal operating conditions and accidents and will detail the physical, automated and management control systems provided to prevent, minimise or render harmless such events.

The Accident Risk Assessment and Management Plan is presented in Appendix E.

2.4.9 Site Condition / Baseline Report

All new application for an environmental permit are required to be supported by a Site Condition Report (SCR).

The SCR describes and records the condition of the land and groundwater at the Site prior to commencement of operations at the Site with reference to relevant hazardous substances to be used, produced or released by the activities. BGH will use it as a reference point to demonstrate that it has protected land and groundwater during the lifetime of the Site and that the land is in a satisfactory state when it comes to surrender its environmental permit.

The Site Condition / Baseline Report is presented in Appendix F.

2.4.10 Noise Impact Assessment

Given the proximity of the Site to noise sensitive receptors, a Noise Impact Assessment (NIA) has been undertaken. The assessment has been undertaken in accordance with the EA's *Noise and vibration management: environmental permits* guidance, using BS4142:2014+A1:2019 as the assessment methodology.

The NIA predicts that that the specific sound level will be equal to or less than the baseline background sound level. With appropriate measures implemented to prevent or where that it is not practicable to minimise noise impact, the rating level is below the background level at all but one nearby sensitive receptor. At the Properties on Bank Lane to the northwest of the site a +1dB difference during the day is predicted, and during the night a +2dB difference is predicted.

It should be noted that the results of the NIA are considered to be conservative. It is based on sound power levels provided by the equipment manufacturers which are at guaranteed levels or based on applicable standards, rather than measured sound power levels. They are therefore conservative. SLR considers that the sound power levels provided are high compared to our experience.

In addition, a +3dB character correction was applied on a precautionary basis. Without this character correction, the rating level would be below the background sound level at all receptor locations.

It is therefore proposed that noise monitoring as outlined in the Noise Management Plan (NMP) is undertaken following commencement of operations to review the impacts.

A level difference between the rating level and the baseline background sound level of up to 5dB is, in accordance with BS4142, likely to be an indication of an adverse impact, depending on the context. A level difference between the rating level and the baseline background sound level of less than 0dB is indicative of a low or no impact.

The NIA is presented in Appendix G.

2.4.11 Noise Management Plan

A NMP has been prepared to ensure noise is managed appropriately. The NMP is for all employees, contractors and subcontractors involved in the design, management and operation of the Barrow Green Hydrogen plant. The Site Manager will be responsible for ensuring its implementation.

The NMP is presented in Appendix H.

2.4.12 Drawings

The following drawings have been prepared for the Site and are enclosed in the drawings section prior to the appendices:

- 01 Site Location Plan;
- 02 Site Layout and Environmental Permit Boundary;
- 03A Environmental Site Setting; and
- 03B Cultural and Natural Heritage.

2.5 Application Fee

The applicable fee for the application is made up of the following elements described in the EA's Environmental Permitting Charging Scheme (2022) amendments up to 18 August 2025:

- 1.4.1 – Section 4.2 – Production of a single inorganic chemical - £13,209;
- 1.19.1 – Habitats Risk Assessment - £779.
- 1.19.7 – Noise Management Plan - £1,246.

On this basis, the total charge for the application is £15,234.

2.6 Technical Standards and Key Control Measures

2.6.1 Technical Standards

Whilst at the time of writing specific BAT guidance for the production of Hydrogen via electrolysis has not been published by the EA, the following documents have been referenced as technical standards:

- EA – Hydrogen production by electrolysis of water: emerging techniques (March 2024);
- EA – Review of emerging techniques for hydrogen production from electrolysis of water (March 2024);
- European Commission – Best available techniques reference document for common waste water and waste gas treatment / management systems in the chemical sector (2016);
- European Commission – Best available techniques reference document for common waste gas management and treatment systems in the chemical sector (January 2023);
- UK BAT Office – Best available techniques reference document for common waste gas management and treatment systems in the chemical sector (Formal Draft 2025);
- EA – How to comply with your environmental permit. additional guidance for: the inorganic chemicals sector – Sector Guidance Note S4.03 (March 2009);
- European Commission – Best available techniques reference document for Industrial Cooling Systems (2001);
- European Commission – Best available techniques reference document for Energy Efficiency (2009)
- EA – Control and monitor your emissions for your environmental permit (December 2025);
- EA – Risk assessment for your environmental permit (December 2025);
- EA – A1 installations: environmental permits (July 2024); and
- EA – Best available techniques: environmental permits (July 2025).

2.6.2 Key Control Measures

The key technical standards and control measures that are necessary to ensure the Site does not give rise to significant environmental impact have been determined through the risk assessment process and are summarised below:

- venting of hydrogen will be avoided and mainly limited to Other Than Normal Operating Conditions (OTNOC) such as pressure relief, start-up, shut down and commissioning of the facility. During normal operations (including regeneration cycles) hydrogen will be minimised to approximately 1.5% of production capacity compared to BEIS estimates of 3-9%;
- activities will be managed in accordance with an environmental management system;
- performance against the environmental management system will be audited at regular intervals;
- an Integrated Control & Safety System (ICSS) will provide process control, monitoring, and safeguarding functionality for the site;
- emissions of noise will be minimised as follows:
    - housing of electrolysers within acoustic containers;
    - minimising of start-up and shut down periods;

- use of silencers on oxygen vents;
- use of acoustic hoods on process unit and utility unit air vents;
- selection of low noise generating equipment;
- facility will be unmanned with low number of vehicle movements and deliveries; and
- maintaining and operation of equipment in accordance with manufacturer's specifications.

- water will be sourced from the mains potable water supply;
- the feed water will be treated as little as necessary so as not to consume more water or raw materials than necessary and minimise the rejection of ions as waste-water;
- only a small number and low volume of raw materials are required to support the operations; and
- electricity to power the operations will come from low carbon emission sources with produced hydrogen to be compliant with the Low Carbon Hydrogen Standard of 20g CO_2e/MJ LHV.

3.0 SITE AND PROCESS DESCRIPTION

The core of the facility will be 6 no. Plug Power EX-2125D units, hereafter referred to as the 'modular electrolyser units'. Each unit comprises a Process Module and a Power Module as illustrated in Figure 2.

The Process Module will produce and purify the hydrogen from water supplied by United Utilities and low voltage direct current (DC) supplied by the Power Module.

3.1 Process Module

Each Process Module is housed within two stacked 40-foot containers. Inside the containers are divided into:

- A Process Container; and
- A Utility Container.

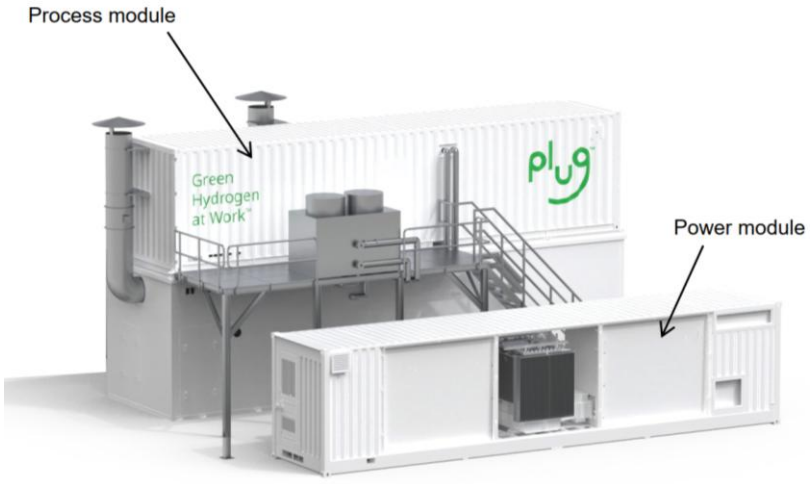


Figure 2 – Plug Power EX-2125D Platform

3.1.1 Process Description

The Hydrogen Generation System is designed to generate hydrogen from potable water using Proton Exchange Electrolysis (PEM).

The key processes within the Process Module are summarised as follows:

3.1.1.1 Water Treatment

Water will be sourced from the United Utilities mains potable water supply. As Ultra Pure Water (UPW) is required for the electrolyser stacks, it requires treatment to make it usable. The potable water will be treated in the water treatment package, where impurities (such as salts and dissolved gasses) are removed by means of activated carbon filtration, water softening, reverse osmosis, membrane degassing, electro-deionization and UV disinfection. The produced UPW is routed to the anode separator for further distribution in the system. The impurities are removed in a reject water stream which will be discharged into the Site's attenuation pond prior to controlled release, ultimately discharging into the Walney Channel.

As there is, during operation, potential ingress of ions in the system, part of the UPW utilised for the stacks operation is recirculated (downstream of the anode heat exchanger) back to the water treatment package for removal of these impurities.

3.1.1.2 Power Conversion

The transformer/rectifier converts medium voltage alternating current (AC), to low voltage (<1500V) direct current (DC) required for the electrolysis process in the stacks. The voltage and current are controlled to achieve hydrogen production at the required setpoint.

The Power Converter is connected by means of DC power cables to the five stacks. One Power Converter powers the five stacks which are electrically operated in series by means of busbars. The Power Converter is equipped with its own cooling system.

The transformer is KNAN type and is foreseen with tap changers. By increasing the voltage towards the stacks, the hydrogen output will remain the same over the lifetime of the stacks.

3.1.1.3 Anode Side

The UPW from the water treatment package to the anode separator is regulated by a level control valve, the purpose of which, is to keep the level in the anode separator constant. The UPW from the anode separator is provided to the 5 stacks in parallel. To achieve the required flow and pressure the anode pump is utilised. The required cooling is achieved through a plate and frame anode heat exchanger in conjunction with the flow controller which regulates the variable frequency drive (VFD) (and thus the flow) of the anode pump (refer to 3.1.1.7 Cooling). The outlet of the anode side of the stacks (UPW and oxygen) is routed back to the anode separator, where the oxygen is separated from the UPW. The oxygen is vented to atmosphere. To achieve the required backpressure for optimal operation on the stacks a pressure control valve is utilised which is located at the oxygen outlet.

3.1.1.4 Electrolysis

In this process, five stacks, containing a large number of electrolysis cells in series, are energised. The stacks consume electricity for the electrochemical splitting of water. During this reaction the stacks generate waste heat which needs to be removed to prevent the stacks from overheating. This is done by circulating water across the stacks.

On the anode side of the membrane oxygen is produced and on the cathode side hydrogen is produced. During the electrolysis process some water is dragged through the membrane from the anode to the cathode side. The hydrogen and water are routed to the cathode separator.

3.1.1.5 Cathode Side

The water and hydrogen from the cathode side of the stack are routed to the cathode separator where the water and hydrogen are separated. The level in the cathode separator is controlled with a level control valve. The UPW separated from the hydrogen in the cathode separator is routed back to the

anode separator for re-use in the electrolysis process. To achieve the required backpressure on the cathode side of the stacks (and the hydrogen treatment) a pressure control valve is utilised.

3.1.1.6 Hydrogen Purification System (HPS)

The hydrogen from the cathode section contains trace amounts of oxygen and is fully saturated with water vapour. Therefore, to achieve the required hydrogen purity, the hydrogen requires treatment to dry it and remove impurities. Oxygen is removed with use of a deoxidiser. A regenerative dryer (duty/ standby) is used to remove the water vapour from the hydrogen stream to achieve the required purity. The removed impurities are discharged to atmosphere.

The hydrogen provided to end-users will be = 99.999% hydrogen with <5ppm O_2 and <5ppm H_2O).

Gas quality analysers will be used to monitor the gas quality. There will be two gas quality analysers:

1. Dew Point Analyser (temperature readout) - during hydrogen production, the moisture content is continuously analysed at the HPS outlet.

2. OTH – Oxygen in Hydrogen (ppm level) - during hydrogen production, the O_2 content is continuously analysed at the HPS outlet.

In the event, of hydrogen being off-specification, the control system would direct hydrogen to the vent stack.

3.1.1.7 Cooling

During the electrolysis process, excess heat is produced. This heat is removed by circulating an excess of UPW across the stacks. This is done by the anode heat exchanger together with the cooling circuit, including the coolant pump, air cooler and temperature controller, which controls the air cooler local VFD (and thus the fan speed and cooling). The temperature control valve in the cooling water loop regulates the amount of cooling water circulation and thus the temperature in the UPW circulation loop is adjusted to the correct temperature.

3.1.2 Utilities

3.1.2.1 Instrument Air

Instrument air is required for operating the control, on/off and shutdown valves in the package. This instrument air is generated by the instrument air package with the required pressure and dewpoint for the processes requiring instrument air.

3.1.2.2 Air Conditioning

The environment in the utility container is managed by a heating, ventilation and air conditioning (HVAC) unit.

3.1.2.3 Air conditioning of process enclosure

The bottom container environment is managed by container ventilation which is controlled by a temperature controller regulating VFD fan. Heating is managed by two space heaters.

3.1.2.4 Stack ventilation

The stack ventilation is managed by dedicated ventilation, which is always in operation when the stacks are operated. The stacks themselves are not certified for use in a hazardous area. The chosen approach is to install the stacks in a dedicated enclosure and provide artificial ventilation such that the area containing the stacks follow the requirements as per IEC 60079-13 to reach the level of protection “vc” (Equipment Protection Level Gc) as per section 4.2.2 of IEC 60079-13, and permit the use of non-Ex equipment in the classified area.

3.1.2.5 Nitrogen

Nitrogen will be used to purge parts of the system during an emergency shutdown. It will also be used for blanketing the gas analysers to prevent saturation and damage of the cell.

3.2 Key Design Points

- Pressure vessels are designed according to ASME BPVC Section VIII Div 1 construction code and PED approved by a recognized notified body.
- Gas and demineralised water system piping are made of SS 316/316L and designed according to ASME B31.12 construction code. Welding Neck Raised Face flanges are used in according with EN-1092-1 and tightened with metric bolts. Gaskets used are soft PTFE or Spiral Wound type (PTFE or graphite filled).
- Glycol Cooling circuits are made of corrosion free polypropylene piping.
- Instrument air lines are made of Polyamid plastic.
- The process assembly is certified by a recognised notification body using the PED Modules B and D, where Module B is the product technical type approval and Module D is the Quality Management System. The requirements for the integration and measures for exceeding its design limits of the complete process assembly are based on the highest possible category of the PED, category IV.
- Pressure safety & relief valves are used to protect the system for over pressurisation across the system. They are designed according to the guidelines of API 520/521.
- To ensure oxygen compatibility, the following are implemented:
  - Oxygen gas velocity is verified against EIGA Doc 13/12/E standard that defines maximum velocity.
  - Every component in contact with gaseous oxygen is selected or designed to ensure that the oxygen wetted parts are oxygen compatible.
  - Every purchased or made component in contact with oxygen will be cleaned, degreased and specifically packaged according to the requirements of ASTM G93.
- Earthing System follows the guidelines of normative standards (IEC 60364, IEC 60204 and IEC 60079) as required by the European Machine directive.
- An internal lightning protection system is part of the product design and includes:
  - Equipotential bonding to prevent the occurrence of dangerous sparking; and
  - Surge protection devices to protect against transient and high-energy voltage peaks.

3.3 Technology Selection

When considering the overall benefits of the different commercially available electrolysis technologies available for the production of hydrogen via electrolysis (Proton Exchange Membrane or PEM, alkaline water and solid oxide electrolysis), BGH selected PEM due to its:

Dynamic and flexible operation PEM electrolysers are capable of ramping up and down production of hydrogen in response to external signals such as the intermittent production of electricity from renewables, therefore ramping up production in line with when renewables are generating sufficient electricity. This effective use of renewable energy results in the production of low carbon hydrogen. PEM electrolysers can quickly respond to fluctuations in electrical input, allowing for efficient integration with renewable energy sources and power-to-gas systems, making them more cost effective and therefore offsetting their production costs.

Electricity conversion They offer high conversion efficiency making them ideal for applications that require rapid responses and intermittent operation.

Low-temperature operation PEM electrolysers operate at low temperatures below 100°C, enabling quick start-up times and energy efficiency.

Design PEM electrolysers are also known for their compactness. They can be placed in areas of potential constraints to soak up excess generation, avoiding lost power and curtailment costs whilst producing a versatile and low-carbon fuel. Their modular design enables units to be easily replaced.

3.4 Modularisation

The Plug Power EX-2125D unit is modularised as standard with the utilities, cooling and water purification included within the process container. BGH did consider centralising the utilities, cooling and water purification during the scoping and design of the scheme however the onus for the installation, wiring, controls, commissioning and process guarantees would move from Plug Power to BGH. Keeping the electrolyser modularised means that Plug Power is responsible for the construction, installation and process guarantees.

3.5 Balance of Plant

The balance of plant serving the electrolyser process units can be summarised as follows:

3.5.1 Utilities

3.5.1.1 Potable Water Storage Tank & Distribution

A connection to United Utilities will provide potable water to the Site. Potable water will be routed, via a Low Carbon Hydrogen Agreement (LCHA) compliant fiscal metering system.

Potable water will be stored within a tank to provide a short-term buffer in case of variability in the water supply. The potable water is pumped from the tank via a manifold to the electrolyser units for use.

3.5.1.2 Instrument Air Package & Distribution

The Instrument Air Package will supply dry air and will include compressors (2 x 100%), one duty and one standby, filters and dryer. Plant air will be provided directly from the package to the plant air distribution header servicing the utility stations. The dry instrument air is routed to the Instrument Air Receiver and to the instrument air supply manifold (to balance the plant control valves, shutdown valves and packages). The Instrument Air Receiver is sized to ensure the plant can shut down safely if the Instrument Air Package stops (e.g. due to fault or loss of power).

3.5.1.3 Nitrogen System & Distribution

Nitrogen will be required for use in the modular electrolyser units for purging and tank blanketing. Each electrolyser unit will be provided with nitrogen cylinder packs. An automatic switchover panel on the outside wall of each modular electrolyser unit will automatically switch over from one cylinder to another, when one is empty.

Nitrogen will also be required for the balance of plant Compression Package and for maintenance purging (via utility stations).

3.5.1.4 Wastewater Collection & Disposal System

A Wastewater Sump will collect wastewater from the electrolyser units only. The electrolyser units will produce a continuous wastewater stream from their water purification systems which is routed via underground gravity drainage piping to the Wastewater Sump.

The Wastewater Sump will comprise a concrete sump which is lined to minimise the potential for degradation of the concrete and associated potential failure. A sump pump will be used to pump from the sump prior to discharge along with Site surface water into the Site's attenuation lagoon. There will be one working and one stand-by pump to control the level in the sump. A level controller will operate the pumps to maintain the level in the sump, but the pumps will also be capable of being operated remotely.

The system will include flow metering, facilities for manual sampling of wastewater, emptying via a vacuum tanker in the event of wastewater being off-specification and an isolation valve prior to discharge.

Periodic maintenance inspections will be undertaken of the wastewater sump to assure its integrity.

3.5.1.5 Substation & Transformers

Outside of the packaged electrolysers, transformers are proposed to convert the high voltage electricity supply to medium and low voltages to supply the plant. A 33kv / 11kv substation will be located on Site, along with a 11kV to 415V distribution transformer.

3.5.2 Post-Electrolyser

3.5.2.1 Hydrogen Buffer Vessels

The hydrogen produced by the modular electrolyser units will be manifolded and routed to one of 9 128,000 litre Hydrogen Buffer Vessels which are provided to smooth supply between the electrolyser units and the hydrogen pipeline user.

The storage vessels operate as a single entity; all being online together with a single pipe to each vessel for both inlet and outlet. Each vessel can be isolated with its own manual DB&B valve and its close coupled emergency shut off valve (ESOV). The emergency shut down system will close all tank ESOVs in the event of an emergency.

The close coupled ESOV will have a fail closed, air driven, spring return actuator fitted.

The Hydrogen Buffer Vessels are sized to provide approximately 2.84 hours of the maximum hydrogen production rate with a rise in pressure from 20barg to 40barg (where the electrolysers will automatically switch to "HOLD" mode).

The Hydrogen Buffer Vessels will provide between 1.4 and 2.7 hours of buffer to the hydrogen pipeline user by drawing down the vessel pressure from 40barg to 20barg, depending on the hydrogen production rate. This buffer can be utilised by Kimberley Clark to take action to switch to an alternative fuel.

3.5.2.2 Hydrogen Let-down and Metering

The hydrogen will be routed from the Hydrogen Buffer Vessels to the pressure let-down station where the hydrogen will be reduced in pressure so that the pressure upon export will be 2barg.

After pressure letdown, the flow of hydrogen to export will be metered at the Metering Station by a fiscal metering package. This metering package will comply with the LCHA specification.

The Hydrogen Metering Station will be a skid mounted unit consisting of two-meter runs – one duty and one standby. The skid includes pneumatic valves and piping which allow the meters to operate independently, in parallel, or in series as required. Flow will be measured by Coriolis meter. The packages include temperature and density measurement required for flow measurement.

3.5.2.3 Hydrogen User Pipeline

Hydrogen will flow into the pipeline via the aforementioned let down station and meter. While owned by BGH, the pipeline will be operated by a third party pipeline operator under an O&M contract. The third party will be the legal operator of the pipeline due to employing all staff associated with the operation and maintenance of the pipeline and will be responsible for its closure in an emergency. BGH will be obliged to follow instructions from the third party pipeline operator with respect to the status of the pipeline and its use for transport of hydrogen to Kimberley Clark.

3.5.3 Gas and Fire Detection Systems

To monitor for loss of containment and/or outbreak of fire, detection devices shall be strategically positioned around the facility. The detection devices form part of an integrated Fire and Gas System (FGS) which shall, on detection of a fire or loss of containment of hydrogen, automatically initiate the appropriate active fire protection measures and initiate the appropriate level of shutdown.

Hydrogen gas detection will be installed on site covering low-level (ground) potential vent sources. In addition, gas detectors will be installed at the chillers, hydrogen let down station, and at the storage vessel common headers and each electrolyser will have its own gas detection located within the container. Considering the radial effectiveness of ultrasonic leak detectors, 1 beacon sounder will be installed for every 3 storage vessels at the common headers, these will also cover the chillers and hydrogen let down station.

In the event of a confirmed fire or gas incident, the FGS will request the Emergency Shutdown System (ESD) to initiate an appropriate level of shutdown (e.g., Total, Production, per electrolyser, or Unit).

Confirmed fire detection in an electrolyser unit will result in an appropriate level of shutdown followed by depressurisation of the affected electrolyser(s).

Confirmed gas detection in a process or utility area within the balance of plant will result in an appropriate level of shutdown (plant wide) followed by depressurisation (by operators) of the affected process area(s).

Confirmed fire or gas detection will implement electrical isolations in the affected area as required. These actions will be made directly by the FGS system logic acting on electrical equipment.

The aim of firefighting capability for process areas onsite shall not be to extinguish ignited hydrogen events (including those from vents). This is due to the potential for a subsequent explosion should a gas cloud build-up be allowed to occur. The firefighting approach for hydrogen is to isolate the source of the leak quickly to reduce the inventory which can be released and let the fire burn until the inventory is consumed. No provision will be made at the Site for directly fighting a process fire caused by hydrogen.

No manual firefighting system is provided since the facility is normally unattended and the Fire and Rescue Service would not arrive at the facility until after notice from BGH personnel. By this time along with successful detection and isolation, the inventory should have depleted and fires will have extinguished due to loss of fuel source.

3.6 Control Philosophy

The Site shall be normally unmanned with control and monitoring undertaken 24 hours a day from a Remote-Control Room (RCR). There will be a ground operations team to mobilise to the Site to provide support during emergency situations and for programmed maintenance, troubleshooting and surveillance activities.

The Integrated Control & Safety System (ICSS) provides overall process control, monitoring, and safeguarding functionality for the site. The ICSS consists of the following core systems:

- Basic Process Control System (BPCS);
- Emergency Shutdown System (ESD); and
- Fire and Gas System (FGS).

3.6.1 Hydrogen System Control

The normal operating case is that the Site will be required to supply hydrogen to the pipeline at 2barg. The quantity of hydrogen produced by the electrolysers will be influenced by the level of renewable electricity supply available to the Site and the quantity of hydrogen that can be consumed by the downstream user.

The downstream processes have a thermal load in excess of the capacity of the electrolyser plant and will therefore consume the hydrogen in parallel with the existing natural gas supply. This will either be as a bulk blend of hydrogen in natural gas, or with individual ports configured to combust natural gas and hydrogen separately available.

The operating philosophy will be as follows:

- Hydrogen production is managed by the Master Controller in the ICSS and will operate on either a flow control mode or a pressure control mode, depending on site requirements and operating conditions at that time;
- All electrolysers are normally online, and ramp-up / ramp-down to meet a pre-determined flowrate profile; and
- For extended periods of low renewable energy generation (days / weeks), one or more electrolyser(s) may be taken offline.

3.6.1.1 Hydrogen Production Control

Hydrogen will be produced by the 6 modular electrolyser units and manifolded and routed to the Hydrogen Buffer Vessels.

Each electrolyser unit operates independently with its own Programmable Logic Controller (PLC) that operates its own Safety Instrumented System, Fire and Gas System and Basic Process Control System (BPCS). To start each electrolyser, the operator provides a start signal via the ICSS and the start-up sequence will be executed automatically. During operation, the hydrogen production setpoint can be changed based on demand. To stop, the operator sends a stop signal via the ICSS, and the stop sequence will be executed automatically.

The operating pressure for the hydrogen manifold and storage vessel is set at approximately 40barg to allow sufficient buffer to minimise the electrolysers unnecessarily switching to “HOLD” mode.

3.6.1.2 Hydrogen Production Master Controller

The overall hydrogen production and export is managed by the Master Controller which resides in the ICSS and will operate on either a flow control basis or a pressure control basis, depending on Site requirements and operating conditions at that time.

Under normal operation, the Master Controller operates in flow control mode, producing as much hydrogen as possible from the available renewable electricity. The electrolysers ramp-up / ramp-down to meet a pre-determined daily supply profile agreed with the pipeline operator.

The Master Controller will continually monitor pipeline pressure. Should the hydrogen demand from the downstream users fall below the rate of production, the pipeline pressure will increase and if it reaches a certain set-point, it will trigger the Master Controller to transition from flow control mode to pressure control mode.

If hydrogen production is disrupted / stopped (e.g. one or more electrolysers trip), the Master Controller will manage the draw-down of the Hydrogen Buffer Vessels.

3.6.1.3 Hydrogen Buffer Vessel Control

If there is disruption to forward flow so that pressure in the Hydrogen Buffer Vessel exceeds 40barg, each electrolyser's PLC will automatically switch the electrolysers to "HOLD" mode. This results in routing all production to the electrolyser vent and reducing production rate to the minimum production rate.

The Hydrogen Buffer Vessels are sized to allow 2.84 seconds of maximum production rate from 20barg to 40barg (at full production capacity) to minimise the electrolysers switching to HOLD mode unnecessarily.

Assuming maximum demand of 1,084kg/hr and depending on hydrogen production rate, the Hydrogen Buffer vessels will provide between 1.4 and 2.7 hours of buffer volume by drawing down the Buffer Vessels pressure from 40barg to 20barg. If hydrogen production is disrupted / stopped (e.g. one or more electrolysers trip), the Master Controller will manage the draw-down of the storage vessels to maintain hydrogen flow to the downstream users for a short period of time and allow transition to natural gas.

3.7 Production Capacity

At the Site's beginning of life (BoL) it will have a production capacity of 6,015Nm^3/h H_2 or 534kg/h. Given the daily regeneration cycle to be performed by each electrolyser, the daily production capacity will be 141,594Nm^3/d H_2 or 12,602kg/d. In practice however it is expected that the electrolysers will operate for approximately 16 hours per day, producing approximately 96,240Nm^3/h H2 or 8,544kg/d.

The electrolyser efficiency is expected to decline by 1% annually. On a conservative basis, BGH has allowed for up 2% efficiency drop per year over 8 years at which point the electrolyser stacks are envisaged to require replacement.

As such, the end of life (EoL) production capacity is predicted to be 84% of that at BoL (5,053Nm^3/h H_2 or 449kg/h).

3.8 Hydrogen Specification

Produced hydrogen will meet the specification in Table 1.

Table 1 – Hydrogen Specification

Component	Specification
Hydrogen	99.999 mole%
Oxygen	<5ppm
Water	<5ppm (-70°C dew point)
Nitrogen	<12ppm

3.9 Key Performance Indicators

Key performance indicators for the plant at BoL 100% production capacity is summarised in Table 2.

Table 2 – Key Performance Indicators

Key Performance Indicator	Value expected	Units
Site Specific Power Consumption	5.27	kWh / Nm^3 H_2

Key Performance Indicator	Value expected	Units
	59.34	kWh / kg H_2
Specific Water Consumption	1.33	litres / Nm^3 H_2
	15.01	kg / kg H_2
Stack Efficiency (DC efficiency)	4.4 +/- 2%	kWh / Nm^3 H_2
	49.9 +/- 2%	kWh / kg H_2
Electrolyser System Efficiency	4.81	kWh / Nm^3 H_2
	54.21	kWh / kg H_2

3.10 Other Than Normal Operating Conditions

The following Other Than Normal Operating Conditions (OTNOC) are envisaged. Prior to commencement of operations, BGH will produce and implement an OTNOC management plan into their EMS.

3.10.1 Regeneration

At a maximum frequency of once per day, each electrolyser's water purification system will require regeneration by flushing with clean water to prevent fouling of the equipment. This avoids the need to dose the system with chemicals such as water softeners and biocides.

3.10.2 Start-Up / Shut Down

3.10.2.1 Shut Down

There are a number of reasons why shut down of the electrolyser(s) may be necessary. These are summarised in Table 3.

Table 3 - Shut Down Reasons

Shutdown reason	Description
Normal managed stop	Normal managed stop is for operational requirements where the operating electrolysers are stopped in a controlled manner, for example to conduct maintenance. When the electrolysers receive a stop command, the electrolyser systems stop hydrogen production and initiate automatic depressurisation followed by inerting with nitrogen.
Single Electrolyser Fault	The electrolyser in question will shutdown and be depressurised followed by inerting with nitrogen. The remaining electrolysers and the balance of plant systems will continue to operate.
Process Shutdown	A process shutdown can be initiated by the electrolysers or the balance of plant systems. The balance of plant trips may include high hydrogen export temperature / pressure and utility system upsets. The process shutdown stops the electrolysers and utility systems as required. The system isolation

Shutdown reason	Description
	valves are closed at the inlet and outlet battery limits and the XZV valves on the hydrogen manifold system are closed. When the electrolysers receive a STOP command, the electrolyser systems stop hydrogen production and initiate automatic depressurisation and followed by inerting with nitrogen.
Plant-wide ESD	A plant-wide ESD results in the trip of the electrolysers, and utility systems as required. The site isolation valves are closed at the inlet and outlet battery limits. When the electrolysers receive an ESD command, the electrolyser systems stop all processes at once and initiate automatic depressurisation and followed by rapid inerting with nitrogen.

In all cases, the shut-down will result in the venting of hydrogen. Accordingly, shut down of the systems will be avoided and minimised to maintenance, emergency or extended periods of low renewable energy generation (days / weeks). Where necessary and possible, turndown of the electrolysers will be prioritised.

3.10.2.2 Start Up

During start-up, the systems will be purged with nitrogen before being purged with hydrogen. Until such time that the hydrogen quality meets the required specification it will be necessary to vent hydrogen to atmosphere.

Start-up will only be necessary following shut down as described in Section 3.10.2.1 and will therefore be minimised. The length of time in start-up will kept to a minimum.

3.10.3 Off-Specification Hydrogen

Off-specification hydrogen will require venting and as such will be avoided as much as possible. In the event of off-specification hydrogen being identified, the cause will identified and appropriate remedial action taken, this may necessitate shut down of an electrolyser to enable maintenance.

3.10.4 Commissioning

During the commissioning period, it will be necessary to vent hydrogen to atmosphere until the hydrogen quality is verified to the specification as required under the LCHA. Prior to operation of the plant, BGH will produce and supply a Commissioning Plan for the facility to the EA.

3.11 Information Sharing

As discussed in Section 2.0, the facility is not considered to comprise a multi-operator installation along with its sole off taker, the Kimberly Clark paper mill, but BGH and Kimberley Clark will share information for the purpose of managing operations and environmental permit compliance.

3.11.1 Process Monitoring Data

To facility consumption of hydrogen, blending of hydrogen with natural gas or switching to natural gas depending on the availability of supply, BGH will supply Kimberley Clark with process information including:

- hydrogen storage tank pressure;

- total electrolyser hydrogen output;
- hydrogen flowrate to pipeline; and
- notification of ESOV trips.

In turn, Kimberley Clark will match hydrogen consumption with production rate and reduce intake when the storage tank pressure falls to 20barg. Kimberley Clark will be required to provide BGH with information including hydrogen consumption and notification of ESOV trips.

Information relating to gas quality, moisture content, pressure, temperature and flow will be supplied to the third party pipeline operator.

3.11.2 Notifications

BGH and Kimberley Clark will notify each other of planned maintenance activities and changes to operations which impact upon hydrogen production or consumption rates so that the two parties can coordinate maintenance activities and manage production / consumption rates accordingly.

Similarly, BGH and Kimberley Clark will notify each other of business matters that could impact upon each other's operations including, but not limited to, for example: change of ownership, change in personnel, partial or total site closure / reduction in thermal input, planned administration, entering a company voluntary arrangement or being wound up.

3.12 Design of the Process

The design of the facility has been completed with consideration to reducing impact to the environment at the forefront of the design specifications. A HAZOP has been completed to inform the design and incorporate safeguards to avoid, or where this is not possible, minimise the likelihood and severity of hazards having an impact.

The design has included environmental assessment of:

- the use of raw materials (see Section 5.2);
- all routine emissions, discharges and solid/liquid waste streams (see Section 6.0); and
- non-routine or unplanned releases from for example start up and shutdown, off-specification hydrogen, spillages and pressure relief (see Section 3.9).

BGH plans to measure, control and record the quantity and quality of emissions, discharges and waste generation as outlined in Sections 5.0 and 6.0.

3.13 Site Surfacing

Operational areas of the Site will be provided with an impermeable pavement with an engineered drainage system for pollution prevention control purposes. The drainage serving the paved operational areas of the Site is described in Section 3.14. Non-operational areas of the Site will be landscaped with surface water drainage comprising percolation and runoff to the Site's attenuation lagoon as per the site's current arrangement.

3.14 Drainage

Drainage of the Site is illustrated on Drawing 02 Site Layout and Environmental Permit Boundary and Flood Risk Assessment (Curtins, 2022) enclosed as Appendix I and discussed below:

3.14.1 Process Wastewater

BGH propose to discharge Process Wastewater from the Wastewater Collection & Disposal System (3.5.1.4) along with Site Surface Water into an existing drain to the north of the Site at SW1 as shown

on Drawing 02 at approximately NGR SD 19285 72167. The discharge of the combined Process Wastewater and Site Surface Water would be made via a Flow Control Chamber at greenfield run off rates (7.7l/s) and Class 1 Full Retention Separator. The drain flows westwards under the railway before ultimately outfalling into the Walney Channel at approximately. NGR SD 18943 72196 as illustrated in Figure 3.

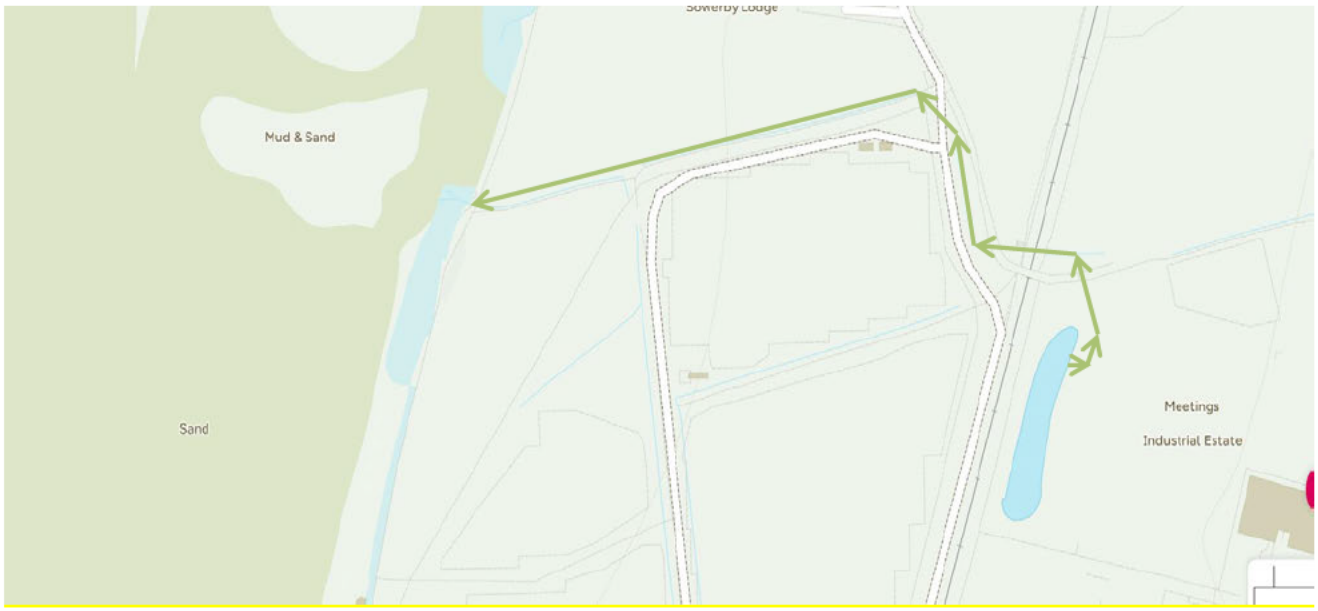


Figure 3 Connectivity of Site, local drainage and Walney Channel

3.14.2 Site Surface Water

3.14.2.1 Operational Areas

Rainwater falling on site surfaces and roofs will drain to the Site's attenuation pond prior to being discharged along with Process Wastewater as described in Section 3.14.1.

Downstream of the attenuation pond, a Class 1 full retention separator will be provided.

3.14.2.2 Landscaped Areas

Areas within the Site's environmental permit boundary which will be non-operational will be landscaped and allowed to drain naturally as per the Site's current arrangements.

3.14.3 Domestic Wastewater

Wastewater from domestic facilities on Site will be handled separately to Process Wastewater generated on Site. Domestic Wastewater will be collected in a septic tank, prior to collection and transport off-site for disposal at a suitably licensed wastewater management facility, or discharged to public foul sewer.

4.0 MANAGEMENT

4.1 Environmental Management System

The facility will implement an Environmental Management System (EMS) accredited to the ISO 14001 standard.

The management system operated by BGH will ensure that;

- the risks that the activities pose to the environment are identified;
- the measures that are required to minimise the risks are identified;
- the activities are managed in accordance with the EMS;
- performance against the EMS is audited at regular intervals; and
- the Environmental Permit is complied with.

In accordance with BAT, the EMS will incorporate all of the following features:

- commitment of the management, including senior management;
- an environmental policy that includes the continuous improvement of the installation by the management;
- planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;
- implementation of procedures paying particular attention to:
  - structure and responsibility;
  - recruitment, training, awareness and competence;
  - communication;
  - employee involvement;
  - documentation;
  - effective process control;
  - maintenance programmes;
  - emergency preparedness and response;
  - safeguarding compliance with environmental legislation; and
  - checking performance and taking corrective action;
- monitoring and measurement;
- corrective and preventive action;
- maintenance of records; and
- independent internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained.

The EMS will be reviewed at least once every four years or in response to significant changes to activities, accidents or non-compliance. The EMS will be supplemented by this application which outlines the proposed operating techniques at the Site and demonstrates conformance with the requirements of relevant EA guidance.

4.2 Management Structure and Responsibilities

The Site Manager will be responsible for day-to-day operations and compliance with the Environmental Permit.

The site will be remotely manned by at least one member of staff who is suitably trained and fully conversant with the requirements of the permit regarding:

- operational controls;
- maintenance;

- record-keeping;
- emergency action plans; and
- notifications to the EA.

4.3 Site Security

In order to prevent unauthorised access, the Site will be fenced, provided with locked access gates and 24-hour CCTV. Only authorised personnel will have access to the Site. All visitors to the Site will be required to sign in and out.

The Site security will be inspected regularly. Any defects or damage which compromise the integrity of the fencing or access gates will be made secure by temporary repair by the end of the working day. Permanent repairs will be affected as soon as practicable.

All inspections, any defects, damage or repairs will be recorded in the Site diary.

4.4 Display of Environmental Permit

A copy of the EP will be kept available for reference by all staff and contractors whose work may have an impact on the environment. This will include any revisions, updates, or changes to the EP.

4.5 Managing Documentation and Records

Controls will be put in place to ensure that all documents are issued, revised and maintained in a consistent fashion.

The documents that will be included within the scope of the controls are as follows:

- policies;
- responsibilities;
- targets;
- maintenance records;
- procedures;
- monitoring records;
- results of audits;
- results of reviews;
- complaints and incident records; and
- training records.

4.6 Reporting Non-Compliance and Taking Corrective Action

Non-compliances detected on Site will be reported, investigated and rectified. Staff will maintain awareness of non-compliances in the following areas:

- actual or potential non-compliance;
- system failure discovered at internal audit;
- suppliers or subcontractors breaking the agreed operating rules;
- incidents, accidents, and emergencies;
- other operational system failure; and

- complaints.

The action taken in response to the non-conformance may include:

- obtaining additional information on the nature and extent of the non-conformance;
- discussing and testing alternative solutions;
- modifying procedures and responsibilities;
- seeking approval for additional resources and training; and
- contacting suppliers and contractors.

4.7 Auditing and Legal Compliance

BGH will employ a procedure to ensure the facility is audited at defined intervals and that the progress of corrective and preventative action is monitored.

4.8 Environmental Performance Indicators

A formalised management structure will be in place at the site to ensure that environmental performance is reviewed at least once a year. This will include monitoring and benchmarking the facility's environmental performance and addressing any necessary actions to minimise environmental impacts from the Site. Indicators will be based on a tonne of hydrogen produced basis to provide a basis of measuring performance year on year.

4.9 Operational Control, Preventative Maintenance and Calibration

The EMS will contain operational procedures that will ensure effective control of Site operations, the use of approved suppliers and contract services, the maintenance of operational equipment and the calibration of monitoring equipment.

All plant and equipment will be subject to a programme of planned preventative maintenance which will follow the inspection and maintenance schedule recommended by the manufacturer.

BGH will implement a Leak Detection and Repair (LDAR) programme to minimise releases including from joints, flanges, seals and glands. The LDAR programme will be used to eliminate and reduce fugitive emissions of hydrogen.

4.10 Design and Construction Quality Assurance

All relevant elements of the facility have been designed in accordance with recognised standards, methodologies and practices.

The design process has employed a risk-based approach and appropriate documents using drawings, specifications and method statements to provide an adequate audit trail.

Construction Quality Assurance (CQA) plans will govern all construction activities. These CQA plans will be prepared by competent and suitably qualified persons and will detail the assurance and validation process for relevant elements of the facility, which shall include:

- material selection;
- handling, storage and installation;
- conformance and performance testing; and
- inspection and validation.

A competent and suitably qualified person will supervise the construction activities and prepare a validation report confirming that the construction activities have been carried out in accordance with

the CQA plan.

BGH require subcontractors to work to recognised quality and environmental standards.

4.11 Accident Management

BGH recognises the importance of the prevention of accidents that may have environmental consequences and minimising those consequences.

An accident management plan for the proposed additional activities will be implemented and maintained at the Site to ensure the Site and Site staff will be fully prepared for any such incidents. The accident management plan will be reviewed at least every four years or as soon as practicable after an incident, with changes made accordingly to minimise the risk of occurrence.

To inform the design of the Site to date, both HAZID and HAZOP studies have been undertaken by BGH to assess the balance of plant and its interface with the electrolysers which are supplied on a turnkey basis by the Original Equipment Manufacturer (OEM).

A high-level Accident Risk Assessment and Management Plan describes the techniques that will be implemented to minimise the risks posed to the environment and is included as Appendix E for the purposes of this application. Following detailed design, this will be revised prior to commencement of operations.

Activities affecting the health and safety (H&S) of operatives, contractors and visitors will be separately managed in compliance with H&S regulation and company H&S Policy.

5.0 RESOURCE EFFICIENCY

5.1 Energy Efficiency, Process Efficiency and Cooling

The following measures on Site will be implemented to ensure high energy efficiency:

- use of electricity from low carbon emission sources (<20gCO2/MJ);
- use of IE3 energy efficient motors and variable speed drives;
- use of LED lighting;
- use of an advanced process control system;
- reducing compressed air system leaks using welded pipework and monitoring to detect leakages;
- use of insulation to reduce heat losses;
- planned preventative maintenance of equipment;
- operation of equipment in accordance manufacturer's recommendations; and
- continual and periodic review of operations and identification of areas or practices that would result in improved energy efficiency.

5.1.1 Energy Consumption

The Site will use approximately 31.6MW of electricity at maximum production capacity, depending on trace heating requirements for pipework. The vast majority (30.66MW) of this will be consumed by the electrolysers.

The Site's specific energy consumption at maximum production capacity will be approximately 5.27kWh/Nm^3 H_2 at BoL.

5.2 Raw Materials and Water Consumption

Only a small number and low volume of raw materials are required to support the operations given the electrolysers will produce hydrogen from water and electricity from low carbon emission sources.

A tabulated list of raw materials to be used is provided in Table 4 below. Storage and containment arrangements are summarised in Table 5.

Table 4 – Raw Material / Chemical Consumption

Raw material	Approximate consumption per annum	Consumption rate (/Nm^3 H_2)	What is the product used for?	Link to safety datasheet
Water	70,220m^3 (excludes domestic uses)	1.33 litres	Supply of potable water to the electrolysers	N/A
Common Salt	N/A small quantities	N/A small quantities	Preventing scaling in water purification system	Appendix J
Ion exchange resin cartridges	6-12 cartridges	Each unit's cartridge to be replaced 1 to 2 times/year	Polishing of feed water following filtering and reverse osmosis.	Appendix J
Activated carbon	Unknown – dependant on water quality.	N/A – not linked to production rate	Filtering of potable water as 1st step of water purification systems	Appendix J
Propylene Glycol	2,454kg	0.002g	Mixed with water at 40% concentration in cooling system loop	Appendix J
Nitrogen	Unknown - used during periods of stand-by, shut down and start up.	N/A – not linked to production rate	Purging and blanketing during stand-by, shut down, start up and maintenance.	
Maintenance oils and greases	Negligible	N/A – not linked to production rate	Maintenance	Appendix J

Table 5 – Raw Material / Chemical Storage Arrangements

Contents	Tank capacity	Location	Tank material construction	Secondary containment / bunding arrangements including type, material of construction and drawings or link to product	Capacity of bund (litres)
Propylene glycol	No storage on site – dosed directly into cooling and chilling systems	N/A	N/A	N/A	N/A
Maintenance oils and greases	No storage on site.	N/A	N/A	N/A	N/A

The raw materials and chemicals to be used are of standard types employed within UK industries for their intended use.

Efficient use of raw materials and water will be achieved by:

- treating the incoming water to match as close as possible to the specification of the electrolyser so as not to consume more water or raw materials than necessary and minimise rejection of ions as wastewater;
- using / dosing raw materials in accordance with manufacturer's recommendations or required specifications, unless operational experience justifies a need to do otherwise;
- preventative and reactive maintenance of processing equipment;
- implementation of closed loop / recirculating cooling systems; and
- minimising periods of start-up, shut down, maintenance and stand-by to a minimum.

The following measures will be employed to prevent impacts from leaks, spills and failure of the primary storage container:

- Tanks / containers of potentially polluting liquids will be provided with secondary containment capable of containing at least 110% of the volume of the largest tank / container within the bund or 25% of the total volume stored within the bund, whichever is the greater.
- Storage tanks / containers will be constructed to the appropriate British Standard.
- Tanks / containers will be regular inspected to ensure the continued integrity of the tanks / containers and identify the requirement for any remedial action.
- Minor spillages will be cleaned up immediately, using sand or proprietary absorbent to clean up liquids and disposed of to an appropriately licensed facility.
- Materials suitable for absorbing and containing minor spillages will be maintained on site.
- The site staff will undertake regular monitoring for evidence of spillage and leakage. Alongside regular visual inspections, tanks will be fitted with level indicators to prevent overfilling.
- In the event of a major spillage immediate action will be taken to contain the spillage and prevent liquid from entering surface water drains and unsurfaced ground. The spillage will be cleared immediately and placed in containers for off-site disposal and the EA will be notified.
- There will be no materials stored on Site that are at risk of reacting with each other.
- Raw material and chemical storage facilities on Site will be:
    - located away from watercourses, sensitive groundwater areas, unprotected drainage systems and sensitive boundaries;
    - clearly marked to identify the materials stored within them;
    - have defined maximum storage capacities;
    - inspected regularly to ensure that containers, including empty containers, have lids, caps, valves secured and in place and the containers are not damaged or leaking; and
    - where the inspection identifies a non-compliance, the Site Manager will rectify the matter immediately including replacement or repair of damaged or leaking containers.

5.3 Avoidance, Recovery and Disposal of Wastes

A tabulated list of process wastes expected to be generated and the anticipated recovery or disposal method is provided in Table 6 below.

Table 6 Process Waste Generation and Management

Waste Stream	Source	Steps Employed to Minimise Amount Generated	Expected Quantity Per Annum	Recovery / Disposal Method
Mixed bed ion exchange resin cartridges	Replacement of the mixed bed ion exchange resin cartridges 1-2 times a year per electrolyser.	Replace in accordance with manufacturer's recommendations, unless a need to do otherwise is found to be required e.g. last longer before requiring regeneration or expire prior to manufacturer's expectations).	6-12 cartridges per year	Regenerated off-site for reuse.
Carbon filter cartridges	Replacement of carbon filter cartridges at rate dependant on water quality and manufacturer's recommendations	Replace in accordance with manufacturer's recommendations depending on water quality.	Unknown.	Recovery of carbon and recycling of metal / plastics.
Electrolyser stacks	Replacement at EoL (c. 8 years)	Planned preventative maintenance. Replace only when necessary, as opposed to at 8 year design life.	N/A	Recycling of precious metals will be dependent on availability of recycling infrastructure at EoL.
Process wastewater	Reject from water purification system	Treat feed water as little as possible according to the potable water quality to minimise reject rate from the reverse osmosis step.	17,082m^3	Disposal.
Packaging waste	Chemical / raw material consumption	Using / dosing raw materials in accordance with manufacturer's recommendations or required specifications, unless operational experience justifies a need to do otherwise.	Unknown but small amounts	Return for cleaning and reuse where possible.
Absorbents used in treatment, dehydration and hydrogen purification	Hydrogen purification	Replace in accordance with manufacturer's recommendations, unless a need to do otherwise is found to be required.	Deoxo catalysts are expected to be replaced every 5-8 years. The molecular sieves are expected to be	Deoxo catalyst will be regenerated and reused. Molecular sieves will be reused if possible or if not require disposal.

Waste Stream	Source	Steps Employed to Minimise Amount Generated	Expected Quantity Per Annum	Recovery / Disposal Method
			replaced every 7-10 years	
Electrolyser components such as seals	Electrolyser maintenance	Operation of electrolysers in accordance with manufacturer's recommendations. Planned preventative maintenance. Replace only when necessary.	Seals are expected to required replacement once every 2 years.	Recovery where possible or failing this disposal.
Spent / damaged membranes	Electrolysers	Operation of electrolysers in accordance with manufacturer's recommendations. Planned preventative maintenance. Replace only when necessary.	Unknown but small amounts.	Recovery where possible or failing this disposal.
Waste arising from routine maintenance activities	Maintenance	Not applicable.	Unknown but small amounts.	Recovery where possible or failing this disposal.

All solid waste will be managed and disposed of in accordance with the Waste (England and Wales) Regulations 2011 and Waste Duty of Care: Code of Practice. This will include characterising waste and provision of accurate information to the waste transferee by way of a waste transfer note for non-hazardous waste and consignment note for hazardous waste.

All solid waste recovered or generated during the processes undertaken at the Site will be removed to a suitable licensed processing or disposal site. Checks will be undertaken on the waste carrier and receiving facility to ensure they are authorised to receive the waste.

An internal programme at the Site will audit waste generation and seek to avoid or where this is not possible minimise its production. Where waste is unavoidably generated, opportunities to maximise its reuse, recycling and recovery of waste in that order will be reviewed.

Records of waste transferred off-site will be retained for a minimum of two years in the case of non-hazardous waste and three years in the case of hazardous waste.

6.0 EMISSIONS

6.1 Point Source Emissions to Air

BGH has sought to avoid and where this is not possible minimise emissions to air at source.

While it has not been possible to avoid all emissions from the Site, point source emissions to air have been minimised as described in the Section.

- Venting of hydrogen will be mainly limited to OTNOC situations such as pressure relief, start-up, shut down and commissioning of the facility. During normal operations (including

regeneration cycles) hydrogen will be vented at an average rate of approximately 90Nm^3/h i.e. 1.5% of total at BoL production capacity. This is significantly less than predictions by BEIS of 3-9%.

- There is no local market for oxygen supply and the OEM for the electrolyser selected does not guarantee the equipment for capture of oxygen. As such, produced oxygen will be continuously vented to atmosphere during normal operations.

The flow of vented Hydrogen of 90Nm^3/hr is based upon a near continuous flow of approximately 16Nm^3/hr from each electrolyser during dryer regeneration. It should be noted that due to the low ambient pressure density of hydrogen, the mass flow is only 8.6kg/hr in total for all electrolysers.

This stream cannot be recovered and reused as it is a waste stream from the drier, containing a lot of water. Due to the low mass flowrate and high buoyancy of hydrogen the vent stream would be dispersed easily.

BGH do not propose to flare or otherwise abate this source of hydrogen emission given the small mass of hydrogen concerned. To incorporate a flare would involve significant additional capital expenditure and introduces concerns such as stack height, exclusion zoning, flare tip visibility and plot plan requirements.

6.1.1 Process Modules

Each Process Module will feature 6 vents stacks as illustrated in Figure 4. The purpose of each of the 6 vents is summarised below.

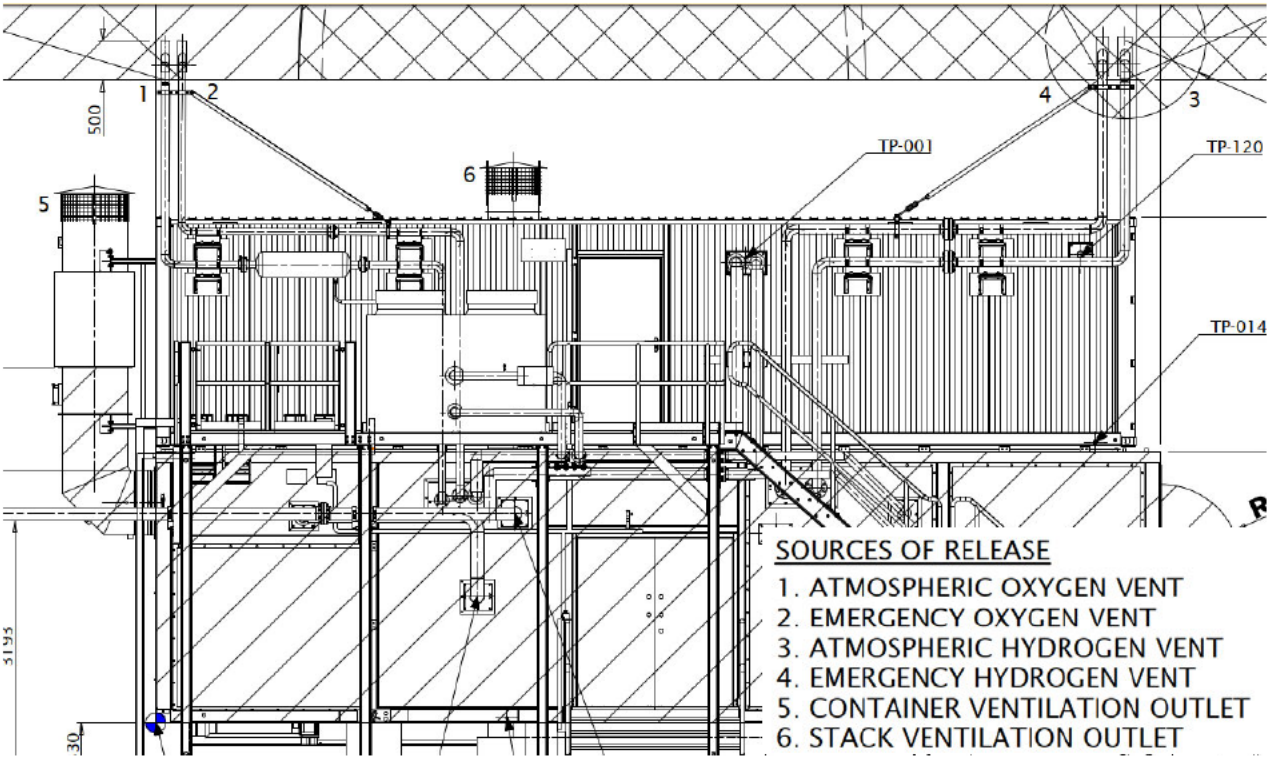


Figure 4 Process Module Vents

6.1.1.1 Atmospheric Oxygen Vent

The atmospheric oxygen vent stacks will be used to vent oxygen during hydrogen production.

6.1.1.2 Emergency Oxygen Vent

The emergency oxygen vent will be used in the event of a pressure safety valve blow off to vent oxygen.

6.1.1.3 Atmospheric Hydrogen Vent

The main hydrogen vent stacks will be used to vent hydrogen in the following circumstances:

- In the event of the hydrogen storage vessels reaching maximum pressure;
- During depressurisation when production is stopped;
- During regeneration, whereby it is necessary to evacuate N_2 in the system following the N_2 purge; and
- Output from the gas quality analysers.

6.1.1.4 Emergency Hydrogen Vent

The emergency hydrogen vent will be used in the event of a pressure safety valve blow off to vent hydrogen.

6.1.1.5 Container Ventilation Outlet

The Container Ventilation Outlet will be used to ventilate the bottom container as described in Section 3.1.2.3

6.1.1.6 Stack Ventilation Outlet

The Stack Ventilation Outlet will be used to ventilate the stack container as described in Section 3.1.2.4.

6.1.1.7 Pressure relief vent stack

The pressure relief vent stacks and catchment tank will be used to manually relieve excess pressure in the event of over pressurisation.

6.1.2 Balance of Plant

There will be no manifolded vent system for the balance of plant as no venting is anticipated during normal operation. Only emergency venting or maintenance purge venting is envisaged. Instead, each vent point will vent directly to atmosphere, to a safe location. Each vent will be routed to a high point to meet requirements for safe venting.

There will be a number of vent points on the balance of plant as follows:

- Hydrogen Buffer Vessel pressure safety valves (PSVs). One per vessel, 9 total; and
- Hydrogen Let Down and Metering Station PSV.

6.1.3 Schedule of Point Source Emissions and Monitoring

The proposed monitoring schedule for point source emissions to air is outlined in Table 7.

Table 7 Point Source Emissions to Air

ID	Source	Location	Components of release	Limit	Reference period	Proposed monitoring frequency	Monitoring methods
A1 – A6	Atmospheric Hydrogen Vent Stacks	As shown on Drawing 02 Site Layout and Environmental Permit Boundary	Hydrogen	No limit set	Flow	Continuous	Emissions monitoring or calculation method to be agreed in writing with the EA
			Nitrogen	N/A	N/A	N/A	N/A
A7 – A12	Atmospheric Oxygen Vent Stacks		Oxygen	N/A	N/A	N/A	N/A
A13 – A18	Emergency Hydrogen Vent Stacks		Hydrogen	No limit set	Record duration and frequency	N/A	Emissions monitoring or calculation method to be agreed in writing with the EA
A19 – A24	Emergency Oxygen Vent Stacks		Oxygen	N/A	N/A	N/A	N/A
A25 – A30	Container Ventilation Outlets		Air	N/A	N/A	N/A	N/A
A31 – A36	Stack Ventilation Outlets		Air	N/A	N/A	N/A	N/A
A37 – A45	Hydrogen Buffer Vessel PSVs		Hydrogen	No limit set	Record duration and frequency	N/A	Emissions monitoring or calculation method to be agreed in writing with the EA
A46	Hydrogen Metering and Let Down Station PSV		Hydrogen	No limit set	Record duration and frequency	N/A	Emissions monitoring or calculation method to be agreed in writing with the EA

6.2 Point Source Emissions to Surface Waters

As discussed in Section 3.14, there will be one point source emission to surface water comprising of combined surface water runoff and process wastewater as identified as SW1 on Drawing EP2.

The proposed monitoring schedule is outlined in Table 8.

Table 8 Point Source Emissions to Surface Water

Monitoring point	Source	Parameter	Limit	Reference period	Monitoring frequency	Monitoring standard or method
W1 - Manhole Immediately	Process wastewater from water	Flow	46.8m^3/day	Total daily volume	Continuous	MCERTS certified flow meter

Monitoring point	Source	Parameter	Limit	Reference period	Monitoring frequency	Monitoring standard or method
downstream of wastewater sump	purification plant					
W2 – Attenuation pond	Site surface water and process wastewater	Visible oil and grease	No visible oil and grease	Instantaneous	Weekly	Visual inspection

In addition to this, BGH would propose to undertake monthly monitoring of pH, TOC, dissolved metals and total dissolved solids in the discharge for an initial period of 12 months in order to characterise it and validate the Surface Water Pollution Risk Assessment undertaken.

This monitoring would be carried out according to the following schedule:

Table 9 Proposed Additional Surface Water Monitoring for Initial 12 Month Period

Monitoring point	Source	Parameter	Limit	Reference period	Monitoring frequency	Monitoring standard or method
W1 - Manhole Immediately downstream of wastewater sump	Process wastewater from water purification plant	TOC	No limit set	Spot sample	Monthly	EN 1484
		pH	No limit set	Spot sample		BS ISO 10523
		Total Dissolved Solids	No limit set	Spot sample		SCA blue book 105
		Dissolved metals (As, Cd, Cr, Cu, Pb, Hg, Ni, B), Fe and Mn)	Copper – 5.51 µg/l	Spot sample		BS EN ISO 11885

6.3 Point Source Emissions to Sewer

There will be no point source emissions to sewer from the activities on Site.

6.4 Point Source Emissions to Ground

There will be no point source emissions to soakaways or land from the activities on Site.

6.5 Fugitive Emissions

6.5.1 Fugitive Emissions to Air

BGH will reduce the potential for fugitive emissions to air by:

- using pressure release valves as opposed to breathing vents;
- maintaining bulk storage temperatures as low as practicable, taking into account changes due to solar heating;
- use of tank paint with low solar absorbency;

- temperature control; and
- inventory management (see Section 3.6.1).

6.5.2 Fugitive Emissions to Surface Water and Groundwater

The drainage system on Site has been designed to prevent fugitive emissions to surface water or groundwater on Site in the event of accidental spillage or leakage. Please refer to Section 3.14 for further information on the Site's drainage system.

In addition to this, to prevent fugitive emissions to surface water or groundwater, BGH will:

- place spill kits at appropriate locations around the Site for use in absorbing and disposing of minor leaks and spills;
- implement a planned preventative maintenance and inspection regime including site surfacing, drainage and pollution control features (such as full retention separators, wastewater sump, secondary containment bunds and valves);
- maintain procedures for the handling of deliveries to the Site;
- deliver training to staff on the safe handling of chemicals / fuels and the undertaking of inspections as relevant to their duties; and
- have procedures for responding to an incident involving a leak or spill.

6.5.3 Odour

Hydrogen is an odourless gas, as such there will be no odour emissions from the production, storage, or handling of hydrogen at the facility and odour abatement or treatment is not required. No addition of odorant is proposed at the Barrow Green Hydrogen Facility.

BGH will:

- have procedures for planned preventative maintenance to minimise the likelihood of a leak occurring; and
- conduct remote monitoring and in-person inspections for the purposes of identifying and remediating leaks.

6.5.4 Noise and Vibration

Emissions of noise will be minimised as follows:

- Implementation of a Noise Management Plan;
- housing of electrolysers within acoustic containers;
- minimising of start-up and shut down periods;
- use of silencers on oxygen vents;
- use of acoustic hoods on process unit and utility unit air vents;
- selection of low noise generating equipment;
- facility will be unmanned with low number of vehicle movements and deliveries; and
- maintaining and operation of equipment in accordance with manufacturer's specifications.

For further information on predicted noise impacts and management of noise, please refer to the NIA in Appendix G and NMP in Appendix H.

6.6 Process Monitoring

The process monitoring outlined in Table 10 is proposed.

Table 10 Process Monitoring

Monitoring point	Parameter	Monitoring frequency	Monitoring standard or method
Diffuse emissions from all sources identified in LDAR programme	Hydrogen	6 months or other frequency agreed in accordance with LDAR programme	In accordance with the LDAR programme
Safety gas analyser at GGS outlet	Hydrogen in Oxygen %	Continuous	-
Safety gas analyser at GGS outlet	Oxygen in Hydrogen %	Continuous	-
Gas quality on outlet of HPS	Dew point	Continuous	-
	Oxygen in Hydrogen (ppm)	Continuous	-
Electricity consumption	MWh	Continuous	LCHA compliant metering system
Water consumption	m^3	Continuous	LCHA compliant metering system
Raw material usage	m^3	Continuous	-
Hydrogen export	Nm^3	Continuous	LCHA compliant metering system
Emergency diesel generator usage	Hours	Continuous	Record of run hours

6.7 Performance Reporting

Performance reporting as summarised in Table 11 is proposed.

Table 11 Performance Reporting

Parameter	Frequency of assessment	Units
Site Specific Power Consumption	Annually	kWh / kg H_2
Stack efficiency	Annually	kWh / kg H_2
Electrolyser system efficiency	Annually	kWh / kg H_2
Specific water consumption	Annually	kg water / kg H_2
Electricity consumption	Annually	MWh
Carbon emissions (calculated as per Low Carbon Hydrogen Standard)	Annually	CO_2e/MJ LHV
Water consumption	Annually	m^3
Raw material usage	Annually	m^3
Hydrogen export	Annually	Nm^3

Parameter	Frequency of assessment	Units
Emergency diesel generator usage	Annually	Hours
Hydrogen vented	Annually	Flow
Duration and frequency of pressure relief	Annually	Record or duration and frequency
Emergency diesel generator usage	Annually	Hours

7.0 BEST AVAILABLE TECHNIQUES (BAT) ASSESSMENT

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) requires operators to take all appropriate measures to prevent or, where this is not practicable, to minimise emissions to the environment, in particular (but not solely) through applying best available techniques (BAT).

This section demonstrates how the facility will meet BAT as summarised in the following BAT Reference documents:

- Common Waste Water and Waste Gas Treatment / Management Systems in the Chemicals Sector (July 2017);
- Common Waste Gas Management and Treatment Systems in the Chemical Sector (January 2023);
- UK BAT Office Common Waste Gas Management and Treatment Systems in the Chemical Sector (2025 Formal Draft)
- Energy Efficiency (February 2009); and
- Industrial Cooling Systems (December 2001).

It should be noted that the requirements of the following other relevant guidance documents are covered Sections 3 to 6 of this document. As such, a tabulated review has not been repeated in this Section.

- EA - Hydrogen production by electrolysis of water: emerging techniques (28th March 2024);
- EA – How to comply with your environmental permit. additional guidance for: the inorganic chemicals sector – Sector Guidance Note S4.03 (March 2009); and
- EA – Control and monitor your emissions for your environmental permit (December 2025).

For this purpose, the conclusions of the BAT Reference documents are summarised in a tabular format along with evidence demonstrating how the requirements will be met.

Table 12 – Common Waste Water and Waste Gas Treatment / Management Systems in the Chemicals Sector

BAT Requirement	Demonstration of BAT
EMS	
1. In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features: (i) commitment of the management, including senior management; (ii) an environmental policy that includes the continuous improvement of the installation by the management;	Please refer to Section 4.1 of this report for a description of how BATc 1 will be met.

BAT Requirement	Demonstration of BAT
(iii) planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; (iv) implementation of procedures paying particular attention to: (a) structure and responsibility; (b) recruitment, training, awareness and competence; (c) communication; (d) employee involvement; (e) documentation; (f) effective process control; (g) maintenance programmes; (h) emergency preparedness and response; (i) safeguarding compliance with environmental legislation; (v) checking performance and taking corrective action, paying particular attention to: (a) monitoring and measurement (see also the Reference Report on Monitoring of emissions to Air and Water from IED installations — ROM); (b) corrective and preventive action; (c) maintenance of records; (d) independent (where practicable) internal or external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; (vi) review of the EMS and its continuing suitability, adequacy and effectiveness by senior management; (vii) following the development of cleaner technologies; (viii) consideration for the environmental impacts from the eventual decommissioning of the plant at the design stage of a new plant, and throughout its operating life; (ix) application of sectoral benchmarking on a regular basis; (x) waste management plan (see BAT 13). Specifically, for chemical sector activities, BAT is to incorporate the following features in the EMS:	

BAT Requirement	Demonstration of BAT
(xi) on multi-operator installations/sites, establishment of a convention that sets out the roles, responsibilities and coordination of operating procedures of each plant operator in order to enhance the cooperation between the various operators; (xii) establishment of inventories of waste water and waste gas streams (see BAT 2). In some cases, the following features are part of the EMS: (xiii) odour management plan (see BAT 20); (xiv) noise management plan (see BAT 22).	
2. In order to facilitate the reduction of emissions to water and air and the reduction of water usage, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the environmental management system (see BAT 1), that incorporates all of the following features: (i) information about the chemical production processes, including: (a) chemical reaction equations, also showing side products; (b) simplified process flow sheets that show the origin of the emissions; (c) descriptions of process-integrated techniques and waste water/waste gas treatment at source including their performances; (ii) information, as comprehensive as is reasonably possible, about the characteristics of the waste water streams, such as: (a) average values and variability of flow, pH, temperature, and conductivity; (b) average concentration and load values of relevant pollutants/parameters and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, salts, specific organic compounds); (c) data on bioeliminability (e.g. BOD, BOD/COD ratio, Zahn-Wellens test, biological inhibition potential (e.g. nitrification)); (iii) information, as comprehensive as is reasonably possible, about the characteristics of the waste gas streams, such as: (a) average values and variability of flow and temperature;	As part of the Front End Engineering Design (FEED), BGH has developed Process Flows, Heat and Mass Balances and Utility Balances which establish an inventory of waste water and waste gas streams. This will be further refined during the detailed design and incorporated into the EMS. Monitoring will be undertaken during the lifetime of the facility with the inventory updated to reflect actual emissions and this will be used for the purposes of assessing compliance and improving performance.

<table>
<tr><th>BAT Requirement</th><th>Demonstration of BAT</th></tr>
<tr><td>(b) average concentration and load values of relevant pollutants/parameters and their variability (e.g. VOC, CO, NOX, SOX, chlorine, hydrogen chloride);
(c) flammability, lower and higher explosive limits, reactivity;
(d) presence of other substances that may affect the waste gas treatment system or plant safety (e.g. oxygen, nitrogen, water vapour, dust).</td><td></td></tr>
<tr><td colspan="2">Monitoring</td></tr>
<tr><td>3. For relevant emissions to water as identified by the inventory of waste water streams (see BAT 2), BAT is to monitor key process parameters (including continuous monitoring of waste water flow, pH and temperature) at key locations (e.g. influent to pre-treatment and influent to final treatment).</td><td>BGH will undertake continuous monitoring of flow and temperature of the process effluent prior to discharge.</td></tr>
<tr><td>4. BAT is to monitor emissions to water in accordance with EN standards with at least the minimum frequency given below. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.
<table>
<tr><th colspan="2">Substance/Parameter</th><th>Standard(s)</th><th>Minimum monitoring frequency (1) (2)</th></tr>
<tr><td colspan="2">Total organic carbon (3)</td><td>EN 1484</td><td rowspan="6">Daily</td></tr>
<tr><td colspan="2">Chemical Oxygen Demand (3)</td><td>No EN standard available</td></tr>
<tr><td colspan="2">Total Suspended Solids</td><td>EN 872</td></tr>
<tr><td colspan="2">Total Nitrogen (4)</td><td>EN 12260</td></tr>
<tr><td colspan="2">Total inorganic nitrogen (4)</td><td>Various EN standards available</td></tr>
<tr><td colspan="2">Total phosphorus</td><td>Various EN standards available</td></tr>
<tr><td colspan="2">Adsorbable organically bound halogens</td><td>EN ISO 9562</td><td></td></tr>
<tr><td rowspan="2">Metals</td><td>Cr</td><td rowspan="2">Various EN standards available</td><td rowspan="2">Monthly</td></tr>
<tr><td>Cu</td></tr>
</table></td><td>Given the characteristics of the process effluent stream will be consistent in quality, it is considered that there should only be an ongoing need for flow monitoring.
BGH would propose to undertake monthly monitoring of pH, TOC, metals and total dissolved solids in the discharge for an initial period of 12 months in order to characterise it and validate the Surface Water Pollution Risk Assessment undertaken.</td></tr>
</table>

BAT Requirement				Demonstration of BAT
	Ni			
	Pb			
	Zn			
	Others			
Toxicity (5)	Fish eggs	EN ISO 15088	To be decided based on risk assessment after initial characterisation	
	Daphnia	EN ISO 6341		
	Luminescent bacteria	EN ISO 11348-1, 2 or 3		
	Duckweed	EN ISO 20079		
	Algae	EN ISO 8692, 10253 or 10710		
(1) Monitoring frequencies may be adapted if the data series clearly demonstrate a sufficient stability. (2) The sampling point is located where the emission leaves the installation. (3) TOC monitoring and COD monitoring are alternatives. TOC monitoring is the preferred option because it does not rely on the use of very toxic compounds. (4) TN and N_{inorg} monitoring are alternatives. (5) An appropriate combination of these methods can be used.				
5. BAT is to periodically monitor diffuse VOC emissions to air from relevant sources by using an appropriate combination of the techniques I-III or, where large amounts of VOC are handled, all of the techniques I-III. I. sniffing methods (e.g. with portable instruments according to EN 15446) associated with correlation curves for key equipment; II. optical gas imaging methods; III. calculation of emissions based on emissions factors, periodically validated (e.g. once every two years) by measurements. Where large amounts of VOCs are handled, the screening and quantification of emissions from the installation by periodic campaigns with optical absorption-based techniques, such as Differential absorption light detection and ranging (DIAL) or Solar occultation flux (SOF), is a useful complementary technique to the techniques I to III.				Not applicable. There will be no VOCs used or produced by the activities.

BAT Requirement	Demonstration of BAT
6. BAT is to periodically monitor odour emissions from relevant sources in accordance with EN standards	Please refer to Section 6.5.3.
Emissions to Water	
7. In order to reduce the usage of water and the generation of waste water, BAT is to reduce the volume and/or pollutant load of waste water streams, to enhance the reuse of waste water within the production process and to recover and reuse raw materials.	Process requires ultra-pure water and effluent quality is determined by the incoming potable water quality. Further treatment to be able to reuse process effluent in the production processes would lead to a higher reject rate, further concentration of the rejected ions, increased energy consumption but offer no benefit with respect to mass of pollutants discharged. Please refer to Section 5.2 for further information on how water consumption, raw material consumption and wastewater generation will be minimised.
8. In order to prevent the contamination of uncontaminated water and to reduce emissions to water, BAT is to segregate uncontaminated waste water streams from waste water streams that require treatment.	Waste water streams on site will be kept segregated so as to prevent cross contamination. All clean site surface run-off from site surfacing and buildings roofs will be collected in a dedicated clean water drainage system. Process effluent, produced by the demineralisation process from hydrogen production, will be collected in a separate dedicated sealed drainage system. Both streams will be combined prior to discharge to the environment but will be capable of being shut-off to prevent contamination in the event of a spill or accident on-site or process wastewater being found to be off-specification. For further information, please refer to Sections 3.14 and 3.5.1.4.
9. In order to prevent uncontrolled emissions to water, BAT is to provide an appropriate buffer storage capacity for waste water incurred during other than normal operating conditions based on a risk assessment (taking into account e.g. the nature of the pollutant, the effects on further treatment, and the receiving environment), and to take appropriate further measures (e.g. control, treat, reuse).	A waste water sump will collect wastewater from the modular electrolyser units only. The electrolyser units will produce a continuous wastewater stream from their water purification systems which is routed via underground gravity drainage piping to the wastewater sump. During OTNOC conditions that might impact the wastewater quality, the wastewater sump isolation valve will be shut off and wastewater

<table>
<tr><th>BAT Requirement</th><th>Demonstration of BAT</th></tr>
<tr><td></td><td>tankered off-site until such a time as normal operating conditions are re-established.</td></tr>
<tr><td>10. In order to reduce emissions to water, BAT is to use an integrated waste water management and treatment strategy that includes an appropriate combination of the techniques in the priority order given below.
<table>
<tr><th colspan="2">Technique</th><th>Description</th></tr>
<tr><td>a</td><td>Process integrated techniques (1)</td><td>Techniques to prevent or reduce the generation of water pollutants.</td></tr>
<tr><td>b</td><td>Recovery of pollutants at source (1)</td><td>Techniques to recover pollutants prior to their discharge to the waste water collection system.</td></tr>
<tr><td>c</td><td>Waste water pre-treatment (1) (2)</td><td>Techniques to abate pollutants before the final waste water treatment. Pre-treatment can be carried out at the source or in combined streams.</td></tr>
<tr><td>d</td><td>Final water treatment (3)</td><td>Final waste water treatment by, for example, preliminary and primary treatment, biological treatment, nitrogen removal, phosphorus removal and/or final solids removal techniques before discharge to a receiving water body.</td></tr>
<tr><td colspan="3">(1) These techniques are further described and defined in other BAT conclusions for the chemical industry.
(2) See BAT 11.
(3) See BAT 12.</td></tr>
</table></td><td>Water purification will be matched as closely as possible to the electrolyser’s specification. This will minimise the rejection rate of ions and therefore contaminant load within the process wastewater from the reverse osmosis step.
Production capacity will be variable according to availability of renewable capacity. Total water consumption and therefore process effluent generation will be in step with this, such that total water consumption will be less than that risk assessed which is based on maximum production capacity.
Given the low contaminant loading of the process wastewater (refer to Surface Water Pollution Risk Assessment in Appendix C), it is not proposed to further treat the waste water prior to discharge, and hence no waste water treatment system is proposed to be installed on site.</td></tr>
<tr><td>11. In order to reduce emissions to water, BAT is to pre-treat waste water that contains pollutants that cannot be dealt with adequately during final waste water treatment by using appropriate techniques.
Waste water pre-treatment is carried out as part of an integrated waste water management and treatment strategy (see BAT 10) and is generally necessary to:</td><td>Not applicable, refer to BATc 10.</td></tr>
</table>

<table>
<tr><th>BAT Requirement</th><th>Demonstration of BAT</th></tr>
<tr><td>— protect the final waste water treatment plant (e.g. protection of a biological treatment plant against inhibitory or toxic compounds);
— remove compounds that are insufficiently abated during final treatment (e.g. toxic compounds, poorly/non- biodegradable organic compounds, organic compounds that are present in high concentrations, or metals during biological treatment);
— remove compounds that are otherwise stripped to air from the collection system or during final treatment (e.g. volatile halogenated organic compounds, benzene);
— remove compounds that have other negative effects (e.g. corrosion of equipment; unwanted reaction with other substances; contamination of waste water sludge).
In general, pre-treatment is carried out as close as possible to the source in order to avoid dilution, in particular for metals. Sometimes, waste water streams with appropriate characteristics can be segregated and collected in order to undergo a dedicated combined pre-treatment.</td><td></td></tr>
<tr><td>12. In order to reduce emissions to water, BAT is to use an appropriate combination of final waste water treatment techniques.
<table>
<tr><th colspan="2">Technique [1]</th><th>Typical pollutants abated</th><th>Applicability</th></tr>
<tr><td colspan="4">Preliminary and primary treatment</td></tr>
<tr><td>a</td><td>Equalisation</td><td>All pollutants</td><td rowspan="3">Generally applicable</td></tr>
<tr><td>b</td><td>Neutralisation</td><td>Acids, alkalis</td></tr>
<tr><td>c</td><td>Physical separation, e.g. screens, sieves, grit separators, grease separators or primary settlement tanks</td><td></td></tr>
<tr><td colspan="4">Biological treatment (secondary treatment)</td></tr>
<tr><td>d</td><td>Activated sludge process</td><td></td><td rowspan="2">Generally applicable</td></tr>
<tr><td>e</td><td>Membrane bioreactor</td><td></td></tr>
</table></td><td>The techniques referenced in BATc 12 are not considered applicable to electrolytic production of hydrogen. The load of pollutants in the reject from the water purification system will be such that BAT-AELs are met without the need for wastewater treatment and annual emissions will be below the thresholds prior to which BAT-AELs apply in any event. No Environmental Quality Standards within the receiving watercourse (Walney Channel) are expected to be exceeded by the H1 Surface Water Pollution Risk Assessment undertaken (see Appendix C).
A period of monitoring during the first 12 months of operation is proposed to confirm this. BGH propose an average ELV for dissolved Copper is set in the environmental permit at the EQS of 5.51 ug/l. BGH propose that monthly monitoring is undertaken for the first 12 months of operation to assess compliance with this ELV. If the concentration of dissolved Copper is found to exceed this ELV, BGH will reassess impacts by proceeding to detailed modelling or action will be taken to prevent a compliance limit breach. This may include, but not be limited to, installation of a carbon filter to remove Copper from the wastewater prior to discharge.</td></tr>
</table>

BAT Requirement				Demonstration of BAT
Nitrogen Removal				
f	Nitrification/denitrification	Total nitrogen, ammonia	Nitrification may not be applicable in case of high chloride concentrations (i.e. around 10 g/l) and provided that the reduction of the chloride concentration prior to nitrification would not be justified by the environmental benefits. Not applicable when the final treatment does not include a biological treatment.	
Phosphorus removal				
g	Chemical precipitation	Phosphorus	Generally applicable	
Final solids removal				
h	Coagulation and flocculation	Suspended solids	Generally applicable	
i	Sedimentation			
j	Filtration (e.g. sand filtration, microfiltration, ultra-filtration)			
k	Flotation			

BAT Requirement	Demonstration of BAT

(1) The descriptions of the techniques are given in Section 6.1.

The BAT-associated emission levels (BAT-AELs), for emissions to water given in Table 1, Table 2 and Table 3 apply to direct emissions to a receiving water body from:

(i) the activities specified in Section 4 of Annex I to Directive 2010/75/EU;

(ii) independently operated waste water treatment plants specified in Section 6.11 of Annex I to Directive 2010/75/EU provided that the main pollutant load originates from activities specified in Section 4 of Annex I to Directive 2010/75/EU;

(iii) the combined treatment of waste water from different origins provided that the main pollutant load originates from activities specified in Section 4 of Annex I to Directive 2010/75/EU.

The BAT-AELs apply at the point where the emission leaves the installation.

Table 1 BAT-AELs for direct emissions of TOC, COD and TSS to a receiving water body

Parameter	BAT-AEL (yearly average)	Conditions
TOC (1) (2)	10 – 33mg/l (3) (4) (5) (6)	The BAT-AEL applies if the emission exceeds 3,3 t/yr.
COD (1) (2)	30 – 100mg/l (3) (4) (5) (6)	The BAT-AEL applies if the emission exceeds 10 t/yr.
TSS	5 – 35mg/l (7) (8)	The BAT-AEL applies if the emission exceeds 3,5 t/yr.

(1) No BAT-AEL applies for Biochemical oxygen demand (BOD). As an indication, the yearly average BOD5 level in the effluent from a biological waste water treatment plant will generally be ≤ 20 mg/l.

(2) Either the BAT-AEL for TOC or the BAT-AEL for COD applies. TOC is the preferred option because its monitoring does not rely on the use of very toxic compounds.

BAT Requirement	Demonstration of BAT

(3) The lower end of the range is typically achieved when few tributary waste water streams contain organic compounds and/or the waste water mostly contains easily biodegradable organic compounds.

(4) The upper end of the range may be up to 100 mg/l for TOC or up to 300 mg/l for COD, both as yearly averages, if both of the following conditions are fulfilled: — Condition A: Abatement efficiency ≥ 90 % as a yearly average (including both pre-treatment and final treatment). — Condition B: If a biological treatment is used, at least one of the following criteria is met: — A low-loaded biological treatment step is used (i.e. ≤ 0,25 kg COD/kg of organic dry matter of sludge). This implies that the BOD5 level in the effluent is ≤ 20 mg/l. — Nitrification is used.

(5) The upper end of the range may not apply if all of the following conditions are fulfilled: — Condition A: Abatement efficiency ≥ 95 % as a yearly average (including both pre-treatment and final treatment). — Condition B: same as Condition B in footnote (4). — Condition C: The influent to the final waste water treatment shows the following characteristics: TOC > 2 g/l (or COD > 6 g/l) as a yearly average and a high proportion of refractory organic compounds.

(6) The upper end of the range may not apply when the main pollutant load originates from the production of methylcellulose.

(7) The lower end of the range is typically achieved when using filtration (e.g. sand filtration, microfiltration, ultrafiltration, membrane bioreactor), while the upper end of the range is typically achieved when using sedimentation only.

(8) This BAT-AEL may not apply when the main pollutant load originates from the production of soda ash via the Solvay process or from the production of titanium dioxide.

Table 2 BAT-AELs for direct emissions of nutrients to a receiving water body

Parameter	BAT-AEL (yearly average)	Conditions
Total Nitrogen (1)	5 – 25mg/l (2) (3)	The BAT-AEL applies if the emission exceeds 2,5 t/yr.

BAT Requirement			Demonstration of BAT
Total Inorganic nitrogen (1)	5 – 20mg/l (2) (3)	The BAT-AEL applies if the emission exceeds 2,0 t/yr.	
Total phosphorus	0.5 – 3mg/l (4)	The BAT-AEL applies if the emission exceeds 300 kg/yr.	

(1) Either the BAT-AEL for total nitrogen or the BAT-AEL for total inorganic nitrogen applies.

(2) The BAT-AELs for TN and N_{inorg} do not apply to installations without biological waste water treatment. The lower end of the range is typically achieved when the influent to the biological waste water treatment plant contains low levels of nitrogen and/or when nitrification/denitrification can be operated under optimum conditions.

(3) The upper end of the range may be higher and up to 40 mg/l for TN or 35 mg/l for N_{inorg}, both as yearly averages, if the abatement efficiency is ≥ 70 % as a yearly average (including both pre-treatment and final treatment).

(4) The lower end of the range is typically achieved when phosphorus is added for the proper operation of the biological waste water treatment plant or when phosphorus mainly originates from heating or cooling systems. The upper end of the range is typically achieved when phosphorus-containing compounds are produced by the installation.

Table 3 BAT-AELs for direct emissions of AOX and metals to a receiving water body

Parameter	**BAT-AEL (yearly average)**	**Conditions**
Adsorbable organically bound halogens (AOX)	0.2 – 1mg/l (1) (2)	The BAT-AEL applies if the emission exceeds 100kg/yr.
Chromium	5 - 25µg/l (3) (4) (5) (6)	The BAT-AEL applies if the emission exceeds 2,5 kg/yr.

BAT Requirement			Demonstration of BAT
Copper	5 - 50µg/l (3) (4) (5) (7)	The BAT-AEL applies if the emission exceeds 5,0 kg/yr.	
Nickel	5 - 50µg/l (3) (4) (5)	The BAT-AEL applies if the emission exceeds 5,0 kg/yr.	
Zinc	20 - 300µg/l (3) (4) (5) (8)	The BAT-AEL applies if the emission exceeds 30 kg/yr.	
(1) The lower end of the range is typically achieved when few halogenated organic compounds are used or produced by the installation. (2) This BAT-AEL may not apply when the main pollutant load originates from the production of iodinated X-ray contrast agents due to the high refractory loads. This BAT-AEL may also not apply when the main pollutant load originates from the production of propylene oxide or epichlorohydrin via the chlorohydrin process due to the high loads. (3) The lower end of the range is typically achieved when few of the corresponding metal (compounds) are used or produced by the installation. (4) This BAT-AEL may not apply to inorganic effluents when the main pollutant load originates from the production of inorganic heavy metal compounds. (5) This BAT-AEL may not apply when the main pollutant load originates from the processing of large volumes of solid inorganic raw materials that are contaminated with metals (e.g. soda ash from the Solvay process, titanium dioxide). (6) This BAT-AEL may not apply when the main pollutant load originates from the production of chromium-organic compounds. (7) This BAT-AEL may not apply when the main pollutant load originates from the production of copper-organic compounds or the production of vinyl chloride monomer/ethylene dichloride via the oxychlorination process. (8) This BAT-AEL may not apply when the main pollutant load originates from the production of viscose fibres.			
Waste			
13. In order to prevent or, where this is not practicable, to reduce the quantity of waste being sent for disposal, BAT is to set up and implement a waste management plan as part of the environmental management system			BGH will produce, as part of their EMS, a waste management plan (WMP) to manage and prioritise waste produced on site. As per BATc 13, the WMP within the site's EMS will cover the management of wastes

<table>
<tr><th>BAT Requirement</th><th>Demonstration of BAT</th></tr>
<tr><td>(see BAT 1) that, in order of priority, ensures that waste is prevented, prepared for reuse, recycled or otherwise recovered.</td><td>produced on site such that waste is minimised or prevented and prepared accordingly for reuse, recycling or to be otherwise recovered.
For further information on avoidance, recovery and disposal of wastes, please refer to Section 5.3.</td></tr>
<tr><td>14. In order to reduce the volume of waste water sludge requiring further treatment or disposal, and to reduce its potential environmental impact, BAT is to use one or a combination of the techniques given below.
<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>a</td><td>Conditioning</td><td>Chemical conditioning (i.e. adding coagulants and/or flocculants) or thermal conditioning (i.e. heating) to improve the conditions during sludge thickening/dewatering.</td><td>Not applicable to inorganic sludges. The necessity for conditioning depends on the sludge properties and on the thickening/dewatering equipment used.</td></tr>
<tr><td>b</td><td>Thickening/dewatering</td><td>Thickening can be carried out by sedimentation, centrifugation, flotation, gravity belts, or rotary drums. Dewatering can be carried out by belt filter presses or plate filter presses.</td><td>Generally applicable</td></tr>
<tr><td>c</td><td>Stabilisation</td><td>Sludge stabilisation includes chemical treatment, thermal treatment, aerobic digestion, or anaerobic digestion.</td><td>Not applicable to inorganic sludges. Not applicable for short-term handling before final treatment.</td></tr>
<tr><td>d</td><td>Drying</td><td>Sludge is dried by direct or indirect contact with a heat source.</td><td>Not applicable to cases where waste heat is not available or cannot be used.</td></tr>
</table></td><td>There will be no wastewater treatment undertaken at the Site. As such, there will be no sludge produced on Site and this BATc is not considered applicable.</td></tr>
<tr><td colspan="2">Emissions to Air</td></tr>
</table>

<table>
<tr><th>BAT Requirement</th><th>Demonstration of BAT</th></tr>
<tr><td>15. In order to facilitate the recovery of compounds and the reduction of emissions to air, BAT is to enclose the emission sources and to treat the emissions, where possible.
The applicability may be restricted by concerns on operability (access to equipment), safety (avoiding concentrations close to the lower explosive limit) and health (where operator access is required inside the enclosure).</td><td>Please refer to Section 6.1 for a description of how emissions to air from the facility have been avoided and minimised.</td></tr>
<tr><td>16. In order to reduce emissions to air, BAT is to use an integrated waste gas management and treatment strategy that includes process-integrated and waste gas treatment techniques.
The integrated waste gas management and treatment strategy is based on the inventory of waste gas streams (see BAT 2) giving priority to process-integrated techniques.</td><td>BGH will implement a Waste Gas Management and Treatment Strategy at the Site to reduce emissions to air. At least every 4 years, BGH will review the management and treatment strategy to review opportunities to further minimise or treat the vented hydrogen, and capture the produced oxygen.</td></tr>
<tr><td>17. In order to prevent emissions to air from flares, BAT is to use flaring only for safety reasons or non-routine operational conditions (e.g. start-ups, shutdowns) by using one or both of the techniques given below.
<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>a</td><td>Correct design of flaring devices</td><td>Optimisation of height, pressure, assistance by steam, air or gas, type of flare tips (either enclosed or shielded), etc., aimed to enable smokeless and reliable operation and to ensure the efficient combustion of excess gases.</td><td>Applicable to new flares. In existing plants, applicability may be restricted due to e.g. maintenance time availability during the turnaround of the plant.</td></tr>
<tr><td>b</td><td>Monitoring and recording as part of flare management</td><td>Continuous monitoring of the gas sent to flaring, measurements of gas flow and estimations of other parameters (e.g. composition, heat content, ratio of assistance, velocity, purge gas flow rate, pollutant emissions (e.g. NOX, CO, hydrocarbons,</td><td>Generally applicable.</td></tr>
</table>
</td><td>No flaring is proposed at the Site. Please refer to Section 6.1 for further discussion.</td></tr>
</table>

<table>
<tr><th colspan="4">BAT Requirement</th><th>Demonstration of BAT</th></tr>
<tr><td></td><td></td><td>noise)). The recording of flaring events usually includes the estimated/ measured flare gas composition, the estimated/measured flare gas quantity and the duration of operation. The recording allows for the quantification of emissions and the potential prevention of future flaring events.</td><td></td><td></td></tr>
<tr><td colspan="4">19. In order to prevent or, where that is not practicable, to reduce diffuse VOC emissions to air, BAT is to use a combination of the techniques given below.

<table><tr><th colspan="2">Technique</th><th>Applicability</th></tr><tr><td colspan="3">Techniques related to plant design</td></tr><tr><td>a</td><td>Limit the number of potential emission sources</td><td rowspan="4">Applicability may be restricted in the case of existing plants due to operability requirements.</td></tr><tr><td>b</td><td>Maximise process-inherent containment features</td></tr><tr><td>c</td><td>Select high-integrity equipment (see the description in Section 6.2)</td></tr><tr><td>d</td><td>Facilitate maintenance activities by ensuring access to potentially leaky equipment</td></tr><tr><td colspan="3">Techniques related to plant/equipment construction, assembly and commissioning</td></tr><tr><td>e</td><td>Ensure well-defined and comprehensive procedures for plant/ equipment construction and assembly. This includes using the designed gasket stress for flanged</td><td>Generally applicable</td></tr></table></td><td>Not applicable. There will be no VOCs used or produced by the activities.</td></tr>
</table>

BAT Requirement			Demonstration of BAT
	joint assembly (see the description in Section 6.2		
f	Ensure robust plant/equipment commissioning and handover procedures in line with the design requirements		
Techniques related to plant operation			
g	Ensure good maintenance and timely replacement of equipment	Generally applicable	
h	Use a risk-based leak detection and repair (LDAR) programme (see the description in Section 6.2)		
i	As far as it is reasonable, prevent diffuse VOC emissions, collect them at source, and treat them		
20. In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: (i) a protocol containing appropriate actions and timelines; (ii) a protocol for conducting odour monitoring; (iii) a protocol for response to identified odour incidents; (iv) an odour prevention and reduction programme designed to identify the source(s); to measure/estimate odour exposure; to characterise the contributions of the sources; and to implement prevention and/or reduction measures. The associated monitoring is in BAT 6. The applicability is restricted to cases where odour nuisance can be expected or has been substantiated.			Not applicable. Odour nuisance is not expected given the nature of the activities.
21. In order to prevent or, where that is not practicable, to reduce odour emissions from waste water collection and treatment and from sludge treatment, BAT is to use one or a combination of the techniques given below.			Not applicable. No wastewater collection / treatment or associated sludge treatment is proposed.

BAT Requirement				Demonstration of BAT
Technique		**Description**	**Applicability**	
a	Minimise residence times	Minimise the residence time of waste water and sludge in collection and storage systems, in particular under anaerobic conditions.	Applicability may be restricted in the case of existing collection and storage systems.	
b	Chemical treatment	Use chemicals to destroy or to reduce the formation of odorous compounds (e.g. oxidation or precipitation of hydrogen sulphide).	Generally applicable	
c	Optimise aerobic treatment	This can include: (i) controlling the oxygen content; (ii) frequent maintenance of the aeration system; (iii) use of pure oxygen; (iv) removal of scum in tanks.		
d	Enclosure	Cover or enclose facilities for collecting and treating waste water and sludge to collect the odorous waste gas for further treatment.		
e	End-of-pipe treatment	This can include: (i) biological treatment; (ii) thermal oxidation.	Biological treatment is only applicable to compounds that are easily soluble in water	

<table>
<tr><th colspan="4">BAT Requirement</th><th>Demonstration of BAT</th></tr>
<tr><td colspan="4">and readily bioeliminable.</td><td></td></tr>
<tr><td colspan="4">22. In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to set up and implement a noise management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:
(i) a protocol containing appropriate actions and timelines;
(ii) a protocol for conducting noise monitoring;
(iii) a protocol for response to identified noise incidents;
(iv) a noise prevention and reduction programme designed to identify the source(s), to measure/estimate noise exposure, to characterise the contributions of the sources and to implement prevention and/or reduction measures.
The applicability is restricted to cases where noise nuisance can be expected or has been substantiated.</td><td>A Noise Management Plan is submitted in support of this application. Please refer to Appendix H.</td></tr>
<tr><td colspan="4">23. In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to use one or a combination of the techniques given below.
<table><tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr><tr><td>a</td><td>Appropriate location of equipment and buildings</td><td>Increasing the distance between the emitter and the receiver and using buildings as noise screens.</td><td>For existing plants, the relocation of equipment may be restricted by a lack of space or excessive costs.</td></tr><tr><td>b</td><td>Operational measures</td><td>This includes:
(i) improved inspection and maintenance of equipment; (ii) closing of doors and windows of enclosed areas, if possible;
(iii) equipment operation by experienced staff;</td><td>Generally applicable</td></tr></table></td><td>Please refer to Section 6.5.4 for information on how noise emissions will be prevented or reduced.</td></tr>
</table>

BAT Requirement				Demonstration of BAT
		(iv) avoidance of noisy activities at night, if possible; (v) provisions for noise control during maintenance activities.		
c	Low-noise equipment	This includes low-noise compressors, pumps and flares.	Applicable only when the equipment is new or replaced.	
d	Noise-control equipment	This includes: (i) noise-reducers; (ii) equipment insulation; (iii) enclosure of noisy equipment; (iv) soundproofing of buildings.	Applicability may be restricted due to space requirements (for existing plants), health, and safety issues.	
e	Noise abatement	Inserting obstacles between emitters and receivers (e.g. protection walls, embankments and buildings).	Applicable only to existing plants; since the design of new plants should make this technique unnecessary. For existing plants, the insertion of obstacles may be restricted by a lack of space.	

Table 13 – Common Waste Gas Treatment / Management Systems

BAT Requirement	Demonstration of BAT
1. In order to improve the overall environmental performance, BAT is to elaborate and implement an environmental management system (EMS) that incorporates all of the following features: i. commitment, leadership, and accountability of the management, including senior management, for the implementation of an effective EMS;	Please refer to Section 4.1 of this report for a description of how BATc 1 will be met.

BAT Requirement	Demonstration of BAT
ii. an analysis that includes the determination of the organisation's context, the identification of the needs and expectations of interested parties, the identification of characteristics of the installation that are associated with possible risks for the environment (or human health) as well as of the applicable legal requirements relating to the environment; iii. development of an environmental policy that includes the continuous improvement of the environmental performance of the installation; iv. establishing objectives and performance indicators in relation to significant environmental aspects, including safeguarding compliance with applicable legal requirements; v. planning and implementing the necessary procedures and actions (including corrective and preventive actions where needed), to achieve the environmental objectives and avoid environmental risks; vi. determination of structures, roles and responsibilities in relation to environmental aspects and objectives and provision of the financial and human resources needed; vii. ensuring the necessary competence and awareness of staff whose work may affect the environmental performance of the installation (e.g. by providing information and training); viii. internal and external communication; ix. fostering employee involvement in good environmental management practices; x. establishing and maintaining a management manual and written procedures to control activities with significant environmental impact as well as relevant records; xi. effective operational planning and process control; xii. implementation of appropriate maintenance programmes; xiii. emergency preparedness and response protocols, including the prevention and/or mitigation of the adverse (environmental) impacts of emergency situations; xiv. when (re)designing a (new) installation or a part thereof, consideration of its environmental impacts throughout its life, which includes construction, maintenance, operation and decommissioning;	

BAT Requirement	Demonstration of BAT
xv. implementation of a monitoring and measurement programme; if necessary, information can be found in the Reference Report on Monitoring of Emissions to Air and Water from IED Installations; xvi. application of sectoral benchmarking on a regular basis; xvii. periodic independent (as far as practicable) internal auditing and periodic independent external auditing in order to assess the environmental performance and to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; xviii. evaluation of causes of nonconformities, implementation of corrective actions in response to nonconformities, review of the effectiveness of corrective actions, and determination of whether similar nonconformities exist or could potentially occur; xix. periodic review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness; xx. following and taking into account the development of cleaner techniques. Specifically for the chemical sector, BAT is also to incorporate the following features in the EMS: xxi. an inventory of channelled and diffuse emissions to air (see BAT 2); xxii. an OTNOC management plan for emissions to air (see BAT 3); xxiii. an integrated waste gas management and treatment strategy for channelled emissions to air (see BAT 4); xxiv. a management system for diffuse VOC emissions to air (see BAT 19); xxv. a chemicals management system that includes an inventory of the hazardous substances and substances of very high concern used in the process(es); the potential for substitution of the substances that are listed in this inventory, focusing on those substances other than raw materials, is analysed periodically (e. g. annually) in order to identify possible new available and safer alternatives, with no or lower environmental impacts.	
2. In order to facilitate the reduction of emissions to air, BAT is to establish, maintain and regularly review (including when a substantial change occurs) an inventory of channelled and diffuse emissions to air, as part of the environmental management system (see BAT 1)	As part of the Front End Engineering Design (FEED), BGH has developed Process Flows, Heat and Mass Balances and Utility Balances which establish an inventory of waste gas streams. This will be further refined during the detailed design and incorporated into the EMS.

BAT Requirement	Demonstration of BAT
	Monitoring will be undertaken during the lifetime of the facility with the inventory updated to reflect actual emissions and use it for the purposes of assessing compliance and improving performance.
3. In order to reduce the frequency of the occurrence of OTNOC and to reduce emissions to air during OTNOC, BAT is to set up and implement a risk-based OTNOC management plan as part of the environmental management system (see BAT 1).	BGH will incorporate an OTNOC management plan into their EMS which incorporates the following features: • identification of potential OTNOC (e.g. failure of equipment critical to the control of channelled emissions to air, or equipment critical to the prevention of accidents or incidents that could lead to emissions to air ('critical equipment')), of their root causes and of their potential consequences; • appropriate design of critical equipment (e.g. equipment modularity and compartmentalisation, backup systems, techniques to obviate the need to bypass waste gas treatment during start-up and shutdown, high integrity equipment, etc.); • set-up and implementation of a preventive maintenance plan for critical equipment (see BAT 1 xii.); • monitoring (i.e. estimating or, where this is possible, measuring) and recording of emissions and associated circumstances during OTNOC; • periodic assessment of the emissions occurring during OTNOC (e.g. frequency of events, duration, amount of pollutants emitted as recorded in point iv.) and implementation of corrective actions if necessary; • regular review and update of the list of identified OTNOC following the periodic assessment.; and • regular testing of backup systems.
4. In order to reduce channelled emissions to air, BAT is to use an integrated waste gas management and treatment strategy that includes, in order of priority, process-integrated recovery and abatement techniques.	BGH will implement an integrated Waste Gas Management and Treatment Strategy at the Site to reduce emissions to air. At least every 4 years, BGH will review the management and treatment strategy to review opportunities to further minimise or treat the vented hydrogen, and capture the produced oxygen. Please refer to Section 6.1 for a description of how emissions to air from the facility have been avoided and minimised.

BAT Requirement	Demonstration of BAT
5. In order to facilitate the recovery of materials and the reduction of channelled emissions to air, as well as to increase energy efficiency, BAT is to combine waste gas streams with similar characteristics, thus minimising the number of emission points.	The flow of vented Hydrogen of 90Nm3/hr is based upon a near continuous flow of approximately 16Nm3/hr from each electrolyser during dryer regeneration. It should be noted that due to the low ambient pressure density of hydrogen, the mass flow is only 8.6kg/hr in total for all electrolysers. This stream cannot be recovered and reused as it is a waste stream from the drier, containing a lot of water. Due to the low mass flowrate and high buoyancy of hydrogen the vent stream would be dispersed easily.
6. In order to reduce channelled emissions to air, BAT is to ensure that the waste gas treatment systems are appropriately designed (e.g. considering the maximum flow rate and pollutant concentrations), operated within their design ranges, and maintained (through preventive, corrective, regular and unplanned maintenance) so as to ensure optimal availability, effectiveness and efficiency of the equipment.	Not applicable. No waste gas treatment proposed.
7. BAT is to continuously monitor key process parameters (e.g. waste gas flow and temperature) of waste gas streams being sent to pretreatment and/or final treatment.	Not applicable. No waste gas treatment proposed.
8. BAT is to monitor channelled emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality	Not applicable. There will no emissions of relevant substances stated in BAT8.
9-14. Organic compounds and dust	Not relevant. There will be no emissions of organic compounds or particulates from the process.
15. In order to increase resource efficiency and to reduce the mass flow of inorganic compounds sent to the final waste gas treatment, BAT is to recover inorganic compounds from process off-gases by using absorption and to reuse them.	The flow of vented Hydrogen of 90Nm3/hr is based upon a near continuous flow of approximately 16Nm3/hr from each electrolyser during dryer regeneration. It should be noted that due to the low ambient pressure density of hydrogen, the mass flow is only 8.6kg/hr in total for all electrolysers. This stream cannot be recovered and reused as it is a waste stream from the drier, containing a lot of water. Due to the low mass flowrate



BAT Requirement	Demonstration of BAT
	and high buoyancy of hydrogen the vent stream would be dispersed easily.
16. In order to reduce channelled emissions to air of CO, NOX and SOX from thermal treatment, BAT is to use technique c. and one or a combination of the other techniques given below.	Not applicable, thermal treatment of waste gases is not proposed.
17. In order to reduce channelled emissions to air of ammonia from the use of selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) for the abatement of NOX emissions (ammonia slip), BAT is to optimise the design and/or operation of SCR or SNCR (e.g. optimised reagent to NOX ratio, homogeneous reagent distribution and optimum size of the reagent drops).	Not applicable.
18. In order to reduce channelled emissions to air of inorganic compounds other than channelled emissions to air of ammonia from the use of selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) for the abatement of NOX emissions), channelled emissions to air of CO, NOX and SOX from the use of thermal treatment, and channelled emissions to air of NOX from process furnaces/heaters, BAT is to use one or a combination of the techniques given below.	Not applicable
19-23. Volatile Organic Compounds (VOCs)	Not relevant. There will be no emissions of VOCs from the process.
24 Process heaters / furnaces	Not relevant. There will no process heaters or furnaces.
25-36 Subsector BAT conclusions	Not a relevant subsector.

Table 14 - Energy Efficiency

BATc Requirement	BATc Details	Demonstration of BAT
BAT 1. BAT is to implement and adhere to an energy efficiency management system (ENEMS) that incorporates, as appropriate to the local circumstances, all of the following features.	(a) commitment of top management	BGH will have a dedicated section within the EMS which focuses on energy efficiency.
	(b) definition of an energy efficiency policy	
	(c) planning and establishing objectives and targets	
	(d) implementation and operation of procedures paying particular attention to:	

BATc Requirement	BATc Details	Demonstration of BAT
	i. structure and responsibility ii. training, awareness, and competence iii. communication iv. employee involvement v. documentation vi. effective control of processes vii. maintenance viii. emergency preparedness and response ix. safeguarding compliant with energy efficiency-related legislation and agreements (where such agreements exist).	
	(e) benchmarking: the identification assessment of energy efficiency indicators over time, and the systematic and regular comparisons with sector, national or regional benchmarks for energy efficiency, , where verified data are available	
	(f) checking performance and taking corrective action paying particular attention to: i. monitoring and measurement ii. corrective and preventive action iii. maintenance of records iv. independent (where practicable) internal auditing in order to determine whether or not the energy efficiency management system conforms to planned arrangements and has been properly implemented and maintained.	

BATc Requirement	BATc Details	Demonstration of BAT
	(g) review of the ENEMS and its continuing suitability, adequacy and effectiveness by top management	
	(j) when designing a new unit, taking into account the environmental impact from the eventual decommissioning of the unit	
	(k) development of energy-efficient technologies, and to follow developments in energy efficiency techniques.	
BAT2: BAT is to continuously minimise the environmental impact of an installation by planning actions and investments on an integrated basis and for the short, medium and long term, considering the cost benefits and cross-media effects		BGH will minimise the environmental impact of the facility to achieve continuous improvement by planning actions and investment on an integrated basis over the short, medium and long term.
BAT 3: BAT is to identify the aspects of an installation that influence energy efficiency by carrying out an audit. It is important that an audit is coherent with a systems approach (see BAT 7).		Energy efficiency has been considered during the design of the plant. During its operational life BGH will conduct regular audits to maintain energy efficiency standards. Key Performance Indicators will be set for the Site, which include environmental and energy usage, water usage, electricity usage, nitrogen emissions and CO_2 emissions.
BAT 4. When carrying out an audit, BAT is to ensure that the audit identifies the	(a) energy use and type in the installation and its component systems and processes	When carrying out an audit, either external or internal, BGH will ensure the appropriate aspects are identified and evaluated. Relevant aspects will be incorporated into the internal and external audits. These will include;

BATc Requirement	BATc Details	Demonstration of BAT
following aspects (see Section 2.11):	(b) energy-using equipment, and the type and quantity of energy used in the installation	• energy usage and review of the systems and processes within the plant; • type and quantity of energy being used; • identify any additional opportunities to further reduce energy usage; and • identify any opportunities to use alternative energy sources within the systems on Site.
	(c) possibilities to minimise energy use, such as: ◦ controlling/reducing operating times, e.g. switching off when not in use (e.g. see Sections 3.6, 3.7, 3.8, 3.9, 3.11) ◦ ensuring insulation is optimised, e.g. see Sections 3.1.7, 3.2.11 and 3.11.3.7 ◦ optimising utilities, associated systems, processes and equipment (see Chapter 3)	
	(d) possibilities to use alternative sources or use of energy that is more efficient, in particular energy surplus from other processes and/or systems, see Section 3.3	
	(e) possibilities to apply energy surplus to other processes and/or systems, see Section 3.3 f. possibilities to upgrade heat quality (see Section 3.3.2)	
	(f) possibilities to upgrade heat quality (see Section 3.3.2).	
BAT 5: BAT is to use appropriate tools or methodologies to assist with identifying and quantifying energy optimisation, such as:	energy models, databases and balances (see Section 2.15)	During the design of the Site, BGH used the appropriate tools and methodologies to ensures that energy optimisation calculations were completed in the most efficient manner. Energy models and mass balances were created.
	a technique such as pinch methodology (see Section 2.12) exergy or enthalpy analysis (see Section 2.13), or thermoeconomics (see Section 2.14)	
	estimates and calculations (see Sections 1.5 and 2.10.2).	

BATc Requirement	BATc Details	Demonstration of BAT
BAT 6: BAT is to identify opportunities to optimise energy recovery within the installation, between systems within the installation (see BAT 7) and/or with a third party (or parties), such as those described in Sections 3.2, 3.3 and 3.4.		There is no opportunity to recover heat within the installation or with nearby third parties.
BAT 7. BAT is to optimise energy efficiency by taking a systems approach to energy management in the installation. Systems to be considered for optimising as a whole are, for example:	- process units (see sector BREFs) - heating systems such as: steam (see Section 3.2), hot water - cooling and vacuum (see the ICS BREF) - motor driven systems such as: compressed air (see Section 3.7), pumping (see Section 3.8) - lighting (see Section 3.10) - drying, separation and concentration (see Section 3.11)	BGH has taken a systems approach to the design to improve energy efficiency. Energy efficiency management will be managed within a dedicated section within the existing EMS for the Site.
BAT 8: BAT is to establish energy efficiency indicators by carrying out all of the following:	(a) identifying suitable energy efficiency indicators for the installation, and where necessary, individual processes, systems and/or units, and measure their change over time or after the implementation of energy efficiency measures (see Sections 1.3 and 1.3.4)	BGH will measures performance on a MWh/kg H_2 produced on a whole site basis and in addition meter and monitor energy use for individual processes throughout the Site in order to be able to identify, prioritise and measure the success of energy efficiency improvements.
	(b) identifying and recording appropriate boundaries associated with the indicators (see Sections 1.3.5 and 1.5.1	
	(c) identifying and recording factors that can cause variation in the energy efficiency of the relevant process,	

BATc Requirement	BATc Details	Demonstration of BAT
	systems and/or units (see Sections 1.3.6 and 1.5.2).	
BAT 10: BAT is to optimise energy efficiency when planning a new installation, unit or system or a significant upgrade (see Section 2.3) by considering all of the following:	(a) the energy-efficient design (EED) should be initiated at the early stages of the conceptual design/basic design phase, even though the planned investments may not be well-defined. The EED should also be taken into account in the tendering process	Energy-efficient design (EED) is being considered at all points in the design of the plant. It will be taken into account during tendering for the detailed design also.
	(b) the development and/or selection of energy-efficient technologies (see Sections 2.1(k) and 2.3.1)	When designing the plant, energy-efficient technologies were considered and selected. For further information on energy saving measures to be implemented, please refer to Section 5.1.
	(c) additional data collection may need to be carried out as part of the design project or separately to supplement existing data or fill gaps in knowledge	No additional data collection was needed to supplement energy-efficiency data during the design the design phase.
	(d) the EED work should be carried out by an energy expert	EED was conducted by an energy expert.
	(e) the initial mapping of energy consumption should also address which parties in the project organisations influence the future energy consumption and should optimise the energy efficiency design of the future plant with them. For example, the staff in the (existing) installation who may be responsible for specifying design parameters.	Mapping of energy consumption during the design included consideration of which parties in the project organisations will influence the future energy consumption and optimise the EED of the proposed plant with them.



BATc Requirement	BATc Details	Demonstration of BAT
BAT 11: BAT is to seek to optimise the use of energy between more than one process or system (see Section 2.4), within the installation or with a third party.		For information on energy saving measures to be implemented, please refer to Section 5.1.
BAT 14: BAT is to ensure that the effective control of processes is implemented by techniques such as:	(a) having systems in place to ensure that procedures are known, understood and complied with (see Sections 2.1(d)(vi) and 2.5)	BGH is committed to ensuring that a process control and utility control system is employed on Site, to ensure adequate control of the processes and operations on Site. A dedicated section within the Site's EMS will focus on energy efficiency. These systems will incorporate methods to identify key performance parameters for energy efficiency and methods for controlling and measuring these parameters, methods for optimising these parameters for energy-efficient operation and methods for documenting and analysing abnormal operating conditions. The impetus and future of these procedures will also be considered to take into account the degradation of efficiency through inefficient operation or maintenance of equipment. The relevant sections of the EMS will be updated to ensure effective control of processes is maintained.
	(b) ensuring that the key performance parameters are identified, optimised for energy efficiency and monitored (see Sections 2.8 and 2.10)	
	(c) documenting or recording these parameters (see Sections 2.1(d)(vi), 2.5, 2.10 and 2.15).	
BAT 15: BAT is to carry out maintenance at installations to optimise energy efficiency by applying all of the following:	(a) clearly allocating responsibility for the planning and execution of maintenance	BGH will implement procedures for maintenance of equipment on Site. This programme will cover reactive and prolonged maintenance to ensure equipment is kept well maintained and as energy efficient as possible. The EMS also details how BGH must consider future maintenance of any new equipment introduced to the Site, to ensure spare and critical parts are readily accessible and affordable should the plant break down
	(b) establishing a structured programme for maintenance based on technical descriptions of the equipment, norms, etc. as well as any equipment failures and consequences. Some maintenance activities may be best scheduled for plant shutdown periods	
	(c) supporting the maintenance programme by appropriate record keeping systems and diagnostic testing	
	(d) identifying from routine maintenance, breakdowns and/or abnormalities possible	

BATc Requirement	BATc Details	Demonstration of BAT
	losses in energy efficiency, or where energy efficiency could be improved	
	(e) identifying leaks, broken equipment, worn bearings, etc. that affect or control energy usage, and rectifying them at the earliest opportunity	
BAT 16: BAT is to establish and maintain documented procedures to monitor and measure, on a regular basis, the key characteristics of operations and activities that can have a significant impact on energy efficiency. Some suitable techniques are given in Section 2.10.	Section 2.10; - Indirect measurement techniques - Estimates and calculations - Metering and advanced metering systems - Low-pressure drop flow measurement in pipework	BGH EMS will include a dedicated section which considers energy efficiency of the Site. Within this section procedures, pertaining to the monitoring and measuring of key parameters relating to the operations and activities which may have a significant impact on energy efficiency are included. Techniques which are used on Site to monitor and measure these indicators are metering and advanced metering systems.
BAT 19: BAT is to maintain the efficiency of heat exchangers by both:	(a) monitoring the efficiency periodically, and	BGH will maintain the efficiency of heat exchangers used on site by monitoring their efficiency periodically and preventing fouling. When necessary, fouling will be removed.
	(b) preventing or removing fouling.	
BAT 21: BAT is to increase the power factor according to the requirements of the local electricity distributor by using techniques such as those in Table 4.3, according to applicability (see Section 3.5.1).	Installing capacitors in the AC circuits to decrease the magnitude of reactive power	Appropriate techniques will be used in order to increase the power factor of the Site. Any motors which require replacement, or any new motors introduced to Site will be energy-efficient motors. Efficiency of motors on Site is also optimised in an energy-efficient way by reducing idling time to a minimum. BGH will avoid operating equipment above its rated voltage.
	Minimising the operation of idling or lightly loaded motors	
	Avoiding the operation of equipment above its rated voltage	
	When replacing motors, using energy efficient motors (see Section 3.6.1)	
BAT 22: BAT is to check the power supply for harmonics and apply filters		BGH will check the power supply for harmonics and apply filters if required.

BATc Requirement	BATc Details	Demonstration of BAT
if required (see Section 3.5.2).		
BAT 23: BAT is to optimise the power supply efficiency by using techniques such as those in Table 4.4, according to applicability:	Ensure power cables have the correct dimensions for the power demand Keep online transformer(s) operating at a load above 40 – 50 % of the rated power Use high-efficiency/low loss transformers Place equipment with a high current demand as close as possible to the power source (e.g. transformer)	BGH will ensure that: • power cables have the correct dimensions for the power demand; • transformers operate at a load above 40-50% of the rated power; • use high-efficiency/low loss transformers; and • have placed transformers as close to the electrolysers as possible.
BAT 24: BAT is to optimise electric motors in the following order (see Section 3.6):	1. optimise the entire system the motor(s) is part of (e.g. cooling system, see Section 1.5.1) 2. then optimise the motor(s) in the system according to the newly-determined load requirements, by applying one or more of the techniques in Table 4.5, according to applicability	Motors will be energy-efficient motors with the appropriate motor sizing. When installing a new motor to Site, BGH will use those which have a variable speed drive.
BAT 26: BAT is to optimise pumping systems by using the techniques in Table 4.7, according to applicability (see Section 3.8):		Pumping systems will be installed to optimise energy-efficiency. This includes: • avoiding oversizing of pumps; • matching of pumps with motors; • design of the pipework system; • use of a flow control and regulation system; • use variable speed drives; • use multiple pumps for example where the pumping flow could be less than half the maximum capacity of a single unit; • undertaking of regular maintenance in accordance with manufacturer's specifications; • minimising the number of valves and bends in pipework; and • optimising pipework diameter.

BATc Requirement	BATc Details	Demonstration of BAT
BAT 27: BAT is to optimise heating, ventilation and air conditioning systems by using techniques such as:	for ventilation, space heating and cooling, techniques in Table 4.8 according to applicability for heating, see Sections 3.2 and 3.3.1, and BAT 18 and 19 for pumping, see Section 3.8 and BAT 26 for cooling, chilling and heat exchangers, see the ICS BREF, as well as Section 3.3 and BAT 19 (in this document).	The facility will have very limited space heating and ventilation need given the electrolysers are containerised. Heating requirements on site have been minimised to trace heating purposes to prevent freezing during winter.
BAT 28: BAT is to optimise artificial lighting systems by using the techniques such as those in Table 4.9 according to applicability (see Section 3.10):		LED light bulbs will be installed as the most energy-efficient option. The appropriate amount and intensity of new lighting will be fitted in accordance with the requirement of the space. BGH will utilise electricity meters on Site to monitor the use of electricity through lighting.
BAT 29: BAT is to optimise drying, separation and concentration processes by using techniques such as those in Table 4.10 according to applicability, and to seek opportunities to use mechanical separation in conjunction with thermal processes:	- Select the optimum separation technology or combination of techniques (below) to meet the specific process equipment's - Use of surplus heat from other processes - Use a combination of techniques - Mechanical processes, e.g. filtration, membrane filtration - Thermal processes, e.g. directly heated dryers, indirectly heated dryers, multiple effect - Direct drying - Superheated steam - Heat recovery (including MVR and heat pumps) - Optimise insulation of the drying system	Gas drying will be undertaken by molecular sieve adsorption cartridges which does not involve use of heat. As such, this BATc is not applicable.

BATc Requirement	BATc Details	Demonstration of BAT
	- Radiation processes e.g. infrared (IR), high frequency (HF), microwave (MW) - Process automation in thermal drying processes	

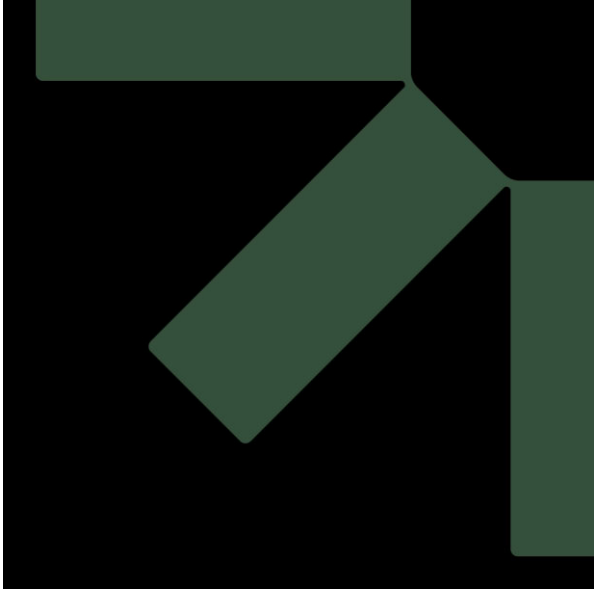
Table 15 – Industrial Cooling

BATc Requirement	BATc Details	Demonstration of BAT
To achieve a high overall energy efficiency when handling large amounts of low level heat (10-25°C) it is BAT to cool by open once-through systems.		The process does not involve large amounts of low level heat, and certainly not at levels which would warrant once through cooling. Closed loop air cooled cooling systems are proposed. Whilst once through cooling systems may be more energy efficient, the facility will be powered by electricity from low carbon emission sources. As such, it is considered that the avoidance of emissions to the water environment and reduced water consumption is preferable to additional energy consumption from low carbon sources.
Where hazardous substances are cooled that (emitted via the cooling system) involve a high risk to the environment, it is BAT to apply indirect cooling systems using a secondary cooling circuit		Not applicable. Cooling systems cool heat generated by the cell stacks and saturated hydrogen and oxygen gas lines, these are closed loop air cooled cooling systems
In principle, the use of groundwater for cooling has to be minimized, for instance where depletion of groundwater resources cannot be ruled out.		Not applicable. Use of groundwater for cooling is not proposed.

BATc Requirement	BATc Details	Demonstration of BAT
Low direct energy consumption by the cooling system is achieved by reducing resistance to water and/or air in the cooling system, by applying low energy equipment. Where the process to be cooled demands variable operation, modulation of air and water flow has been successfully applied and can be considered BAT.		BGH will employ IE3 energy efficient motors and variable speed drives in the cooling systems. The process will require variable operations, as such the system will have the capability to modulate air and water flow.
Recirculation of cooling water, using an open or closed recirculating wet system, is BAT where the availability of water is low or unreliable.		The plant will use closed loop air cooled cooling systems to minimise water usage for cooling.
In recirculating systems an increase of the number of cycles can be BAT, but demands on cooling water treatment may be a limiting factor		Not applicable. The plant will use closed loop air cooled cooling systems.
It is BAT to apply drift eliminators to reduce drift to less than 0.01% of the total recirculating flow.		Not applicable. The cooling systems to be employed are not evaporative in nature.
In line with the BAT approach, the application of the potential techniques to reduce emissions to the aquatic environment should be considered in the following order:	Selection of cooling configuration with lower emission level to surface water.	BGH have selected cooling configurations with no emissions to surface water.
	Use of more corrosion resistant material for cooling equipment.	Corrosion resistant martials will be employed in the cooling systems. Glycol cooling circuits will be made of corrosion free polypropylene piping

BATc Requirement	BATc Details	Demonstration of BAT
	Prevention and reduction of leakage of process substances into the cooling circuit.	BGH will implement a planned preventative maintenance and inspection regime to prevent and reduce leakage of process substances into the cooling circuits. Process monitoring (for example pressure) will be employed to detect leakage of process substances. Should a leakage be identified, the cause will be investigated and remediated.
	Application of alternative (non-chemical) cooling water treatment	Chemical treatments are necessary to protect against corrosion, scaling and biofouling however it is proposed that blowdown is collected and disposed off-site at a suitably licensed wastewater management facility.
	Selection of cooling water additives with the aim of reducing impact on the environment	Propylene glycol is proposed for use over ethylene glycol given it is lower toxicity and given the process requirements don't necessitate ethylene glycol.
	Optimized application (monitoring and dosage) of cooling water additives	Monitoring and dosing of the cooling water with additives will be optimised in line with manufacturer's recommendations.
BAT is reducing the need for cooling water conditioning by reducing the occurrence of fouling and corrosion through proper design. In recirculating systems, in addition to design measures, it is BAT to identify the applied cycles of concentration and the corrosiveness of the process substance to enable selection of material with adequate corrosion resistance.		The need for cooling water conditioning has been addressed by the OEM during the design of the electrolysers to reduce the occurrence of fouling and corrosion. For example, avoiding stagnant areas, turbulence and use of polypropylene piping. The plant will use closed loop air cooled cooling systems.
BAT is to employ low noise equipment.		Low noise generating pumps and cooling fans will be utilised in the cooling systems.
BAT are:	Preventing leakage by design	The cooling systems have been designed to prevent leakage.
	Operating within the design limits	BGH will operate the cooling systems with design limits as specified by the manufacturer.

BATc Requirement	BATc Details	Demonstration of BAT
	Regular inspection of the cooling system	The cooling systems will form part of BGH's Planned Preventative Maintenance system.
The occurrence in a cooling system of Legionella pneumophila cannot be fully prevented. It is considered BAT to apply the following measures:	Avoid stagnant zones and keep sufficient water velocity.	Not applicable. The plant will use closed loop air cooled cooling systems.
	Optimize cooling water treatment to reduce fouling, algae and amoeba growth and proliferation.	
	Apply periodic cleaning of the cooling tower basin.	
	Reduce respiratory vulnerability of operators by supplying noise and mouth protection when entering an operating unit or when high-pressure cleaning the tower.	
BAT is to apply the safety concept of VCI for reduction of emissions to water		No emissions to water are proposed. Containment is proposed to capture leaks from the cooling water circuits should leaks occur.



Drawings

Notes:

1.

Legend:

Environmental Permit Boundary

P0	Preliminary Issue	15/07/25	SJB	GA	
Rev	Amendments	Date	By	Chk	Auth

SLR

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Drawing Purpose

Suitability Code

Client
Barrow Green Hydrogen Ltd

Project
Environmental Permit Application

Drawing Title
Site Location Plan

Scale
1:10,000 @ A3

SLR Project No.
416.066073.00001

Designed	Drawn	Checked	Authorised
	DR	GA	
Date	Date	Date	Date
	08/07/25	15/07/25	

Drawing Number
01

Rev.
P0

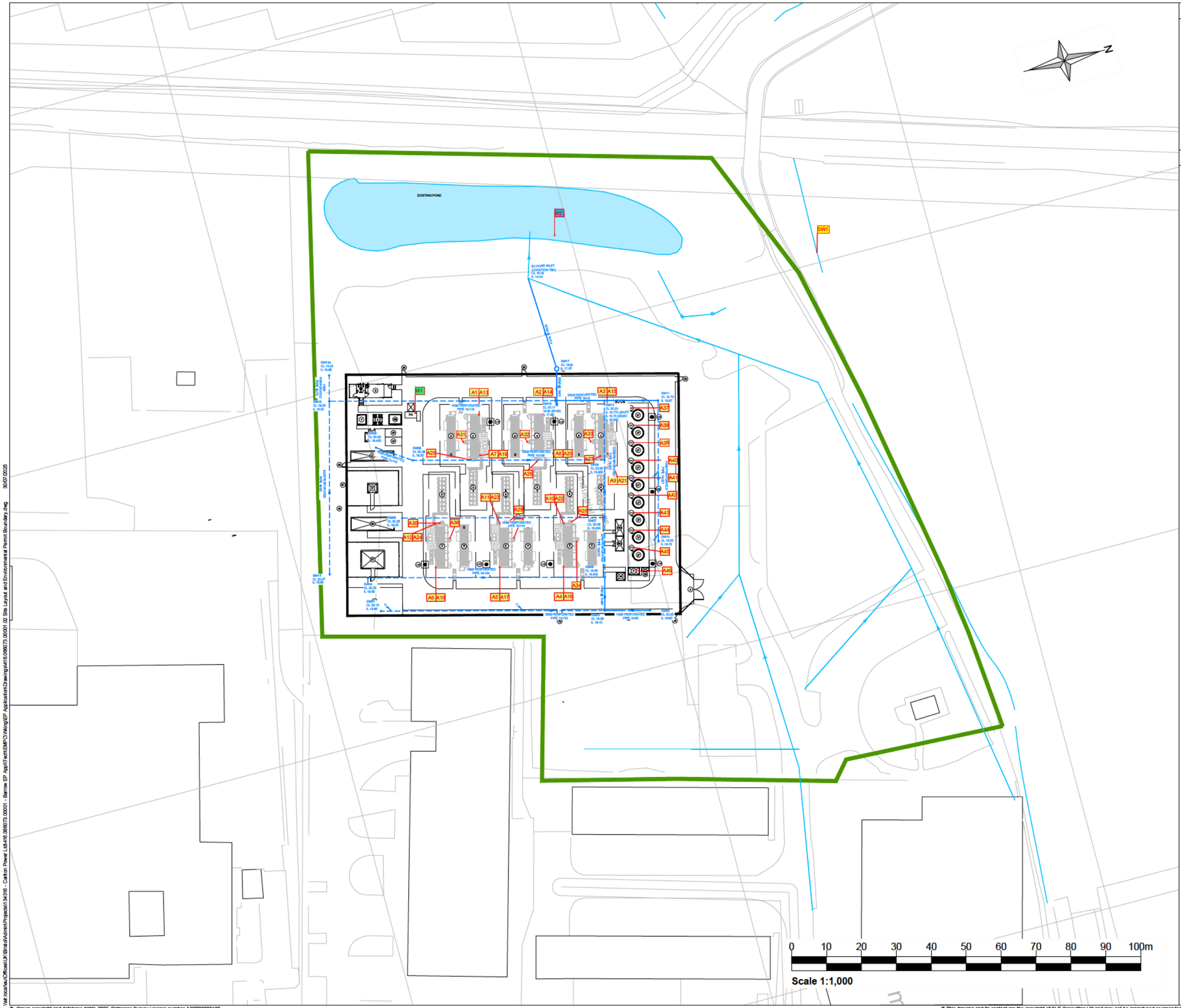
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Notes:

1. Key plan layout supplied by dalkia edf group. Drawing no. BGH-DAL-XX-DR-C-02 Rev 13 dated Nov 2024.

Legend:

- Environmental Permit Boundary
- A37 — Point Source Emissions to Air
- Proposed Surface Water Drain
- Proposed Surface Water Land Drain
- SW1 — SW1 Approximate Location of Point Source Discharge to Surface Water
- W1 — W1 Approximate Location of Process Waste Water Monitoring Chamber
- W2 — W1 Approximate Location of Process Waste Water Monitoring Chamber
- Existing Surface Water Drain

Rev	Amendments	Date	By	Chk	Auth
P1	Proposed Drainage added	24/07/25	SJB		
P0	Preliminary Issue	15/07/25	SJB	GA	

SLR

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Drawing Purpose

Suitability Code

Client: Barrow Green Hydrogen Ltd

Project: Environmental Permit Application

Drawing Title: Site Layout and Environmental Permit Boundary

Scale		SLR Project No.
1:1,000	@ A3	416.066073.00001

Designed	Drawn	Checked	Authorised
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Date	Date	Date	Date
	08/07/25	15/07/25	

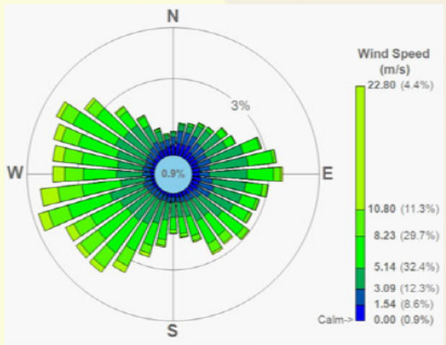
Drawing Number: 02

Rev.: P1

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Notes:

1.

Legend:

- Environmental Permit Boundary
- 500m Offset Boundary
- Local Road Network
- Commercial / Industrial
- Residential
- Woodland / Open Ground / Agricultural
- Open Water / Ditches
- Sand
- Railway
- Solar Farm
- Educational

Rev	Amendments	Date	By	Chk	Auth
P0	Preliminary Issue	15/07/25	SJB	GA	

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Drawing Purpose

Suitability Code

Client: Barrow Green Hydrogen Ltd

Project: Environmental Permit Application

Drawing Title: Environmental Site Setting

Scale		SLR Project No.
1:5,000	@ A3	416.066073.00001

Designed	Drawn	Checked	Authorised
	DR	GA	
Date	Date	Date	Date
	08/07/25	15/07/25	

Drawing Number: 03A

Rev.: P0

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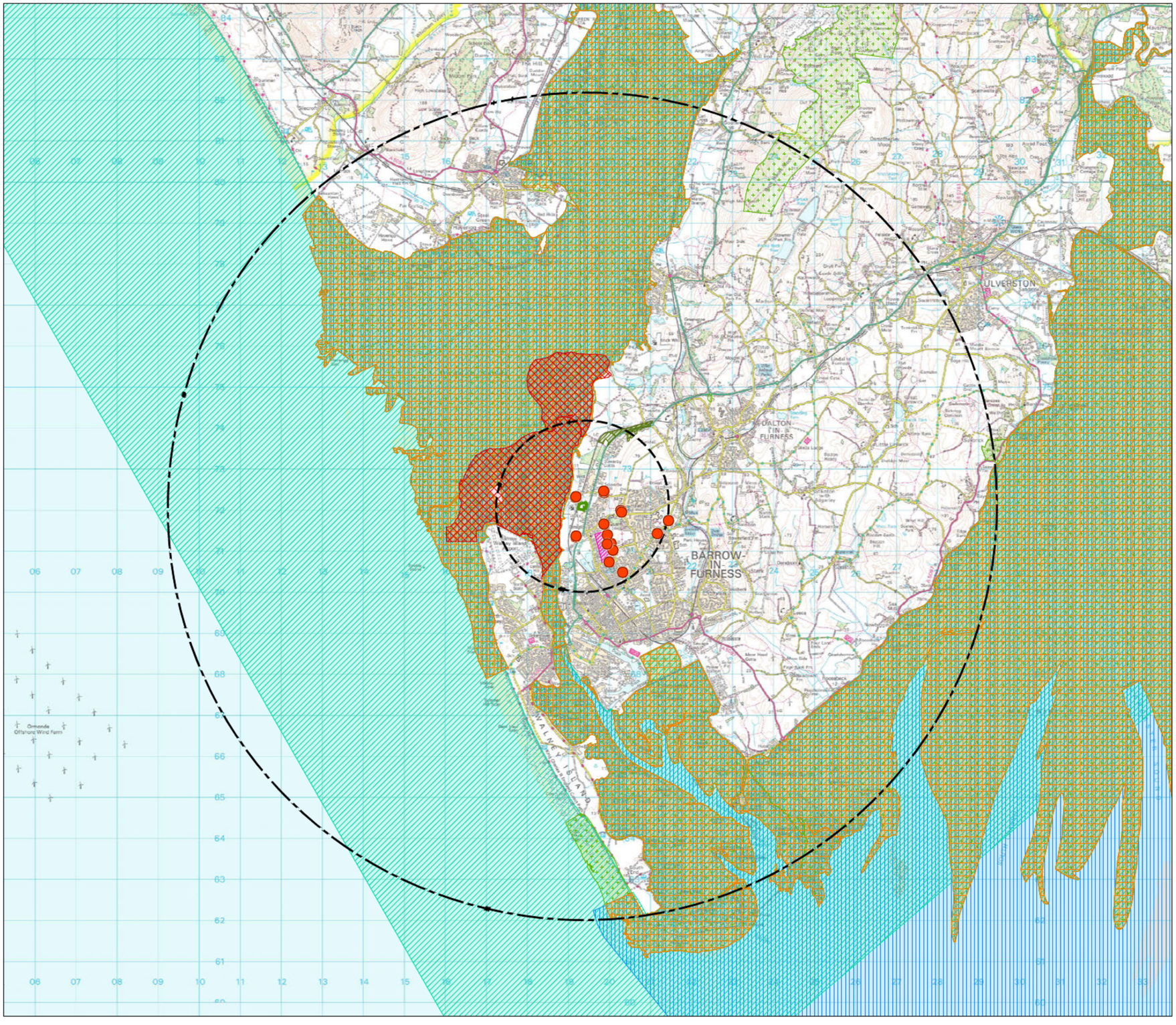
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Scale 1:100,000

Notes:

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Legend:

- Environmental Permit Boundary
- 2km Boundary Offset
- 10km Boundary Offset
- Local Road Network
- Ancient Woodland
- Registered Parks and Gardens
- Special Protection Area (Marine Components)
- Special Areas of Conservation (SAC) and Special Areas of Conservation (Marine Components)
- Site of Special Scientific Interest (SSSI)
- Ramsar Site
- National Nature Reserve

Rev	Amendments	Date	By	Chk	Auth
P0	Preliminary Issue	15/07/25	SJB	GA	

SLR

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Drawing Purpose

Suitability Code

Client
Grenian Hydrogen Ltd

Project
Barrow Green Hydrogen
Environmental Permit Application

Drawing Title
Cultural and Natural Heritage

Scale		SLR Project No.
1:100,000	@ A3	416.066073.00001

Designed	Drawn	Checked	Authorised
	DR	GA	
Date	Date 08/07/25	Date 15/07/25	Date

Drawing Number
03B

Rev.
P0

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Appendix A Pre-Application Advice

Barrow Green Hydrogen Ltd
26 Ellerbeck Court
Stokesley, Middlesborough
TS9 5PT

Date: 18/07/2025

Dear Raghuram Sridhar

Pre application advice – Enhanced service

Pre-application reference: EPR/VP3128LT/P001

Site: Barrow Green Hydrogen Plant
Meetings Industrial Estate
Park Road
Westmorland and Furness Council
LA14 4TL

Thank you for your pre application enquiry on 20/05/2025.

I am pleased to provide you with your pre-application advice. This advice is based on the information you have provided on your pre application advice form and conversations/emails recorded on the following dates:

- Supporting document submitted with the pre-application form on 20/05/2025
- Supporting information email on 23/06/2025
- Teams Meeting on 24/06/2025
- Minutes of meeting received on 26/06/2025

What this enhanced pre application advice covers

As part of this service, we have provided you with the following information:

Documents attached

1. Nature and Habitats Conservation screening report
2. Installations basic pre-app advice letter
3. Noise Impact Assessment (NIA) pre-app basic advice
4. Noise Management Plan Template
5. Validation external briefing for waste and installations
6. Enhanced pre-application advice letter

Application charge required

Ref	Item	Charge
1.4.4	Section 4.2 - production of a single inorganic chemical.	£13,209
1.19.2	Habitats Risk Assessment	£779

1.19.7	Noise and vibration management plan (if applicable)	£1,246

Forms required to be submitted

1. Application for an environmental permit: part A about you
2. Application for an environmental permit: part B2 new bespoke permit
3. Application for an environmental permit: part B3 new bespoke installation
4. Application for an environmental permit: part B6 bespoke water discharge activity, groundwater activity, or point source emission to water from an installation
5. Application for an environmental permit (charges and declarations): part F1

Pre-application advice

Please see below some comments on the meeting minutes and additional advice. Other than the below, we agree with the remaining items mentioned in the pre-application minutes of meeting.

Item no. 3

EA comment – We agree with the listed activity and directly associated activities (DAAs), although the final DAAs will be confirmed at the time of determination of the application.

Item no. 4

EA comment – You have informed us that the Kimberly Clark Paper Mill site will be the sole receiver and primary user of the hydrogen gas produced at the Barrow Green Hydrogen (BGH) site. Based on this, we believe this would be a multi-operator installation due to the technical connection between Kimberly Clark and BGH. If you agree with the multi-operator installation, then note that our guidance requires both parties to submit the environmental permit application simultaneously.

This would also mean that the pipeline which transfers the hydrogen from BGH to Kimberly Clark will be included in the installation boundary, and it will need to be included on one of the permits. We believe it would be appropriate if the pipeline is on BGH's permit as BGH owns the pipeline. However, you are free to make a proposal in this case.

There is a technical connection test which is detailed in Regulatory Guidance Note No. 2 Understanding the meaning of regulated facility - Appendices 1 and 2.

However, after reviewing the guidance, if you believe that the multi-operator installation is not applicable, then you may justify this in your application.

EA post-meeting comment

Based on the telephone conversation dated 07/07/2025, you informed us that you agree with the multi-operator installation criteria however the pipeline will be fully controlled by Cadent. This means Cadent has the authority to permit or deny the use of the pipeline. Our advice is to check Cadent's operational authority against the criteria stated in Legal operator and competence requirements: environmental permits - GOV.UK.

Based on the outcome –

1. If you apply as a multi-operator installation, our guidance requires both operators (here BGH & Kimberly Clark) to submit the environmental permit application simultaneously.
2. If you believe that Cadent will be the legal operator for the pipeline, then that might break the technical connection. In this case, BGH would be an independent operator, and you may not have to apply for a multi-operator installation.

You must refer to the above guidance links and justify your proposals when you submit the application.

Item 7

EA Comment – The environmental risk assessment should consider a site specific risk assessment following the guidance Control and monitor emissions for your environmental permit - GOV.UK which will also form part of the operating techniques as well as process parameters such as energy efficiency, water usage efficiency, hydrogen emissions to air, fugitive emissions of hydrogen, justification of venting instead of flaring and an accident management plan.

EA post-meeting comment

The key areas of your risk assessment should include water, noise and accidents. Please refer to the following guidance for carrying out the risk assessments.

- Risk assessments for your environmental permit - GOV.UK
- Surface water pollution risk assessment for your environmental permit - GOV.UK
- Noise and vibration management: environmental permits - GOV.UK

Additional advice regarding the noise impact assessment and a template for the noise management plan are attached.

Item 8

Regarding implementation of the Best Available Techniques Associated Emission Levels (BAT-AELs) for emissions to water, SLR enquired about the applicability of all the substances with a BAT-AEL and their respective monitoring frequency.

EA Comment – The BAT-AELs only apply if the emissions of the substances in the effluent exceed their respective thresholds. If BGH & SLR can provide evidence that the mass emissions of these substances do not exceed their thresholds, then the BAT-AELs for those substances will not be applicable. In terms of monitoring, where the BAT-AELs apply, the monitoring frequency of these substances will be according to the frequency stated in the Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector BAT Conclusions. However, if the operator can show consistently stable emissions data, these monitoring frequencies may be adapted in discussion with the site inspector. A separate variation is not required for this alone.

Item 9

EA Comment – There is a possibility that the point of discharge in the Walney Channel is an area of restricted dilution and dispersion. For conducting the risk assessment, BGH &

SLR may use the Sewage Treatment Reduction Factors for water filter provided in this document Sewage_treatment_reduction_factors.ods to calculate the final concentration of the substances, as BGH will be using a carbon filter to pre-treat their process water.

BGH must submit the MSDS for the anti-scalant and its dosage concentration. Further, for a worst-case risk assessment, we will need to assume that the attenuation pond is dry and therefore there is no dilution from rainwater.

EA post meeting comment – We can confirm that the location of discharge **SD 1894 7219** is intertidal i.e. an area of land covered by tidal range. Therefore, this area will be above water at low tide, as the point of discharge is above the mean high water line. In this case, BGH will need to have a timed discharge, so that the effluent is not discharged when the water level is too low.

For the surface water risk assessment, we cannot rely on rainwater for dilution. You have informed us that the attenuation pond will never be dry and that there needs to be a certain level of water in the pond for it to flow into the culvert. However, this water may not necessarily be the rainwater, especially in drought conditions. We need you to provide a more consistent idea of dilution within this attenuation pond, and the data to support it. Otherwise, we will need to consider the effluent on its own, without any dilution for a worst-case scenario.

Further, we would not look at the dilution provided by the Walney channel to screen out emissions at the initial stage. We would be treating the discharge as standalone for screening. We would need to see the raw data which is used for the true Transitional and Coastal (TraC) waters H1 risk assessment and if any pollutants fail at Test 1, you would need to do complex hydrodynamic modelling as this is a direct discharge to a conservation site.

You have stated in the supporting information provided in this pre-application, that the emissions to water risk assessment uses publicly available data. However, the limit of detection (LOD) for some of the substances that pass through to modelling, are not sufficiently low to pass TraC screening Test 1 i.e. not less than 100% of the EQS/PNEC. You may use these LODs in the modelling (at half face value), provide justification why the higher LODs have been used and whether concentrations are actually expected to exceed relevant EQS/PNEC or carry out additional monitoring with lower LODs to establish whether the substances screen out at Test 1.

You would also need to provide calculations for how the PNEC for Phosphonobutane Tricarboxylic Acid (PBTC) has been derived.

Based on the outcome of the initial H1 screening test, if TraC modelling is required, then you should model the limits you seek in the permit as the worst-case scenario. The limits must not exceed the BAT-AELs for the substances being modelled.

BGH must comply with the Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector BAT conclusions.

Item 13

EA Comment – The statutory timescale is 4 months for determination, however the complexity of the application, the risk assessments and period of external consultation

may affect this timescale. We have a process of validation by which, the applicant receives confirmation within 6 weeks, if their application can be duly made or not. Following duly making, the application goes into the determination queue.

Further, you may request prioritisation, but it is not guaranteed. The priority tracked services is currently introduced for major infrastructure and complex projects only, in case of BGH, a payment for prioritisation is not applicable i.e. this cannot be a priority tracked application. If you would like your application to be prioritised, you must provide a proper business justification at the time of application submission.

EA post meeting comment – Regarding the paid for prioritization service, while this is under consideration there is currently no system in place for paying for prioritization. We are trialling a 'tracked service' at the moment with specific cross-regime projects. More generally while we will consider a request for prioritization this is not guaranteed, and we would only consider a prioritization request once it's proved possible to duly make the application. Assuming it can be duly made, any acceptance of prioritization doesn't mean it will be allocated to an officer straightaway as it is dependent on the availability of Permitting Officers with the right experience.

A document explaining the validation process is attached.

Additional information

We have included our basic pre-application advice documents which cover relevant information for your application. You should read these carefully and use the information to help prepare your application.

You must ensure you provide dates of birth for all appropriate people as per Appendix 1 in form Part A. Failure to do so will delay your application being put into our systems. Please note that these details will not be made available on the Public Register.

After you apply

The information that you need to submit with your application is explained in the application form and its guidance. The Environment Agency will check that you have submitted this information and the correct application charges. This is to ensure we have enough information to start to determine your permit application

We will contact you if information is missing and can feasibly be provided within 10 working days. If we consider information cannot be provided within this time frame, we will return your application with a list of what is missing.

We'll retain 20% of the correct application charge to cover our costs in reviewing your application and requesting information. This maximum amount we'll retain is capped at £1,500. This is explained in the environmental permitting charges guidance.

We will not charge this if we return an application after having done very little work – for example, because it contained obvious errors or omissions.

Once we have duly made an application we will start to determine it. This is when we do our technical checks. We may need to ask you for further information or additional documents at this stage.

Once an application is validated and duly made, it is ready to be allocated for determination.

The time it takes us to allocate an application depends on a number of factors, including the complexity of the specific application and the availability of a member of our team with the right skills to assess it.

The amount of time taken to determine your application will vary. It will be impacted by factors such as:

- The quality of the application
- The complexity of the application
- Whether an application is of high public interest
- Whether the application includes novel technologies or techniques
- Whether the determination requires input from others, both internal and external to the Environment Agency
- Whether modelling and/or monitoring and assessment is required, for example Air Quality modelling and assessment or water discharge or groundwater activity specific substances assessment.

The Permitting Officer determining your application will be able to keep you updated with the progress of your application.

What happens next?

If you submit an environmental permit application then please quote this pre-application reference number: EPR/VP3128LT/P001

If the advice above details using the online digital application form, your application can be submitted using this method. If not, please send your completed application documents via email to:

psc@environment-agency.gov.uk

Please email applications where possible. If email is not possible you can submit by post to:

Environment Agency, Permitting Support Centre, Quadrant 2, 99 Parkway Avenue, Sheffield, S9 4WF

Scope of this advice

We have only provided the specific advice you requested based on the information provided. We cannot provide advice on all aspects of your application, so it is important you read all available online guidance and the application forms to ensure anything not covered within this advice is considered as part of your application.

It is important to remember:

- this is advice, we are not agreeing anything at this stage

- we have provided this advice based on the limited information we have about your proposals at this time
- we have only provided the advice you specifically requested
- we may need to request additional information when we have a full application

Disclaimer

The advice given is based on the information you have provided, and does not constitute a formal response or decision of the Environment Agency with regard to future permit applications. Any views or opinions expressed are without prejudice to the Environment Agency's formal consideration of any application. Please note that any application is subject to duly making and then full technical checks during determination, and additional information may be required based on your detailed submission and site specific requirements and the advice given is to address the specific pre-application request.

This advice covers installations only.

Other permissions from the Environment Agency and/or other bodies may be required for associated or other activities.

Enhanced pre application cost estimate

At this stage the pre-application advice is expected to cost up to **£2,600** plus VAT. An invoice will be sent separately.

If you have any questions regarding this letter please contact Anjali.Ozhakkal@environment-agency.gov.uk

If you require additional enhanced pre-application advice please complete our online form.

Yours sincerely

Anjali Ozhakkal

Permitting Officer

Nature and Heritage Conservation

Screening Report: Bespoke installation

Reference	**EPR/VP3128LT/P001**
NGR	**SD 19321 72089**
Buffer (m)	**150**
Date report produced	**20/06/25**
Number of maps enclosed	**2**

This nature and heritage conservation report

The nature and heritage conservation sites, protected species and habitats, and other features identified in the table below **must be considered in your application**.

In the further information column, there are links which give more information about the site or feature type and indicate where you are able to self-serve to get the most accurate site boundaries or feature locations.

Most designated site boundaries are available on Magic map. Using Magic map allows you to zoom in and see the site boundary or feature location in detail, Magic map also allows you to measure the distance from these sites and features to your proposed boundary. Help videos are available on Magic map to guide you through.

Where information is not publicly available, or is only available to those with GIS access, we have provided a map at the end of this report.

Sites and Features within screening distance	Screening distance (km)	Further Information
Special Areas of Conservation (cSAC or SAC)	10	Joint Nature Conservation Committee and Magic map
Morecambe Bay		
Special Protection Area (pSPA or SPA)	10	Joint Nature Conservation Committee and Magic map
Morecambe Bay and Duddon Estuary		

Ramsar **Duddon Estuary** **Morecambe Bay**	10	Joint Nature Conservation Committee and Magic map
Sites of Special Scientific Interest (SSSI) **Duddon Estuary**	2	Natural England and Magic map
National Nature Reserve (NNR) **North Walney**	2	Natural England and Magic map
Local Wildlife Sites (LWS) (see map below) **Sowerby Wood** **Lower Ormsgill Reservoir and Cocken Pool** **Willow Woods (Lenny Hill)** **Park Road Woods**	**2**	**Appropriate Local Record Centre (LRC)**
Ancient Woodland **Various**	**2**	**Woodland Trust** **Forestry Commission** Natural England and Magic map

Protected Habitats within screening distance	Screening distance (km)	Further Information
Mudflats (see map below)	up to 2	Natural England

Where protected species are present, a licence may be required from Natural England to handle the species or undertake the proposed works.

The relevant Local Records Centre must be contacted for information on the features within local wildlife sites. A small administration charge may also be incurred for this service.

The following nature and heritage conservation sites, protected species and habitats, and other features have been checked for, where they are relevant for the permit type requested, but have not been found within screening distance of your site unless included in the list above.

Special Areas of Conservation (cSAC or SAC), Special Protection Area (pSPA or SPA), Marine Conservation Zone (MCZ), Ramsar, Sites of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Local Nature Reserve (LNR), Local Wildlife Sites (LWS), Ancient Woodland, relevant species and habitats.

Please note we have screened this application for features for which we have information. It is however your responsibility to comply with all environmental and planning legislation, this information does not imply that no other checks or permissions will be required.

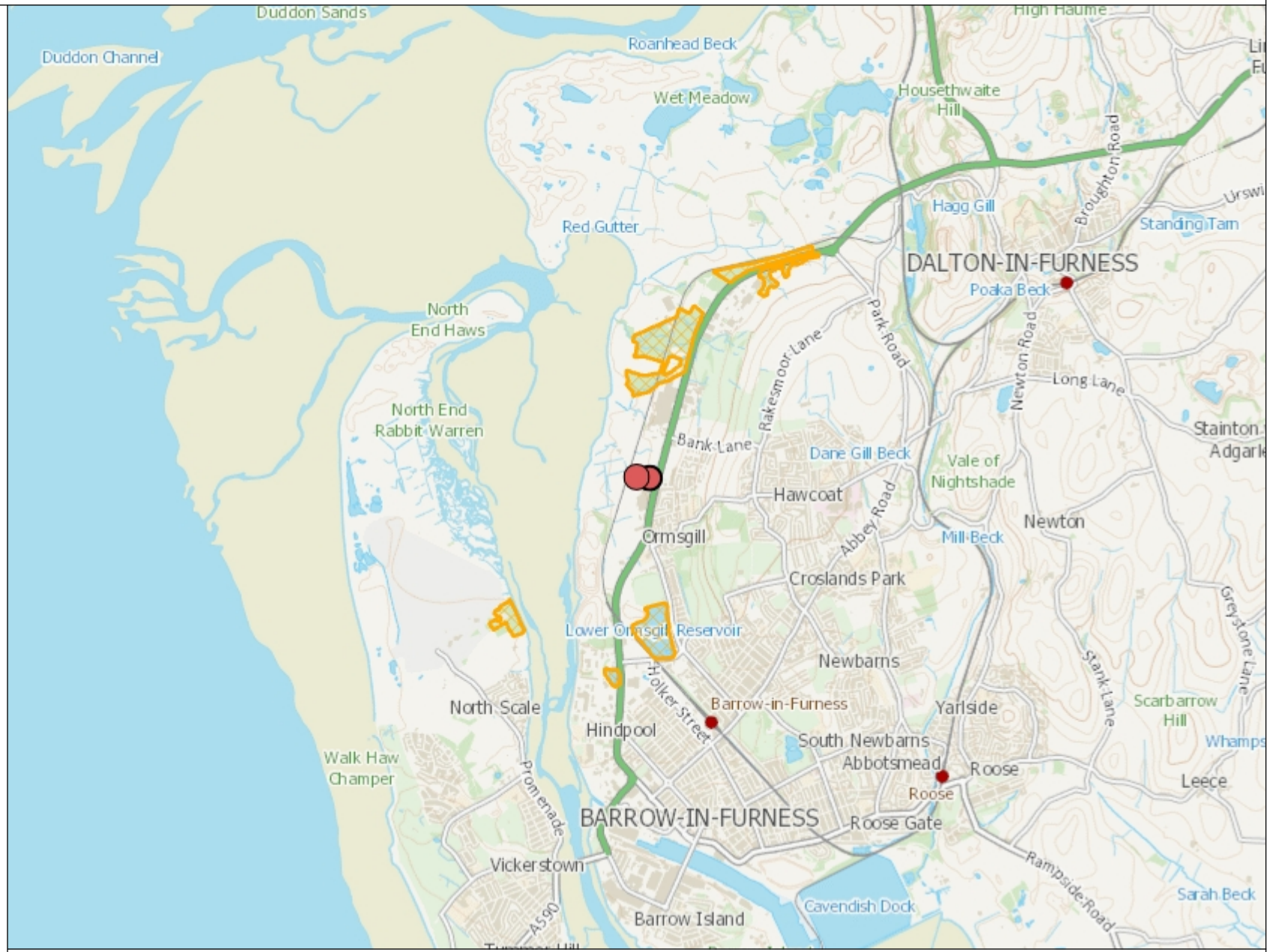
The nature and heritage screening we have conducted as part of this report is subject to change as it is based on data we hold at the time it is generated. We cannot guarantee there will be no changes to our screening data between the date of this report and the submission of the permit application, which could result in the return of an application or requesting further information.

Local Wildlife Sites

Environment Agency

Legend

Local Wildlife Sites



1: 50,000

0 1,250

Metres

N W E S

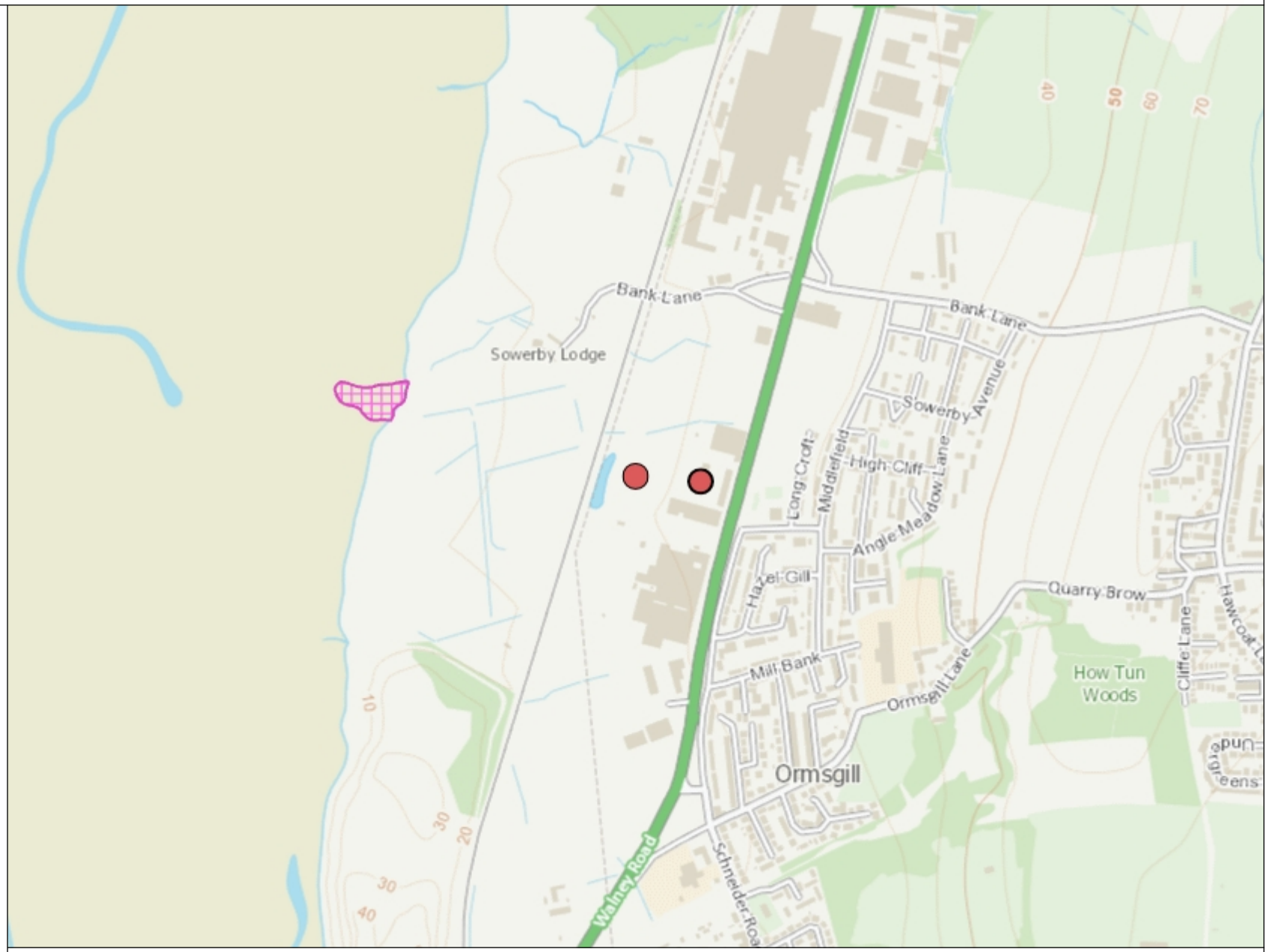
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Protected Habitats

Environment Agency

Legend

Protected Habitats screened for Env Permits



1: 10,000

0 250

Metres

N W E S

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Installations basic general pre-application advice

Check if you need an environmental permit

If you are unsure whether your activity requires an environmental permit or what kind of permit you require, you should read our guidance on whether you need an environmental permit.

How do I apply for a new permit?

To apply for a new permit, you must complete the relevant application forms and provide the required supporting information.

For some operations you can apply for a standard rules environmental permit. These have fixed conditions and are only suitable for a limited number of activities and locations. For all other activities and locations, you need to apply for a bespoke permit.

Standard rules:

- Apply for a new standard rules online
- You can also use the application forms for a new standard rules permit. You need to email the completed forms, along with supporting documentation, to psc@environment-agency.gov.uk

Bespoke permit:

- To apply for a bespoke installation permit you must complete application forms A, B2, B3 and F1.
- You will also need to complete application form part B6 if your installation includes a point source emission(s) to water, groundwater or sewer.

You should read the guidance notes that accompany each form. You should download the application forms and open with an Adobe Acrobat Reader. You may not be able to complete the form using other pdf readers, such as the one built into your internet browser.

Application forms and guidance for a bespoke permit application.

You need to email the completed forms, along with supporting documentation, to psc@environment-agency.gov.uk

When sending documents please ensure they are named appropriately to clearly identify the contents. Please use the following format: Application [Application Type] [Document Title] DDMMYYYY

The document name cannot contain special characters apart from -_.( ). If additional text is required, it should go before the document date. For example:

- Application Bespoke Supporting Information Risk Assessment 14022024
- Application Bespoke Non Tech Summary 14022024
- Application Standard Rules Site Plan 16022024
- Application Variation Part C2 16022024

IMPORTANT: Do not reply to the email address you received this email from, it is not monitored. Please send any replies to preapplicationservice@environment-agency.gov.uk

How do I change, transfer or cancel my permit?

If you already have a permit, and want to change (vary) it, transfer it to another person or business, or surrender it, you must provide the correct forms and supporting information.

How to change details of your environmental permit, transfer it to somebody else or surrender it.

If you are considering carrying out research or trials check if you can follow the standard rules SR2024 No 1: research and development at a Part A(1) installation. To apply for this standard rules you must complete application forms A, C1 and F1, fees and charges can be found here Register a research and development trial under SR2024 No 1 - GOV.UK. For further information, read Waste operations and A1 installations: carrying out research or trials. You may not need to apply to vary your permit when you carry out research activity or trials if you follow this guidance.

How much will my permit cost?

Before applying, you should read the Environmental permitting charges guidance. This sets out how to calculate the relevant charge and when certain charges apply.

You need to provide payment via credit or debit card or BACS transfer when your application is submitted. We will not provide an invoice. If your Finance team require evidence before they can make funds available we suggest you send them a copy of your completed application form Part F1 and a link to the charging scheme.

Baseline charge

You can find a full list of activity charges in table 1 in the tables of charges in the Environmental permitting charging scheme. The baseline charge for an application covers the work the Environment Agency carries out each time they determine a typical permit application.

There are fixed baseline charges for new applications, variations to permits, transfer applications and surrender applications.

Add-on charges

You may have to pay an add-on assessment charge for the assessment of plans, for example an odour management plan.

If we need to carry out additional assessments, for example a habitats assessment, we may charge extra for this work.

You must pay the add-on charge when applying for a new permit or if you need to submit a new plan when applying for a permit variation.

In some cases the costs of assessing these plans is included in the baseline application charge. The activity description in table 1 in the tables of charges will say if this is the case.

The plans and assessments are listed in table 1.19 in the tables of charges in the charging scheme.

Habitats assessment

For certain protected sites we need to carry out a habitats assessment. For these sites we charge a fixed amount of £779.

This is an assessment of the risks to one or more of these sites, a:

- European Site within the meaning of the Conservation of Habitats and Species Regulations 2017
- site referred to in the National Planning Policy Framework 2018 as requiring the same assessment as a European Site
- site of special scientific interest within the meaning of the Wildlife and Countryside Act 1981
- marine conservation zone within the meaning of the Marine and Coastal Access Act 2009

We have included further information on when this is required in the supporting documents section below.

Subsistence

If we grant a permit, you will need to pay an annual subsistence charge to cover the ongoing costs of regulating the permit. The subsistence charges are listed in the tables of charges in Part 3 of the charging scheme.

Sites of High Public Interest (SHPI)

If your site is designated as a SHPI a different charging processes is applied. Additional information on SHPI is included in section 2.5 of the Environmental Permitting Charges Guidance.

- An application for a SHPI is subject to a newspaper advertising charge of £500.

- The number of hours it takes to determine the application will be calculated at £100 per hour (commonly referred to as a 'time and materials' charge). If this is higher than the standard application charge listed in the Charging Scheme, the additional charge component will be applied – please see section 2.5 of the Environmental Permitting Charges Guidance.

Declaration

Please ensure the Declaration section is completed by each "relevant person".

- For an application from an individual, a relevant person is the person to be named on the permit.
- For an application from more than one individual, each person who is applying for their name to be on the permit must complete the declaration – you will have to complete a separate copy of the declaration page for each additional individual.
- In the case of a company a relevant person must be an active director/company secretary as listed on Companies House.
- For a limited liability partnership, the declaration must be completed by a partner.
- For a charity, a relevant person is a key post holder: chair, chief executive, director or trustee.

Further information on who should complete the declaration can be found in section 5 of the guidance notes for the F1 application form.

Supporting documents

You need to supply supporting documents with your application. The online guidance and application form guidance explain what documents you need to provide. Depending on the type of application, you might not be required to provide all the documents listed below.

If you do not provide the correct supporting information this may delay the processing your application.

Non-Technical Summary

For new bespoke permits and most variation applications you need to send us a simple explanation of your proposed activities (or in the case of a variation, what changes you propose to make). This should include a summary of your operations and a summary of the key technical standards and control measures arising from your risk assessment.

As a guide, this summary document should be no more than one to two pages in length.

Site plan

New installations applications require a site plan. It is also required when you propose to increase or reduce your site boundary.

The plan must clearly show the full site boundary in a single unbroken line. For standard rules permits, the boundary must be in green (note this does not apply to standard rules SR2024 No.1 – R&D at a Part A(1) Installation).

Your plan should clearly mark the site layout, infrastructure and drainage arrangements.

Environmental Management System

For new bespoke permit applications and transfer applications you must send a summary of your environmental management system (EMS). An update to your EMS may also be required for some variation applications. You should follow the guidance on developing a management system.

Habitats risk assessment

You should check if your site is located within the relevant screening distance of a designated site. If so, you need to assess the risk to the site(s) from your activity. You may need to pay an additional charge to cover the assessment of the risk. Further information is included in the 'How much will my permit cost' section above.

To help you identify relevant sites, you can ask us to complete a Nature and Heritage Conservation Screening assessment for you, using the online pre-application service. The screening assessment service is free of charge.

If you are applying for a variation and emissions or impacts are increasing as a result of that change then depending on the location of the facility you may need to assess how the increased impact will affect habitat sites.

If your proposed operation involves any nitrogen or phosphorus nutrient inputs to surface water (or groundwater in hydrological continuity with surface water) and it is within the relevant screening distance of one of the protected conservation sites listed in Annex C table 1 or 2 of the Natural England Water Quality and Nutrient Neutrality Advice (16 March 2022) - NE785 then you will need to consider how you will achieve nutrient neutrality for your operation. In line with the Habitats Regulations any proposed net increase in nutrient load discharged into these catchments, which are currently failing to meet their water quality objectives for nutrients, will cause an adverse effect to the protected site and must therefore be considered for refusal. For more information on Nutrient neutrality see Natural England's guidance at the following link: Nutrient Neutrality and Mitigation: A summary guide and frequently asked questions - NE776.

Environmental Risk Assessment

For new applications or when you make changes, you must consider the environmental risk posed by your proposals. This must take the form of an environmental risk assessment which should follow the methodology set out in risk assessments for your environmental permit.

You should read our guide to risk assessments for specific activities and consider using our assessment tool to evaluate your environmental risk. Our assessment tool will inform you when more detailed modelling is required.

You should check if your site is located in a flood risk zone. If the site is in a flood zone, you should assess the risk of pollution in the event of a flood.

Depending on the outcome of your initial environmental assessment, you may be required to undertake detailed modelling of your environmental risk.

- If you need to assess the risk of emissions to air, use the air emissions risk assessment for your environmental permit guidance.

You must carry out detailed modelling assessment on any emissions that you didn't screen out through your air emissions risk assessment. Your modelling report needs to follow the air dispersion modelling reports guidance.

- If you need to assess the risk of hazardous pollutants to surface water, you need to follow the surface water pollution risk assessment guidance.
- If you need to assess the risk from sanitary determinands you should follow the assessment of sanitary and other pollutants in surface water discharges methodology.
- If you need to undertake detailed modelling of the risk to surface water you should follow the surface water pollution risk assessment methodology.
- If you need to undertake an assessment of the risk to groundwater you should follow the groundwater risk assessment guidance.

Technical Description and BAT assessment

For new permit applications, you will need to provide a technical description of the activity (or in the case of a variation, the changes you propose to make).

You need to detail the plant, equipment and infrastructure, including design capacities. You must demonstrate how you will meet any relevant Best Available Techniques (Including compliance with BAT conclusions where these have been published for your activity). This should include consideration for any relevant Directives, such as Medium Combustion Plant Directive (MCPD), Energy Efficiency Directive and Waste Framework Directive (WFD).

The technical assessment should also include details of your operating techniques and the infrastructure you are using to minimise the risk of pollution, including any details of secondary containment used (such as bunds) and how this meets any relevant standards. Please see the pollution prevention guidance for additional advice.

If you are varying your permit, you should detail any existing operating techniques (as listed in table S1.2 of your permit) that are subject to change by the application being made and demonstrate how they will meet any relevant BAT. Note any new equipment or activities are likely to need to meet any new and relevant BAT standards.

Amenity management plans

You must read our guidance on how to control and monitor emissions for your environmental permit.

This includes guidance on controlling pollution from odour, dust, noise, pests and other 'fugitive emissions' (emissions without set emission limits).

You may be required to produce standalone management plans to demonstrate how you will control and monitor emissions. These will be assessed as part of your application. For odour and dust, we can supply a management plan template. The templates have been designed to cover the aspects of your operations that we will assess. You do not have to use this template, but if you do and provide all the information requested, it makes it more likely your plans will be accepted. You should contact the following teams to request a copy the template:

- Odour: odourteam@environment-agency.gov.uk
- Dust: air.quality@environment-agency.gov.uk

For activities where dust and or odour has the potential to be a high risk, we have included the relevant templates with this advice. You may need to pay an additional charge for the assessment. Further information on this is included in the 'How much will my permit cost' section above.

This also applies to variations which may lead to an increase in emissions as a result of the changes being proposed.

We have included additional notes below on specific considerations for noise impact assessments below.

Risks from Noise and Vibration, Industrial and Commercial Sound and Noise Management Plans

If your risk assessment shows your operation is likely to cause pollution from noise or vibration beyond your site boundary you must provide a noise impact assessment (NIA) based on BS4142:2014+A1:2019 – 'Methods for rating and assessing industrial and commercial sound'.

Where your assessment has used calculations or modelling to predict sound pressure levels at receptors, you must follow our guidance on the presentation of your acoustic data: Noise impact assessments involving calculations or modelling.

We have attached some supplementary advice on producing a NIA.

Your NIA must be accompanied by a Noise Management Plan based on the results of your NIA. We have attached a template to help you produce a noise management plan.

Fire Prevention Plan (FPP)

If you store combustible wastes at your site you need to provide an FPP. You must follow our guidance on Fire Prevention Plans. This tells you what to include in your FPP and the fire prevention measures you must put in place. We have also produced a template to help you prepare your plan.

If you are varying your permit and this will lead to an increased fire risk, then a new or updated plan will be required.

Accident prevention and management plan

Your EMS should include a plan for dealing with any incidents or events that could result in pollution. This should follow our guidance on producing an accident prevention and management plan. If applying for a variation, you may need to update this plan to incorporate the proposed changes.

Technical Competence

If your activities include waste management, you must meet legal operator and competence requirements. You will need to send in evidence of appropriate technical competence for the proposed activities (or in the case of variations, the proposed changes). You will need to include valid certificates or other acceptable evidence.

Site condition report (SCR)

For guidance on site condition reports and establishing baseline reference data see H5 Site Condition Report guidance.

If you are proposing to use, produce or release hazardous substances you may need to complete or update a stage 1 to 3 assessment in accordance with EC Commission Guidance on baseline reporting (2014/C 136/03) dated 6 May 2014.

To identify hazardous substances use the criteria given in article 3 in the Classification, labelling and packaging of substances and mixtures regulations.

See sections below for further advice on SCR and stage 1 to 3 assessments for new bespoke and permit variation applications.

A supplementary stage 1 to 3 assessment advice note is included at the end of this basic pre-app advice.

New bespoke permit - SCR

You must submit a SCR with sections 1 to 3 of the SCR template completed with your permit application. You should use the H5 Site Condition Report word template to prepare your SCR.

You must complete a stage 1 to 3 assessment and include this in your SCR if you are proposing to use, produce or release hazardous substances.

Permit variations - SCR

You must update your existing site condition report if you are proposing to:

- extend your site boundary
- use, produce or release any new hazardous substances

You must submit your updated site condition report with your permit variation application. If you have not previously produced a site condition report you should use the H5 Site Condition Report word template to prepare your SCR.

If you have an existing Application site report (ASR) and Site Protection and Monitoring Programme (SPMP) you should either update or replace these with a site condition report.

If you are applying for a variation and you propose to use, produce or release new hazardous substances, you must:

- update your existing stage 1 to 3 assessment
- produce a new stage 1 to 3 assessment if you do not already have one
- update or collect new baseline reference data, if applicable

This also applies if you are proposing to relocate any hazardous substances you currently use, produce or release to a new area within your site boundary.

You must submit this to us as part of your updated site condition report.

Guidance for new bespoke permits and variations - SCR

A stage 1 to 3 assessment is required to comply with the requirement for a baseline report in Schedule 7 (paragraph 5 [m]) in the Environmental Permitting Regulations.

If your stage 1 to 3 assessment identifies a risk to soil and groundwater we recommend baseline reference data is established for these substances and you do soil and groundwater monitoring during the life of your permit.

It is recommended that A1 installations who do not have hazardous substances complete the stage 1 to 3 assessment for any other potentially polluting substances.

This will help you demonstrate your site is in a satisfactory state when you apply to surrender all or part of your permit.

Multi-operator installations

If different parts of the installation (that are technically connected) will be operated by different organisations or people you will need to apply for a multi-operator installation. This means that if we granted the application the Installation will be covered by more than one permit (issued to different operators), with each permit defining their responsibility within the Installation area.

When making an application each potential operator will need to apply for a permit for the parts of the site they will be responsible for. The applications must be submitted at the same time. Each applicant will need to pay the relevant application charge for the activities they are applying for. It is important all operators discuss proposals with each other and consider the impacts of their operations on the other operators.

The applications should refer to each other so we can assess them together. Each application needs to include any relevant supporting information requested by our application forms, such as site condition reports, environmental risk assessments and descriptions of operating techniques.

We will normally return any individual applications for multi-operator installations where the other applications for the site have not yet been submitted. For new applications we will typically issue any granted permits at the same time so the application timescales will be dependent on each other.

It is important we understand which parts of the installation each operator will be responsible for if a permit is granted. In your applications all operators will need to include:

- Site plans showing the boundaries of the whole site and the boundaries for the specific activities controlled by each operator
- An environmental risk assessment which covers the whole site and all activities (for example cumulative impacts for noise emissions from both permits operational at the same time)
- Explanation of how the different activities are interconnected and who has responsibility for what in their operating techniques. Where there is crossover (for example a conveyor carrying material into the other site) and it is not possible to divide responsibility, the application should identify the overall responsible operator for that plant
- Explanation of how the respective Environmental Management Systems address the interaction between the two operators and will implement effective communication throughout the life of the permit

Any future changes to the permits such as variations or transfers need to be discussed with all operators and depending on the changes proposed (such as where there is an interaction between emissions) may require applications from all operators to make any required changes to all permits.

If you think you will have more than one operator at your site we recommend you seek enhanced pre-application advice.

Water Discharges

If your application will include water quality discharges which form part of the same installation facility you must complete the installation application forms and water quality application forms. If the discharge is standalone (not technically linked to the installations facility) on another separate permit you can access pre-application advice here or follow the guidance here.

Waste Activities and Exemptions

If you require pre-application advice about a standalone waste activity, then you can access advice here. If the waste activity will be included with your installations permit application, and is not a directly associated activity, you should follow the guidance here and complete application form's part B4 or B1 as appropriate.

A waste exemption is a waste operation that is exempt from needing an environmental permit. Future reforms to waste exemptions will mean exemptions cannot be registered at or adjacent to (where there is a direct link) permitted installations. Waste exemptions cannot currently be used on a permitted installation. For further details including transition periods, please read Waste Exemptions – Getting Ready for Change. We do not expect changes to the Environmental Permitting Regulations (EPR) before 2025. The exact date depends on parliament and its legislative programme.

Other permissions required

The above advice covers installations activities only. Other permissions from the Environment Agency and/or other bodies may be required for your activity or if you carry out any associated or additional activities, for example:

- List of activities that need an environmental permit
- If you abstract or impound water
- Planning permission
- If you work on or near a river, flood defence or sea defence

Submitting an application

Please submit your application by email or, if applicable, by using the online form as detailed in the ‘How do I apply for a new permit?’ section above.

Send environmental permit application information in stages

You can ask the Environment Agency if you can submit application information in stages if your proposal is either or both:

- complex

- a novel technology

If you want to submit information in stages read the guidance and follow the instructions to request as part of enhanced pre-application advice.

After you apply

We will check your application to make sure it is complete. We refer to these checks as ‘validation’ and ‘duly making’. This is to ensure we have enough information to start to determine your permit application. We will contact you if information is missing and can feasibly be provided within 10 working days. If we consider information cannot be provided within this time frame we will return your application with a list of what is missing.

If we cannot progress your application past this stage for any reason, we will return it and refund the application charge minus 20% to cover our costs to that point.

We will not charge this if we return an application after having done very little work – for example, because it contained obvious errors or omissions.

The amount we will keep is capped at £1,500.

Once we have duly made an application we will start to determine it. This is when we do our technical checks. We may need to ask you for further information or additional documents at this stage.

Once an application has been validated or duly made, it is ready to be allocated for determination.

The time it takes us to allocate an application varies, depending on the complexity of the specific application and the availability of a member of our team with the right skills to assess it.

The amount of time taken to determine your application will vary. It will be impacted by factors such as:

- The quality of the application
- The complexity of the application
- Whether an application is of high public interest
- Whether the application includes novel technologies or techniques
- Whether the determination requires input from others, both internal and external to the Environment Agency
- Whether modelling and/or monitoring and assessment is required, for example Air Quality modelling and assessment

The Permitting Officer determining your application will be able to keep you updated with the progress of your application.

I still have questions about my application, and I’d like further advice

If you have remaining basic questions about your application which have not been answered by.gov.uk guidance pages or the advice given in this document (and any supplementary activity document) you can email us with your application specific question to: preapplicationservice@environment-agency.gov.uk

Please quote your unique Environment Agency EPR number found in your pre-app response email. Please note this basic free advice is limited to:

- The correct application charges
- The correct application forms to use
- What guidance you must follow
- Information about administrative tasks the Environment Agency may need you to do as part of your application
- If there are standard rules sets relevant to your activities and if you meet the criteria for them
- Information about risk assessments you may need to do to accompany your application

Alternatively, if you have decided that you now need chargeable enhanced pre-application advice to ask more detailed site-specific technical questions about your application then you will need to complete this form to access this service, insert your unique EPR number found in the basic pre-app response email when prompted by the form.

This enhanced service could include advice on:

- the type of permit you need
- complex modelling
- preparing risk assessments
- parallel tracking for complex permits with planning applications
- specific substances assessments
- monitoring requirements (including baseline)
- what guidance you must follow before you submit your application
- the correct application charge

Priority Tracked Service

We offer coordination for pre-application advice and decisions for large or complex projects which require multiple environmental permits or licences, or a combination of both. You can use this optional service to help you submit multiple applications effectively. Further information is available via Request environmental permit coordination for major projects.

Supplementary stage 1 - 3 assessment advice (Part A installations)

Background

Schedule 7 to the EPR transposes the requirements of the Industrial Emissions Directive into domestic law. This requires Part A1 installations to complete a 'baseline report.'

To satisfy the requirement for a 'baseline report' Part A1 installations are required to produce a stage 1 - 3 assessment if they propose to use, produce or release any hazardous substances during the life of the permit to identify if there is a risk of pollution risk to soil and groundwater.

Where a risk to soil and groundwater is identified baseline reference data **must** be established and periodic soil and groundwater monitoring carried out – at a frequency to be agreed but every 10 and 5 years respectively as a minimum.

Whilst a periodic monitoring condition is included in all Part A1 installation permits this condition only becomes active when a risk from relevant hazardous substances is identified.

Further information on the Stage 1 - 3 assessment is detailed in the EC guidance concerning baseline reports (2014/C 136).

We are currently updating our existing H5 SCR guidance on GOV.UK to provide further information on complying with baseline reporting and periodic monitoring requirements.

Stage 1 – Identify hazardous substances used on site

You should produce a list of all hazardous substances you propose to use, produce or release within your site boundary.

Include raw materials, effluent discharges, products, intermediaries, by-products, emissions or wastes.

You should then determine which of the substances are classified as hazardous substances.

Hazardous substances are defined in article 3 of the Classification, labelling and packaging of substances and mixtures regulations (CLPR).

They are defined as a substance or a mixture of substances that meet the criteria given in Parts 2 to 5 of Annex I of the CLPR. They are:

- Part 2 – physical hazards.
- Part 3 – health hazards.

- Part 4 – environmental hazards.
- Part 5 – additional hazard to the ozone layer

Your material safety data sheets will state if any substances you are proposing to use, produce or release are hazardous substances.

You can also use the:

- C&L Inventory on the European Chemicals Agency (ECHA) website
- Registered substances on the ECHA website
- eChemPortal on the Organisation for Economic Co-operation and Development website

Include the chemical constituents if substances are listed as trade names. Give details of the proportion of the largest constituent chemicals if there are mixtures or compounds.

Stage 2 – Identify relevant hazardous substances

You must work out the potential pollution risk of each hazardous substance you have identified in Stage 1. If they could cause soil and groundwater pollution, they are called 'relevant hazardous substances'.

To identify relevant hazardous substances, you must do this by reviewing the chemical and physical properties of each hazardous substance by assessing the:

- solubility
- toxicity
- mobility
- persistence – consider for example degradation rates, breakdown products and the potential for bio-accumulation
- biodegradability
- physical state - solid, liquid or gas

To get information on physical and chemical properties you can use your material safety data sheets.

You can also use the:

- eChemPortal on the Organisation for Economic Co-operation and Development website

Where a group of substances display similar characteristics, you can assess them together. Your assessment must include:

- your data and how you interpreted it
- a justification if any hazardous substances have been excluded, included or grouped together
- substances you have identified as relevant hazardous substances

The information for this stage is generally summarised in a table with the final column identifying whether a substance has the potential to cause pollution and is therefore a Relevant Hazardous Substance (RHS) or a substance with a pollution potential.

You can use Example 1 as a checklist for the type of information you will need to provide for your Stage 1 and 2 assessment. We recommend the final column identifies whether a substance has been identified as relevant hazardous substance.

Stage 3 – Assessment of site specific pollution possibility

You must assess the potential pollution risk to soil and groundwater for each RHS for all activities that will take place on your site. For example, production areas, tank farms, fuel storage and warehousing.

The assessment of the potential pollution risk from each RHS needs to include:

- a detailed physical inspection
- their location
- quantity of each one used, produced or released
- location of delivery
- existing pollution prevention measures and whether they are fit for purpose
- the circumstances under which emissions may occur

The EC guidance contains useful detail on this stage.

Use the information you have collected to assess if there is a risk to soil and groundwater from the relevant hazardous substances you have identified. Use a source-pathway-receptor approach.

If a risk is identified, you **must** establish baseline reference data for soil and groundwater for those relevant hazardous substances and you will be required to do periodic soil and groundwater monitoring.

You should provide the information in a table or series of tables for each type of activity on-site for example, production areas, tank farms, warehousing with additional supporting details in the body of the report – i.e. the zone assigned in the site plan.

The supporting information in the report should include a ‘detailed’ summary of the procedures (including document references) and the systems in place within your company environmental management system (EMS) for the inspection and maintenance of all pollution prevention measures.

It is recommended the assessment of existing pollution prevention measures is undertaken using a ‘lines of evidence’ type approach to set out the primary, secondary and tertiary containment measures and process control measures for

example, alarms, manned loading / off loading facilities that are in place to prevent the pollution of soil and groundwater.

Where possible it is useful to refer to asset numbers of tanks and bunds so the assessment can be crossed referenced with the inspection and maintenance programme within your EMS – and the reporting elements of your operational SCR. This should be carried out in the text and table format with reference to the detailed zoned site plan.

Drainage systems, collection pits/sumps, interceptors should also be included in the assessment.

Examples 2 and 3 provide worked examples of the types of information you will need to include.

Example 1: Stage 1 – 2 assessment

Trade name	Hazardous Substance	Composition	Classification Labelling Packaging (CLP) Classification (EC No 1272/2008)	Physical State	Solubility	Toxicity	Mobility	Persistence	Potential to pollute soil and groundwater	Relevant Hazardous Substance
Not applicable	Xylene	Xylene 100%	Physical Hazards Flammable liquids Category 3 (H226) Health Hazards Aspiration Toxicity Category 1 (H304) Acute dermal toxicity Category 4 (H312)	Liquid	Low	High	Med	Yes	Yes. Moderately mobile in soil and may leach into groundwater and be persistent for many years.	Yes

Trade name	Hazardous Substance	Composition	Classification Labelling Packaging (CLP) Classification (EC No 1272/2008)	Physical State	Solubility	Toxicity	Mobility	Persistence	Potential to pollute soil and groundwater	Relevant Hazardous Substance
			Acute Inhalation Toxicity - Vapours Category 4 (H332) Causes skin irritation Category 2 (H315) Causes serious eye irritation Category 2 (H319) Specific target organ toxicity - (single							

Trade name	Hazardous Substance	Composition	Classification Labelling Packaging (CLP) Classification (EC No 1272/2008)	Physical State	Solubility	Toxicity	Mobility	Persistence	Potential to pollute soil and groundwater	Relevant Hazardous Substance
			exposure) Category 3 (H335) Specific target organ toxicity - (repeated exposure) Category 2 (H373) <u>Environmental Hazards</u> Toxic to aquatic life with long lasting effects Category 4 (H411)							

Trade name	Hazardous Substance	Composition	Classification Labelling Packaging (CLP) Classification (EC No 1272/2008)	Physical State	Solubility	Toxicity	Mobility	Persistence	Potential to pollute soil and groundwater	Relevant Hazardous Substance
Not applicable	Sulphuric acid	Sulphuric acid 72% weight solution	Health Hazards Causes severe skin burns and eye damage Category 1A (H314) Causes serious eye damage Category 1 (H318)	Liquid	High	Low	High	Low	Yes. May affect pH in groundwater.	Yes

Example 2: Stage 3 assessment

This example of a tank farm shows the relevant hazardous substance is not a pollution risk to soil and groundwater.

Relevant Hazardous Substance (RHS)	Tank Number	Maximum capacity of tank (tonnes)	Maximum amount stored at site (tonnes)	Maximum amount used annually (tonnes)	Details of existing pollution prevention measures	Is the RHS a pollution risk?
Xylene	T001	25	15	100	Primary containment measures Stainless steel tank seated on concrete plinth. Tank fitted with level indication and alarm system with independent high-level alarm. Tank is inspected and maintained in line with manufacturers guidelines in accordance with Standard Operating Procedure (SOP) 01 Inspection and testing of primary tanks. Tanker off-loading activities are supervised and completed in accordance with SOP 02 Off-loading of bulk chemical road tankers. Instructions identifying destination tank are issued in writing and tank contents are checked before tanker offloaded to confirm sufficient capacity available. Secondary containment measures Tank located in secondary containment bund constructed of reinforced concrete tied into underlying reinforced concrete slab with a bund liquid alarm detection switch. Bund volume meets	No

Relevant Hazardous Substance (RHS)	Tank Number	Maximum capacity of tank (tonnes)	Maximum amount stored at site (tonnes)	Maximum amount used annually (tonnes)	Details of existing pollution prevention measures	Is the RHS a pollution risk?
					CIRIA C736 requirements of a 110% capacity. Sump observed in the bund. This was observed to be in good condition. Bund integrity is tested annually by a certified contractor in accordance with procedure SOP 03 Site Bund Inspections. The removal and disposal of surface water from the bund is completed in accordance with SOP 04 Removal and disposal of surface water from bunds. <u>Tertiary containment measures</u> Offloading area is served by an impermeable concrete surface with containment provision for the entirety of the largest tanker delivery. The surfacing is in good condition. There are no evidence of cracks or damage. Site surfacing is inspected in accordance with procedure SOP 05 Inspection of site surfacing. The tanker unloading area and external hard standing are inspected on a monthly basis. <u>Environmental Management System: Inspections and Procedures</u> Daily checks of all primary, secondary and tertiary containment are completed in accordance with procedure SOP 06 Daily	

Relevant Hazardous Substance (RHS)	Tank Number	Maximum capacity of tank (tonnes)	Maximum amount stored at site (tonnes)	Maximum amount used annually (tonnes)	Details of existing pollution prevention measures	Is the RHS a pollution risk?
					checks for primary, secondary and tertiary containment. Defects logged on the maintenance system and assigned a timescale for repair on a risk basis. A register is maintained via the Environmental Management System to record all inspection, maintenance repair and replacement work for all primary, secondary and tertiary containment including drainage systems to ensure these remain fit for purpose. <u>Emergency response procedure</u> Spill kits observed to be available and training on use provided. Procedures governing the inspection, use and training of spill kits and emergency equipment is documented within procedure SOP 07 Site Spillage Control Equipment and SOP 08 Emergency response equipment. Emergency incidents and spillages are dealt with in accordance with procedure SOP 09 Procedure for dealing with environmental incidents and emergencies.	

Example 3: Stage 3 assessment

This example of a tank farm shows the relevant hazardous substance is a pollution risk to soil and groundwater.

Relevant Hazardous Substance (RHS)	Tank Number	Maximum capacity of tank (tonnes)	Maximum amount stored at site (tonnes)	Maximum amount used annually (tonnes)	Details of existing pollution prevention measures	Is the RHS a pollution risk?
Sulphuric Acid (72% weight solution)	T002	8	5	20	<u>Primary containment measures</u> High density polyethylene tank (HDPE) seated on concrete plinth Tank fitted with level indication and alarm system with independent high-level alarm. Tank is inspected and maintained in line with manufacturers guidelines in accordance with procedure SOP 01 Inspection and testing of primary tanks. Tanker off-loading is supervised but no formal procedure is in place detailing instructions to be followed. <u>Secondary containment measures</u> Tank located in secondary containment. Bund constructed of reinforced concrete tied into underlying reinforced concrete slab. Extensive loss of surface observed on bund wall and base slab revealing exposed aggregate. Hairline cracks observed in bund wall. Rainwater in bund observed to be permeating into bund wall at base. No corrosive protective coating observed on bund walls or base slab. Bund volume does not meet CIRIA C736 requirements of a 110%. Given these observations there is a	Yes

Relevant Hazardous Substance (RHS)	Tank Number	Maximum capacity of tank (tonnes)	Maximum amount stored at site (tonnes)	Maximum amount used annually (tonnes)	Details of existing pollution prevention measures	Is the RHS a pollution risk?
					medium – high potential that soil and groundwater may be potentially impacted. Bund integrity testing is not completed by a certified contactor. Integrity assessed via daily checks only. No formal procedure in place for bund integrity assessment checks or for the removal and disposal of rainwater in the bund. <u>Tertiary containment measures</u> Offloading area is served by a concrete and tarmac surface. Any spills are likely to seep through the permeable tarmac surface and corrode the tarmac due to the corrosive nature of the substance and migrate into soil and groundwater. Joints within the concrete observed to be unsealed and cracks observed potentially creating a pathway for any spills to migrate into the soil and groundwater. No containment provisions are in place for spillages or loss of entire tank load. Any spills are likely to enter nearby surface water drains and potentially impact any receiving water bodies. There is no information on the integrity of the surface water drains. Due to the corrosive nature of the substances this may corrode the drains and potentially impact soil and groundwater.	

Relevant Hazardous Substance (RHS)	Tank Number	Maximum capacity of tank (tonnes)	Maximum amount stored at site (tonnes)	Maximum amount used annually (tonnes)	Details of existing pollution prevention measures	Is the RHS a pollution risk?
					Environmental Management System: Inspections and Procedures Daily checks of all primary, secondary and tertiary containment are completed, and defects logged on the maintenance system and assigned a timescale for repair on a risk basis. No formal procedure in place documenting daily checks for primary, secondary and tertiary containment. A register is maintained via the Environmental Management System to record all inspection, maintenance repair and replacement work for all primary, secondary and tertiary containment including drainage systems. Emergency response procedure Spill kits observed to be available and training on use provided. Procedures governing the inspection, use and training of spill kits and emergency equipment is documented within procedure SOP 02 Site Spillage Control Equipment and SOP 03 Emergency response equipment. Emergency incidents and spillages are dealt with in accordance with procedure SOP 04 Procedure for dealing with environmental incidents and emergencies.	

Supplementary pre-application advice on preparing a noise impact assessment

Introduction

We require Noise Impact Assessments (NIA) for environment permit applications at sites where there is potential for noise impacts from your activities.

This could be because:

- you are using noisy equipment or carrying out noisy activities
- your operations take place outside or at night
- there are sensitive receptors, such as housing near your site, or you location is particularly sensitive to additional noise

It may be a combination of these factors.

You must follow the criteria and reporting requirements of British Standard (BS) 4142 when submitting noise impact assessments (NIAs) in support of environmental permit applications.

This is because we regulate the impact of sound emissions from all of our sites in accordance with the methodology in BS 4142. Our standard permit condition which requires that the operator must "prevent or where that is not practicable, to minimise, the noise and vibration", is in line with this.

Our regulation process is consistent with the aims of the Noise Policy Statement for England (NPSE), i.e. avoiding significant adverse noise impacts, mitigating and minimising adverse impacts on health, and contributing to the improvement of health and quality of life, where possible.

We do not set noise limits or accept assessments based on the principles of other British Standards such as BS 5228-1.

Detailed information related to NIAs is found on the Noise and vibration management: environmental permits guidance page. Note that we have also published a Method implementation document (MID) for BS 4142 - GOV.UK (www.gov.uk), which must be followed when preparing a BS 4142 noise impact assessment in support of an environmental permit application. This document is intended to provide supplementary advice to the detailed guidance and MID, providing a clear outline of the expected structure and content of an NIA. Details of technical requirements for calculations and modelling submitted with NIA submissions are found on the NIAs involving calculations or modelling guidance page.

If you follow the guidance and proposed structure, and include all the relevant information in your NIA, we will be able to assess your application quicker.

NIA Structure and Contents

The NIA should contain:

Covering page with sign-off.

- Include company name, site name and location, site permit number, applicant contact, author and assessor sign-off, including qualifications
- A table showing revisions with comments and dates

Synopsis / Summary

- A one page (maximum) non-technical summary of the report findings

Then the following numbered sections:

1. **Introduction**

Briefly describe the site, and circumstances of the permit application (new operation, variation to existing operation etc.). Discuss site history, including a clear description of proposed activities and sound sources, operational periods, and refer to complaints if existing site.

2. **Assessment location(s)**

Describe locations used to represent the nearest noise sensitive receptors (NSRs), and justification of surrogate locations used during baseline sound survey (if applicable). Identify buildings which may affect noise modelling or spreadsheet calculations.

3. **Equipment and meteorology**

Detail equipment used during baseline sound survey and weather conditions throughout. Note that weather conditions should be quantified in accordance with BS4142 Section 6.4, and the use of meteorological data from non-local weather stations is unlikely to be accepted. Report meteorological data obtained at local receptors.

4. **Assessment Methodology**

Note that the assessment methodology must be in accordance with BS4142. Describe the methodology used in determining specific sound levels.

5. **Noise monitoring data and specific sound level predictions**

Provide results of baseline sound monitoring, including derivation of background sound levels. Provide predictions of specific sound levels, including all assumptions used.

NOTE 1: Background sound level measurements

The survey should be representative of the proposed operational periods for the site. Provide justification for the duration and time periods used during the baseline sound survey, in line with BS 4142. Clearly describe the dominant sound sources at the NSRs, as they will affect the background and residual sound climates. If the survey is deemed inadequate, the assessment may be rejected. The site being assessed must not be operational at the time of the survey.

NOTE 2: Sound sources

State the methodology used to determine sound power levels. When obtaining measurements of a large source, the ratio of the measurement distance to the largest source dimension is ideally >2, when assuming point source propagation. For sources where this ratio is not achievable, sound power levels should be determined by use of the “shoebox” method (see BS EN ISO 3746).

NOTE 3: Propagation modelling or calculations

Include details of any noise propagation modelling software used. Where spreadsheet calculations have been used, clearly reference and justify any formula used which is non-standard (i.e. not in accordance with ISO 9613-2). Where barriers or buildings provide screening of sound at NSR(s), clearly justify the methodology used to predict the calculated attenuation. The use of ground height data is important for obtaining accurate screening calculations, and terrain data such as LIDAR should be used. In addition, provide the height and location of the building(s) or barrier(s), and details of the construction materials, including sound reduction performance data where available.

NOTE 4: Variations

If the application is for a variation to an existing environmental permit, provide details for all existing sound sources. Clearly identify which activities are existing and which are part of the proposed variation. Include separate calculations for:

- Existing site only
- Activities which are part of the proposed variation only
- Existing and proposed activities together

Background sound level measurements must not be affected by sound from the existing site (see the Risk Assessments for your Environmental Permit and Noise and vibration management: environmental permits guidance pages for more detailed information).

6. Noise impact assessment

Include the following as per BS4142:

- A justification of decisions to include acoustic feature corrections (or not)
- Specific and rating levels for each operational scenario at each NSR

- A discussion of context, and how this affects the predicted impacts. Ensure that you have adequately considered the predicted specific sound levels in relation to the existing sound climate at the NSRs

7. Mitigation / Noise control

Detail how the noise impact is to be prevented, or if not practicable, minimised. Provide details of mitigation measures, and sound reduction performance data where available.

8. Uncertainty

Provide a discussion of the sources of uncertainty associated with the baseline sound survey measurements, source data, noise modelling outputs, spreadsheet calculations, etc. Demonstrate how uncertainty has been minimised in the assessment.

9. Conclusions and next steps

Summarise the main findings and proposed tasks or actions, including additional mitigation measures / noise control or further monitoring.

Appendices – additional information

Provide the following information along with your NIA report:

- Raw data from your baseline sound survey at each location, in spreadsheet format, in 15-minute samples, including all relevant indices (L_{Aeq}, L_{A90}, L_{Amax})
- Calibration details for all equipment used in baseline sound survey
- Noise modelling files which include all input data used to predict the specific sound levels at each receptor for the assessment, for each operational scenario. Note where commercial noise modelling software has been used, provide the relevant project files which can be opened easily using our software licences (CadnaA & SoundPLAN). Where an alternative software package has been used, provide .QSI data exchange or .shp files.
- Where specific sound levels have been calculated using alternative methods, provide full spreadsheet calculations for each operational scenario
- Credentials for everyone involved in compiling the report (author, surveyor, assessor/sign-off)

Latest version of this document is available as part of pre-application advice

[Guidance starts – read and delete

Noise Management Plan Template

How to use this Noise Management Plan (NMP) template

You can use this template to prepare a noise management plan (NMP). The use of this template is optional but a clearly written and structured plan will help to avoid delays in processing your permit application caused by not being able to duly make it, or having to ask for further information.

If you use the template it does not automatically mean the NMP will be approved, because that depends on the content that you choose to include. However, if you do use the template, it will help you to provide the level of information that we, the Environment Agency, need in order to assess it.

This is a generic NMP template that uses common headings but is intended to be used for all sectors and types of facility e.g. waste transfer station, anaerobic digestion plant, food production, incineration, recycling centres etc.

You should read the relevant sections of the noise and vibration management and risk assessments for your environmental permit guidance and sector specific guidance before you prepare your plan. You will need to identify controls and explain how they will be used and monitored depending on ***sector-specific*** *and* ***site specific issues.***

Delete all the shaded boxes of guidance text and other instructions we have provided after you have finished writing your plan, before you submit it.

It's important to note that guidance gets updated from time to time and we will endeavour to periodically update this template to keep it current. However, the onus is on you to check you are using the most up to date sources of information.

If you have any feedback or suggestions on this template, please contact us using AQMAU@environment-agency.gov.uk

Preparing your NMP

Your NMP should:

- *Include appropriate measures / Best Available Techniques (BAT) for your type of facility.*
- *be written in an active style and demonstrate the commitment of the operator to control noise on site without conditions being added to statements e.g. "A barrier will be installed along the eastern boundary of the site, the location of the barrier is shown in Figure A.1 in Appendix A", not "a barrier is required and could be installed on the eastern boundary of the site".*
- *be specific to the site and the sector.*

- *include clear instructions to your staff on how to prevent / minimise any impact of noise pollution outside the site boundary, under both normal operations and during abnormal events.*
- *the NMP is part of the Environment Management System and all cross-referenced documents must be dated and have a version number. These should be sent as attachments when submitting the NMP. Should amendments be made to cross-referenced documents and these changes impact the NMP then the NMP will need to be updated accordingly.*
- *be simple to review and update when required.*

Guidance ends]

Noise Management Plan

[Guidance starts – read and delete

Complete the information below to create the cover page for your noise management plan.

Guidance ends]

Site details

Site name:

Site address:

Operator name:

Permit number:

Who this plan is for

[*Guidance starts – read and delete*

Use the space below to list the people who should read this plan, for example this may include your staff, customers, Environment Agency officers and contractors working on site].

Guidance ends]

- Who should be made aware of this plan?
- How will they be made aware?

Document owner

Document author:

Version number:

List of revisions

[Guidance starts – read and delete

Use the following table to record information each time the NMP is revised. The revision description should make it clear which sections have been changed and provide a short description of the change. Add more rows in the table as required.

Guidance ends]

Latest version of this document is available as part of pre-application advice

Revision number	Revision authorised by	Date submitted to Environment Agency	Revision owner

Contents

[*Guidance starts – read and delete*

Please add a table of contents listing the main headings and the page numbers. Microsoft Word can do this for you automatically under the "References Tab" – remember to press "Update Table" after making any changes.

Guidance ends]

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1. Introduction

[Guidance starts – read and delete

Provide a brief overview of your site using the sections below.

Guidance ends]

1.1 Site description

[Guidance starts – read and delete

Provide a brief overview of the type of site and its location and clearly state the answers to the questions in the following bullet points.

Guidance ends]

- brief description of type of site, e.g. waste transfer station, (full details of operations to be described in Section 3)
- describe the site location, e.g. industrial area, countryside etc.
- state the days and hours of operation – if there are different pieces of equipment operated during different times, state the hours of operation (e.g HGV movements are proposed between 07:00 – 18:00 Mon - Fri, the main building will operate 24 hours, 7 days a week)
- any other information you feel is relevant

1.2 Maintenance and review of the NMP

[Guidance starts – read and delete

This section is about identifying who (job role/title) is responsible for managing noise on site and what training they receive to ensure they are competent to do so.

Clearly state the answers to the questions in the bullet points below or provide a noise training matrix. Copies of training documents do NOT need to be supplied with this document.

Guidance ends]

- who (job Title) is responsible for the NMP and ensuring people are trained?
- where is the plan stored?
- state when the plan is reviewed
- what training have the staff on site received in order to implement the NMP?
- how often are they trained and who delivers the training?
- any other information you feel is relevant

- who will maintain records of complaints and associated investigations due to noise on site?
- who is responsible for carrying out ongoing noise monitoring and acting on the results of this monitoring?

1.3 Relevant sector guidance on which this NMP is based

[Guidance starts – read and delete

This section is about being clear which guidance documents have been used in the completion of the NMP. Your plan will be more robust if relevant and up to date guidance is used, especially when deciding on the appropriate measures and BAT to be included.

Clearly state the answers to the questions in the following bullet points.

Guidance ends]

- provide titles, sources and publication dates of all guidance referred to when writing this NMP
- any other information you feel is relevant

2. Receptors

[Guidance starts - read and delete

Identifying receptors helps you assess the risk of noise pollution taking into account the Source Pathway Receptor model. Provide details of who is at risk of being affected by noise from your site by completing Table 2.1 and support this with a scale map (Figure 2.1) showing the location of the site and each of the receptors listed in Table 2.1.

See examples in orange text below and add more lines to Table 2.1 as required. Add or delete rows in Table 2.1 as needed.

Guidance ends]

2.1. Receptor List

Table 2.1. Receptor list

Receptor reference (A, B, C etc. Use to label Fig 2.1)	**Land use e.g. house, school, hospital, commercial**	**Direction from site (north, south, east, west)**	**Approximate distance to site boundary (m)**
A	residential	north east	200

Figure 2.1 Map of site location and receptors

[Guidance starts – read and delete

Provide a clear map showing the location of your site in relation to the receptors listed in Table 2.1 and mark the installation boundary. Use the same receptor references on the map as used in Table 2.1. The map should be easily legible at A4 size. Include a scale bar and show compass point to north.

Guidance ends]

3. Noise sources and processes

[Guidance starts – read and delete

Understanding the noise sources and processes which occur on site are key to creating an effective mitigation strategy. Using the sections below, describe what the site does and be specific about the site activities e.g. delivery procedures, treatment processes / storage locations etc. Support this with a simple site layout plan (Figure 3.3) to show how the site is laid out and which parts are relevant in terms of noise emitting processes and noise emission locations. This information may also be held in other management plans and therefore, the relevant information needs to be copied and detailed below.

Guidance ends.]

3.1 Noise impact assessment (NIA) conclusion

[Guidance starts – read and delete

The conclusion of your NIA should be considered before starting to write your NMP. The information within the NIA should aid you to identify which noise sources, and to what extent each of these sources, require further mitigation.

Guidance ends.]

- state the overall conclusion of the noise impact assessment (low / below adverse / adverse / significant adverse impact) and the location at which this impact occurs.
- describe any important contextual points
- state which sound sources on site are dominant at nearby receptors

3.2 Noise sources

[Guidance starts – read and delete

In the table below, list the noise sources and their measured sound pressure and sound power levels. As an operator you should be aware of the processes on site and the risk associated with these activities and measures you put in place to minimise the associated noise.

See examples in orange text below and add more lines to Table 3.2 as required.

Guidance ends.]

Table 3.2 Description of noise emitting processes

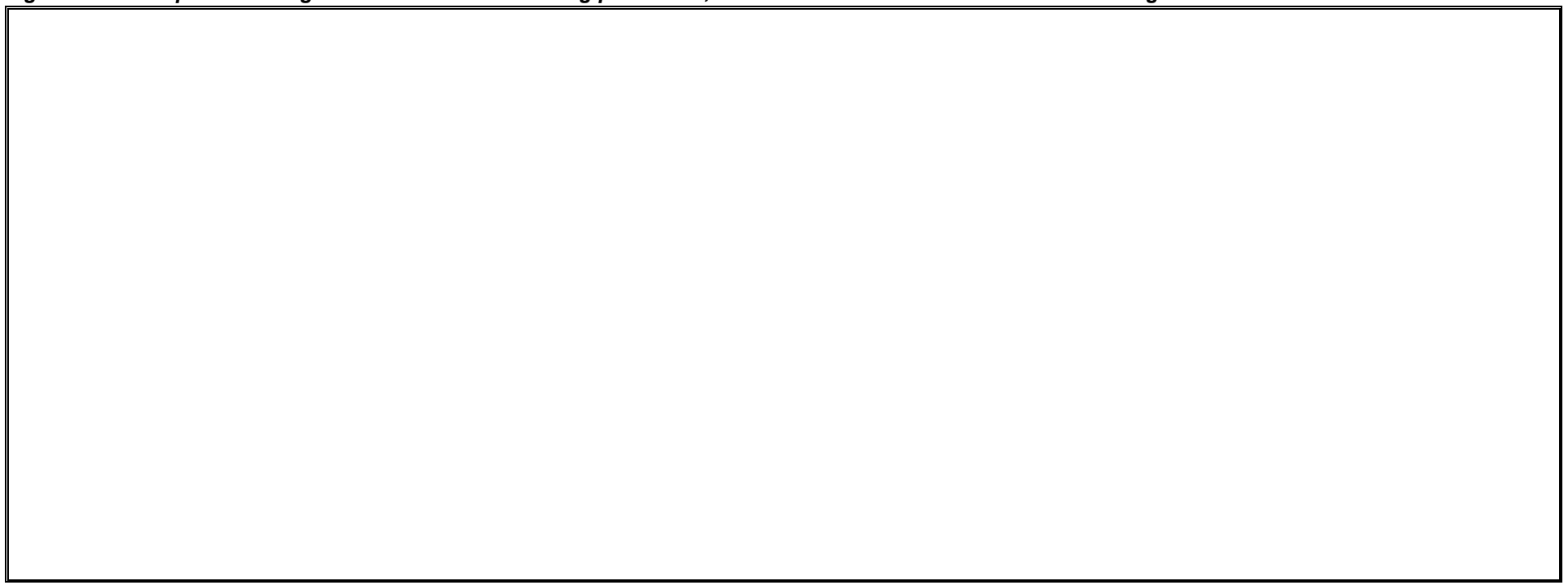
Noise source	Sound power level (dBA)	Sound pressure level (dBA)	Measurement distance (m)	Operational conditions	Additional comments
HGV Movements	113	85	10	8 deliveries an hour (07:00 – 17:30)	Measurement taken on site.

3.3 Overview of noise processes and emissions

Provide a description (whether text / diagrams or tables) of the site layout and the processes carried out including the information in the bullet points below as a minimum. Use Figure 3.3 as a guide to show the site infrastructure relevant to any noise emitting processes carried out and the sound emission locations on your site e.g.

- name and type of buildings,
- loading and unloading areas,
- routes which mobile plant take on site,
- locations of static equipment,
- storage areas,
- processing areas,
- which activities create the most noise,
- fixed plant and layout of equipment, e.g. trommel, conveyor etc,
- locations of mobile plant,
- noise emission points,
- any other information you feel is relevant

Figure 3.3 – Site plan showing locations of noise emitting processes, with routes shown of mobile noise emitting sources



4. Control measures and process monitoring

[*Guidance starts – read and delete*

The previous section described the noise sources and processes on site which do, or could, result in the risk of noise pollution. The purpose of this section is for you to demonstrate how you prevent or minimise the noise from activities on site. The type of operation you run will determine whether or not you use containment and abatement; if you do, this should be described in Table 4.1. Your choice of appropriate measures / best available techniques (BAT) should be informed by up to date guidance which is both robust and relevant to the sector in which you work. The guidance you have used in making these decision should be referenced in Section 1.3.

Guidance ends]

4.1 Appropriate measures / Best available techniques (BAT)

[Guidance starts – read and delete

Detail in the table below what action(s) you will take to prevent and / or minimise this risk using appropriate measures and BAT. You should take into account the level of risk associated with each potentially noise emitting activity on your site (section 3) and the type of sensitive receptors in the surrounding area (section 2). Ensure details of all monitoring carried out and completed is recorded accordingly.

*Use **Column 1** to identify every relevant process on site that causes noise within the permit boundary.*

*Use **Column 2** to state the operational hours of each piece of equipment listed.*

*Use **Column 3** to detail all existing control measures including **containment, abatement, appropriate measures and BAT**.*

*Use **Column 4** to state if this sound source on site contributes to the overall specific sound level at nearby noise sensitive receptors.*

*Use **Column 5** to explain what action is taken if the monitoring shows results outside of the optimum performance levels.*

You may already have a standalone monitoring procedure for appropriate measures / BAT on site in which case, this plan can cross-referenced.

See examples in orange text below and add more lines to Table 4.2 as required.

Guidance ends]

Table 4.1 Actions and procedures which will be in place to achieve appropriate measures / best available techniques (BAT)

Activity which produces noise	Operational Hours / days	Control measures (Appropriate Measure / BAT)	Contribution to overall impact	Action taken if outside optimum process parameters
Crusher processing material	07:30 – 17:30; Mon to Friday only	Location on site – furthest from residential areas, behind main building. "Low noise" crusher to be used. Daily visual inspection, yearly full mechanical inspections, trained staff using equipment. Regular toolbox sessions on standard procedures. Regular site walks by site mangers checking on procedures.	high	Cease operation and investigate reasons for elevated sound levels.
Forklift truck	24 hours a day, 7 days a week	White noise reversing alarms to be used on forklift trucks instead of tonal "beep"	medium	Cease operation and investigate reasons for elevated sound levels.

4.2 Onsite monitoring procedures

[*Guidance starts – read and delete*

Section 3.1 contains the conclusions of the noise impact assessment which informs this noise management plan. In this section you should demonstrate how the site will ensure that the impacts would be either maintained or reduced. Demonstrate this by describing the checks and processes which will be carried out on site.

Particular attention should be paid to processes which maintain any mitigation measures (such as barriers or low noise equipment) which are going to be implemented on site.

Guidance ends]

Table 4.2 Description of onsite processes which will ensure impacts do not increase on site.

Description of procedure	Procedure	When will this be carried out?	Corrective action
Replacing old / faulty equipment	Procurement of new equipment	When equipment requires replacing	Replace equipment that have sound levels which are equivalent or lower sound levels compared to existing equipment
Checking noise barriers	Visual inspection of barriers to ensure no gaps or holes	Monthly	Repair the barriers if holes or gaps are found.

4.3 Monitoring off site sound levels

[*Guidance starts – read and delete*

Within this section define the protocol which will be implemented on site and in the surrounding neighbourhood to monitor sound from the site. This should be a robust process which is repeatable and therefore can be used to verify if sound emissions from the site have increased or decreased over time.

Consider that your monitoring procedures should be able to identify increased sound emissions from the site due to extended use or malfunction equipment or operational changes on site. These assessments and the associated measurements should be carried out by a competently qualified person.

Guidance ends]

Figure 4.1 – plan showing locations of sound level measurement positions used to monitor sound from the site.

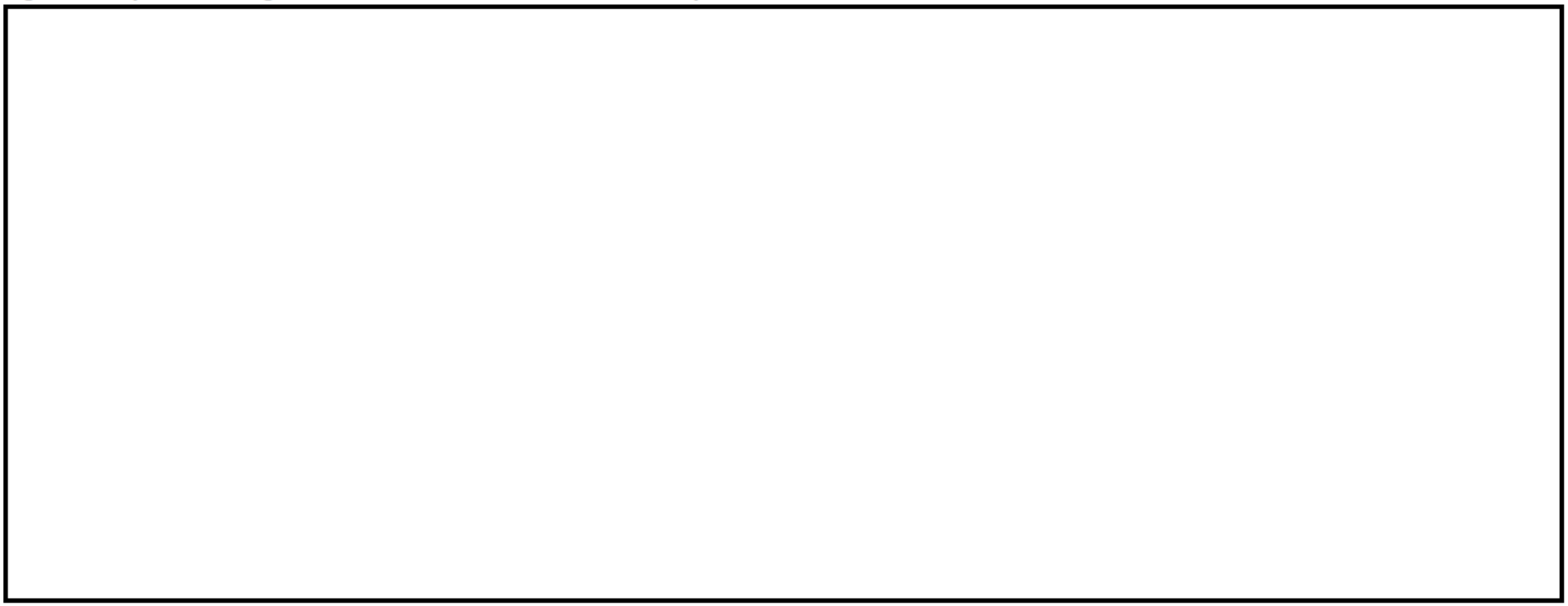


Table 4.3 Description of the sound monitoring procedures

Measurement Location	Frequency of measurement	Minimum measurement duration	Measurement period	Operating conditions on site	Expected specific sound level

A	Every 3 months	1 hour	Within operational hours (07:30 – 18:00)	Screener and crusher operational	Below 40 dB $L_{Aeq,1hour}$

Provide a description (whether text / diagrams or tables) of the procedure which will be implemented if sound levels are measured which are in excess of the expected results in Table 4.1 above.

- who will be responsible for carrying out the investigation? This should be a competently qualified person.
- what immediate steps will be taken in the short term to reduce sound levels?
- what steps will be taken in the long term to reduce sound levels?
- when will equipment be replaced?

5. Complaints reporting

[Guidance – read and delete

Provide details on how you will respond to a noise pollution notification and provide time limit within which you will investigate the noise and record the complaint e.g. 48 hours. Ensure this is in line with your permit. Being a good neighbour is important and can be very beneficial to a business. Any form used for this section can be cross-referenced.

Guidance ends]

Describe how the public can contact the site with a noise complaint (e.g., dedicated phone number/email address on company website?)

Detail the protocol for each stage of your complaints response:

- recording,
- investigation,
- notification of EA,
- remedial action (describe general criteria for considering that a complaint is resolved),
- feedback to complainants and EA,
- attain feedback from complainant.

Ensure that your procedures are in line with your permit and include a review and improvement cycle following complaints.



Validation

Changing how we process complex waste and installation permit applications

Date: July 2024

What's changing?

In June 2024, we are changing the way we process complex permit applications by adding a new process called validation.

- Applications will be checked soon after they're received, instead of being held in a queue awaiting allocation to a permitting officer.
- Validation checks will focus on the key risks associated with each application, and will be carried out by a permitting officer with the appropriate knowledge and experience.
- We will aim to contact customers with a validation outcome within four weeks of receiving an application.

This change will apply to waste, waste deposit and installation applications from Monday 10 June.

This change will apply to some water discharge and groundwater activity and water abstraction and impounding licences and we will communicate any requirements for these customers separately.

Why are we making changes?

We are responding to customer feedback. Validating applications early in the process will mean that:

- Customers hear from us sooner.
- Good quality applications are processed faster.
- Missing information is identified quicker.

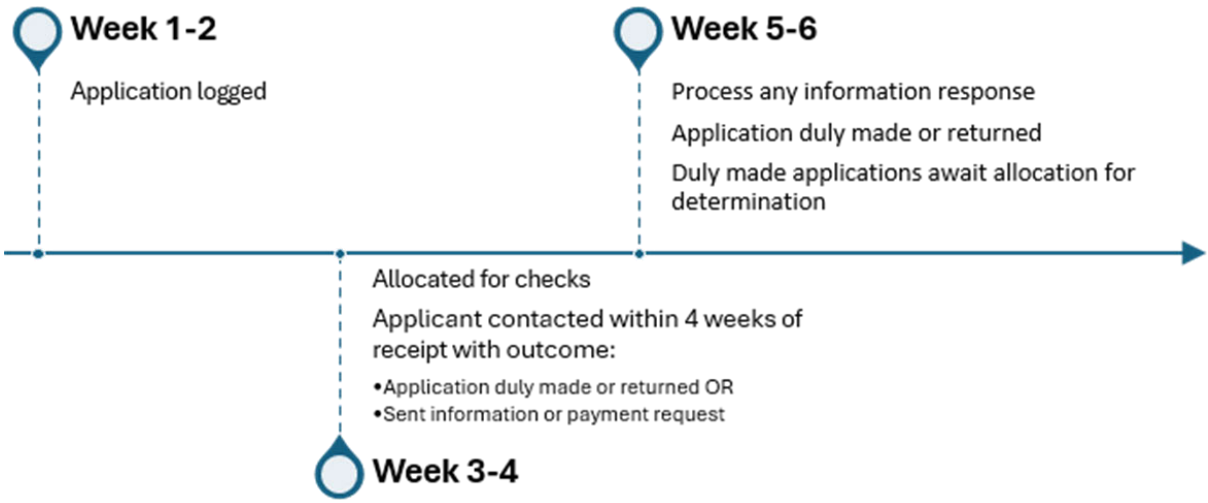
We expect applicants to use our online guidance and pre-application advice service to include all necessary information in their application. Poor quality applications with information missing will be returned.

Which applications are affected?

The validation process will only apply to more **complex applications**. It will not apply to:

- standard rules permits.
- full transfers.
- waste low-risk surrenders.
- administrative variations.

Validation timeline



Our customers may notice that:

- They speak to a different permitting officer at validation and assessment.
- We may ask them to provide additional information within under 10 working days.
- There is a wait between validation (duly making) and assessment (determination).

Where we return applications that are not duly made we will retain up to 20% of the correct application charge (capped at £1,500) to cover the cost of reviewing the application. If we return an application after having done very little work, because it contained obvious errors or omissions, we will refund the total charge. This is in accordance with our charging scheme. When we return an application after validation checks we will include a list of what is missing to help applicants reapply.

Existing applications

If customers have applied for multiple permits before and after 10 June 2024, some may be validated and some may be processed under our previous way of working.

Waste and Installations: Applications received after 10 June will undergo validation. Applications received before this date may be validated if we have the capacity to do so. This is more likely for applications received closest to the go-live date.

Waste deposit: Applications will be validated in batches according to age. The oldest applications will be validated first.

Would you like to find out more about us or your environment?

Then call us on

03708 506 506 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Or visit our website

www.gov.uk/environment-agency

incident hotline

0800 807060 **(24 hours)**

floodline

0345 988 1188 **(24 hours)**

Find out about call charges (https://www.gov.uk/call-charges)

Environment first

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Minutes

Barrow Green Hydrogen Project– Environmental Permit Pre-Application Meeting

Date:	24 June 2025	**Time:**	11:00	**Location:**	Microsoft Teams
Client:	Barrow Green Hydrogen Ltd			**SLR Project No.:**	416.066073.00001
Attendees	Chris Leach (Barrow), Robyn Somerville (Barrow), Greg Altria (SLR), Raghuram Sridhar (SLR), Anjali Ozhakkal (EA), Thomas Proudfoot (EA), Rach Hopkin (EA)				
Chairperson	Greg Altria (SLR)				

Item no.	Item	Notes	Action
1	Introductions	Introduction of attendees' backgrounds. Review of the agenda	
2	Overview of the site setting and process	CL – Overview of the site history and site location.	
3	Agreement of regulated activities to be undertaken	GA - Overview of site processes and equipment. Ch 4, 4.2 Part A(1) (a) and directly associated activities: • Demineralisation of water in a water purification system; • Discharge to surface water from the water purification process; • Other waste-water handling; • Raw material storage; • Storage of gaseous hydrogen; • Hydrogen purification; • Venting of oxygen and hydrogen to atmosphere; • Surface water collection and discharge; • Operation of a nitrogen purging system; • Operation of electrolyte and gas cooling systems; Six 5MW electrolysers will require 1,300l/h of potable water supplied by United Utilities. The potable water will be treated (activated carbon filters, reverse osmosis). There will be no diesel generators or odourisation onsite.	
4	Extent of installation boundary (noting specifically the hydrogen pipeline to Kimberly-	CL - Planning drawings to be replaced with final revised designs, which are also to be used in the permit application. Low Carbon Hydrogen Agreement signed with	AO and GA to review guidance and determine whether the site should be regulated as a multi-operator installation.

	Clark) and directly associated activities;	DESNZ. Kimberly Clark pipeline is below ground, under Park Road. AO – Advised that due to Kimberly Clark being the sole receiver and primary user of hydrogen, it may be a multi-operator installation. Asked who is responsible for the pipeline. RS – Clarified that BGH will own and operate the pipeline. They will subcontract maintenance to Cadent. RS – Stated that refuelling station is a plan for the future, pipeline to KC is the main priority. GA – Raised issues of pre-existing contamination along KC pipeline being associated with BGHP. RH – Stated that if it is technically connected then it must be a multi-operator installation. Recommended checking RGN2 guidance. AO – Stated that if it is a multi-operator installation, the pipeline is in the permit boundary and BGH and KC must submit permit application/variation at the same time. If not, it stops at the valve following metering.	
5	Scope, content and format of the environmental permit application submission	GA – Overview of the forms and documents to be submitted for the EP application: • Application Forms • Non-Technical Summary • Site and Process Description • Management System and Procedures Summary • Resource Efficiency covering energy, raw materials, water, waste generations and emissions to the environment; • Risk Assessment for Discharge to Sewer; • Amenity Risk Assessment; • Accident Risk Assessment & Management Plan; • Site Condition / Baseline Report; • Drawings; • Best Available Techniques Assessment. AO – Stated that the noise assessment for permitting will be different than for planning. There will be a separate charge for noise management plan if required.	

		GA – Asked whether the 2022 Noise Assessment can be resubmitted, seen as it identified the risk of noise as low. AO – Stated that the same document cannot be used, but you can refer to the 2022 Noise Assessment and produce a qualitative assessment in accordance with EA guidance. If the impact of noise is low, then a quantitative risk assessment is not required.	
6	The need for permitting this site	AO – Initial thoughts are that due to Kimberly Clark being the sole receiver and primary user of hydrogen, it is likely to be a multi-operator installation.	AO to determine whether the site should be regulated as a multi-operator installation.
7	The extent of the environmental assessment and best available techniques (BAT) appraisal required;	AO – Stated that operating techniques, energy efficiency, water efficiency, hydrogen emissions to air, fugitive hydrogen emissions, an accident management plan and the reason for using venting instead of flaring must all be included in the application.	
8	Applicable BAT-Associated Emission Level (BAT-AELs) and agreement of the proposed approach to determining emission limits for assessment	AO – Stated that BGH and SLR must demonstrate in their application that concentrations are low and then BAT-AELs are not applicable.	
9	The risk assessment process for discharge to surface water to be applied given the nature of the wastewater and volume of dilution available in the Walney Channel;	TP – Requested to see the route of effluent discharge, from the attenuation pond to culvert to Walney Channel. GA – Displayed the effluent drainage route. RH – Stated that there is a possibility that Walney Channel is in a restricted dilution and dispersion area. This can be assessed as part of the pre-app. GA – Provided clarity on the makeup of the effluent. RH – Stated that a carbon filter factor on an EA spreadsheet can be used to calculate concentrations of substances and that an MSDS needs to be submitted for antiscalant. Stated the EA must assume that the attenuation pond is dry and therefore dilution from rainwater is not applicable to water quality estimates (worst-case scenario). GA and CL – Clarified on the data used to build the water quality estimates being publicly available data. Practically, attenuation pond will never be dry. GA – Stated that there is no collected blowdown from cooling system in the drainage system.	EA to determine whether the Walney Channel discharge point is a restriced dilution and dispersion area.

10	Confirmation that no technical assessment of emissions to air is required given the nature of the emissions;	GA – Confirmed there are no emergency diesel generators on site, and that a leak detection and repair programme will be implement. AO – Confirmed that no technical assessment of air emissions required but will need some quantification of hydrogen under normal operating conditions and OTNOC. Asked whether oxygen produced in the process can be reused? GA - Confirmed that oxygen reuse is not feasible as no local market.	
11	Relevant legislation and guidance documents	GA - listed relevant guidance documents: • EA - Draft Guidance on emerging techniques for hydrogen production by electrolysis of water (2024); • European Commission – Best available techniques reference document for common wastewater and waste gas treatment / management systems in the chemical sector (2016); • European Commission – Best available techniques reference document for common waste gas management and treatment systems in the chemical sector (January 2023); • European Commission – Best available techniques reference document for Energy Efficiency (2009) • EA – Control and monitor your emissions for your environmental permit (November 2022); • EA – Risk assessment for your environmental permit (November 2023);	
12	Application fees and determination timescales	AO – 1.4.4 on charging scheme (£13209), others are potential charges (habitat assessment, NIA, NMP, modelling). GA – Confirmed a habitats screening is required	EA to confirm application fees.
13	Expected timetable for application submission and the proposed development.	AO – Stated that the regulatory timescale is 4 months but depends on the complexity of the project. It will be validated and made clear within 6 weeks if the application will be duly made. Following duly making, the application will wait until assigned to an officer for determination.	EA to confirm application timescale. SLR to produce meeting minutes and distribute to the EA.

		GA – Stated BGH and SLR's aim for determination by the end of the year. Asked if that feasible for the EA. AO – Stated that it is likely that it will be allocated immediately. The EA will get back to BGH and SLR on timescale, as potential modelling time must be accounted for. RH – Stated that prioritisation can be requested but cannot be confirmed. AO – Stated that priority tracked services is for major infrastructure projects and complex projects. Payment for prioritisation is not possible in this case. BGH and SLR must state during application reason for prioritisation in order to request fast-tracking.	

Appendix B Application Forms

Application for an environmental permit
Part A – About you

Environment Agency

When to complete the Part A form

Complete this part of the application form if you are:

- applying for a new permit (apart from exclusion 1 below)
- applying to vary (change) an existing permit (apart from exclusion 2 below)
- notifying or applying for a permit surrender (apart from exclusion 3 below)
- notifying or applying to transfer an existing permit to yourself

Exclusions – when you do not need to complete this form

You do not need to complete this form if you are:

1. applying for a new permit for:
   - intensive farming – see **Part B3.5 form**
   - discharge of treated domestic sewage up to 20 cubic metres a day to surface water – see **Part B6.5 form**
   - discharge of treated domestic sewage up to 15 cubic metres a day into ground – see **Part B6.5 form**
   - existing small discharges of sewage to ground in a source protection zone 1 – see **Part B6.6 form**
   - a medium combustion plant standard rule permit – see **MCP guidance**
   - a specified generators standard rule permit – see **SG guidance**
2. applying for a variation to:
   - make an administrative change – see **Part C0.5 form**. Note: you will still need to complete this Part A form if you're changing a name or address on the permit.
   - make a non-administrative change to an intensive farming permit – see **Part C3.5 form**.
3. notifying us of a water discharge or groundwater activity permit surrender – see **Part E1 form**. Note: this exclusion does not apply to surrender applications for standalone groundwater activities at onshore oil and gas facilities. You will need to complete this Part A form for those surrender applications.

Do not use this form for radioactive substance regulation permitting. See **RSR: environmental permit application forms**

Completing the form

Visit our website to check this is the latest version of the form. See **Application for an environmental permit: part A about you**.

Please read through the form before completing it. We expect it will take less than 1 hour to complete if you have all the necessary information available.

The form can be:

saved onto a computer and then filled in. We recommend using Adobe Acrobat software to avoid any compatibility issues.

- printed off and filled in by hand. Please write clearly in the answer spaces. If you need to use the links in this form, you can access the electronic version here: **https://www.gov.uk/government/publications/application-for-an-environmental-permit-part-a-about-you**

Other forms you will need to complete

You will also need to complete other parts of the application form. This depends on your facility type and what you are applying for:

- for a new bespoke permit, see: **New bespoke environmental permit: application forms**
- for a new standard rules permit, see: **Application for an environmental permit: part B1 standard facilities permit**
- If you already have a permit, see **Change, transfer or cancel your environmental permit**

Contents

Section 1: About you

Section 2: Applications from an individual

Section 3: Applications from more than one individual

Section 4: Applications from public bodies

Section 5: Applications from ministerial government departments

Section 6: Applications from registered companies, limited liability partnerships and other corporate bodies

Section 7: Contact details

Section 8: Environmental record check

Section 9: How to contact us

Section 10: Where to send your application

Appendix 1: Date of birth information for installation and waste activities

1 About you

Tick the box that describes you as the applicant.

- ☐ An individual. Now go to **section 2**.
- ☐ More than one individual. Now go to **section 3**.
- ☐ A public body. Now go to **section 4**.
- ☐ A ministerial government department. Now go to **section 5**.
- ✔ A registered company, limited liability partnerships, or other incorporated body. Now go to **section 6**.

To apply, you must be the legal operator of the activity or facility. See: **Legal operator and competence requirements: environmental permits**

2 Applications from an individual

2.1 Name of applicant

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

2.2 Address of applicant

Address

Postcode

2.3 Contact details for applicant

Email

Telephone number

Use a business address and contact details where possible. Otherwise use personal details. Individuals based overseas must provide an address for service in the UK.

Now go to **question 7.2**

3 Applications from more than one individual

3.1 Names and addresses of individuals

This could be, for example:

- individuals acting jointly
- individuals that are partners in a general or limited partnership (but not a limited liability partnership)
- unincorporated charities, trusts and associations, (unless we have agreed the charity, trust or association is a legal entity)

For unincorporated trusts, charities and societies provide the names and addresses of all governing individuals. For example:

- trustees
- chairperson
- treasurer
- secretary
- or a person with a similar position

For applications from other individuals provide the names and addresses of all individuals. However, for applications involving large numbers of individuals, a smaller number of individuals can be nominated. These individuals will be named on the permit and responsible for controlling activities. For example, where a group of 20 individuals are involved, you may decide to identify four individuals as being the operator. This is only applicable to permit and transfer applications. For variation and surrender applications, provide up to date details of the permit holders.

Use a continuation sheet as necessary.

3.1a Name of first individual

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

3.1b Address of first individual

Use a business address where possible. Otherwise use a personal address. Individuals based overseas must provide an address for service in the UK.

3 Applications from more than one individual, continued

Address

Postcode

3.1c Name of second individual

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

3.1d Address of second individual

Use a business address where possible. Otherwise use a personal address. Individuals based overseas must provide an address for service in the UK.

Address

Postcode

3.1e Name of third individual (where applicable)

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

3 Applications from more than one individual, continued

3.1f Address of third individual (where applicable)

Use a business address where possible. Otherwise use a personal address. Individuals based overseas must provide an address for service in the UK.

Address

Postcode

3.1g Continuation sheet for additional individuals (where applicable)

Document reference of continuation sheet

3.2 Organisation type (if any)

For example, individuals acting jointly (e.g. a club), general partnership, unincorporated charity

3.3 Charity Commission registration number (if any)

Recognised charities may qualify for reduced permitting fees for certain water discharge activities. We'll need a Charity Commission registration number to check if this applies to this application.

3.4 Companies House registration number (Limited Partnerships only)

Now go to **section 7: Contact details**

4 Applications from public bodies

4.1 Name of public body

4 Applications from public bodies, continued

4.2 Address of public body

Address

Postcode

4.3 Type of public body

For example, local government body, executive agency, non-departmental public body

4.4 Charity Commission number (if any)

Now go to **section 7: Contact details**

5 Applications from ministerial government departments

5.1 Title of Secretary of State for relevant government department

Title

For example, Secretary of State for Environment, Food and Rural Affairs

5.2 Address of the government department

Address

Postcode

Now go to **section 7: Contact details**

6 Applications from registered companies, limited liability partnerships and other corporate bodies

6.1 Name of company, limited liability partnership, or other incorporated body

Barrow Green Hydrogen Limited

6.2 Principal address or Registered Office of registered company, limited liability partnership, or other incorporated body

Address

26 Ellerbeck Court
Stokesley
Middlesbrough

Postcode

TS9 5PT

For registered companies and limited liability partnerships this is the office address registered with Companies House. For other incorporated bodies use your principal business address or the address registered with The Charity Commission.

6.3 Main UK business address for overseas corporate bodies (if applicable)

Your main UK business address is required only if your principal or registered office address is overseas.

Address

Postcode

6 Applications from registered companies, limited liability partnerships and other corporate bodies, continued

6.4 Type of incorporated body

Private Limited Company

For example, private limited company, public limited company, limited liability partnership, incorporated society, charitable incorporated organisation or community interest company

6.5 Companies House registration number (if any)

13625005

6.6 Charity Commission number (if any)

6.7 Additional information if not registered with Companies House or The Charity Commission (if applicable)

This question does not apply to variation or surrender applications.

If you are not registered with Companies House or The Charity Commission, supply:

- evidence that your company or corporate body is a legal entity
- a description of how you will be the legal operator if you are an overseas company without a UK presence.

Document reference for evidence/description:

Evidence of legal entity could, for example, include:

- a copy of your Certificate of Incorporation for companies.
- a copy of your Memorandum and Articles of Association for incorporated charities and trusts

Now go to section 7: Contact details

7 Contact details

7.1 Contact for receipt of official documents

This question does not apply to applications from an individual. We'll send documents to the individual named in **section 2** of this form. Go to **question 7.2** instead.

Provide the details of someone we can send official documents to, such as notices and copies of permits.

7 Contact details, continued

Important: this must be the permit holder and cannot be an agent or consultant acting on their behalf.

For companies this person must be a company secretary, clerk or a director.

For partnerships this must be a person with control or management of the partnership.

For applications from more than one individual, provide details of everyone who is to receive official documents. You can include all individuals or nominate one or more people. Add a continuation sheet where necessary.

If relevant, we'll also send a copy of official documents to the application contact.

Title (Mr, Mrs, Miss and so on) (optional)

Mr

First name

Eric Charles

Last name

Adams

Position

Director

'Position' could, for example, be a director, secretary, trustee, or managing partner

Address

26 Ellerbeck Court
Stokesley
Middlesbrough

Postcode

TS9 5PT

Email

eadams@carltonpower.co.uk

Document reference of continuation sheet for additional people (if any). For applications from more than one individual only.

7 Contact details, continued

7.2 Application contact

Provide the details of someone we can contact about the application. The person must have the authority to act on behalf of the applicant.

☐ Contact details are the same as **section 2** (application from an individual). You do not need to fill in their details again.

☐ Contact details are the same as **question 7.1** (contact for receipt of official documents). You do not need to fill in their details again.

✔ New contact. Add their details below

Title (Mr, Mrs, Miss and so on) (optional)

Mr

First name

Greg

Last name

Altria

Address

3rd Floor
Brew House
Jacob Street
Tower Hill
Bristol

Postcode

BS2 0EQ

Phone number

+44 3300 886631

Email

galtria@slrconsulting.com

Position

Consultant

'Position' could, for example, be the applicant, their employee, or an agent or consultant acting on their behalf.

✔ Tick if you would like all general communication about this application sent to the above email address.

7 Contact details, continued

7.3 Operational contact

We use this information to help us know who to contact about operations at the site, returns and reporting. The operational contact is ordinarily the permit holder. Anyone else must have the authority to act on behalf of the permit holder.

- ☐ Contact details are the same as **section 2** (application from an individual). You do not need to fill in their details again.
- ☐ Contact details are the same as **question 7.1** (contact for receipt of official documents). You do not need to fill in their details again.
- ☐ Contact details are the same as **question 7.2** (application contact). You do not need to fill in their details again.
- ✔ New contact. Add their details below

Title (Mr, Mrs, Miss and so on) (optional)

Dr

First name

Chris

Last name

Leach

Address

26 Ellerbeck Court
Stokesley
Middlesbrough

Postcode

TS9 5PT

Phone number

Email

cleach@carltonpower.co.uk

Position

Applicant

'Position' could, for example, be the applicant, an employee, or an agent or consultant acting on their behalf.

7 Contact details, continued

7.4 Billing contact

Provide a billing contact where we can send requests for payment, such as invoices for the annual subsistence charge.

- ☐ Contact details are the same as **section 2** (application from an individual). You do not need to fill in their details again.
- ☐ Contact details are the same as **question 7.1** (contact for receipt of official documents). You do not need to fill in their details again.
- ☐ Contact details are the same as **question 7.2** (application contact). You do not need to fill in their details again.
- ☐ Contact details are the same as **question 7.3** (operational contact). You do not need to fill in their details again.
- ✔ New contact. Add their details below

Title (Mr, Mrs, Miss and so on) (optional)

Ms

First name

Julie

Last name

Benson

Address

26 Ellerbeck Court
Stokesley
Middlesbrough

Postcode

TS9 5PT

Phone number

07825 260 635

Email

accounts@carltonpower.co.uk

For applications from public bodies and ministerial government departments, go to **section 9**.

For all other applications, go to **section 8**.

8 Environmental record check

Question 8.1 applies if you are:

- applying for a new installation or waste permit
- applying to transfer an existing installation or waste permit
- applying to add a relevant waste operation to a permit that has not previously had one

'Relevant waste operations' are one or both of the following:

- a waste operation (not carried on at an installation or by means of a Part B mobile plant).
- a specified waste management activity (certain installations carrying out waste management activities).

For further details of relevant waste operations, see: **The Environmental Protection (Miscellaneous Amendments) (England and Wales) Regulations 2018**

We use the date of birth information to check your environmental record.

If this question does not apply, go to **section 9**

8.1 Complete the date of birth information in **Appendix 1** for the applications set out above.

✓ Tick the box to confirm that Appendix 1 has been completed where required.

Then go to **section 9**

9 How to contact us

If you have difficulty using this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: **enquiries@environment-agency.gov.uk**

Website: **www.gov.uk/government/organisations/environment-agency**

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

You don't have to answer this part of the form, but it will help us improve our forms if you do.

We want to make our forms easy to fill in and easy to understand. Please use the space below to give us any comments that you may have about this form.

9 How to contact us, continued

How long did it take you to fill in this form?

We will use your feedback to improve our form.

Would you like a reply to your feedback?

- Yes please
- No thank you

Go to **section 10**

10 Where to send your application

Send one electronic copy of your completed application via email to:

- **PSC-WaterQuality@environment-agency.gov.uk** for water discharge activities
- **PSC@environment-agency.gov.uk** for waste or installation activities
- **flood.permitting@environment-agency.gov.uk** for flood risk activities

Alternatively send one paper copy of your application to:

Integrated Permitting Services
Environment Agency
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Appendix 1: Date of birth information for installation and waste activities

Dates of birth information in this appendix will not be put onto our Public Register.

Only complete this Appendix if required by **question 8.1**.

A1.1 Are you applying as an individual; group of individuals; or a registered company, limited liability partnership or other incorporated body?

- ☐ An individual. Now go to **A1.2**
- ☐ More than one individual. Now go to **A1.3**.
- ✓ A registered company, limited liability partnership or other incorporated body. Now go to **A1.4**.
- ☐ Public body or ministerial government department. Do not complete this appendix. Go to **section 9** instead.

A1.2 Applications from an individual

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

Date of birth (DD/MM/YYYY)

Now go to **section 9**

A1.3 Applications from more than one individual

For unincorporated trusts, charities and associations provide the name and date of birth of all individuals that are part of the group's controlling or guiding mind. For example:

- trustees
- chairperson
- treasurer
- secretary
- or a person with a similar position

In all other instances, provide the names and address of all individuals listed in **section 3** of this form.

Use a continuation sheet where necessary.

Appendix 1: Date of birth information for installation and waste activities, continued

First individual

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

Date of birth (DD/MM/YYYY)

Second individual

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

Date of birth (DD/MM/YYYY)

Third individual

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

Date of birth (DD/MM/YYYY)

Fourth individual

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

Date of birth (DD/MM/YYYY)

Continuation sheet for additional individuals

Document reference of continuation sheet (if any):

Now go to **section 9**

Appendix 1: Date of birth information for installation and waste activities, continued

A1.4 Applications from registered companies, limited liability partnership or other incorporated bodies

For registered companies provide the names and dates of birth of all directors and any company secretary.

For limited liability partnerships provide the names and dates of birth of all partners.

For other incorporated bodies provide the name and date of birth of all individuals that are part of the body's controlling or guiding mind. For example:

- trustees
- chairperson
- treasurer
- secretary
- or a person with a similar position

Use a continuation sheet where necessary.

Provide the company name and registration number on a continuation sheet for any corporate:

- directors
- company secretaries
- partners

First person

Title (Mr, Mrs, Miss and so on) (optional)

SEE APPENDIX B1

First name

Last name

Position

Date of birth (DD/MM/YYYY)

Appendix 1: Date of birth information for installation and waste activities, continued

Second person

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

Position

Date of birth (DD/MM/YYYY)

Third person

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

Position

Date of birth (DD/MM/YYYY)

Fourth person

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

Position

Date of birth (DD/MM/YYYY)

Document reference of continuation sheet for additional people or corporate officers (if any):

Appendix B1

Now go to **section 9**

CONTINUATION SHEET – LIST OF DIRECTORS

Name: EDWARDS, John Lyndsay Fernyhough

Position: Secretary

DoB: [redacted]

Name: ADAMS, Eric Charles

Position: Director

DoB: [redacted]

Name: BENSON, Michael Fred Shaw

Position: Director

DoB: [redacted]

Name: MADSEN, Kristian Hoeeg

Position: Director

DoB: [redacted]

Name: SANDWORTH, James Peter

Position: Director

DoB: [redacted]

Name: UNWIN, Hugh Alexander

Position: Director

DoB: [redacted]

Application for an environmental permit
Part B2 – General – new bespoke permit

Environment Agency

You will need to use an Adobe Acrobat product to complete this form. The form may not work properly if you use a different pdf reader, such as the one built-in to your internet browser.

Fill in this part of the form together with parts A and F1 if you are applying for a new bespoke permit. You also need to fill in part B2.5, B3, B4, B5, B6, or B7 (this depends on what activities you are applying for).

Please check that this is the latest version of the form available from our website.

Please read through this form and the accompanying Part B2 guidance notes(see **https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1102174/Guidance-app-for-an-environmental-permit-part-b2-general-new-bespoke-permit.pdf**).

The form can be:

1) saved onto a computer and then filled in.

2) printed off and filled in by hand. Please write clearly in the answer spaces

It should take less than two hours to fill in this part of the application form.

Contents

1 About the permit

2 About the site (excludes mobile plant)

3 Your ability as an operator

4 Consultation

5 Supporting information

6 Environmental risk assessment

7 How to contact us

Appendix 1 – Low impact installation checklist

Appendix 2 – Date of birth information for Relevant offences and/or Technical ability questions only

1 About the permit

1a Discussions before your application

If you have had discussions with us before your application, including having requested to submit your application in stages, give us the permit reference or details on a separate sheet. Tell us below the reference you have given this extra sheet(s).

Permit or document reference

Appendix A

1 About the permit, continued

1b Is the permit for a site or for mobile plant?

☐ Mobile plant Now go to **question 1c**

✔ Site Now go to **section 2**

Note: The term 'mobile plant' does not include mobile sheep dipping units.

Mobile plant only

1c Have we told you during pre-application discussions that we believe that a mobile permit is suitable for your activity?

☐ No

☐ Yes

1d Have there been any changes to your proposal since this discussion?

☐ No Now go to **section 3**

☐ Yes You should send us a description of the activity you want to carry out, highlighting the changes you have made since our pre-application discussions

Document reference

Now go to **section 3**

2 About the site (excludes mobile plant)

2a What is the site name, address, postcode and national grid reference?

Site name

Barrow Green Hydrogen Plant

Address

Meetings Industrial Estate,
Park Road,
Barrow - in - Furness,
Cumbria

Postcode

LA14 4TL

National grid reference for the middle of the site, or for water quality/groundwater activities, the discharge point (for example, ST 12345 67890).

SD 19436 72080

2 About the site (excludes mobile plant), continued

2b What type of regulated facility are you applying for?

Note: if you are applying for more than one regulated facility then go to 2c.

✔ Installation

Waste operation

Mining waste operation

Water discharge activity

Groundwater activity (point source)

Groundwater activity (discharge onto land)

What is the national grid reference for the regulated facility (if only one)?
(**See the guidance notes on part B2**.)

✔ As in 2a above

☐ Different from that in 2a Please fill in the national grid reference below

National grid reference for the regulated facility

Now go to **question 2d**

2c If you are applying for more than one regulated facility on your site, what are their types and their grid references?

See the guidance notes on part B2.

Regulated facility 1

National grid reference

What is the regulated facility type?

☐ Installation

☐ Waste operation

☐ Mining waste operation

☐ Water discharge activity

☐ Groundwater activity (point source)

☐ Groundwater activity (discharge onto land)

2 About the site (excludes mobile plant), continued

Regulated facility 2

National grid reference

What is the regulated facility type?

☐ Installation

☐ Waste operation

☐ Mining waste operation

☐ Water discharge activity

☐ Groundwater activity (point source)

☐ Groundwater activity (discharge onto land)

Use several copies of this page or separate sheets if you have a long list of regulated facilities. Send them to us with your application form. Tell us below the reference you have given these extra sheets.

Document reference

Now go to **question 2d**

2d Low impact installations (installations only)

Are any of the regulated facilities low impact installations?

✔ No

Yes If yes, tell us how you meet the conditions for a low impact installation (**see the guidance notes on part B2** – Appendix 1).

Document reference

☐ Tick the box to confirm you have filled in the low impact installation checklist in **appendix 1** for each regulated facility

2e Treating batteries

Are you planning to treat batteries? (**See the guidance notes on part B2**.)

✔ No

Yes Tell us how you will do this, send us a copy of your explanation and tell us below the reference you have given this explanation

Document reference for the explanation

2 About the site (excludes mobile plant), continued

2f Ship recycling

Is your activity covered by the Ship Recycling Regulations 2015? (**See the guidance notes on part B2**.)

✔ No

Yes Tell us how you will do this. Please send us a copy of your explanation and your facility recycling plan, and tell us below the reference numbers you have given these documents

Document reference for the explanation

Document reference for the facility recycling plan

2g Multi-operator installation

If the site is a multi-operator site (that is there is more than one operator of the installation) then fill in the table below the application reference for each of the other permits.

Table 1 – Other permit application references

3 Your ability as an operator

If you are only applying for a standalone water discharge or for a groundwater activity, you only have to fill in **question 3d**.

3a Relevant offences

Applies to all except standalone surface water discharges and groundwater discharges (**see the guidance notes on part B2**).

Have you, or any other relevant person, been convicted of any relevant offence? (see https://www.gov.uk/government/publications/relevant-conviction-guidance-for-permit-applications-for-waste-activities-and-installations-only)

✔ No Now go to **question 3b**

Yes Please give details below

3 Your ability as an operator, continued

Name of the relevant person

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position held at the time of the offence

Name of the court where the case was dealt with

Date of the conviction (DD/MM/YYYY)

Offence and penalty set

Date any appeal against the conviction will be heard (DD/MM/YYYY)

If necessary, use a separate sheet to give us details of other relevant offences and tell us below the reference number you have given the extra sheet.

Now go to **question 3b**

Please also complete the details in **Appendix 2**.

3b Technical ability

Relevant waste operations only (see the guidance notes on part B2).

Please indicate which of the two schemes you are using to demonstrate you are technically competent to operate your facility and the evidence you have enclosed to demonstrate this.

ESA/EU skills

Please select one of the following:

☐ I have enclosed a copy of the current Competence Management System certificate

or

☐ We will have a certified Competence Management System within 12 months and have enclosed evidence of the contract with an accredited certification body

3 Your ability as an operator, continued

CIWM/WAMITAB scheme

Your answers below must relate to the person(s) providing technically competent management when the permitted activities start.

Please select **one** of the following:

- I have enclosed a copy of:

  ☐ the relevant qualification certificate/s

  or

  ☐ evidence of deemed competence

  or

  ☐ Environment Agency assessment

  or

  ☐ evidence of nominated manager status under the transitional provisions for previously exempt activities

  and, if deemed competent or Agency-assessed, or nominated manager, or if the original qualification is over two years old:

  ☐ I have enclosed a copy of the relevant current continuing competence certificate/s

- ☐ The technically competent manager will complete their qualification within four weeks of starting the permitted activities and I have enclosed evidence of their registration with WAMITAB or their EPOC booking as appropriate

- **For medium- and high-risk tier activities other than landfill**

  ☐ The technically competent manager will complete the qualification within 12 months and I have enclosed evidence of their registration with WAMITAB and, where relevant, EPOC booking. I understand they must complete either four specified units of the relevant qualification or an EPOC within four weeks of the permitted activities commencing

For each technically competent manager please give the following information. If necessary, use a separate sheet to give us these details and tell us below the document reference you have given the extra sheet.

Title (Mr, Mrs, Miss and so on)

First name

Last name

Phone

Mobile

Email

3 Your ability as an operator, continued

Please provide the environmental permit number/s and site address for all other waste operations, (**see part B2 guidance notes**), that the proposed technically competent manager provides technical competence for, including permits held by other operators. Continue on a separate sheet as required.

Permit number	Site address	Postcode

Document reference

Now go to **question 3c**

Please also complete the details in **Appendix 2**.

3c Finances

Installations, waste operations and mining waste operations only.

Please note that if you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

Do you, or any relevant person, or a company in which you (or they) (or any relevant person) were a relevant person, have current or past bankruptcy or insolvency proceedings against you?

✔ No

Yes Please give details below, including the required set-up costs (including infrastructure), maintenance and clean up costs for the proposed facility against which a credit check may be assessed

We may want to contact a credit reference agency for a report about your business's finances.

See **Environmental permits privacy notice - GOV.UK (www.gov.uk)** for how we use your personal information to support environmental permitting.

3 Your ability as an operator, continued

Landfill, Category A mining waste facilities and mining waste facilities for hazardous waste only

How do you plan to make financial provision (to operate a landfill or a mining waste facility you need to show us that you are financially capable of meeting the obligations of closure and aftercare)?

☐ Renewable bonds

☐ Cash deposits with the Environment Agency

☐ Other – provide comprehensive details

Document reference

Provide a cost profile and expenditure plan of your estimated costs throughout the aftercare period of your site.

Document plan reference

Now go to **question 3d**

3d Management systems (all)

You must have an effective, written management system in place that identifies and reduces the risk of pollution. You may show this by using a certified scheme or your own system.

Your permit requires you (as the operator) to ensure that you manage and operate your activities in accordance with a written management system.

You need to be able to explain what happens at each site and which parts of the overall management system apply. For example, at some sites you may need to show you are carrying out additional measures to prevent pollution because they are nearer to sensitive locations than others.

For waste and installation permits only: your management system must also explain your resilience to climate change.

You can find guidance on management systems on our website at **https://www.gov.uk/guidance/develop-a-management-system-environmental-permits**

✔ **Tick this box to confirm that you have read the guidance and that your management system will meet our requirements**

What management system will you provide for your regulated facility?

✔ ISO 14001

BS 8555 (Phases 1–5)

BS EN ISO 14005:2019

Green dragon

Own management system

EMAS Global

Other

Please send us a summary of the management system you are using and a copy of your accreditation (if applicable) with your application.

Document reference/s

Management System Summary

4 Consultation

Fill in 4a to 4c for installations and waste operations and 4d for installations only.

Could the waste operation or installation involve releasing any substance into any of the following?

4a A sewer managed by a sewerage undertaker?

✔ No

Yes Please name the sewerage undertaker

4b A harbour managed by a harbour authority?

✔ No

Yes Please name the harbour authority

4c Directly into relevant territorial waters or coastal waters within the sea fisheries district of a local fisheries committee?

✔ No

Yes Please name the fisheries committee

4d Is the installation on a site for which:

4d1 a nuclear site licence is needed under section 1 of the Nuclear Installations Act 1965?

✔ No

Yes

4d2 a policy document for preventing major accidents is needed under regulation 5 of the Control of Major Accident Hazards Regulations 2015, or a safety report is needed under regulation 7 of those Regulations?

✔ No

Yes

5 Supporting information

5a Provide a plan or plans for the site

But not any mobile plant

Clearly mark the site boundary or discharge point, or both. The site plan must be legible at A4 size, drawn to scale and include a scale bar.

5 Supporting information, continued

Also include site drainage plans, site layout plans, and plant design drawings/process flow diagrams (as required). (**See the guidance notes on part B2**.)

Document reference/s of the plans

Drawing 02

5b Provide the relevant sections of a site condition/baseline report if this applies

See the guidance notes on part B2

Document reference of the report

Appendix F

✔ If you are applying for an installation, tick the box to confirm that you have sent in a baseline report

5c Provide a non-technical summary of your application

See the guidance notes on part B2 for what needs to be included.

Document reference of the summary

Section 2.0

5d Are you applying for an activity that includes the storage of combustible wastes?

This applies to all activities excluding standalone water and groundwater discharges.

✔ No

Yes Provide a fire prevention plan (**see the guidance notes on part B2**).

Document reference of the plan

6 Environmental risk assessment

Provide an assessment of the risks each of your proposed regulated facilities poses to the environment. The risk assessment must follow the methodology set out in 'Risk assessments for your environmental permit' at **Risk assessments for your environmental permit – GOV.UK (www.gov.uk)** or an equivalent method.

For air dispersion modelling see: **Environmental permitting: air dispersion modelling reports – GOV.UK (www.gov.uk)**

Document reference(s) for the assessments, including modelling reports and files where applicable

Appendix D and E

7 How to contact us

If you have difficulty using this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: **enquiries@environment-agency.gov.uk**

7 How to contact us, continued

Website: **www.gov.uk/government/organisations/environment-agency**

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

☐ Yes please

☐ No thank you

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

☐ No

☐ Yes

Amount received (£)

Appendix 1 – Low impact installation checklist

Low impact installation criterion (see the Part B2 guidance notes)	Section of supporting document that shows how your proposed activity meets the LII criterion	Do you meet LII criterion?
A – Management techniques		☐ Yes ☐ No
B – Wastewater		☐ Yes ☐ No
C – Abatement systems/ releases to air		☐ Yes ☐ No
D – Emissions to groundwater		☐ Yes ☐ No
E – Waste production		☐ Yes ☐ No
F – Energy consumption		☐ Yes ☐ No
G – Accident prevention		☐ Yes ☐ No
H – Noise		☐ Yes ☐ No
I – Emissions of polluting substances		☐ Yes ☐ No
J – Odours		☐ Yes ☐ No
K – Compliance history		☐ Yes ☐ No

If you answered 'No' to any of the questions above, your installation cannot be considered as a low impact installation.

Appendix 2 – Date of birth information for Relevant offences and/or Technical ability questions only

Date of birth information in this appendix will not be put onto our Public Register. Continue on a separate sheet if necessary

1. Relevant Offences – date of birth information for relevant persons(s)

Please give us the following details if you have answered 'Yes' to question 3a

Name

Date of birth (DD/MM/YYYY)

2. Technical ability – date of birth information for technically competent manager(s)

Please give us the following details (relevant waste operations only)

Name

Date of birth (DD/MM/YYYY)

Application for an environmental permit
Part B3 – New bespoke installation permit

If you are applying for a new bespoke permit for an installation, fill in this part of the form, together with parts A, B2 and F1.

Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that go with it.

If you are applying for a permit for an intensive farm do not use this form, but complete application form part B3.5 instead.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than three hours to fill in this part of the application form.

Contents

1 What activities are you applying for?
2 Point source emissions to air, water and land
3 Operating techniques
4 Monitoring
5 Environmental impact assessment
6 Resource efficiency and climate change
8 How to contact us
Appendix 1 – Specific questions for the combustion sector
Appendix 2 – Specific questions for the chemical sector
Appendix 3 – Specific questions for the waste incineration sector
Appendix 4 – Specific questions for the landfill sector and recovery of hazardous waste on land activities

1 What activities are you applying for?

Fill in Table 1a below with details of all the activities listed in schedule 1 or other references (see note 1) of the Environmental Permitting Regulations (EPR) and all directly associated activities (DAAs) (in separate rows), that you propose to carry out at the installation.

Fill in a separate table for each installation you are applying for. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given the document.

Document reference

1 What activities are you applying for?, continued

Table 1a – Types of activities

Schedule 1 listed activities						
Installation name	Schedule 1 or other references (See note 1)	Description of the activity (See note 2)	Activity capacity (See note 3)	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity (if this applies) (See note 3)	Non-hazardous waste treatment capacity (if this applies) (See note 3)
If there are not enough rows, send a separate document and give the document reference number here	Put your main activity first			For installations that take waste only	For installations that take waste only	For installations that take waste only
Barrow Green Hydrogen Plant	4.2 Part A(1)(a)(i)	Producing inorganic	12,816 kg/d			

Directly associated activities (See note 4) Also note: if the DAA is a Medium Combustion Plant or Specified Generator (MCP/SG) please also fill in part B2.5, (see https://www.gov.uk/government/publications/application-for-an-environmental-permit-part-b25-new-bespoke-medium-combustion-plant-and-specified-generator-permit)		
Name of DAA If there are not enough rows, send a separate document and give the document reference number here	Description of the DAA (please identify the schedule 1 activity it serves)	
Section 2.1		
For installations that take waste (See note 5 below)	Total storage capacity	
	Annual throughput (tonnes each year)	

1 What activities are you applying for?, continued

Notes

1. Quote the section number, part A1 or A2 or B, then paragraph and sub-paragraph number as shown in EPR part 2 of schedule 1, schedule 13 and 14 for Local Authority regulated activities, or schedule 25/25B for Medium Combustion Plant or Specified Generators.
2. Use the description from the relevant schedule of the regulations. Include any extra detail that you think would help to accurately describe what you want to do.
3. By 'capacity', we mean:

- the total incineration capacity (tonnes every hour) for waste incinerators
- the total landfill capacity (cubic metres) for landfills
- the total capacity (cubic metres) for the recovery of hazardous waste on land
- the total treatment capacity (tonnes each day) for waste treatment operations
- the total storage capacity (tonnes) for waste storage operations
- the processing and production capacity for manufacturing operations, or
- the thermal input capacity for combustion activities

Fill each listed activity as a separate line and give an accurate description of any other activities associated with your schedule 1 activities. You cannot have Directly Associated Activities (DAAs) as part of a mobile plant application. If the DAA is a Medium Combustion Plant or Specified Generator (MCP/SG) please fill in the table in appendix 1 question 13.

By 'total storage capacity', we mean the maximum amount of waste, in tonnes, you store on the site at any one time.

Types of waste accepted

For those installations that take waste, for each line in Table 1a (including DAAs), fill in a separate document to list those wastes you will accept on to the site for that activity. Give the List of Wastes catalogue code and description (see https://www.gov.uk/government/publications/waste-classification-technical-guidance).

If you need to exclude waste from your activity or facility by restricting the description, quantity, physical nature, hazardous properties, composition or characteristic of the waste, include these in the document. Send it to us with your application form.

Please provide the reference for each document.

You can use Table 1b as a template.

If you want to accept any waste with a code ending in 99, you must provide more information and a full description of the waste in the document, (for example, detailing the source, nature and composition of the waste). Where you only want to receive specific wastes within a waste code you can provide further details of the waste you want to receive. Where a waste is dual coded you should use both codes for the waste.

Document reference of this extra information

1 What activities are you applying for?, continued

Table 1b – Template example – types of waste accepted and restrictions

Waste code	Description of the waste
Example	Example
02 01 08*	Agrochemical waste containing hazardous substances
18 01 03*	Infectious clinical waste, not contaminated with chemicals or medicines – human healthcare (may contain sharps) for alternative treatment
17 05 03*/17 06 05*	Non-hazardous soil from construction or demolition contaminated with fragments of asbestos cement sheet

1c Recovery of hazardous waste on land

Are you applying for a waste recovery activity involving the permanent deposit of inorganic hazardous waste on land for construction or land reclamation?

No ☐ Now go to question 2

Yes ☐

Have you written a waste recovery plan (WRP) that shows that you will use waste to perform the same function as non waste materials you would have used?

No ☐ You must write a WRP to support your application.

Yes ☐

Have we advised you during pre-application discussions that we believe the activity is waste recovery?

No ☐

Yes ☐

Have there been any changes to your proposal since the discussions?

No ☐

Yes ☐

Please send us a copy of your current waste recovery plan that complies with our guidance at https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-recovery-plans-and-deposit-for-recovery-permits. You need to highlight any changes you may have made since your pre-application discussions.

Document reference

Please note that there is an additional charge for the assessment or re assessment of a waste recovery plan that must be submitted as part of this application. For the charge see https://www.gov.uk/government/publications/environmental-permitting-charges-guidance/environmental-permitting-charges-guidance

2 Point source emissions to air, water and land

Fill in Table 2 below with details of the point source emissions that result from the operating techniques at each of your installations.

Fill in one table for each installation, continuing on a separate sheet if necessary.

Table 2 – Emissions (releases)

Installation name	Barrow Green Hydrogen Plant			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
416.066073.00001_BGH_EP_Appl				
Section 6.1				
Point source emissions to water (other than sewers)				
Emission point reference and location	Source	Parameter	Quantity	Unit
416.066073.00001_BGH_EP_Appl				
Section 6.2				
Point source emissions to sewers, effluent treatment plants or other transfers off site				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				
Point source emissions to land				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				

You will also need to complete application form part B6 if your installation includes a point source emission(s) to:

- water
- groundwater or
- sewer

Supporting information

3 Operating techniques

3a Technical standards

Fill in Table 3a for each activity at the installation you refer to in Table 1a above and list the 'Best Available Techniques' you are planning to use. If you use the standards set out in the relevant BAT conclusion(s), BAT reference document(s) (BREF) and/or technical guidance(s) (TGN) there is no need to justify using them within your documents in Table 3a.

For Part A(2) activities refer to https://www.gov.uk/government/collections/integrated-pollution-prevention-and-control-sector-guidance-notes and for Part B and Schedule 14 activities see https://www.gov.uk/government/collections/local-air-pollution-prevention-and-control-lappc-process-guidance-notes

You must justify your decisions in a separate document if:

- there is no technical standard
- the technical guidance provides a choice of standards, or
- you plan to use another standard

This justification could include a reference to the Environmental Risk Assessment provided in part B2 (General bespoke permit) of the application form.

For each of the activities listed in Table 1a, the documents in Table 3a should summarise:

- the operations undertaken
- the measures you will use to control the emissions from your process, as identified in your risk assessment or the relevant BAT conclusions, BREF or technical guidance
- how you will meet other standards set out in the relevant BAT conclusions document, BREF or technical guidance

Table 3 – Technical standards

Fill in a separate table for each activity at the installation.

Installation name	Barrow Green Hydrogen Plant	
Description of the schedule 1 activity or directly associated activity	Best available technique (BATC, BREF or TGN reference) (see footnote below)	Document reference (if appropriate)
Section 2.6		

* Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

In all cases, describe the type of facility or operation you are applying for and provide site infrastructure plans, location plans and process flow diagrams or block diagrams to help describe the operations and processes undertaken. Give the document references you use for each plan, diagram and description.

Document reference: Section 2.0

3b General requirements

Fill in a separate Table 4 for each installation.

Table 4 – General requirements

Name of the installation	Barrow Green Hydrogen Plant
If the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them	Document reference or references N/A
Where the technical guidance or your risk assessment shows that odours are an important issue, send us your odour management plan	Document reference or references N/A
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)	Document reference or references Appendix H

For guidance on risk assessments for your environmental permit see https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

3c Types and amounts of raw materials

Fill in Table 5 for all schedule 1 activities. Fill in a separate table for each installation.

Table 5 – Types and amounts of raw materials

Name of the installation		Barrow Green Hydrogen Plant		
Capacity (See note 1 below)				
Schedule 1 activity	Description of raw material and composition	Maximum amount (tonnes) (See note 2 below)	Annual throughput (tonnes each year)	Description of the use of the raw material including any main hazards (include safety data sheets)

Notes

1 By 'capacity', we mean the total storage capacity (tonnes) or total treatment capacity (tonnes each day).

2 By 'maximum amount', we mean the maximum amount of raw materials on the site at any one time.

Use a separate sheet if you have a long list of raw materials, and send it to us with your application form. Please also provide the reference of this extra sheet.

Document reference: Section 5.2

3d Information for specific sectors

For some of the sectors, we need more information to be able to set appropriate conditions in the permit. This is as well as the information you may provide in sections 5, 6 and 7. For those activities listed below, you must answer the questions in the related document.

Table 6 – Questions for specific sectors

Sector	Appendix
Combustion	See the questions in appendix 1
Chemicals	See the questions in appendix 2
Incinerating waste	See the questions in appendix 3
Landfill and recovery of hazardous waste on land	See the questions in appendix 4

General information

4 Monitoring

4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

You should also describe any environmental monitoring. Tell us:

- how often you use these measures
- the methods you use
- the procedures you follow to assess the measures

Document reference: Section 6

4b Point source emissions to air only

4b1 Has the sampling location been designed to meet BS EN 15259 clause 6.2 and 6.3?

No ☐
Yes ☐

4b2 Are the sample ports large enough for monitoring equipment and positioned in accordance with section 6 and appendix A of BS EN 15259?

No ☐
Yes ☐

4b3 Is access adjacent to the ports large enough to provide sufficient working area, support and clearance for a sample team to work safely with their equipment throughout the duration of the test?

No ☐
Yes ☐

4b4 Are the sample location(s) at least 5 HD from the stack exit

No ☐
Yes ☐

4b5 Are the sample location(s) at least 2 HD upstream from any bend or obstruction?

No ☐
Yes ☐

4b6 Are the sample location(s) at least 5 HD downstream from any bend or obstruction?

No ☐
Yes ☐

4b7 Does the sample plane have a constant cross sectional area?

No ☐
Yes ☐

4b8 If horizontal, is the duct square or rectangular (unless it is less than or equal to 0.35 m in diameter)

No ☐
Yes ☐

4b9 If you have answered 'No' to any of the questions 4b1 to 4b8 above, provide an assessment to how the standards in BS EN 15259 will be met.

Document reference of the assessment

5 Environmental impact assessment

5a Have your proposals been the subject of an environmental impact assessment under Council Directive 85/337/EEC of 27 June 1985 [Environmental Impact Assessment] (EIA)?

No ☑ Now go to question 6

Yes ☐ Please provide a copy of the environmental statement and, if the procedure has been completed:

- a copy of the planning permission
- the committee report and decision on the EIA

Document reference of the copy

6 Resource efficiency and climate change

If the site is a landfill or a recovery of hazardous waste on land activity, you only need to fill in this section if the application includes gas engines.

6a Describe the basic measures for improving how energy efficient your activities are

Document reference of the description: Section 5.1

6b Provide a breakdown of any changes to the energy your activities use up and create

Document reference of the description: Section 5.1.1

6c Have you entered into, or will you enter into, a climate change levy agreement?

No ☑ Describe the specific measures you use for improving your energy efficiency

Document reference of the description: Section 5.1

Yes ☐ Please give the date you entered (or the date you expect to enter) into the agreement (DD/MM/YYYY)

Please also provide documents that prove you are taking part in the agreement.

Document reference of the proof

6d Explain and justify the raw and other materials, other substances and water that you will use

Document reference of the justification: Section 5.2

6e Describe how you avoid producing waste in line with Council Directive 2008/98/EC on waste

If you produce waste, describe how you recover it. If it is technically and financially impossible to recover the waste, describe how you dispose of it while avoiding or reducing any effect it has on the environment.

Document reference of the description: Section 5.3

7 Installations that include a combustion plant (excluding waste incinerators)

7a List all your combustion plant at the site and provide thermal input and operating hours for each

Document reference

7b Do any of your combustion plants have a net rated thermal input of 1 or more MW and is not an excluded MCP?

No ☐ Go to 7c

Yes ☐ Please fill in the table in appendix 1 question 13

7c Is the aggregated net thermal input of your combustion plant more than 20 MW?

No ☐

Yes ☐ Please go to appendix 1 question 11

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: https://www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19107
Clarity approved by Plain English Campaign

For Environment Agency use only

Date received (DD/MM/YYYY)

Payment received?

No ☐

Yes ☐ Amount received

Our reference number

£

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 4.

Appendix 1 – Specific questions for the combustion sector

1 Identify the type of fuel burned in your combustion units (including when your units are started up, shut down and run as normal). If your units are dual fuelled (that is, use two types of fuel), list both the fuels you use

Fill in a separate table for each installation.

Installation reference			
Type of fuel	When run as normal	When started up	When shut down
Coal	☐	☐	☐
Gas oil	☐	☐	☐
Heavy fuel oil	☐	☐	☐
Natural gas	☐	☐	☐
WID waste	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Landfill gas	☐	☐	☐
Other	☐	☐	☐

Notes

1. Not covered by Industrial Emissions Directive 2010/75/EU.
2. 'Biomass' is referred to The Renewables Obligation Order 2002 (https://www.legislation.gov.uk/uksi/2002/914/contents/made)

Give extra information if it helps to explain the fuel you use.

Document reference

Appendix 1 – Specific questions for the combustion sector, continued

2 Give the composition range of any fuels you are currently allowed to burn in your combustion plant

Fill in a separate table for each installation, continuing on a separate sheet if necessary

Fuel use and analysis					
Installation reference					
Parameter	Unit	Fuel 1	Fuel 2	Fuel 3	Fuel 4
Maximum percentage of gross thermal input	%				
Moisture	%				
Ash	% wt/wt dry				
Sulphur	% wt/wt dry				
Chlorine	% wt/wt dry				
Arsenic	% wt/wt dry				
Cadmium	% wt/wt dry				
Carbon	% wt/wt dry				
Chromium	% wt/wt dry				
Copper	% wt/wt dry				
Hydrogen	% wt/wt dry				
Lead	% wt/wt dry				
Mercury	% wt/wt dry				
Nickel	% wt/wt dry				
Nitrogen	% wt/wt dry				
Oxygen	% wt/wt dry				
Vanadium	mg/kg dry				
Zinc	mg/kg dry				
Net calorific value	MJ/kg				

Appendix 1 – Specific questions for the combustion sector, continued

3 If NOx factors are necessary for reporting purposes (that is, if you do not need to monitor emissions), please provide the factors associated with burning the relevant fuels

Fill in a separate table for each installation.

Installation reference	
Fuel	NOx factor (kgt^{-1})
Fuel 1	
Fuel 2	
Fuel 3	
Fuel 4	

Note: kgt^{-1} means kilograms of nitrogen oxides released for each tonne of fuel burned.

4 Will your combustion plant be subject to Chapter III of the Industrial Emissions Directive 2010/75/EU?

No ☐ Now fill in application form part F

Yes ☐

5 What is your plant?

an existing one ☐ A plant licensed before 1 July 1987

a new one ☐ A plant licensed on or after 1 July 1987 but before 27 November 2002, or a plant for which an application was made before 27 November 2002 and which was put into operation before 27 November 2003

a new-new one ☐ A plant for which an application was made on or after 27 November 2002

6 If you run more than one type of plant or a number of the same type of plant on your installation, please list them in the table below

Fill in a separate table for each installation.

Installation reference	
Type of plant	Number within installation
Existing	
New	
New-new	
Gas turbine (group A)	
Gas turbine (group B)	

Appendix 1 – Specific questions for the combustion sector, continued

7 If you run an existing plant, have you submitted a declaration for the 'limited life derogation' set out in Article 33 of Chapter III of the Industrial Emissions Directive?

No ☐ Now go to question 9

Yes ☐

8 Have you subsequently withdrawn your declaration?

No ☐

Yes ☐

9 List the existing large combustion plants (LCPs) which have annual mass allowances under the National Emission Reduction Plan (NERP), and those with emission limit values (ELVs) under the LCPD

Installation reference	
LCPs under NERP	LCPs with ELVs

10 Do you meet the monitoring requirements of Chapter III of the Industrial Emissions Directive?

No ☐

Yes ☐ Document reference

11 Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?

No ☐ Please provide supporting evidence of why a CBA is not required (for example, an agreement from us)

Document reference of this evidence

Yes ☐ Please submit a copy of your CBA

Document reference of the CBA

Appendix 1 – Specific questions for the combustion sector, continued

12 Does your installation need to be combined heat and power-ready (CHP-ready)?

No ☐ Please provide supporting evidence of why a CHP-ready assessment is not required (for example, an agreement from us)

Document reference of this evidence

Yes ☐ Please provide a copy of your CHP-ready assessment

Document reference of the CHP-ready assessment

13 Information to be provided by the operator to the competent authority for each Medium Combustion Plant as identified in Annex I of Medium Combustion Plant Directive (EU/2015/2193)

MCP specific identifier*	
12-digit grid reference or latitude/longitude	
Rated thermal input (MW) of the MCP	
Type of MCP (diesel engine, gas turbine, other engine or other MCP)	
Type of fuels used: gas oil (diesel), natural gas, gaseous fuels other than natural gas, landfill gas	
Date when the new MCP was first put into operation	
Sector of activity of the MCP or the facility in which it is applied (NACE code)	
Expected number of annual operating hours of the MCP and average load in use	

Where the option of exemption under Article 6(8) is used the operator (as identified on Form A) should sign a declaration here that the MCP will not be operated more than the number of hours referred to in this paragraph	

* identifier – the MCP must be traceable via a serial number or other unique identifier, name plate, manufacturer and or model

NACE code means Nomenclature of Economic Activities and is the European statistical classification of economic activities (http://www.export.gov.il/files/EEN/ListNACEcodes.pdf).

To find out the 12-digit grid reference you can search on the UK Grid Reference Finder website at https://gridreferencefinder.com/

Appendix 2 – Specific questions for the chemical sector

1 Please provide a technical description of your activities

- The description should be enough to allow us to understand:
- the process
- the main plant and equipment used for each process
- all reactions, including significant side reactions (that is, the chemistry of the process)
- the material mass flows (including by products and side streams) and the temperatures and pressures in major vessels
- the all emission control systems (both hardware and management systems), for situations which could involve releasing a significant amount of emissions – particularly the main reactions and how they are controlled
- a comparison of the indicative BATs and benchmark emission levels standards: technical guidance notes (TGNs) (see https://www.gov.uk/government/collections/technical-guidance-for-regulated-industry-sectors-environmental-permitting); additional guidance 'The production of large volume organic chemicals' (EPR 4.01); 'Speciality organic chemicals sector' (EPR 4.02); 'Inorganic chemicals sector' (EPR 4.03); and best available techniques reference documents (BREFs) for the chemical sector

Document reference: Section 3.0

2 If you are applying for a multi-purpose plant, do you have a multi-product protocol in place to control the changes?

No ☐

Yes ☐ Provide a copy of your protocol to accompany this application

Document reference

3 Does Chapter V of the Industrial Emissions Directive (IED) apply to your activities?

No ☑

Yes ☐ Fill in the following

3a List the activities which are controlled under the IED

Installation reference	
Activities	

3b Describe how the list of activities in question 3a above meets the requirements of the IED

Document reference

Appendix 3 – Specific questions for the waste incineration sector

If you are proposing to accept clinical waste, please complete your answer to question 3a 'Technical standards' with reference to relevant parts of our healthcare waste appropriate measures guidance (see https://www.gov.uk/guidance/healthcare-waste-appropriate-measures-for-permitted-facilities)

1a Do you run incineration plants as defined by Chapter IV of the Industrial Emissions Directive (IED)?

No ☐ You do not need to answer any other questions in this appendix

Yes ☐ IED applies

1b Are you subject to IED as

An incinerator? ☐

A co-incinerator? ☐

2 Do any of the installations contain more than one incineration line?

No ☐ Now go to question 4

Yes ☐

3 How many incineration lines are there within each installation?

Fill in a separate table for each installation.

Installation reference		
Number of incineration lines within the installation		
Reference identifiers for each line		

You must provide the information we ask for in questions 4, 5 and 6 below in separate documents. The information must at least include all the details set out in section 2 ('Key Issues') of S5.01 'Incineration of waste: additional guidance' (under the sub heading 'European legislation and your application for an EP Permit'). See https://www.gov.uk/government/collections/technical-guidance-for-regulated-industry-sectors-environmental-permitting.

You must answer questions 7 to 13 on the form below.

4 Describe how the plant is designed, equipped and will be run to make sure it meets the requirements of IED, taking into account the categories of waste which will be incinerated

Document reference

5 Describe how the heat created during the incineration and co-incineration process is recovered as far as possible (for example, through combined heat and power, creating process steam or district heating)

Document reference

Appendix 3 – Specific questions for the waste incineration sector, continued

6 Describe how you will limit the amount and harmful effects of residues and describe how they will be recycled where this is appropriate

Document reference

For each line identified in question 3, answer questions 7 to 13 below

Question 3 identifier, if necessary

7 Do you want to take advantage of the Article 45 (1)(f) allowance (see below) if the particulates, CO or TOC continuous emission monitors (CEM) fail?

No ☐

Yes ☐ This allows 'abnormal operation' of the incineration plant under certain circumstances when the CEM for releases to air have failed. Annex VI, Part 3(2) sets maximum half hourly average release levels for particulates (150 mg/m3), CO (normal ELV) and TOC (normal ELV) during abnormal operation.

Describe the other system you use to show you keep to the requirements of Article 13(4) (for example, using another CEM, providing a portable CEM to insert if the main CEM fails, and so on).

8 Do you want to replace continuous HF emission monitoring with periodic hydrogen fluoride (HF) emission monitoring by relying on continuous hydrogen chloride (HCl) monitoring as allowed by IED Annex VI, Part 6 (2.3)?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you control hydrogen chloride and keep it to a level below the HCl ELVs.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

9 Do you want to replace continuous water vapour monitoring with pre-analysis drying of exhaust gas samples, as allowed by IED Annex VI, Part 6 (2.4)?

Under this you do not have to continuously monitor the amount of water vapour in the air released if the sampled exhaust gas is dried before the emissions are analysed.

No ☐

Yes ☐ Please give your reasons for doing this

10 Do you want to replace continuous hydrogen chloride (HCl) emission monitoring with periodic HCl emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen chloride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

11 Do you want to replace continuous HF emission monitoring with periodic HF emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

12 Do you want to replace continuous SO2 emission monitoring with periodic sulphur dioxide (SO2) emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for sulphur dioxide if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

13 If your plant uses fluidised bed technology, do you want to apply for a derogation of the CO WID ELV to a maximum of 100 mg/m³ as an hourly average, as allowed by IED Annex VI, Part 3?

No ☐

Does not apply ☐

Yes ☐ Please give your reasons for doing this

14 Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?

No ☐ Please provide supporting evidence of why a CBA is not required (for example, an agreement from us)

Document reference of this evidence

Yes ☐ Please submit a copy of your CBA

Document reference of the CBA

15 Does your installation need to be combined heat and power-ready (CHP-ready)?

No ☐ Please provide supporting evidence of why a CHP-ready assessment is not required (for example, an agreement from us)

Document reference of this evidence

Yes ☐ Please provide a copy of your CHP-ready assessment

Document reference of the CHP-ready assessment

Appendix 4 – Specific questions for the landfill sector and recovery of hazardous waste on land activities

1. For the landfill sector, provide your Environmental Setting and Installation Design (ESID) report and any other risk assessments to control emissions.

For recovery of hazardous waste on land activities, provide your Environmental Setting and Site Design (ESSD) report and any other risk assessments to control emissions

Document reference

2. For recovery of hazardous waste on land activities, provide your Waste Acceptance Procedures (including Waste Acceptance Criteria)

Document reference

Refer to our guidance at

https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-acceptance-procedures-for-deposit-for-recovery

3. Provide your hydrogeological risk assessment (HRA) for the site

Document reference

4. Provide your outline engineering plan for the site

Document reference

5. Provide your stability risk assessment (SRA) for the site

Document reference

6. Provide your landfill gas risk assessment (LFGRA) for the site

Document reference

We have developed guidance on these assessments and their reports which can be found at
https://www.gov.uk/government/collections/environmental-permitting-landfill-sector-technical-guidance

7. For recovery of hazardous waste on land activities, have you completed a monitoring plan for the site?

No ☐ Please refer to the section of your ESSD that explains why this is unnecessary for your site

Document reference of this evidence

Yes ☐ Document reference

Appendix 4 – Specific questions for the landfill sector and recovery of hazardous waste on land activities, continued

8. Have you completed a proposed plan for closing the site and your procedures for looking after the site once it has closed?

No ☐ If you have answered 'no' for recovery of hazardous waste on land activities, refer to the section of your ESSD that explains why this is unnecessary for your site

Document reference of this evidence

Yes ☐ For landfill you must provide a closure and aftercare plan

Document reference

Application for an environmental permit Part B6:
1. New bespoke water discharge activity
2. New bespoke groundwater activity (point source discharge)
3. Point source emission to water from an installation.

Environment Agency

You will need to use an Adobe reader product to complete this form. The form may not work properly if you use a different pdf reader, such as the one built-in to your internet browser.

This application is for a bespoke water discharge activity or groundwater point source discharge activity environmental permit. Check **https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits** to ensure that you need a permit and the type of permit you need.

You should also complete this form if you are applying for a bespoke installation activity that includes a point source emission to water, groundwater or sewer.

Fill in this part of the form, together with parts A, B2 and F1, **https://www.gov.uk/government/collections/environmental-permit-application-forms-for-a-new-bespoke-permit** if you are applying for a new bespoke permit for a water discharge activity or a point source discharge groundwater activity. You need to fill in part B6, including any relevant appendices, once for each effluent you are applying for.

Fill in this part of the form, together with parts A, B2, B3 and F1, **https://www.gov.uk/government/collections/environmental-permit-application-forms-for-a-new-bespoke-permit** if you are applying for a new bespoke permit for an installation where a point source emission to water, groundwater or sewer forms part of the operation.

If you want to apply for a standalone discharge of treated domestic sewage effluent of up to fifteen cubic metres (15 m^3) a day to ground or up to twenty cubic metres (20 m^3) a day to surface water, please fill in form B6.5.

If you want to apply for an environmental permit for a ground source or surface water source heating and cooling scheme fill out forms A, B8 and F1. **https://www.gov.uk/government/publications/new-ground-source-heating-and-cooling-scheme-form-and-guidance-notes**

You may also need to complete this form if you have a point source emission to water from a waste operation. For further information see **https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits**

Please check that this is the latest version of the form available from our website.

Grey boxes indicate the guidance notes to help you complete the form. The form can be:

1) saved onto a computer and then filled in.

2) printed off and filled in by hand. Please write clearly in the answer spaces.

We anticipate it will take less than three hours to fill in this part of the application form if you have all the necessary information available.

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1 About the effluent – details and type

From the list below, tick the box for the type of effluent you are applying for on this form and answer the questions shown in that row in Table 1. You must fill in a separate copy of this form and the appropriate section or sections for each effluent you plan to discharge. For mixed effluents which share treatment and have a common monitoring point, for example sewage treated with trade and/or non-sewage, choose the type of effluent which makes up the highest volume of the discharge.

Table 1 – About the effluent

Type of effluent	Charge band	Tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Treated sewage effluent (non-water company)	1.3.3 Sewage effluent discharge with a volume up to and including 5m³ a day to surface water from domestic household or organisation operating for charitable purposes	☐	All	All	b	-	All	All	All	-	-	b, j, k	All
	1.3.4 Sewage effluent discharge with a volume up to and including 5m³/day to groundwater from domestic household or organisation operating for charitable purposes	☐	All	All	b	-	All	All	All	-	-	b, j, k	All
	1.3.5 Sewage effluent discharge with a volume up to and including 5m³ a day to surface water	☐	All	All	b	-	All	All	All	-	-	b, j, k	All
	1.3.6 Sewage effluent discharge with a volume up to and including 5m³/day to groundwater	☐	All	All	b	-	All	All	All	-	-	b, j, k	All
	1.3.7 Sewage effluent discharge with a volume greater than 5m³/day up to and including 15m³/day to groundwater	☐	All	All	b	-	All	All	All	b, c, d	-	b, j, k	All
	1.3.8 Sewage effluent discharge with a volume greater than 15m³/day to groundwater	☐	All	All	b	-	All	All	All	b, c, d	d, f	a, b, c, d, e, f, j, k	All

Type of effluent	Charge band	Tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Treated sewage effluent (non-water company)	1.3.9 Sewage effluent discharge with a volume greater than 5m³/day up to and including 50m³/day to surface water	☐	All	All	b	-	All	All	All	b, c, d	a or b, f	b, j, k	All
	1.3.10 Sewage effluent discharge with a volume greater than 50m³/day to surface water	☐	All	All	b	-	All	All	All	b, c, d	a or b, f	a, b, c, d, e, f, j, k	All
Water company WwTW treated sewage effluent	1.3.5 Sewage effluent discharge with a volume up to and including 5m³/day to surface water	☐	All	a, b, e	a (b is optional)	-	-	All	All	a, b, c, d	c, f	a, b, c, f, j, k	All
	1.3.6 Sewage effluent discharge with a volume up to and including 5m³/day to groundwater	☐	All	a, b, e	a (b is optional)	-	-	All	All	a, b, c, d	c, f	a, b, c, f, j, k	All
	1.3.7 Sewage effluent discharge with a volume greater than 5m³/day up to and including 15m³/day to groundwater	☐	All	a, b, e	a (b is optional)	-	-	All	All	a, b, c, d	c, f	a, b, c, f, j, k	All
	1.3.8 Sewage effluent discharge with a volume greater than 15m³/day to groundwater	☐	All	a, b, e	a (b is optional)	-	-	All	All	a, b, c, d	c, d, f	a, b, c, d, e, f, j, k	All
	1.3.9 Sewage effluent discharge with a volume greater than 5m³/day up to and including 50m³/day to surface water	☐	All	a, b, e	a (b is optional)	-	-	All	All	a, b, c, d	b if relevant, c, f	a, b, c, f, j, k	All
	1.3.10 Sewage effluent discharge with a volume greater than 50m³/day to surface water	☐	All	a, b, e	a (b is optional)	-	-	All	All	a, b, c, d	b if relevant, c, f	a, b, c, d, e, f, j, k	All

Type of effluent	Charge band	Tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Settled storm sewage	1.3.18 Sewerage network and sewage treatment works storm sewage	☐	All	a, b, e	-	a, b, c, d, f, g, h, i, j, k	-	-	All	-	c, f	b, g, h, l, j, k	All
Storm sewage	1.3.18 Sewerage network and sewage treatment works storm sewage	☐	All	a, b, e	-	a, b, c, e, f, g, h, i, j, k	-	-	All	-	c, f	b, g, j, k	All
Emergency overflow	1.3.19 Emergency overflows	☐	All	a, b, e	-	a, l, m, n, o	-	-	All	-	c, f	b, g, j, k	All
Trade and/or non-sewage – known volume	1.3.11 Trade and/or non-sewage effluent discharge to surface water or groundwater with a volume up to and including 5m³/day	☐	All	All	b, c	-	All	All	All	b, c, d	a, b or d, f	b, f, j, k	All
	1.3.12 Trade and/or non-sewage effluent discharge to surface water or groundwater with a volume greater than 5m³/day	☐	All	All	b, c	-	All	All	All	b, c, d	a, b or d, f	b, d, e, f, j, k	All
Trade and/or non-sewage –rainfall dependent	1.3.11 Trade and/or non-sewage effluent discharge to surface water or groundwater with a volume up to and including 5m³/day	☐	All	a, b, e	b, c, d, e	-	-	All	All	b, c, d	a, b or d, f	b, f, j, k	All
	1.3.12 Trade and/or non-sewage effluent discharge to surface water or groundwater with a volume greater than 5m³/day	☐	All	a, b, e	b, c, d, e	-	-	All	All	b, c, d	a, b or d, f	b, d, e, f, j, k	All

Type of effluent	Charge band	Tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Cooling water or thermal discharge (includes heating and cooling systems)	1.3.13 Cooling water or thermal discharge to surface water	☐	All	All	b, c	-	-	All	All	b, c, d, e, f	a, b or d, f	a, b, d, e, f, j, k	All
	1.3.14 Cooling water or thermal discharge to groundwater	☐	All	All	b, c	-	-	All	All	b, c, d, e, f	a, b or d, f	a, b, d, e, f, j, k	All
Aquaculture	1.3.17 Aquaculture	☐	All	All	b, c	-	-	All	All	b, c, d	a, b or d, f	a, b, d, e, f, j, k	All
Effluent and/or contaminated surface water run-off arising from the operation of an installation	No additional charge, as already included as part of the installation permit application charge	☑	a, b, d	c	b, c, d	-	a, b2	All	a, b, g	b, c, d, e, f	e, f	a, b, d, e, f, j, k	All

1a Give a brief description of the discharge you want a permit for, for example, the nature of the trade carried on at the premises, or for a discharge of treated domestic sewage effluent, which premises are connected to the sewage treatment plant.

Domestic sewage is explained at: **https://www.gov.uk/government/publications/domestic-sewage-discharges-to-surface-water-and-groundwater/domestic-sewage-discharges-to-surface-water-and-groundwater**

Where the discharge is from a sewage treatment plant operated by a water company and serving an 'agglomeration' you must tell us the name of the agglomeration and the population equivalent served by the treatment plant. (An agglomeration is where a population is sufficiently concentrated for urban waste water to be collected and treated in an urban waste water treatment plant).

The site is a hydrogen production facility that proposes to discharge site surface water runoff, roof waters, and wastewater from electrolysers into an attenuation pond onsite, Flow from the attenuation pond will drain via gravity and a hydrobrake at a maximum rate of 7.7litres/second and Class 1 Full Retention Separator to a culvert northwest of the site with drainage ultimately outfalling to the Walney Channel. If wastewater quality is deemed unsuitable for discharge to the drainage system, it will be emptied via a vacuum truck.

1b Give this effluent a unique name.

Process wastewater

You must use this reference to identify this effluent throughout this application and all associated documents. For example 'treated sewage effluent' or 'trade effluent'.

1c Is this a release from a dam, weir or sluice ('reservoir release') under Schedule 21 of the Environmental Permitting Regulations (EPR) meaning of water discharge activity?

Yes

No

1d Have you obtained all the necessary permissions to ensure that you can undertake the proposed discharge and comply with monitoring requirements?

For example, the permission from landowners for pipework to cross their land, or to have a sampling point on their land, or the Canal and Rivers Trust if you want to discharge into a canal that they manage. **Please note that this is not an exhaustive list.** Please be aware that if you do not have all the necessary permissions you will not be discharging lawfully. Explained at: **https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits#apply-for-a-bespoke-permit**. Where permission has not been granted, you should also seek alternative options before applying.

✓ Yes

No

Does not apply

Explain which permissions you have not been able to get and why in the following box or on an extra sheet.

Document reference

2 About the effluent – how long will you need to discharge the effluent for?

2a What date do you want the permit for this effluent to start?

☐ As soon as possible

☐ Other date

Provide the date ⌊_____⌋ (DD/MM/YYYY)

Please note that this is the date that your annual subsistence charges will start, even if you have not started to discharge, unless you contact us to change or delay the start date. To change or delay the start date use the Administrative Variation application form C0.5. The start date cannot be before the permit is issued and cannot be changed or delayed after it has already passed.

2b Is the discharge temporary?

No

Yes

Provide the date you expect the discharge to end: ⌊_____⌋ (DD/MM/YYYY)

Please note that your permit will not end on that date, and you will still need to tell us to surrender the permit. This is explained at **https://www.gov.uk/guidance/change-transfer-or-cancel-your-environmental-permit#cancel-surrender-your-permit**.

2c Will the discharge take place all year?

☑ Yes

☐ No

Provide details of the dates when your discharge will start and end each year, for example, April 1st to October 31st.

⌊_____⌋

2d Will the discharge take place on more than six days in any year?

Yes

No

2e Is this application to permit an existing discharge?

Answer 'yes' if you are applying for an existing discharge that does not have a permit, and if no part of the treatment system needs replacing or upgrading. Please note for recent installations, a permit will not be granted if the site is considered to be within a reasonable distance to connect to a foul sewer, even if the system is already in place.

Yes

No

3 How much do you want to discharge?

3a What is the daily dry weather flow? ⌊_____⌋ cubic metres

Read 'Calculating dry weather flow (DWF) at waste water treatment works' at **https://www.gov.uk/government/publications/calculating-dry-weather-flow-dwf-at-waste-water-treatment-works/calculating-dry-weather-flow-dwf-at-waste-water-treatment-works** on how dry weather flow is calculated.

3b What is the maximum volume of effluent you will discharge in a day? ⌊665⌋ cubic metres

You must ensure that you choose a volume you can always comply with. For some sewage effluent discharges and some trade effluent discharges you must use the industry 'Code of practice: flows and loads 4' to calculate your maximum daily flow. Flows and Loads – Sizing criteria, treatment capacity for sewage treatment systems at **https://www.britishwater.co.uk/page/Publications.**

Show how you calculated the figure given in the box below and continue on an extra sheet if necessary.

Maximum rate of discharge is 7.7l/s controlled by a hydrobrake.

7.7 l/s x 86,400 s/d = 665,280 l/d.
665,280 l / 1000 = 665.28 m3/d.

Document reference ⌊_____⌋

3c What is the maximum rate of discharge? ⌊7.7⌋ litres a second

This is the maximum instantaneous rate at which the effluent is discharged. It may be the maximum pumped rate (for example, in pumped discharges of quarry water) or the theoretical maximum flow from a gravity-fed pipe from lagoons used to balance rainfall-dependent discharges. For rainfall-dependent discharges this should typically be based on the 1-in-30-year storm event.

Show how you calculated the figure given in the box below and continue on an extra sheet if necessary.

Pre - existing hydrobrake on outfall from site attenuation lagoon.

Document reference ⌊_____⌋

3d What is the maximum volume of non-rainfall dependent effluent you will discharge in a day?

⌊46.8⌋ cubic metres

In a discharge containing rainfall dependent effluent, this will be the maximum total daily volume of any non-rainfall-dependent element.

Show how you calculated the figure given in the box below and continue on an extra sheet if necessary.

Maximum rate of discharge from each electrolyser's water treatment package will be 325 l/h.
325 * 6 = 1,950 l/h.
1,950l/h x 24 = 46,800 l/d
46,800 / 1,000 = 46.8 m3/d.

Document reference

3e What is the maximum rate of rainfall dependent discharge? litres a second

In a discharge containing rainfall dependent effluent, this will typically be based on the 1-in-30-year storm event.

Show how you calculated the figure given in the box below and continue on an extra sheet if necessary.

Document reference

4 Intermittent sewage discharges

Further guidance can be found in 'Water companies: environmental permits for storm overflows and emergency overflows permits' at **https://www.gov.uk/government/publications/water-companies-environmental-permits-for-storm-overflows-and-emergency-overflows**.

4a For each answer to 4b to 4n below, show how you worked out all the figures on an extra sheet

Document reference 4b

Document reference 4c

Document reference 4d

Document reference 4e

Document reference 4g

Document reference 4h

Document reference 4i

Document reference 4j

Document reference 4k

Document reference 4l

Document reference 4m

Document reference 4n

4b What is the total volume of the off-line/storm tank storage? cubic metres

4c What is the total volume of on-line storage? cubic metres

4d What is the pass forward flow at the settled storm overflow setting?

litres a second

4e What is the pass forward flow at the storm overflow setting? litres a second

4f Is the discharge screened?

☐ Yes **Answer the relevant questions from 4g to 4j**

☐ No **Now go to 4k**

4g and 4i. If your effluent is screened answer 4g for a mesh screen, 4i for a bar screen, or 4g and 4i for a split screen.

4h and 4j. If your effluent is screened provide the maximum flow receiving screening. For split screens provide details of the maximum flow receiving the mesh screening as well as the maximum flow receiving bar screening. (The maximum flow receiving screening may also be described as the minimum screen capacity flow).

4g What is the mesh screen spacing? _____ millimetres

4h What is the minimum screen capacity flow through the mesh screen?

_____ litres a second

4i What is the bar screen spacing? _____ millimetres

4j What is the minimum screen capacity flow through the bar screen?

_____ litres a second

4k Is the overflow constructed to good engineering design?

☐ Yes

☐ No **On an extra sheet explain what standards the overflow has been constructed to**

4l What is the emergency storage capacity of the sewer and wet well?

_____ cubic metres

4m What is the storage time within the sewer and the wet well above the top water level at dry weather flow?

_____ hours and minutes

4n What is the pass forward flow at the pumping station? _____ litres a second

4o For intermittent emergency overflows you must provide a document setting out the key protection measures you will provide.

Document reference for pumping station key protection measures.

_____

5 Should your discharge be made to the foul sewer?

Before answering these questions, you must read the guidance **https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits#discharges-in-sewered-areas**

Foul sewer means public or private foul sewer. You will also need to contact your sewerage undertaker (usually your local water company) and you may need to check if it is possible to connect to a private foul sewer.

5a Provide the shortest distance between any boundary of premises served by the sewage treatment facility, or any boundary of the trade premises, and the nearest public foul sewer and/or private sewer.

100 metres

National grid reference (NGR) for the nearest sewer system.

NGR SD 19543 72172

Use 2 letters and 10 digits, for example, ST 12345 67890. To find out the national grid reference search on **https://explore.osmaps.com**

5b1 Discharges from domestic properties

Provide the number of domestic properties served by the sewage treatment system.

Multiply the number of properties served by the sewage treatment system by 30 metres.

Number of domestic properties served by the sewage treatment system metres		× 30 metres =		metres
	0		0	

5b2 Discharges from all other premises including trade effluent

Divide the volume of the discharge (in cubic metres) by 0.75 and then multiply this figure by 30 metres.

Volume of the discharge (answer to question 3b)		cubic metres÷0.75 =		× 30 =		metres
	46.8		62.4		1872	

5b3 Is your answer to question 5b1 or 5b2 above greater than the distance to the nearest foul sewer (answer to 5a)?

☐ No You do not need to explain why you cannot discharge your effluent into the foul sewer at this point. However, we may in some cases still request this information from you when we determine your application if this information is subsequently required. **Now go to question 6.**

☑ Yes Before you submit the application, you must explore the possibility of connecting to the foul sewer. Then, you must explain why you cannot discharge your effluent into the foul sewer in the following box or an extra sheet.

The waste water from the electrolyser's water purification process is of a low strength and is better suited to discharge into the environment than to a sewage treatment works via foul sewer which are designed for effluents with a BOD or COD load. United Utilities have been engaged and have advised their preference would be for the discharge to be made to the environment.

Document reference

We will only agree to the use of private treatment systems within sewered areas if you can demonstrate that:

- the additional cost of connecting to the foul sewer would be unreasonable
- connection is not practically feasible, or
- the proposed private treatment system can be shown to significantly benefit the environment.

5c Is the sewer nearby a public or private one?

You must provide details of the nearest sewer including evidence that you have approached the sewerage undertaker and their formal response regarding connection.

☐ Public Where you could connect to the foul sewer through a public foul sewer, you must send us evidence that you have approached the sewerage undertaker and their formal response regarding connection.

☐ Tick this box to confirm you have included this information with your application.

Document reference

If the sewerage undertaker has indicated that they would not allow connection due to lack of capacity you should contact us. We are unlikely to grant a permit for a discharge of treated domestic sewage in circumstances where a private sewerage system is being proposed due to a lack of capacity in the nearest public sewerage network. Before proceeding with your application, you can apply for our enhanced pre-application advice. This is a chargeable service. For more information see Get advice before you apply for an environmental permit: **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit**.

If you have already had enhanced pre-application for this proposal provide the reference number for your enhanced pre-application.

Pre-application reference number:

Document reference for enhanced pre-application advice:

☐ Private Where you could connect to the foul sewer through a private sewer, you must send us evidence to show that you have requested to connect to the private sewer. Written responses from the owners of the private sewer must be provided.

☐ Tick this box to confirm you have included this information with your application on an extra sheet.

Document reference

5d Is the existing system a factor in your justification for not connecting to the public foul sewer?

If you are applying for an existing discharge, that does not have a permit and no part of the treatment system needs replacing or upgrading, you may give this as a reason for not connecting to a nearby sewer. However, you must provide the date the treatment system was installed as accurately as you can. Please note that for new systems that have been recently installed or systems that have been recently replaced or upgraded a permit will not be granted if the site is considered to be within a reasonable distance to connect to a foul sewer (even if the system is already in place).

No

Yes What date was the system installed?

(DD/MM/YYYY)

5e Is cost a factor in your justification for not connection to public or private foul sewer?

If you have answered 'yes' to 5b3, you need to show the difference between the cost of connection to the foul sewer and that of your proposed private treatment system. This applies to new discharges, or existing discharges where you are proposing to replace or upgrade any part of your existing treatment system.

☐ No

☐ Yes

You must provide evidence of the extra cost of connecting to a sewer compared to the treatment system you propose.

Document reference

Please note that if we consider that you have not provided enough justification, we will return your application to you.

Foul sewer connection costs:

Cost of sewer pipe and infrastructure, for example, gravity sewer, pipework, manholes, or rising main and pumping.

£

Pumping equipment, pump and sump pump, if necessary. Maintenance or running costs of these if they are not adopted by the sewerage undertaker.

£

Installation: Digging up of roadside verges, roads or land on route to the sewer and making good.

£

Road closure costs, if necessary.

£

Legal easements to cross land, cost of land purchase, if necessary.

£

Initial connection charges from the sewerage undertaker.

£

Cost of maintenance and upkeep.

£

The sewerage undertaker will expect any pipe work connecting to their system to be constructed to adoptable standards or to the specification of the latest edition of 'Sewers for Adoption – A Design & Construction Guide for Developers'.

Other: Provide details on an extra sheet

£

Document reference

Total cost to foul sewer: £

Proposed treatment system costs

Cost of treatment system, pipe work and other materials.

£

Pumping equipment, if necessary.

£

Installation including excavation and digging up of roadside verges, roads or land on route to the treatment system, making good and commissioning.

£

Road closure costs, if necessary.

£

Legal easements to cross land, cost of land purchase, if necessary.

£

Maintenance and running costs.

£

Other – Provide details on an extra sheet.

£

Document reference

Total cost of proposed treatment system: £

5f Are you using physical or technical barriers as a factor in your justification for not connecting to public or private foul sewer?

☐ No

☐ Yes You must provide justification

Your justification should include details of any physical obstacles that may impede connection to the foul sewer, for example, topography, roads, railways, designated habitats sites, rivers or canals. Please be aware that we may require cost estimates to be provided to prove that it is not viable for these physical obstacles to be overcome. Provide justification on an extra sheet.

Document reference

5g Are you proposing that the private treatment system can be shown to significantly benefit the environment as the justification for not connecting to public or private foul sewer?

☐ No

☐ Yes

To prove significant environmental benefit, you must answer the following:

Have you provided evidence that the effluent will be treated to a higher standard than if connected to foul sewer? Provide a justification on an extra sheet.

☐ No

☐ Yes

Document reference

Have you shown that the additional environmental benefits from your proposed system would outweigh the potential environmental risks from a private system at the location proposed? Provide justification on an extra sheet.

☐ No

☐ Yes

Document reference

When assessing this, we consider the nature of the environmental risks that would be associated with non-compliance of your proposed system. Before proceeding with your application, you can apply for our enhanced pre-application advice. This is a chargeable service. For more information see Get advice before you apply for an environmental permit: **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit**.

6 Nutrient neutral

Check Natural England's page to find out if you are within a nutrient neutral catchment: **https://publications.naturalengland.org.uk/publication/4792131352002560**. To find a list of vulnerable sites download the records file on this page.

If your new discharge contributes to a net increase in nutrient loading (phosphorus and/or nitrogen) in a nutrient neutral catchment, request a GIS screening report from our pre-application service. If the screening confirms your discharge is within the relevant distance of a nutrient neutral designated site, you will be required to have appropriate mitigation in place.

6a Are you in a nutrient neutral catchment?

☑ No **Now go to question 7.**

☐ Yes

What is the name of the nutrient neutral catchment?

6b Is this permit for a new discharge?

☐ No **Now go to question 6c.**

☐ Yes

Will you be required to have appropriate mitigation in place? Contact your local planning authority (LPA) and/or Natural England to discuss appropriate mitigation in your area.

☐ No Provide justification of why you do not need to have appropriate mitigation in place in the following box or an extra sheet.

Reference for the extra sheet.

☐ Yes If you have your mitigation plan in place, provide this with your application

Document reference.

Now go to question 7

6c Is this permit for an existing discharge?

☐ Yes

Has the location of the discharge point or volume of the discharge changed?

☐ No **Now go to question 7.**

☐ Yes

Will you be required to have appropriate mitigation in place? Contact your local planning authority (LPA) and/or Natural England to discuss appropriate mitigation in your area.

☐ No Provide justification of why your discharge will not result in a net increase of nutrient loading (meaning phosphorus and/or nitrogen) in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

☐ Yes If you have your mitigation plan in place, provide this with your application.

Document reference. ⌊_____⌋

If you have completed independent third-party testing that meets British Standard BS12566, provide your certificate.

Reference for this certificate. ⌊_____⌋

7 How will the effluent be treated?

7a Is your effluent treated?

☑ Yes

☐ No You must explain why the effluent will not be treated.

Document reference for where you have given this justification.

7b Fill in Table 2 for each stage of the treatments carried out on your effluent in the order in which they are carried out.

For installations and waste applications with point source emission to water or sewer **complete all relevant parts of question 8**, there is no need to duplicate information already provided in part B3 or Part B4 forms. Where this information is already provided, give the document reference.

Document reference

Table 2 – Treatments carried out on your effluent

Description	Order of treatment (for example first, second, third, fourth)	
package treatment plant		Now go to 7d
septic tank		Now go to 7d
septic tank with internal septic tank retrofit kit		Now go to 7d
septic tank and sequential batch reactor		Now go to 7d
septic tank and rotating biological contactor		Now go to 7d
septic tank and reedbed		Now go to 7d
trench arch system		Now go to 7d
biological filtration		Now go to 7g
high rate biological		Now go to 7g
tertiary biological		Now go to 7g
chemical		Now go to 7g
activated carbon		Now go to 7g

Description	Order of treatment (for example first, second, third, fourth)	
sand filtration		Now go to 7g
activated sludge		Now go to 7g
oxidation ditch		Now go to 7g
dosing using aluminium for phosphate removal		Now go to 7g
dosing using iron for phosphate removal		Now go to 7g
dosing using iron and aluminium for phosphate removal		Now go to 7g
dosing using polyelectrolytes		Now go to 7g
primary settlement		Now go to 7g
screening		Now go to 7g
maceration		Now go to 7g
no treatment required – good engineering design		Now go to 7g
lagoon settlement	1	Now go to 7g
oil interceptor	2	Now go to 7g
chlorination		Now go to 7g
dechlorination		Now go to 7g
ph correction		Now go to 7g
UV disinfection		Now go to 7g
membrane filtration		Now go to 7g
sterilisation		Now go to 7g
land irrigation		Now go to 7g

Description	Order of treatment (for example first, second, third, fourth)	
reedbed		Now go to 7g
constructed wetland		Now go to 7g
Other		Now go to 7c

7c Provide design details of this other system including the stages of treatment carried out on your effluent, in the following box or an extra sheet. Now go to 7g.

See Appendix G – Flood Risk Assessment.

Document reference

7d For existing sewage treatment systems, did the treatment system meet the relevant British Standards at the time of installation?

☐ Yes **Now go to 7g.**

☐ No **Now go to 7e.**

How to check if your treatment system meets the British Standard is explained at **https://www.gov.uk/guidance/general-binding-rules-small-sewage-discharge-to-a-surface-water**.

Your septic tank or treatment plant met the British Standard in place at the time of installation if:

- it has a CE mark – **https://www.gov.uk/guidance/ce-marking**
- the manual or other documentation that came with your tank or treatment plant has a certificate of compliance with a British Standard
- it's on British Water's list of approved equipment – **https://www.britishwater.co.uk/page/Accreditation-Certificationcertified-small-wastewater-treatment-systems-for-up-to-50-pt**

You can also ask the company that installed your equipment to confirm that it met the British Standard in place at the time of installation.

7e Provide justification as to why you are not using a British Standard system in the following box or an extra sheet.

Document reference

7f Will the secondary treatment system you are applying for be designed, maintained and operated to deliver the required final effluent quality?

For discharges to surface water, you must confirm whether the treatment system will provide secondary treatment. As a minimum this requires a final effluent quality of 40 mg/l BOD (Biochemical Oxygen Demand) and 60mg/l suspended solids (or better) as maximum concentrations.

☐ Yes

☐ No What is the secondary treatment system you are applying for designed to deliver for BOD as a maximum concentration?

mg/l

What is the secondary treatment system you are applying for designed to deliver for suspended solids as a maximum concentration?

mg/l

7g You must provide details on an extra sheet of the final effluent discharge quality that the overall treatment system is designed to achieve.

Document reference

8 What will be in the effluent?

For all applications, whether to surface water, or onto or into ground, you should still check to see if your discharge is likely to contain any of the specific substances listed in the guidance documents on 'Risk assessment for treated sewage or trade effluent discharges to surface water or groundwater'

(see **https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit**).

If you answer 'yes' to any of 8a to 8c, the discharge contains, or potentially contains, specific substances, you must answer question 9 and send us the screening or modelling and data.

Specific substances means:

For a groundwater activity:

- hazardous substances (as defined by paragraph 4 of Schedule 22 to the Regulations)
- non-hazardous pollutants (as defined by paragraph 5 of Schedule 22 to the Regulations)

This does not include discharges that only contain, or are only likely to contain as their primary pollutants, ammoniacal nitrogen or ammonium and suspended solids.

You can find a list of these substances at **https://www.wfduk.org/resources/groundwater-hazardous-substances-standards**

For a surface water discharge activity:

- priority hazardous substances
- priority substances or other pollutants as defined by the Environmental Quality Standards Directive (EQSD) (2008/105/EC, as amended by 2013/39/EU)
- specific pollutants as defined by Annex 8 of the Water Framework Directive (2000/60/EC) and transposed into UK legislation through the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015
- or any other substances which the Agency requires assessment because of their bioaccumulative, toxic or ecotoxicological properties
- or any other properties which the Agency considers to present a risk to the aquatic environment

You can find a list of these substances at: **https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit**

Answer all relevant questions for your discharge below.

8a Are any of the specific substances, as defined in the above guidance, entering your upstream sewerage network through any authorised trade consents or known inputs?

☐ Yes Complete this question and ensure you complete the relevant parts of question 9. You will need to complete a risk assessment.

☐ No Provide details on an extra sheet of how you have established that the effluent is not likely to contain specific substances.

Document reference

☑ Does not apply I am not a commercial site treating effluent and do not provide treatment for other effluent streams.

8b Are any of the specific substances, as defined in the above guidance, added to or present in the effluent as a result of the activities on site?

☑ Yes Complete all remaining relevant parts of questions 8 and ensure you complete the relevant parts of question 9. You will need to complete a risk assessment.

☐ No Provide details on a separate sheet of how you have established that the effluent is not likely to contain specific substances.

Document reference Appendix C

8c Have any of the specific substances, as defined in the above guidance, been detected in samples of effluent?

☑ Yes Complete all remaining relevant questions in section 8 and ensure you complete the relevant parts of question 9. You will need to complete a risk assessment.

☐ No Provide details on an extra sheet of how you have established that the effluent is not likely to contain specific substances.

Document reference Appendix C

8d If you have answered 'No' to any of questions 8a to 8c provide details of the evidence you have submitted, include data of all substances assessed, whether or not they require to be taken forward to question 9.

Please note that if you discharge directly into a designated conservation site, we will consult with Natural England which may result in the requirement for further modelling which you may be required to carry out.

Tick all relevant boxes to indicate the evidence you have provided

☐ Sampling data

☐ Monitoring data

☐ Literature review

☑ Process review

☐ Other

Document reference Appendix C

Complete 8e and 8f if the temperature of the discharge will change compared to an incoming water supply. Then, if you have answered yes to any of questions 8a-8c, you must answer at least one of the questions in 9.

8e What is the maximum temperature of your discharge?

ambient degrees Celsius

8f What is the maximum expected temperature change of the incoming water supply?

increase in degrees Celsius no change

decrease in degrees Celsius no change

9 Environmental risk assessments and modelling

You will need to carry out an environmental risk assessment or modelling to support your application. In some cases we will carry out your risk assessment: **https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit**. Answer all the questions that are relevant to your discharge. If an environmental risk assessment or modelling is required, you must send it to us with your application. We recommend you contact us for pre-application advice. You can apply for our enhanced pre-application advice. This is a chargeable service. For more information see Get advice before you apply for an environmental permit: **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit.**

Further guidance can be found in 'Surface water pollution risk assessment for your environmental permit' at **https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit** and 'Groundwater risk assessment for your environmental permit' at **https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit**.

Send us the completed H1 risk assessment tool along with the raw data used to create the summary statistics.

The following information is required to allow the assessment to be undertaken:

- Which substances may be present in the discharge? Substances may be present if:
  i. They're allowed to be added to the discharge (for example water company trade effluent consent or discharges from installations).
  ii. You have added them to the discharge (for example iron or aluminium to remove phosphorus). Read the Environment Agency's guidance on dosed substances for the rules on this.
  iii. You have detected them using chemical analysis.
- For existing discharges, the discharge effluent will need to be analysed for all the substances that may be present in the effluent. Baseline (upstream) river quality data may also be beneficial, as it will provide more accurate information for the assessment to be undertaken.
- For new discharges, estimated or proxy site data will be necessary.
- For each substance, please provide the information set out in the table below.

Substance	The chemical name of the substance being analysed
Unit	The units of measurement. These will usually be micrograms per litre (µg/l), but may also be mg/l or ng/l
Maximum concentration	The maximum recorded concentration of the substance in the effluent
Minimum concentration	The minimum recorded concentration of the substance in the effluent
Mean concentration	The average recorded concentration of the substance in the effluent
Maximum flow	The maximum recorded effluent flow
Mean flow	The average recorded effluent flow
Number of samples	The minimum number of samples required for screening and modelling is 12; the ideal number is 36 (or, for new discharges, assumed means and standard deviations can be accepted if effluent data are not available).

Inputting metals into the H1 risk assessment tool	For metals with bioavailable EQSs for a more accurate assessment, we recommend running the dissolved data through the H1 risk assessment tool rather than total data. For all other metals use total data.
If the H1 risk assessment tool shows modelling is required	For metals with bioavailable EQS's you only need to provide dissolved data. Total data can be used but this will lead to a more precautionary assessment. For metals without bioavailable EQS's you need to provide dissolved and total data.
Required minimum reporting value	'Surface water pollution risk assessment for your environmental permit' at **https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit** or 'Groundwater pollution risk assessment for your environment permit' at **https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit** and **https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution**, should be checked to determine the minimum reporting value for the analysis of each substance. If the detection limit used is not low enough, the analysis may need to be repeated.
EQS	The relevant environmental quality standard for the substance. This can be found in 'Surface water pollution risk assessment for your environmental permit' at **https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit**

For discharges to a freshwater (non-tidal) river, in general you do not need to carry out modelling for sanitary parameters such as biochemical oxygen demand or ammonia. Most of the information we will need to do this can be provided on part B6, but you may need to add other relevant details. If our assessment concludes that we are not able to accept the proposed activity, we may ask you to provide further evidence by carrying out a higher level of assessment yourself, or we may advise you that the proposed discharge is unacceptable. Where you plan to do the assessment yourself you may need to contact us for information or advice first.

9a Discharges to surface water (except canal, lake, or reservoir).

For discharges to a freshwater (non-tidal) river, if you have answered 'yes' to any of 8a to 8c, the discharge contains, or potentially contains, specific substances.

You must carry out a specific substances screen of sample data using the H1 risk assessment tool in 'Surface water pollution risk assessment for your environmental permit' at **https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit**. Send us the completed H1 risk assessment tool along with the raw data used to create the summary statistics.

Document reference for the H1 risk assessment tool and raw data

Note: if you do not submit the H1 risk assessment tool and raw data we will return your application to you.

9b Discharges to canals, lakes, reservoirs, estuaries, coastal waters or bathing waters.

For discharges to canals, lakes, estuaries, coastal waters or bathing waters you must submit a risk assessment.

Document reference for the risk assessment 416.066073.00001_Barrow H1 Assessment

In addition, if you have answered 'yes' to any of 8a to 8c, the discharge contains, or potentially contains, specific substances. You must carry out another modelling report following the guidance 'Surface water pollution risk assessment for your environmental permit' (see **https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit**). Send us details of how the modelling was carried out and the outcome.

We cannot undertake assessments on your behalf, but we can offer advice as to what needs to be done. If you do not have the skills to do this yourself, then you will need to engage a consultant to advise you and to undertake the assessment.

Document reference for the modelling report 416.066073.00001_Barrow H1 Assessment

Note: if you do not submit the risk assessment and the modelling report we will return your application to you.

9c Sewer modelling report (for discharges of final effluent from a water company WwTW or intermittent sewage discharges).

For discharges of final effluent from a water company WwTW or intermittent sewage discharges, you must submit a sewer modelling report. Send us details of how the modelling was carried out and the outcome.

Document reference for the H1 risk assessment tool and raw data

Have you answered yes to any of 8a to 8c?

☐ No

☑ Yes Send us the completed H1 risk assessment tool, along with the raw data used to create the summary statistics

Document reference for the H1 risk assessment tool and raw data

Appendix C

Note: if you do not submit the H1 risk assessment tool and modelling report, we will return your application to you.

9d Discharges to ground.

You must carry out a groundwater quantitative risk assessment following the guidance in 'Groundwater risk assessment for your environmental permit' (see **https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit**). For discharges to ground, we will usually be able to carry out a risk assessment for you where the discharge is less than 15 cubic metres per day of treated domestic sewage and in a non-sensitive area, (see **https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit** for further information).

We will expect you to do the risk assessment in other situations and we can offer advice as to what needs to be done. If you do not have the skills to do this yourself, then you will need to engage a suitably qualified consultant to advise you and to undertake the assessment. For further guidance see 'Groundwater risk assessment for your environmental permit' at **https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit**

For groundwater remediation schemes you must send us send a site-specific remediation strategy that has been agreed with the local Environment Agency groundwater and contaminated land team. This should include:

- conceptual model
- quantitative site-specific risk assessment
- site-specific remedial targets
- details of the contaminant concentrations contained within the proposed discharge

Send us details of how the modelling was carried out and the outcome.

Document reference

Note: if you do not submit the risk assessment and modelling report we will return your application to you.

9e Discharges to freshwater (non-tidal) rivers from an installation, including discharges via sewer

If the discharge contains, or potentially contains, any specific substances, you must carry out screening following the guidance (see **https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit**).

Have you answered yes to any of 8a to 8c?

☐ No

☐ Yes Send us the completed H1 risk assessment tool, along with the raw data used to create the summary statistics. Where the discharge is via sewer, include sewage treatment reduction factors in the calculations.

Document reference for the H1 risk assessment tool and raw data

Note: if you do not submit the H1 risk assessment tool, we will return your application to you.

9f Environmental impact assessment.

Have you carried out an environmental impact assessment?

☑ No

☐ Yes Send us details of how the assessment was carried out and the outcome.

Document reference for the environmental impact assessment

10 Monitoring arrangements

10a What is the national grid reference of the inlet sampling point? (for example, SJ 12345 67890)

This is the sample point that will be used for discharges which are made up of returned abstracted water; for example, fish farms and cooling water. In these cases we will set a comparative limit to assess compliance against. It is also required for larger sewage treatment sites that meet the requirements of the Urban Waste Water Treatment Regulations (UWWTR). It allows a composite sample of the influent to the sewage treatment works to be obtained. You must provide a permanent means of access to monitoring points.

NGR: N/A

10b What is the national grid reference of the effluent sample point?

This is the sample point used to assess compliance with any water quality emission limits on your permit. You must ensure that it allows a representative sample of the discharge to be obtained. You must also ensure that all constituents of the discharge pass through the sampling point at all times. The sample point can be where the effluent meets the receiving environment only in cases where no other effluent is added before this point. You must provide a permanent means of access to monitoring points.

Note for small existing discharges to ground only:

If you are applying for a permit for an existing discharge of treated sewage effluent of not more than 5 cubic metres a day to ground (for example, using a drainage field) which does not already have a sample point we will not expect you to provide one.

NGR: SD 19312 72047

10c Do you have an Urban Waste Water Treatment Directive final effluent sampling point?

This is a requirement for larger sewage treatment sites that meet the requirements of the UWWTR. It allows a composite sample of the final effluent from the sewage treatment works to be obtained. Further guidance on the UWWTR can be found **https://www.gov.uk/government/publications/waste-water-treatment-works-treatment-monitoring-and-compliance-limits/waste-water-treatment-works-treatment-monitoring-and-compliance-limits#Population-equivalent-thresholds-for-analytical-parameters**. You must provide a permanent means of access to monitoring points.

☐ Yes Please provide the national grid reference

☑ No

10d What is the national grid reference of the flow monitoring point?

If your effluent has a maximum volume of 50 cubic metres a day or less you do not need to complete questions 10d or 10e. See **https://www.gov.uk/government/publications/minimum-requirements-for-self-monitoring-of-flow-mcerts-performance-standard**

NGR:

10e Does the flow monitor have an MCERTS certificate?

☐ Yes Please give the certificate number

☐ No

10f Do you have a UV disinfection efficacy monitoring point?

This type of monitoring point is only required for discharges that undergo some form of disinfection. For example, ozone or ultraviolet disinfection, membrane filtration and so on.

☐ Yes Please provide the national grid reference

☑ No

10g Do you have an event duration monitoring or a discharge operation monitoring point?

☐ Yes Please provide the national grid reference

☐ No

10h Do you have an overflow operation (into storm tank) monitoring point?

☐ Yes Provide the national grid reference

☐ No

10i Do you have a flow passed forward monitoring point?

☐ Yes Provide the national grid reference

☐ No

If you have answered yes to 10i, where is the flow passed forward monitor installed?

☐ Inlet

☐ Post treatment process

10j You should clearly mark on the plan the locations of any of the above that apply to this effluent.

You must send us a map or plan that:

- is A4 or larger
- is at a scale of 1:10,000 (approximately 6 inches to 1 mile)
- shows clearly which direction north is

The plan should show:

- the boundary of the site including the full extent of the land ownership relating to the permit application
- the premises discharging effluent
- the site in relation to the local area
- any watercourses, wells, springs or boreholes on the site (or within 50 metres of it).

You must also mark on the map points to show where:

- effluent is discharged into the controlled waters
- samples of effluent and influent can be taken automatically or manually (if required)

- flow or quality will be measured (if required)

You may submit more than one plan if necessary.

Document reference for the plan Drawings 02 and 03a

10k Do you intend to do your own effluent monitoring?

☑ Yes

☐ No

11 Where will the effluent discharge to?

11a Mark in Table 3 where this effluent discharges to and fill in the relevant section or sections.

You must use the name you gave to this effluent in answer to question 1b of this form when filling in your relevant appendix or appendices.

Table 3 – Where the effluent discharges to

Receiving environment		Relevant section
Tidal river, tidal stream, estuary or coastal waters	☑	1
Non-tidal river, stream or canal	☐	2
Lake or pond	☐	3
Discharges to a British Standard drainage field or drainage mound	☐	4 and 5
Discharges into ground not using a British Standard drainage field or drainage mound	☐	4 and 6
Discharges onto land via grass plot	☐	4 and 7

Effluents are usually discharged to one location in one receiving environment. However, if your effluent can be discharged to more than one location within a single receiving environment, for example, two different discharge points on a non-tidal river, you should complete the appropriate section and ensure you give all relevant details of every discharge point that the effluent can be discharged through. To do this you will need to complete a relevant appendix for each separate discharge point for an effluent and explain any different circumstances under which each is used.

If your effluent discharges to more than one location in a different receiving environment, for example, to a borehole or to a non-tidal river (under different circumstances), you will need to complete all relevant appendices for each discharge point and explain the different circumstances under which each is used.

Note: You need to make sure that you have all the necessary permissions to discharge from landowners, for example The Canal and Rivers Trust, if you want to discharge into a canal that they manage, or the local highways authority if you want to discharge via a highway drain.

11b Is this effluent discharged through more than one outlet?

☑ No

☐ Yes Give details, on an extra sheet, of the circumstances under which each outlet would be used by this effluent

Document reference

11c If you answered yes to question 11b above make sure you show clearly on your discharge point section or sections and site plan that this one effluent can discharge to more than one discharge point.

You must give us all the details we need for each of the discharge points used by this effluent.

12 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm) Textphone: 03702 422549 (Monday to Friday, 8am to 6pm)

Email: **enquiries@environment-agency.gov.uk**

Website: **https://www.gov.uk/government/organisations/environment-agency**

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

☐ Yes please

☐ No thank you

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

☐ No

☐ Yes

Amount received (£)

Section 1: Discharges to tidal river, tidal stream, estuary or coastal waters

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

1.1 Give the discharge point a unique name.

For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan)

SW1

1.2 Give the national grid reference of the discharge point.

NGR: SD 19283 72120

1.3 Give the name of the tidal river, tidal stream, estuary or area of coastal water.

Walney Channel

1.4 Is the discharge into a:

- ☐ Tidal river
- ☐ Tidal stream
- ☐ An estuary
- ☑ Coastal water

1.5 Does the discharge reach the watercourse by flowing through a surface water sewer?

Most effluents pass along a dedicated pipe and are discharged via an outlet to a receiving water. In some cases effluents may be discharged into a surface water sewer owned by someone else before they discharge into a receiving water. If this is the case you must give the national grid reference where your discharge enters the surface water sewer

☑ Yes, give the national grid reference where the discharge enters the surface water sewer.

NGR: SD 19285 72166

Give the national grid reference where the surface water sewer meets the final watercourse, for example, river or lake.

NGR: SD 18941 72196

☐ No

1.6 Does the discharge reach the final surface watercourse or canal by flowing through highway drains?

Highway drains: "Highway drain" means a drain which a highway authority or other person is entitled to keep open by virtue of section 100 of the 1980 Act.

☑ No

☐ Yes Give the national grid reference where the discharge enters the highway drain.

NGR:

Note: Give the national grid reference where the highway drain meets the final surface water course, for example, river or lake.

NGR:

Have you obtained written permission from the relevant highways authority?

☐ Yes You need to get a written permission from the relevant highways authority and submit it with your application.

If yes, it is your responsibility to ascertain whether the relevant highways authority is responsible for the roadside drain or ditch. If it is, you need to secure the appropriate permissions before submitting an application for an environmental permit to the Environment Agency. A copy of the written permission from the relevant highways authority must be submitted with the environmental permit application.

Document reference for the written permission

Note: Your application will be returned if you do not get written permission from the relevant highways authority before you submit this permit application.

1.7 Is the discharge point above the mean low water spring tide mark?

☐ No however, final outfall into Walney Channel is above low water spring tide mark.

☑ Yes Please explain, on an extra sheet, why the discharge cannot be made below this point

Document reference Not need to be. Quality to be below EQS.

1.8 How is the effluent dispersed?

Open channel

For example, open pipe or diffuser system. Choose 'open pipe' if the effluent enters the tidal river, estuary or coastal water from a pipe. We will have told you if a diffuser is needed during pre-application discussions.

If diffuser system go to question 1.9

1.9 Give details, on an extra sheet, of the design of the diffuser system.

Document reference

Section 2: Discharges to non-tidal river, stream, ditch or canal

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

2.1 Give the discharge point a unique name.

For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan)

2.2 Give the national grid reference of the discharge point:

NGR:

2.3 Give the name of the watercourse, canal or the main watercourse if it is a tributary:

2.4 Is the discharge into a

- ☐ Non-tidal river
- ☐ Stream or ditch
- ☐ Canal

2.5 Does the discharge reach the watercourse or canal by flowing through a surface water sewer?

Most effluents pass along a dedicated pipe and are discharged via an outlet to receiving water. In some cases effluents may be discharged into a surface water sewer owned by someone else before they discharge into a receiving water. If this is the case you must give the national grid reference where your discharge enters the surface water sewer.

☐ Yes Give the national grid reference where the discharge enters the surface water sewer.

NGR:

Give the national grid reference where the surface water sewer meets the final watercourse, for example, river or lake.

NGR:

☐ No

2.6 Does the discharge reach the final surface watercourse or canal by flowing through highway drains?

Highway drains: "Highway drain" means a drain which a highway authority or other person is entitled to keep open by virtue of section 100 of the 1980 Act.

☐ No

☐ Yes Give the national grid reference where the discharge enters the highway drain.

NGR:

Give the national grid reference where the highway drain meets the final surface water course, for example, river or lake.

NGR: _____

Note: If yes, it is your responsibility to ascertain whether the relevant highways authority is responsible for the roadside drain or ditch. If it is, you need to secure the appropriate permissions before submitting an application for an environmental permit to the Environment Agency. A copy of the written permission from the relevant highways authority must be submitted with the environmental permit application.

Have you obtained written permission from the relevant highways authority?

☐ Yes

Document reference for the written permission from the relevant highways authority.

_____

Note: Your application will be returned if you do not get written permission from the relevant highways authority before you submit this permit application.

2.7 Does the watercourse dry up for part of the year?

If a watercourse is dry other than at times of rainfall, this means it does not have a year-round flow. We would expect for a watercourse to have flow all year round regardless of rainfall events unless an event such as extreme drought or an unusually long period of dry weather.

☐ No, it always has flowing water in it.

☐ Yes, it is dry for part of the year: indicate the months when the watercourse is dry:

- ☐ January
- ☐ February
- ☐ March
- ☐ April
- ☐ May
- ☐ June
- ☐ July
- ☐ August
- ☐ September
- ☐ October
- ☐ November
- ☐ December

☐ Yes, it is dry all year-round.

If you apply to discharge to a watercourse that never has flowing water, you must provide justification why a discharge into ground via a British Standard drainage field is not possible. You must prove this justification by completing **section 4: Preliminary questions for discharges to ground.**

☐ Tick to confirm you have completed **section 4: Preliminary questions for discharges to ground.**

2.8 If the watercourse does dry up for part of the year, how many metres downstream of the discharge is it before the discharged effluent soaks into the ground?

You must install an appropriate length of perforated pipe before the discharge point that does not extend more than 10 metres from the bank of any watercourse. Any section of that pipe which lies within 10 metres of the bank of any watercourse must be perforated. The length of perforated pipe installed should be designed appropriately to ensure that when the watercourse is dry, the discharge must be made indirectly to the watercourse via the soil surrounding the perforated pipe. You must make sure to design your system to ensure an appropriate length of perforated piping is installed.

☐ Tick the box to confirm you will install a section of perforated pipe as per the above guidance.

Section 3: Discharges to a lake or pond

You do not need a permit to discharge to an enclosed lake or pond. This means a lake or pond in which all of the following apply:

- it contains water throughout the year, other than in extreme weather conditions
- it does not have an outfall that connects it to a watercourse, or has an outfall that only discharges in extreme weather conditions
- It is sealed or lined to prevent water draining into the ground or soaking into the surrounding soil.

You must use appropriate pollution prevention measures to make sure your discharge does not cause pollution.

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

3.1 Give the discharge point a unique name.

For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan)

3.2 Give the national grid reference of the discharge point.

NGR:

3.3 Give the name of the lake or pond.

3.4 Select from the following list the type of lake or pond you will be discharging to and answer the relevant questions

Type of lake or pond

- ☐ A lake or pond that does not discharge into a river or a watercourse or another pond that then discharges into a river or a watercourse. **Permit not required.**
- ☐ A lake or pond that does not discharge into a river or watercourse or another pond that then discharges into a river or watercourse, where you have had a notice served under paragraph 5 of Schedule 21 of the Environmental Permitting (England and Wales) Regulations 2016.
- ☐ A lake or pond that discharges into a river or watercourse.

3.5 What is the surface area of the lake or pond?

square metres

3.6 What is the maximum depth of the lake or pond?

metres

3.7 What is the average depth of the lake or pond?

metres

Section 4: Preliminary questions for discharges to ground

If you are applying to continue to discharge sewage effluent to ground using an infiltration system which was installed before 1 January 2015 provide, the information in question 4.4 onwards, but if you have it, also provide the information in questions 4.1, 4.2 and 4.3.

For all proposed discharges to ground and for systems which started discharging to ground on, or after, 1 January 2015 start at question 4.1.

Percolation testing

An infiltration system is a restricted and well-defined area of ground designed to allow effluent to enter the ground. We expect any new infiltration system to be built to British Standard BS6297:2007 +A1:2008 Code of practice for the design and installation of drainage fields for use in wastewater treatment (or latest version).

Drainage fields are an important component of the treatment of your sewage. If you are proposing to use an alternative infiltration system, we require you to first demonstrate whether a shallow drainage field, designed in accordance with the BS6297, could be achieved based on ground conditions, the percolation rate and available space.

BS6297 sets out the percolation test procedure. You need to carry out percolation tests following this procedure which is summarised at **https://www.gov.uk/guidance/infiltration-systems-groundwater-risk-assessments#percolation-tests**. Use of alternative test methods, for example, test methods for surface water soakaways, will not be accepted.

4.1a Were each of the percolation test holes 300mm square and 300mm deep below the proposed invert level (bottom) of the infiltration pipe?

☐ Yes

☐ No Provide justification why you have not used the above measurement. Use of an alternative test method, for example, test methods for surface water soakaways, will not be accepted. Provide the details in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

4.1b Did you fill each hole with water to a depth of at least 300mm and allow it to seep away overnight before starting your measured percolation testing?

☐ Yes

☐ No Tell us why, in the following box or an extra sheet.

Reference for the extra sheet.

4.1c What were the weather conditions when you carried out the percolation testing?

Describe the conditions in the following box.

4.1d Did your percolation tests achieve a drop in water level of 150mm from the moment the holes were 75% full to when they were only 25% full?

☐ Yes Complete Table 1: **For percolation test results where a drop of 150mm was achieved.**

☐ No Complete Table 2: **For percolation test results where a drop of 150mm was not achieved.**

☐ No Infiltration system installed before 1 January 2015 and no information available on percolation tests. **Now go to question 4.4.**

To meet the British Standard requirements, you must complete at least three tests in two holes which are spaced evenly along the proposed line of the subsurface drainage field.

Information for more than two test holes can be supplied – especially if a large area has been investigated or initial tests show unsatisfactory results.

Table 1: For percolation test results where a drop of 150mm was achieved

Worked example

Percolation test hole number:	**1**	**Your unique reference for this hole (as used on your site plan)**	**TP – 01**

				Elapsed time for water to drain from 75% full to 25% full (a depth of 150 mm)			
Test date (DD/MM/YYYY)	**Test no.**	**Start time (24-hour clock)**	**Finish time (24-hour clock)**	**As hours and minutes**	**As minutes**	**As seconds**	**Percolation value (Vp) – Seconds divided by 150mm (s/mm)**
01/04/2023	1	09:50	11:00	1h 10mins	70	4,200	28
01/04/2023	2	11:15	12:15	1hr	60	3,600	24
01/04/2023	3	13:30	14:50	1hr 20mins	80	4,800	32

Your reference number should match the reference number used to show the location of each test hole on your site plan requested in question 4.7. Each test hole should have a unique reference number.

To calculate the average Vp you will need to add the Vp for each test you have completed and divide by the number of tests.

Test 1 Vp	**Test 2 Vp**	**Test 3 Vp**	**Total**	**Divided by the number of tests completed (3 tests in this scenario)**	**(Test 1 Vp + Test 2 Vp + Test 3 Vp) ÷ 3**		**Average Vp**
28	24	32	84		(28 + 24 + 32 = 84) ÷ 3 =	28	= Average Vp for worked example

Table 1a: For percolation test results where a drop of 150mm was achieved

Percolation test hole number:	**1**	**Your unique reference for this hole (as used on your site plan)**	

Elapsed time for water to drain from
75% full to 25% full (a depth of 150 mm)

Test date DD/MM/YYYY	**Test no.**	**Start time (24-hour clock)**	**Finish time (24-hour clock)**	**As hours and minutes**	**As minutes**	**As seconds**	**Percolation value (Vp) – Seconds divided by 150mm (s/mm)**
	1						
	2						
	3						

Average Vp for Hole 1

Table 1b: For percolation test results where a drop of 150mm was achieved

Percolation test hole number:	**2**	**Your unique reference for this hole (as used on your site plan)**	

Elapsed time for water to drain from
75% full to 25% full (a depth of 150 mm)

Test date DD/MM/YYYY	**Test no.**	**Start time (24-hour clock)**	**Finish time (24-hour clock)**	**As hours and minutes**	**As minutes**	**As seconds**	**Percolation value (Vp) – Seconds divided by 150mm (s/mm)**
	1						
	2						
	3						

Average Vp for Hole 2

Table 1c: For percolation test results where a drop of 150mm was achieved

Percolation test hole number:	**3**	**Your unique reference for this hole (as used on your site plan)**	

Elapsed time for water to drain from 75% full to 25% full (a depth of 150 mm)

Test date DD/MM/YYYY	**Test no.**	**Start time (24-hour clock)**	**Finish time (24-hour clock)**	**As hours and minutes**	**As minutes**	**As seconds**	**Percolation value (Vp) – Seconds divided by 150mm (s/mm)**
	1						
	2						
	3						

Average Vp for Hole 3

If you complete tests in more than three holes provide the results on an extra sheet, and ensure you include this data in the calculation of average Vp.

Reference for the extra sheet.

Table 1d: Average Vp of all test holes

Average Vp for Hole 1 (table 1.a) + Average Vp for Hole 1 (table 1.b) + Average Vp for Hole 1 (table 1.c), if completed =

Total , divide the total by the number of test holes completed = Overall average Vp of all your test holes.

Table 2: For percolation test results where a drop of 150mm was not achieved

Percolation test hole number	Your reference number (if alternative numbering used on site plan)	Test date (DD/MM/YYYY)	Test No.	Start time (24-hour clock)	Finish time (24-hour clock)	Change in water level during test (mm)

British Standard BS6297 trial holes

British Standard BS6297 requires a trial hole to be excavated to characterise the soil and subsoil and show whether shallow groundwater is present. The trial hole should be excavated adjacent to the area where the drainage field will be installed. If soil conditions are variable further trial holes should be dug. Trial holes differ to test holes which are used to establish soil percolation rates.

4.2a What were the characteristics of the soil and subsoil that you observed in the trial holes and test holes on site?

Only describe what was observed in your trial holes and test holes, do not include information from other sources. Use the following box or an extra sheet.

Reference for the extra sheet.

Provide at least one photograph per trial and test hole, and written observations made on site.

References for these photograph attachments and observations.

4.2b Was groundwater present in the trial hole?

☐ No

☐ Yes At what depth?

metres below ground level

Infiltration system area

4.3a Calculate the trench area required for a British Standard BS6297 drainage field based on your percolation value (Vp): If the infiltration rate was so slow a drop of 150mm was not achieved and you have filled out Table 2, you are not able to calculate a Vp value. Now go to question 4.3b.

150 litres (equivalent to 0.15 cubic metres) is the standard residential volume of sewage generated per person per day. We use this to calculate the population for both domestic and non-domestic premises.

	use your answer to 1.3			
Max volume of effluent (m^3/day)		÷ 0.15	=	**p**

Now you need to calculate the trench area in accordance with British Standard BS6297 using the population (p) and your percolation value (Vp).

If your Vp result indicates fast infiltration (less than 15 s/mm) you need to use a sand layer or drainage mound. The area of your system should meet or exceed the area calculated based on a Vp of 15 s/mm.

If your Vp is greater than 100 s/mm, it is outside the British Standard BS6297 acceptable range and indicates slow infiltration rates which are not suitable for the installation of a drainage field.

For septic tanks:

p [ ] × Vp [ ] × 0.25 for septic tanks **=Trench area** [ ] m^2

For sewage treatment plants:

p [ ] × Vp [ ] × 0.20 for sewage treatment plants **=Trench area** [ ] m^2

4.3b What is the actual total area of your existing or proposed infiltration system?

For British Standard BS6297 drainage fields this will include an allowance for natural ground between trenches and around the outer trenches. For a square or rectangular shaped infiltration system this is the length (in metres) multiplied by the width (in metres).

[ ] Total Area (square metres)

How have you calculated the area of your infiltration system?

Provide the details in the following box or an extra sheet.

Reference for the extra sheet. [ ]

Site setting

You need a permit if you are discharging to ground in a source protection zone 1 (SPZ1). Source protection zones are explained at **https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs**. A groundwater SPZ1 is also any area within 50 metres of a private water supply used for human consumption or food production.

You must check if there are any private wells, springs, or boreholes used to supply water for human consumption or food production purposes within 50 metres of your proposed discharge. You can contact your local authority for details on private water supplies. These supplies are not required to hold a permit from the Environment Agency if they pump less than 20 cubic metres (20 m^3) per day, so we do not have the relevant information.

This information may belong to your neighbours. How you should manage this is explained at **https://www.gov.uk/guidance/environmental-permits-privacy-notice#your-responsibility-with-other-peoples-personal-data**.

4.4a Are there any wells, springs or boreholes within 50 metres of your infiltration system?

Tick to confirm you have checked with:

- ☐ Local property and landowners
- ☐ Neighbours
- ☐ Local authority

☐ No **Now go to 4.4d.**

☐ Yes

4.4b Is the well, spring or borehole you have identified used to supply drinking water or for food production purposes?

☐ No **Now go to question 4.4d.**

☐ Yes You must describe what the water supplied is used for, in the following box or an extra sheet. Identify the location of the well, spring or borehole on the plan required in question 4.7.

Reference for the extra sheet. ⌊_____⌋

4.4c Where available provide the following information:

- The depth to groundwater from ground level.
- Construction details for boreholes and wells.
- The depth of the pumping equipment from ground level.
- Results of any water quality testing.
- Details of treatment of the water prior to consumption.
- Details of any known pollution incidents that impacted the water.

Provide these details in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

4.4d What is the distance to the nearest watercourse (for example, surface water, river or stream)?

⌊_____⌋ metres

If the watercourse is within 10 metres of your infiltration system identify it on the site plan required by question 4.7.

Feasibility of a British Standard drainage field

Our preferred system for treated sewage effluent to be discharged to ground is an engineered, shallow drainage field designed in accordance with British Standard BS6297.

4.5a Is the average percolation test result within the acceptable range (15 to 100 s/mm) required by British Standard BS6297?

Check your answer to question 4.1, Table 1d Average Vp

- ☐ Yes **Now go to question 4.5b.**
- ☐ No The average Vp is less than 15 s/mm. **Now go to question 4.5b.**
- ☐ No The average Vp is greater than 100 s/mm. **Now go to 4.5e.**
- ☐ Not sure I will be using an infiltration system installed before 1983 and do not have any percolation test results. **Now go to question 4.5d.**
- ☐ Not sure I will be using an infiltration system installed between 1983 and 2014 and do not have percolation test results. **Now go to question 4.5d.**
- ☐ Not sure Other. Explain why in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

4.5b Is there space for a British Standard BS6297 drainage field?

Use the area you have calculated in question 4.3a and 4.3b, the dimensions of the land available and presence of any buildings to explain your response.

☐ Yes

☐ No Explain why in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

4.5c Are there any other restrictions to installing a British Standard BS6297 drainage field?

☐ No

☐ Yes Explain what these are in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

4.5d Will your discharge be to a new or existing drainage field which complies with the British Standard BS6297?

☐ Yes, a British Standard drainage field or drainage mound (or sand layer) will be used. **Complete questions 4.6 to 4.8, then go to Section 5.**

☐ Unsure, I will be using an existing system installed before 1 January 2015 and do not know if it complies with BS6297.

Tick to confirm which of the following best describes your existing system:

- ☐ Drainage field. **Complete questions 4.6 to 4.8, then go to Section 5.**
- ☐ Pit or soakaway. **Complete questions 4.6 to 4.8, then go to Section 6**.
- ☐ Well or borehole. **Complete questions 4.6 to 4.8, then go to Section 6**.
- ☐ Concrete ring. **Complete questions 4.6 to 4.8, then go to Section 6**.

☐ No, I will be using a non-British Standard infiltration system.

If your answers to questions 4.5a, 4.5b, and 4.5c indicate a British Standard drainage field could be installed but you are choosing not to use one when there are no restrictions, explain why. Provide your answer in the following box or an extra sheet.

Reference for the extra sheet.

If **ground conditions** and **space** would allow the installation of a British Standard drainage field, but you are choosing not to install one **we are more likely to refuse an environmental permit** for such discharges.

4.5e Where would your non-British Standard infiltration system discharge the effluent?

☐ Into land **Complete questions 4.6 and 4.7, then Section 6.**

☐ Onto land via a grass plot **Complete questions 4.6 and 4.7, then Section 7.**

☐ Other

Before proceeding with your application, you can apply for our enhanced pre-application advice. This is a chargeable service. For more information see: **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit**.

If you have already had enhanced pre-application advice for this proposal provide the reference number for your enhanced pre-application.

Reference for the enhanced pre-application advice.

4.6 Are you proposing a new discharge of treated domestic effluent to ground via a shallow sub-surface infiltration system in a groundwater source protection zone 1 (SPZ1) with a discharge volume between 2 to 15 cubic metres a day?

☐ No Your proposed discharge does not require you to submit a separate quantitative risk assessment, but you must provide sufficient information as required by this application form to allow the risk assessment to be completed on your behalf by the Environment Agency.

☐ Yes Your proposed discharge requires you to submit a quantitative risk assessment.

Reference for the risk assessment.

To do this you need to follow the guidance at **https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit** and send us details of how the risk assessment was carried out and the outcome. If the discharge is, or will be, made to a subsurface infiltration system then we recommend you read **https://www.gov.uk/guidance/infiltration-systems-groundwater-risk-assessments**. This includes advice and a worksheet on how to carry out the risk assessment for shallow infiltration systems. This methodology is not appropriate for deep infiltration systems such as boreholes and wells or systems which cover a relatively small area, for example, concrete rings.

Site plan

4.7 Provide a site plan that contains the following information with your application.

The requirements detailed below must match the national grid references for the relevant locations provided in this application, or the processing of your application may be delayed, or returned. If you are applying for a permit for an existing discharge to ground using an infiltration system installed before 1983, please provide as much detail as possible on your site plan but we understand you may not possess detailed records.

Reference for your site plan. ⌊_____⌋

Required for all cases: Tick the boxes to confirm you have added these requirements to the site plan

- ☐ The boundary of the site including the full extent of the land ownership relating to the permit application.
- ☐ Location of the treatment system.
- ☐ Location of the sampling point or points.
- ☐ Location of the discharge point or points.

  If you are discharging to ground, this is the location where the effluent from the treatment system enters the infiltration system.
- ☐ A north arrow.

The properties served by the treatment system do not have to be shown.

Where a percolation test has been carried out, mark the test hole locations. Each test hole should be given a unique reference number to match the reference used in the percolation results in Table 1 or Table 2. We need to understand which percolation result relates to which hole.

- ☐ Unique percolation test hole reference.
- ☐ The extent of the infiltration system with the length and width of each side annotated in metres.
- ☐ Any restrictions in installing a British Standard BS6297 drainage field? For example, the boundary of the property, or proximity to any other buildings. Please also provide distances in metres.
- ☐ The area covered by any infiltration system which is being replaced and will no longer be used.
- ☐ Any well, spring or borehole within 50 metres of the discharge point.
- ☐ Any watercourse within 10 metres of your infiltration system.

4.8 If your application is for a sewage treatment plant which you are already using or you have selected the plant you propose to use, provide details:

Make and model:

⌊_____⌋

The final effluent quality achieved for:

Ammoniacal nitrogen

⌊_____⌋ (mg/l as nitrogen (N)).

Any other chemical parameters quoted by the manufacturer

	parameter		mg/l
	parameter		mg/l
	parameter		mg/l
	parameter		mg/l

For new discharges to a non-British Standard infiltration system, we expect you to treat your effluent using a sewage treatment plant that meets British Standard BS12566 or BS12255.

Section 5: Discharges to a British Standard drainage field or drainage mound

Ensure you have fully completed **Section 4** before completing this section.

5.1 Tick to confirm which type of British Standard system you are applying for:

☐ Drainage field.

☐ Drainage field with additional sand layer due to fast infiltration (less than 15 s/mm).

☐ Drainage mound.

☐ A drainage field installed before 1983. For systems installed before 1983 **complete questions 5.2 and 5.3**. You only need to answer questions 5.4 to 5.7 if you have the information.

☐ A drainage field installed between 1983 and 2014 and you do not have percolation test results. **Complete questions 5.2 and 5.3**. You only need to answer questions 5.4 to 5.7 if you have the information.

5.2 Tick the appropriate box to describe the drainage field or mound.

☐ Not built yet.

☐ Built but not yet in use.

When was it built? ⌊_____⌋ (DD/MM/YYYY)

☐ Already being used to discharge effluent.

When was it built? ⌊_____⌋ (DD/MM/YYYY)

When was it operational? ⌊_____⌋ (DD/MM/YYYY)

5.3 What are the maximum dimensions of your drainage field?

Tick to show whether this is measured, proposed or estimated:

Length ⌊_____⌋ metres:

- ☐ Measured
- ☐ Proposed
- ☐ Estimated

Width ⌊_____⌋ metres:

- ☐ Measured
- ☐ Proposed
- ☐ Estimated

Depth ⌊_____⌋ metres:

- ☐ Measured
- ☐ Proposed
- ☐ Estimated

Drainage field details

5.4 What is the thickness of your distribution layer beneath the infiltration pipes?

_____ metres

The British Standard BS6297:2007 + A1:2008 requires the distribution layer to be 0.2 to 0.3 metres thick.

If your answer to question 5.4 is less than 0.2 metres you will also need to complete Section 6 as you have not met the minimum thickness required by the British Standard.

5.5 Is there a minimum of 1.2 metres of unsaturated soil between the seasonally highest groundwater level and the base of the trench that the perforated pipes are laid in?

☐ Yes

☐ No

Tell us how you know this and if you have any additional information on the local depth to groundwater.

Provide you answer in the following box or an extra sheet.

Reference for the extra sheet. _____

5.6 Drainage mounds and drainage fields with additional sand layers.

Tell us why you need a drainage mound or additional sand layer in the following box or an extra sheet.

Reference for the extra sheet. _____

5.7 If the average percolation test value (Vp) is less than 15 s/mm, tick both to confirm:

☐ A minimum 0.7 metres thick layer of medium or coarse washed sand is laid on a geotextile membrane below the granular fill distribution layer.

☐ The minimum floor area must be calculated using a Vp equal to 15 s/mm. **Refer to question 4.3a.**

Section 6: Discharges to ground NOT using a British Standard drainage field or drainage mound

Our preferred infiltration systems are drainage fields designed in accordance with British Standard BS6297. Drainage fields are an important component of a non-mains wastewater treatment system and provide additional treatment of the effluent. When the risk to groundwater, or other environmental receptors is assessed, we allow for this additional treatment.

If your infiltration system is not sized or designed in accordance with guidance in the British Standard it is likely to concentrate the discharge over a smaller area and/or discharge at a greater depth. This will pose a higher risk of groundwater pollution because it reduces the potential for further treatment of the effluent compared to a drainage field meeting the British Standard. Therefore, we are more likely to refuse an environmental permit for such discharges.

To evaluate this additional risk requires a more complex assessment. We require information on the design, dimensions, and local conditions to be able to complete this risk assessment on your behalf.

Before we complete this assessment, we need you to robustly demonstrate all of the following:

1. there is no other alternative (for example, discharge to a BS6297 drainage field or surface water) and then;
2. there is adequate evidence to inform a risk assessment;
3. the system will be no deeper than required to achieve sufficient infiltration;
4. evidence is provided to demonstrate how the discharge will not be direct to groundwater. Direct discharges of pollutants to groundwater cannot be permitted and any existing direct discharges will need to be made indirect;
5. where a new discharge is proposed then the effluent will first be treated by a package treatment plant.

Ensure you have fully completed **Section 4** before completing this section.

Depth to groundwater in the local area

The depth to groundwater is an important parameter in our risk assessments. Provide any relevant existing information on local groundwater levels, for example, from borehole records (BGS GeoIndex Onshore at **https://www.bgs.ac.uk/map-viewers/geoindex-onshore**) or knowledge of local wells, boreholes or springs.

6.1a What is the depth to groundwater at, or near, your chosen discharge location?

⌊_____⌋ metres below ground level.

6.1b How far away from your discharge location is the information on groundwater level provided in question 6.1a?

Distance: ⌊_____⌋

Units: ⌊_____⌋ metres, kilometres or miles

6.1c What is the source of your information on the depth to groundwater?

Reference for the source of information. ⌊_____⌋

Additional hydrogeological information

In addition to the depth to groundwater, our risk assessment uses information on the hydrogeological properties of the unsaturated and saturated zones beneath your discharge. When we assess your application, we will check if we already hold appropriate information. If we do not, we will ask you to supply this information at a later stage and this will lengthen the time to determine your application.

If you wish to know if we hold relevant information before submitting your permit application, you can apply for our enhanced level of pre-application advice. This is a chargeable service. For more information see **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit.**

6.2a What type of infiltration system are you proposing to use to discharge the effluent to the ground?

Provide details in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

6.2b Tick the appropriate box to describe the infiltration system.

☐ Not built yet.

☐ Built but not yet in use.

When was it built? ⌊_____⌋ (DD/MM/YYYY)

☐ Already being used to discharge effluent.

When was it built? ⌊_____⌋ (DD/MM/YYYY)

When was it operational? ⌊_____⌋ (DD/MM/YYYY)

6.2c What are the maximum dimensions of your infiltration system?

For a square or rectangular system.

Tick to show whether this is measured, proposed or estimated:

Length ⌊_____⌋ metres:

☐ Measured
☐ Proposed
☐ Estimated

Width ⌊_____⌋ metres:

☐ Measured
☐ Proposed
☐ Estimated

Depth ⌊_____⌋ metres:

- ☐ Measured
- ☐ Proposed
- ☐ Estimated

For circular systems, for example, boreholes, wells or concrete rings:

Depth ⌊_____⌋ metres:

- ☐ Measured
- ☐ Proposed
- ☐ Estimated

Diameter ⌊_____⌋ metres:

- ☐ Measured
- ☐ Proposed
- ☐ Estimated

If you have estimated any of the dimensions of an existing system, explain what evidence the dimensions have been based on.

Provide details in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

Existing infiltration systems – including those that have been built but not yet operational.

6.3a Does your infiltration system contain standing groundwater?

- ☐ Yes – always contains groundwater. **Now go to question 6.3b.**
- ☐ Sometimes – groundwater is present occasionally. **Now go to question 6.3b.**
- ☐ No – never contains groundwater. **Now go to question 6.3d.**

6.3b If groundwater is always, or sometimes present, tell us the highest level it reaches?

⌊_____⌋ metres below ground level.

Is this:

- ☐ Measured
- ☐ Estimated

6.3c Tell us how you will ensure that your discharge will not be directly into groundwater, including when groundwater levels are at a seasonal high. Provide details in the following box or an extra sheet.

Discharges must not be direct to groundwater. This is outlined in position statements G1 and G9 in the Environment Agency's "Groundwater protection position statements", **https://www.gov.uk/government/publications/groundwater-protection-position-statements**.

Provide details in the following box or an extra sheet.

Reference for the extra sheet.

6.3d Provide a document reference for any records, diagrams or borehole logs you have that can help us understand the design and construction of the system. For boreholes tell us about the casing design.

Document reference.

Provide photocopies where possible. If this is not possible (for example, if the documents are large or bulky) summarise any extra information you have on an extra sheet.

Reference for the extra sheet.

6.3e For an existing system being used to discharge effluent: Has maintenance been carried out on your non-British Standard infiltration system (for example, to aid effective drainage)?

☐ No

☐ Yes Provide details in the following box or an extra sheet.

Reference for the extra sheet.

6.4a Is sufficient infiltration provided by the existing or proposed system to avoid surcharging, flooding or overland run off?

If you are using a non-British Standard infiltration system, it is your responsibility to ensure the system will provide adequate infiltration and we need you to show us you have assessed this.

☐ No

☐ Yes

Provide details on how you have assessed this in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

If the proposed or existing system does not, or will not, allow sufficient infiltration for the volume of treated domestic effluent to avoid surcharging, flooding or overland run-off we are likely to refuse the environmental permit. Before proceeding with your application, you can apply for our enhanced pre-application advice. This is a chargeable service. For more information see: **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit**.

6.4b Tell us how your non-British Standard infiltration system is no deeper than needed to allow appropriate infiltration for the discharge. For the depth given in question 6.2c, provide details on how you have addressed this requirement.

It is important that non-British Standard infiltration systems should be no deeper than is needed to allow appropriate infiltration for the discharge.

Provide details in the following box or an extra sheet.

Reference for the extra sheet. ⌊_____⌋

Section 7: Discharges onto land via grass plot

Ensure you have fully completed **Section 4** before completing this section.

Site setting

7.1 Is your unlined grass plot liable to flooding?

☐ No

☐ Yes Tell us about when flooding occurs, the area it covers and how long it typically lasts in the following box or an extra sheet.

Reference for the extra sheet.

7.2 What is the slope of your grass plot?

It should be no more than 12 degrees. If the slope of your grass plot is greater than 12 degrees, we are more likely to refuse an environmental permit for such discharges.

Tell us how you have calculated or measured the slope in the following box or an extra sheet.

Reference for the extra sheet.

7.3 Is the grass plot severely compacted?

No

Yes What part of the grass plot is compacted? How will this affect the ability of the land to allow the effluent to infiltrate to ground? What has caused the compaction? Provide these details in the following box or an extra sheet.

Reference for the extra sheet.

Operating Technique Document

7.4 We require your application to be accompanied by an operating technique document we can include in the permit:

☐ Tick to confirm you are providing this as a standalone document in Word or PDF format.

Provide the number of each section in your operating technique document which contains the following compulsory information:

A site plan showing the extent, location and design of the grass plot.

Section No. ⌊_____⌋

The design, operation, and maintenance of the grass plot.

Section No. ⌊_____⌋

How the operator will ensure:

there is no ponding of effluent on the grass plot

Section No. ⌊_____⌋

no run-off containing effluent can leave the plot boundary or cause a nuisance

Section No. ⌊_____⌋

the requirements for no ponding and no effluent leaving the plot will still be met in the event the ground is:

frozen hard or snow-covered

Section No. ⌊_____⌋

waterlogged due to prolonged rainfall

Section No. ⌊_____⌋

Application for an environmental permit Part F1 – Charges and declarations

Environment Agency

When to complete the Part F1 form

Complete this form for all applications for:

- installations (except exclusions 1 and 2)
- waste operations (except exclusion 1)
- mining waste operations (except exclusion 1)
- medium combustion plant (except exclusions 1 and 3)
- specified generators (except exclusion 1 and 4)
- water discharges to surface water (except exclusions 1, 5, 6 and 7)
- groundwater activities (except exclusions 1, 6, 8, 9 and 10)

Exclusions – when you do not need to complete this form

You do not need to complete this form if your application is for:

1. an administrative variation. Use the **Part C0.5 form** instead.
2. a permit or non-administrative variation for intensive farming. Use the **Part B3.5 form** or **Part C3.5 form** as appropriate.
3. a medium combustion plant standard rule permit. See **MCP guidance**
4. a specified generator standard rule permit. See **SG guidance**
5. a permit to discharge up to 20 cubic metres a day of treated domestic sewage to surface water. Use the **Part B6.5 form**.
6. a water discharge or groundwater activity transfer notification. Use the **Part A** and **Part D1** forms. This exclusion does not apply to partial transfer of activities. You'll need to complete this Part F1 form as part of the permit variation to reflect the partial transfer.
7. a water discharge surrender notification. Use the **Part E1 form**. This exclusion does not apply to partial surrenders that need a permit variation. If a variation is required, you'll need to complete this Part F1 form as part of your variation application.
8. a permit to discharge up to 15 cubic metres a day of treated domestic sewage to ground. Use the **Part B6.5 form**.
9. a permit for an existing discharge up to 2 cubic metres a day of treated domestic sewage to ground in a source protection zone 1. Use the **Part B6.6 form**.
10. a groundwater activity surrender notification. Use the **Part E1 form**. You will still need to complete this Part F1 form for the following:
    - surrender applications for standalone groundwater activities at onshore oil and gas facilities
    - partial surrender notifications that need a permit variation. If a variation is required, you'll need to complete this Part F1 form as part of your variation application.

Completing this form

Visit our website to check this is the latest version of the form. See **Application for an environmental permit (charges and declarations): part F1**

Please read through this form before completing it.

You will need to refer to our **charging scheme and charge tables** and **charging guidance** to complete the form.

You can also use our **pre-application advice service** to help you work out your charges.

We expect it will take less than 3 hours to complete the form.

The form can be:

- saved to your computer or device and then filled in. We recommend using Adobe Acrobat software to avoid any compatibility issues.
- printed off and filled in by hand. Please write clearly in the answer spaces. If you need to use the links in this form, you can access the electronic version here: **https://www.gov.uk/government/publications/application-for-an-environmental-permit-part-f1-opra-charges-declarations**

Other forms you will need to complete

You'll also need to complete other parts of the application form in addition to this Part F1 form. This depends on your facility type and what you are applying for:

- for a new bespoke permit visit **New bespoke environmental permit: application forms**
- for a new standard rules permit visit **Application for an environmental permit: part B1 standard facilities permit**
- If you already have a permit visit **Change, transfer or cancel your environmental permit**

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11 Where to send your application

Appendix 1 – declarations from additional people

1 When you need to pay an application charge

1.1 What are you applying for?

Complete Table 1 with your facility type, application type and number of applications.

Table 1

Facility type (see **note 1**)	Application type (see **note 2**)	Number of applications
Installation	New Bespoke Permit Application	1

Table 1 notes

1. Facility type

Choose the facility type from the following list:

- groundwater activity
- installation
- medium combustion plant or specified generator
- mining waste
- waste operation
- water discharge

Use a separate row for each facility type and each application type.

2. Application type

Choose the application type from the following list:

New permit:

- new bespoke permit
- new standard rules permit

Variation:

- minor variation
- normal variation
- substantial variation

Surrender:

- full surrender
- low risk surrender
- partial surrender
- partial surrender with variation

1 When you need to pay an application charge, continued

Transfer:

- full transfer
- partial transfer with variation

Use a separate row for each facility type and each application type.

1.2 Are you applying for any of the following?

Tick any that apply

- ☐ Part B installation surrender (except a partial surrender requiring a permit variation)
- ☐ waste mobile plant surrender
- ☐ authorised ship recycling facility (applications and renewals)
- ☐ bespoke groundwater mobile plant (all application types)
- ☐ staged application

If **none** of the above apply, go to **section 2**

If you have ticked **any** of the above, go to **section 4**

The following applications do not attract a charge:

- Part B installation surrender (except a partial surrender requiring a permit variation)
- waste mobile plant surrender

The following charges are payable on demand as time and materials charges:

- authorised ship recycling facility (applications and renewals)
- bespoke groundwater mobile plant (all application types)
- staged applications

For all other applications, charge payments must be made at the time of application.

2 Working out your application charge

For all applications, enter your fixed charges in Table 2. These charges are detailed in our charging scheme tables.

Complete Table 3 if additional charges apply. For example, where additional chargeable assessments are needed.

Your total application charge consists of your fixed charges, plus any additional charges. Complete Table 4 with these figures.

Do not add VAT as most application charges are outside the scope of VAT. The exception is pre-application charges where VAT is applicable. Your pre-application invoice will show if VAT has been included in the charge.

Application charges are set out in **Environmental permits and abstraction licences: tables of charges**.

Guidance on charges is available at **Environmental permits: when and how you are charged**.

You can also use our pre-application advice service to help you work out your charges. Visit **Get advice before you apply for an environmental permit**.

2 Working out your application charge, continued

2.1 Fixed charges

Complete Table 2 with all fixed charges relevant to your application.

Table 2

Ref (from charging table)	**Activity description** (from charging table)	**Additional description** (where applicable – see **note 1**)	**Application type** (from charging table)	**Fixed charge amount** (see **note 2**)
1.4.4	Section 4.2 - Production of a single inorganic chemical		Permit Application	£13,209
Total fixed charges				£13,209

Continue on separate sheet as necessary

Document reference of continuation sheet (if any):

2 Working out your application charge, continued

Table 2 notes

1. Additional description

For multiple activities on the same permit:

- use a separate row for each chargeable activity
- add a description to help identify the correct charge. For example, if the same activity is being carried out multiple times or is a secondary activity.

Bulk permit transfer with the same charging table reference can be entered on the same row.

2. Fixed charge amount

Enter the fixed charge amount from the relevant **charging table**.

Show any reductions for:

- **batch permit transfers** (also see example 1 below)
- **multi-activity new permit applications** (also see example 2 below)
- **standalone directly associated activities**

New standard rules may not be shown in the current charging scheme tables. Whilst the scheme is being updated, you can find the charges by visiting **Standard rules: environmental permitting**. Then follow the link to the relevant rule set. The charges will be listed on the individual rule set page. Alternatively, you can contact us for pre-application advice by visiting **Get advice before you apply for an environmental permit**.

2 Working out your application charge, continued

Example 1 – batch transfer of 11 permits

Ref (from charging table)	**Activity description** (from charging table)	**Additional description** (where applicable)	**Application type** (from charging table)	**Fixed charge amount**
1.16.9	Household waste amenity site taking hazardous waste; includes assessment of fire prevention plan and odour management plan		Transfer application	£2,529 (100% of largest transfer charge)
1.16.9	Household waste amenity site taking hazardous waste; includes assessment of fire prevention plan and odour management plan		Transfer application	£5,058 (10 applications after 80% reduction)
Total fixed charges				£7,587

Example 2 – multi-activity new permit application

Ref (from charging table)	**Activity description** (from charging table)	**Additional description** (where applicable)	**Application type** (from charging table)	**Fixed charge amount**
1.7.1	Section 6.8: food and drink production	First production line	Permit application	£13,984 (100% of largest activity charge)
1.7.1	Section 6.8: food and drink production	Second production line (same activity carried out multiple times)	Permit application (part of above application)	£1,398 (after 90% reduction)
1.16.2.2	Section 5.4 (a)(ii): non-hazardous waste installation – physico-chemical treatment for disposal	Effluent treatment plant discharging to sewer (secondary activity)	Permit application (part of above application)	£1,344 (after 90% reduction)
Total fixed charges				£16,726

Note: example charges and calculations were correct at time of form publication.

2 Working out your application charge, continued

Now go to **question 2.2**

2.2 Additional application charges

Complete Table 3 with any additional application charges

Table 3

Charging scheme reference (table 1.19 or paragraph reference)	Additional charge type	Tick all applicable	Charge amount
1.19.1	Waste recovery plan or variation or revision of a waste recovery plan assessment	☐	
1.19.2	Habitats assessment (except where the application activity is a water discharge or groundwater activity)	✓	£779
1.19.3	Fire prevention plan assessment	☐	
1.19.4	Pests management plan assessment	☐	
1.19.5	Emissions management plan assessment	☐	
1.19.6	Odour management plan assessment	☐	
1.19.7	Noise and vibration management plan assessment	✓	£1,246
1.19.10	Habitats assessment for discharges to water and groundwater activities	☐	
1.19.11	Specific Substances Assessment for a water discharge activity to surface water	☐	
1.19.12	Specific Substances Assessment for a groundwater activity	☐	
Paragraph 10(a)	Advertising charge	☐	
Paragraph 10(c)	Enhanced pre-application charges (invoiced but not yet paid). Include the amount and invoice number in the 'Charge amount' column		
Total additional charges			£2,025

2 Working out your application charge, continued

Table 3 notes

Complete Table 3 if additional charges apply to your application.

Chargeable plans and assessments

Tick all chargeable plans and assessments submitted in support of your application. Enter the charge amount for each. Charges can be found in the relevant charging table at **Environmental permits and abstraction licences: tables of charges**

Some charges for assessing your plans and documents are already included in the fixed charge. Where this is applicable, it will be shown in the charge table description. For example, the description may say 'includes assessment of fire prevention plan'.

For further guidance visit **Charges for plans and assessments** for further information. There is no need to complete table 3 for assessments already included in the fixed charge.

Advertising charge

Tick the advertising charge box if we've told you we will be advertising your application. For further information see **Advertising charge**.

Enhanced pre-application advice charge

You must pay any outstanding pre-application charge invoices with your application. We will return any applications with unpaid invoices.

Now go to **question 2.3**

2.3 Total amount payable

Complete Table 4 with the total application charges payable.

Table 4

Charge	Charge amount
Total fixed charges (from **Table 2**)	£13,209
Total additional charges (from **Table 3**)	£2,025
Total amount payable	£15,234

Now go to **section 3**

3 Payment

Only complete this section if your application needs to be accompanied by a payment. Refer to **question 1.2**.

Please note we are unable to:

- send you an invoice for application charges, (other than pre-application charges)
- accept payments in instalments

3 Payment, continued

3.1 Payment method

Tick one option to show your payment method. Then follow the link to the relevant payment section and follow the steps shown.

- ☐ Online card payment using GOV.UK Pay – go to **Paying by GOV.UK Pay**
- ✓ Electronic bank transfer (for example, by BACS) – go to **Paying by electronic bank transfer**
- ☐ Credit or debit card payment over the phone – go to **Paying by phone**
- ☐ Cheque – go to **Paying by cheque**

A. Paying by GOV.UK Pay

GOV.UK Pay is a digital payment system where you can pay using a Visa, MasterCard, Maestro card and some digital wallets.

Follow steps A1 to A3 to pay using GOV.UK Pay.

A1 Create your payment reference number

You'll need to include a unique reference number when making your payment. This reference number means we can match the payment to your application. It may cause delays if you do not include a reference number.

1. Start your reference number with one of the following codes, based on your facility type:
   - PSCAPPWASTE – for waste operations and mining waste operations
   - PSCAPPINST – for installations and medium combustion plant or specified generators
   - PSCAPPWQ – for water discharge and groundwater activities
2. Follow this with the first five letters of the applicant's name
3. Finish with your chosen unique identifying number

Example

- application is for a waste operation, so the code is: PSCAPPWASTE
- applicant is Anyfirm Limited, so the first five letters are: ANYFI
- applicant's chosen identifier is: 01

The payment reference number is therefore: PSCAPPWASTEANYFI01

Make a note of this reference number. You'll need to provide it in step A3 below.

A2 Go to GOV.UK Pay payment page

Click on the relevant link below according to your facility type. This will take you to the relevant page to make your payment.

- Link for: **waste operations and mining waste operations**
- Link for: **installations and medium combustion plant/specified generators**
- Link for: **water discharges and groundwater activities**

3 Payment, continued

A3 Complete the payment details below

Payment reference number

Payment amount

Payment date

Now go to **section 4**

B. Paying by electronic bank transfer

Follow steps B1 to B3 to pay by electronic bank transfer, such as BACS.

B1 Create your payment reference number

You'll need to include a unique reference number when making your payment. This reference number means we can match the payment to your application. It may cause delays if you do not include a reference number.

1. Start your reference number with one of the following codes, based on your facility type:

- PSCAPPWASTE – for waste operations and mining waste operations
- PSCAPPINST – for installations and medium combustion plant or specified generators
- PSCAPPWQ – for water discharge and groundwater activities

2. Follow this with the first five letters of the applicant's name
3. Finish with your chosen unique identifying number

Example

- application is for a waste operation, so the code is: PSCAPPWASTE
- applicant is Anyfirm Limited, so the first five letters are: ANYFI
- applicant's chosen identifier is: 01

The payment reference number is therefore: PSCAPPWASTEANYFI01

Make a note of this reference number. You'll need to provide it in step B3 below.

B2 Log onto your banking system

Log onto your banking system to transfer the funds.

You'll need to use the following information to make your payment:

Payee name:	Environment Agency
Sort code:	60-70-80
Account number:	10014411
Account name:	EA RECEIPTS

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23NWBK60708010014411 and our SWIFTBIC number is NWBKGB2L.

3 Payment, continued

B3 Complete the payment details below

Name of account holder

Barrow Green Hydrogen Ltd

Payment reference number

PSCAPPINSTBARRO01

Payment amount

£15,234

Payment date

04/02/2026

Also email your payment details and reference number to **ea_fsc_ar@gov.sscl.com**.

Now go to **section 4**

C. Paying by phone

If you want to pay by phone, add the name and phone number of the person making the payment.

Name

Phone number

We'll call the above person to arrange payment. We can accept payments by Visa, MasterCard or Maestro card only.

Now go to **section 4**

D. Paying by cheque

Make your cheque payable to 'Environment Agency' and cross it with 'A/C Payee' (if not already printed on the cheque).

Write the following on the back of your cheque:

- applicant's name
- application reference number (if known)
- application site address and postcode (where applicable)

Enter the cheque number below

3 Payment, continued

If you're submitting a paper application, include your cheque with the application.

If you're emailing your application, include a covering note with your cheque. Post your cheque to our Integrated Permitting Services at the address shown in **section 11**.

Please note, we're unable to accept post-dated cheques.

It is usually quicker and easier to complete your payment online or by phone.

Now go to **section 4**

4 Privacy notice

See how we use your personal information in services to support environmental permitting by visiting **Environmental permits privacy notice**.

Now go to **section 5**

5 Commercial and industrial confidentiality

We're required to put a copy of your application on a public register. We may exclude information we consider to be confidential from the public register. 'Confidential information' in this context means it is commercially or industrially confidential.

You can ask for information in your application to be treated as confidential. You should request confidentiality when you submit your application.

To be considered fully, your request must:

- clearly identify which information should be considered confidential
- include a clear justification for each item you want kept from the public register
- include evidence that the confidentiality is provided by law to protect a legitimate economic interest

Confidential information should be easy to separate from the rest of your application. For example, you could submit two versions of the same document. One version that contains the confidential information and is marked accordingly. The other document is the same, but with the confidential information hidden or removed.

Information identified as confidential won't be put on the public register while we review your request. We'll let you know the outcome once our decision has been made.

You can find further information on commercial and industrial confidentiality by visiting **Environmental permitting guidance: Core guidance**.

Only tick the box below if you do want to claim commercial or industrial confidentiality.

☐ I wish the information I have identified to be treated as confidential and excluded from the public register.

Now go to **section 6**

6 National security

We maintain a public register of permitting applications. We can be directed to exclude information in the interests of national security. If your application contains such information, you may notify the Secretary of State. They will decide whether it should be excluded from the register.

You must tell us if you have given notice to the Secretary of State. You must still include the information in your application. It will be excluded from the register unless the Secretary of State decides it should be included.

You cannot apply for national security using this application form.

You can find further information on national security by visiting **Environmental permitting guidance: Core guidance**.

Now go to **section 7**

7 Ecological survey information

7.1 Have you provided ecological survey data as part of your application?

☐ Yes – go to **question 7.2**

☑ No – go to **section 8**

7.2 Use of ecological survey data

We may wish to use any ecological survey data you have supplied for other purposes as detailed below.

We assume that we are permitted to use the information you supply to us, in connection with our statutory and regulatory responsibilities. In particular (although there may be other uses), we may:

- incorporate the information into our datasets and mapping. These are used for a variety of purposes
- provide information to other applicants and organisations where this enables us to protect wildlife as we are directed to do in the Environment Act
- respond to requests for information under the Freedom of Information Act and the associated Environmental Information Regulations 2004 and agree limited usage rights in accordance with our Standard Notices that we use when supplying our information
- license datasets and mapping derived from or containing information

If you have any queries, please contact us using the details in **section 10** of this form

☐ Tick this box if you do **not** want us to use information from any ecological survey that you have supplied with your application

8 Declaration

Who should complete the declaration

The person needing to complete the declaration depends on the type of legal entity applying. This is set out below:

Individual

One of the following must sign the declaration:

- the individual

8 Declaration, continued

- someone with written authorisation from the individual

Multiple individuals (see below for unincorporated organisations)

One of the following must sign the declaration:

- all individuals named, or to be named on the permit
- someone with written authorisation from all individuals named, or to be named on the permit

Unincorporated trusts, charities and societies

One of the following must sign the declaration:

- trustee
- chairperson
- treasurer
- secretary
- person with a similar position
- someone with written authorisation from any of the above

Registered company

One of the following must sign the declaration:

- director registered at Companies House
- company secretary registered at Companies House
- any similar company officer registered at Companies House
- someone with written authorisation from any of the above

Limited liability partnership

One of the following must sign the declaration:

- partner registered at Companies House
- partnership secretary registered at Companies House
- someone with written authorisation from any of the above

Other incorporated body

One of the following must sign the declaration:

- chairperson
- treasurer
- secretary
- person with a similar position
- someone with written authorisation from any of the above

Public body or ministerial government department

A person with delegated authority under the body's non-financial scheme of delegation must sign the declaration.

Corporate bodies subject to insolvency procedures

The official Receiver or appointed insolvency practitioner must sign the declaration.

8 Declaration, continued

Written authorisations

If you are the applicant and want someone to complete the below declaration on your behalf, you must give them written authorisation to do so.

Your authorisation must confirm the person has authority to complete the declaration for you. Include a copy of the authorisation with your application, unless we already hold a valid one on file.

Agents or consultants cannot complete the declaration without written authorisation from the applicant.

8.1 Declaration by current permit holder or applicant applying for a new permit

The declaration and details below must be completed by the:

- current permit holder for variation, transfer and surrender applications
- applicant applying for a new permit

Declaration

Note: It is an offence under the Environmental Permitting (England and Wales) Regulations 2016 to knowingly or recklessly make a statement that is false or misleading for the purpose of obtaining an environmental permit, variation, transfer or surrender (for yourself or anyone else)

For further information visit **Environmental Permitting Regulations (EPR) offences**

I declare that the information in this application is true to the best of my knowledge and belief.

I understand that this application may be refused, or approval withdrawn if I give false or misleading information.

✓ Tick this box to confirm that you understand and agree with the declaration above.

In addition, if you are applying for a standard rules permit, tick the box below if you agree with the statement.

☐ I confirm that my standard rules facility will fully meet the rules that I have applied for.

Now complete your details below. You do not need to provide a signature as well.

Person completing declaration

Title (Mr, Mrs, Miss and so on) (optional)

Mr

First name

Eric

Last name

Adams

on behalf of (if relevant; for example, a company or organisation and so on)

Barrow Green Hydrogen Ltd

Position (if relevant)

Director

'Position' could, for example, be a director, secretary, trustee, or partner in a partnership

8 Declaration, continued

Date of declaration (DD/MM/YYYY)

09/12/2025

Use **Appendix 1** if more than one person needs to complete the declaration for the same applicant. For example, where multiple individuals are to be named on the permit.

8.2 Are you applying for a permit transfer?

☐ Yes – now go to **question 8.3**

✓ No – now go to **section 9**

8.3 Declaration by proposed new permit holder

The proposed new permit holder must complete the declaration and their details below.

Declaration for permit transfer applications

Permit transfer applications are joint applications.

The existing permit holder must complete the declaration and details in **question 8.1**.

The proposed new permit holder must complete the declaration and details below.

Note: there may be situations when you're unable to trace the permit holder or a joint holder. You may still be able to transfer the permit without their declaration. Contact us to discuss this. You'll need to supply evidence in your application to confirm you're unable to trace them.

It is an offence under the Environmental Permitting (England and Wales) Regulations 2016 to knowingly or recklessly make a statement that is false or misleading for the purpose of obtaining an environmental permit, variation, transfer or surrender (for yourself or anyone else)

For further information visit **Environmental Permitting Regulations (EPR) offences**

Declaration

I declare that the information in this application is true to the best of my knowledge and belief.

I understand that this application may be refused, or approval withdrawn if I give false or misleading information.

☐ Tick this box to confirm that you understand and agree with the declaration above.

Now complete your details below. You do not need to provide a signature as well.

Person completing declaration

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

on behalf of (if relevant; for example, a company or organisation and so on)

Position (if relevant)

8 Declaration, continued

'Position' could, for example, be a director, secretary, trustee, or partner in a partnership

Date of declaration (DD/MM/YYYY)

Use **Appendix 1** if more than one person needs to complete the declaration for the same applicant. For example, where multiple individuals are to be named on the permit.

Now go to **section 9**

9 Application review section

You must complete this section.

We are unable to return any application or supporting documents. Do not send original legal or important documents.

We can't progress applications that are incomplete or lack sufficient detail.

If you aren't sure about what you need to send, contact us before submitting your application. For further information on pre-application advice visit **Get advice before you apply for an environmental permit**.

9.1 Checklist

Tick to confirm you've completed the following:

- ✓ filled in all relevant parts of the application form clearly
- ✓ included all required supporting documents and listed them in the table below
- ☐ included supporting information for any commercial or industrial confidentiality claim (where applicable)
- ✓ declaration completed by a relevant person, with written authorisation if needed
- ✓ sent the correct payment

9.2 Table of supporting documents

List of all the documents submitted as part of your application in the table below

Question reference e.g. Part B1, Q5b	Document title	Document reference
All	416.066073.00001_BGH_EP_Appl	

9 Application review section, continued

Question reference e.g. Part B1, Q5b	Document title	Document reference

Continue on a separate sheet if necessary.

Document reference of continuation sheet (where applicable)

Now go to **section 10**

10 How to contact us

If you have difficulty using this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: **enquiries@environment-agency.gov.uk**

Website: **www.gov.uk/government/organisations/environment-agency**

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

You don't have to answer this part of the form, but it will help us improve our forms if you do.

We want to make our forms easy to fill in and easy to understand. Please use the space below to give us any comments that you may have about this form.

How long did it take you to fill in this form?

We will use your feedback to improve our form.

Would you like a reply to your feedback?

- ☐ Yes please
- ☐ No thank you

Now go to **section 11**

11 Where to send your application

A. By email

Send water discharge and groundwater activity applications to: **PSC-WaterQuality@environment-agency.gov.uk**

Send all other applications to: **PSC@environment-agency.gov.uk**

If your documents are too large to email, you can upload them to a file sharing site and send us the download link. You can also send multiple emails with attachments.

B. By post

Send one paper copy to:

Environment Agency
Integrated Permitting Services
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Appendix 1 – declarations from additional people

Declaration – additional person 1

Note: It is an offence under the Environmental Permitting (England and Wales) Regulations 2016 to knowingly or recklessly make a statement that is false or misleading for the purpose of obtaining an environmental permit, variation, transfer or surrender (for yourself or anyone else)

For further information visit **Environmental Permitting Regulations (EPR) offences**

Complete the declaration and add your details below.

Declaration

I declare that the information in this application is true to the best of my knowledge and belief.

I understand that this application may be refused, or approval withdrawn if I give false or misleading information.

☐ Tick this box to confirm that you understand and agree with the declaration above.

In addition, if you are applying for a standard rules permit, tick the box below if you agree with the statement.

☐ I confirm that my standard rules facility will fully meet the rules that I have applied for.

Now complete your details below. You do not need to provide a signature as well.

Person completing declaration

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

on behalf of (if relevant; for example, a company or organisation and so on)

Position (if relevant)

'Position' could, for example, be a director, secretary, trustee, or partner in a partnership.

If applying to transfer a permit, state whether you're the current or proposed holder.

Date of declaration (DD/MM/YYYY)

Declaration – additional person 2

Note: It is an offence under the Environmental Permitting (England and Wales) Regulations 2016 to knowingly or recklessly make a statement that is false or misleading for the purpose of obtaining an environmental permit, variation, transfer or surrender (for yourself or anyone else)

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☐ I confirm that my standard rules facility will fully meet the rules that I have applied for.

Now complete your details below. You do not need to provide a signature as well.

Person completing declaration

Title (Mr, Mrs, Miss and so on) (optional)

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Date of declaration (DD/MM/YYYY)

Declaration – additional person 3

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Now complete your details below. You do not need to provide a signature as well.

Person completing declaration

Title (Mr, Mrs, Miss and so on) (optional)

First name

Last name

on behalf of (if relevant; for example, a company or organisation and so on)

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If applying to transfer a permit, state whether you're the current or proposed holder.

Date of declaration (DD/MM/YYYY)

Continue on separate sheet as necessary

Document reference of continuation sheet (if any)

Appendix C Surface Water Pollution Risk Assessment

Wastewater Discharge Risk Assessment

Barrow Green Hydrogen

Barrow Green Hydrogen Limited

Prepared by:

SLR Consulting Limited

3rd Floor, Brew House, Jacob Street, Tower Hill,
Bristol, BS2 0EQ

SLR Project No.: 416.066073.00001

19 January 2026

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	9 June 2025	EL / RC	GA	GA
02	19th September 2025	RS	GA	GA

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Barrow Green Hydrogen Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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Acronyms and Abbreviations

AA	Annual Average
BDL	Below Detectable Limits
CEH	Centre for Ecology and Hydrology's
EA	Environment Agency
ELV	Emission Limit Value
EQS	Environmental Quality Standards
LOD	Limit of Detection
MAC	Maximum Allowable Concentration
MRVs	Minimum Reporting Values
PAH	Polyaromatic hydrocarbons
PC	Process Contribution
PEC	Predicted Environmental Concentration
PEM	Proton Exchange Membrane
RQP	River Quality Planning
STRF	Sewage Treatment Reduction Factor
STW	Sewage Treatment Works
SW	Surface Water
UU	United Utilities
Units	
l/h	Litres per hour
m^3/s	Cubic metres per second
mg/l	Milligrams per litre
µg/l	Micrograms per litre

1.0 Introduction

Barrow Green Hydrogen Limited (BGH) has instructed SLR Consulting (SLR) to undertake a Wastewater Discharge Risk Assessment (often referred to as an H1 assessment) of process effluent from the proposed Barrow Green Hydrogen Plant (BGHP), located at Meetings Industrial Estate, Park Road, Barrow-in-Furness, LA14 4TL (hereafter referred to as 'the Site').

Site surface water runoff, roof waters and process effluent comprising of reject water from the demineralisation of potable water to feed electrolysers will be discharged into an existing attenuation pond to the west of the Site. The discharge of the combined Process Wastewater and Site Surface Water would be made via a Flow Control Chamber at greenfield run off rates (7.7l/s) and Class 1 Full Retention Separator. The drain flows westwards under the railway before ultimately outfalling into the Walney Channel at approximately. NGR SD 18943 72196

The Environment Agency (EA) requires a Surface Water Pollution Risk Assessment (hereinafter referred to as a SW Risk Assessment) to quantify the environmental impact of discharging hazardous pollutants to the receiving watercourse (i.e. Walney Channel). If a hazardous pollutant is screened from the Risk Assessment, it is deemed by the EA as not being liable to cause pollution to the receiving watercourse.

This report details the methodology, data inputs and findings from the Risk Assessment.

2.0 Surface Water Pollution Risk Assessment Methodology

A SW risk assessment is required when applying for a bespoke environmental permit that includes discharging hazardous pollutants to surface water or if a variation of an existing permit is required to cover an increase in quantity and/or concentration of hazardous pollutants to surface water under the Environmental Permitting Regulations[1].

The purpose of a SW risk assessment is to quantify the environmental impact of discharging hazardous chemicals and elements to a receiving watercourse to assess whether they are a risk to the environment.

This includes discharging to:

- Freshwaters;
- Estuaries and coastal waters; and
- Sewers

The EA methodology contained in the "*Surface water pollution risk assessment for your environmental permit"* guidance[2] provides guidance on assessing effluent discharges containing hazardous pollutants to surface water. Hazardous pollutants are the pollutants listed in the tables of the guidance. The EA's "*H1 Annex D2 – Assessment of sanitary andother pollutants within surface water"* guidance[3] was also used, which provides guidance

[1] Environmental Permitting (England and Wales) Regulations 2016

[2] Environment Agency and DEFRA, (2022). Surface water pollution risk assessment for your environmental permit. [Available at]: https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit

[3] Environment Agency, (2014). H1 Annex D2: Assessment of Sanitary and Other Pollutants within Surface Water Discharges (v1.0). [Available at]: H1 annex D2: assessment of sanitary and other pollutants in surface water discharges - GOV.UK (www.gov.uk)

on assessing effluent discharges containing sanitary and other pollutants within surface water.

Assessing whether a hazardous chemical or element is a risk to the environment is a two-phase process i.e., screening (phase 1) and modelling (phase 2).

If phase 1 screening show that a hazardous chemical or element is a potential risk to the receiving watercourse, then further tests called "phase 2 modelling" need to be undertaken. Modelling may result in a substance being shown to be low risk to the receiving watercourse or otherwise maximum possible emission limit values (in order to pass the H1 assessment) can be determined.

2.1 Environmental Quality Standards

The surface water risk assessment guidance contains a list of environmental quality standards (EQS) for hazardous chemicals and elements.

There are two types of EQS values that might apply:

- Maximum Allowable Concentration EQS (MAC-EQS) - to evaluate the short-term environmental impact of emissions to a receiving watercourse; and
- Annual Average (AA-EQS) - to evaluate the long-term environmental impact of emissions to a receiving watercourse.

A hazardous chemical or element may only have a corresponding AA-EQS value, a MAC-EQS value or both an AA-EQS and MAC-EQS value.

2.2 Screening Phase

Phase 1 screening eliminates all hazardous chemicals and elements which are considered to not be a risk to the environment. This phase uses precautionary raw data which has not been "cleaned-up" (e.g., the minimum reporting values (MRVs) are taken at "face-value").

Phase 1 screening is composed of two parts – part A for all hazardous chemicals and elements and part B for priority hazardous substances.

The EA has developed a Risk Assessment software tool[4] to perform many of the calculations involved in the Risk Assessment to aid in the quantification of the impact of releases from the regulated activities.

2.2.1 Screening Tests

Phase 1- Part A screening comprises of a series of tests. These tests vary depending on whether the receiving water is freshwater or coastal/Estuarine. The tests for coastal water are described in Table 2-1 as Walney Channel is a coastal watercourse at the point of discharge.

Table 2-1: Coastal Waters Screening Tests

Estuary/Coastal Screening Test	Test Detail
Test 1	This test is devised to quickly screen out hazardous pollutants.

[4] Environment Agency (2016). Environment Agency H1 Software Tool, Version 2.7.6, February 2016 (64-bit). Available upon request from the Environment Agency.

Estuary/Coastal Screening Test	Test Detail
	If the concentration of the hazardous pollutant in the effluent exceeds its EQS (both AA and MAC limits if available), it is potentially significant and should be carried forward to Test 2.
Test 2	This test applies for discharges to low water channels in the upper parts of an estuary where the water is mainly fresh. If this is the case, the screening tests for freshwaters needs to be carried out (starting at Test 2). If the discharge point isn't to a low water channel, Test 2 for estuaries and coastal waters can be skipped.
Test 3	This test asks if the point of discharge has restricted dispersion or dilution (for example, coves, docks and ports). If this is the case, extra modelling is required. If it is not, then Test 4 can be carried out.
Test 4	This test requires a chart datum point to be identified (i.e. this is the point where the water depths are shown on nautical charts as zero). The discharge point must be at least 1m below and at least 50m away from the chart datum point. If this is not the case, then further modelling is required. If it is, then Test 5 can be undertaken.
Test 5	This test only applies if the discharge is buoyant. If the discharge is not buoyant, then further modelling is required. The effective volume flux of the discharge is calculated and compared to the allowable effective volume flux (which is proportional to the water depth). If the effective volume flux is outside the allowable limits, further modelling is required.

2.2.2 Significant Load Assessment

Phase 1- Part B screening assesses whether the discharge exceeds pre-determined significant load limits and is only carried out on Priority Hazardous Pollutants. Priority Hazardous Pollutants must be screened out in the Part A assessment and the Part B assessment (where applicable) to be deemed to require no further detailed assessment.

2.3 Modelling

Modelling of effluents into coastal waters is generally specific to the site / discharge context and tends to be carried out in as an iterative approach.

3.0 Effluent Management and Treatment

The electrolytic hydrogen production project is expected to have a capacity to produce up to 12,816 kg of hydrogen per day. In order to achieve this, the facility will use containerised Proton Exchange Membrane (PEM) electrolysers.

BGH plan to install and operate a water purification system to supply the PEM electrolysers. Each of the six electrolysers will require approximately 1,300 l/h of potable water supplied by United Utilities (UU) via the mains water supply. The potable water will be treated in the water treatment package, where impurities (such as salts and dissolved gasses) are removed by means of activated carbon filtration, water softening, reverse osmosis, membrane degassing, electro-deionization and UV disinfection.

Approximately 75% of the potable water feed will be consumed as a purified water for electrolysis, whilst the remaining 25% (i.e. 325 l/h/unit or 1,950 l/h aggregated total) will

require handling as a wastewater due to the concentration of substances contained within the potable water source by an estimated factor of 4.

BGH propose to discharge this wastewater along with surface water runoff and roof water from the site into an existing attenuation pond. The discharge of the combined Process Wastewater and Site Surface Water would be made via a Flow Control Chamber at greenfield run off rates (7.7l/s) and Class 1 Full Retention Separator. The drain flows westwards under the railway before ultimately outfalling into the Walney Channel at approximately NGR SD 18943 72196.

4.0 Data Inputs to Surface Water Pollution Risk Assessment

4.1 Assumptions

The following assumptions have been made by SLR in preparing this Risk Assessment:

- The concentration of contaminants in the potable water will be reduced as per sewage treatment reduction factors specified in EA guidance[2] by the carbon filtration step but then concentrated by four times as a result of reverse osmosis.
- Hazardous chemicals which are referenced in the EA guidance but for which no data is presented in UU's potable water supply data, have not been considered in this report.

4.2 Effluent Quality

Potable water quality data for the Site's location (taken from August 2024 to July 2025) has been obtained from UU. This data has then been analysed and average and maximum effluent quality estimated as per the assumptions discussed in Section 4.1.

In practice, it is likely that the other treatment steps will remove contaminants (for example chlorine) from the influent potable water, making the water quality assumptions presented in this report a conservative estimation.

Furthermore, there will be dilution by surface water run-off within the lagoon prior to discharge into the Walney Channel. However, this has not been accounted for in the assessment since the dilution will vary depending on the rainfall rate.

4.3 Effluent Flow Rate

It is estimated that a maximum of 1,950 l/h (0.00054 m^3/s) of effluent will be discharged by the electrolysers and this flow rate has been used as both average and maximum to maintain a conservative approach. In practice, the average would be lower.

5.0 Results From Screening

This section describes the results from the EA Risk Assessment software tool used for screening the hazardous pollutants listed in Table 4-1.

5.1 H1 Tool Screening Tests

5.1.1 Test 1

The Test 1 assessment was carried out. All substances screened out with the exception of Copper and Benzo(ghi)pyrene.

5.1.2 Significant Load Assessment

Part B screening is for hazardous pollutants considered to be priority hazardous pollutants by the EA. Out of hazardous pollutants assessed in the Risk Assessment, two are considered to be priority hazardous pollutants (i.e. Cadmium and PAHs).

Part B screening calculates if the annual limit of priority hazardous pollutants discharged is more than the significant load limit (an annual load limit that has been set for priority hazardous pollutants).

Table 5-1 below shows the significant load calculation and comparison against the significant load limit for the priority hazardous pollutants considered in the Risk Assessment.

Table 5-1: Significant Load Calculation for Priority Hazardous Pollutants

Priority Hazardous Pollutant	Significant load (kg/year)	Significant load limit (kg/year)
PAHs	0	5
Cadmium	0.002	5

The significant load calculated for all of the priority hazardous pollutants is lower than its corresponding significant load limit and therefore pass Part B screening.

5.2 pH

The effect of the purification process on UU's potable water influent is unknown at this stage, however the effluent is not expected to have a pH which is outside of the MAC-EQS range of 6-9.

6.0 Further Assessment

Further assessment is required if the phase 1 screening tests did not screen out all hazardous pollutants.

6.1 Copper

The estimated average concentration of Copper in the effluent (11.38 ug/l) exceeds the annual average EQS of 5.51 ug/l as supplied by the EA in pre-application discussions[5].

There are limitations in the data supplied by UU however.

1. The UU data presents total Copper whereas the EQS relates to dissolved Copper. Only a proportion of the total copper will be dissolved and therefore dissolved Copper will be lower than assessed.
2. 6 of the 8 samples taken during the sampling period were reported at below a detection limit of 10.4 ug/l. Given this detection limit exceeds the EQS, the non-detects were assumed to be at the detection limit skewing the average.

In practice, it is not expected that average concentrations of dissolved Copper will be as high as those conservatively estimated by the approach used. On this basis, BGH propose an average ELV for dissolved Copper is set in the environmental permit at the EQS of 5.51 ug/l. BGH propose that monthly monitoring is undertaken for the first 12 months of operation to assess compliance with this ELV. If the concentration of dissolved Copper is found to exceed this ELV, BGH will reassess impacts by proceeding to detailed modelling or action

[5] Email from Anjali Ozhakkal to Greg Altria 'Re-sending the pre-app advice in full' dated 31st July 2025.

will be taken to prevent a compliance limit breach. This may include, but not be limited to, installation of a carbon filter to remove Copper from the wastewater prior to discharge.

6.2 Benzo(ghi)pyrene

Similar to Copper, there are limitations in the data supplied by UU. All 7 samples taken during the sampling period were reported at below a detection limit of 0.004 ug/l. Given this detection limit exceeds the MAC-EQS (0.0008 ug/l), the non-detects were assumed to be at the detection limit meaning the maximum concentration in the effluent appears higher than the MAC-EQS. In practice, there is no reason to believe that Benzo(ghi)pyrene or any other PAH would be present in the effluent due to their being no source. Accordingly, this substance has been discounted from further assessment.

7.0 Conclusion

BGH plan to install and operate a water purification system used to supply 6 PEM electrolysers. Potable water (supplied by United Utilities) will be treated via reverse osmosis prior to consumption for electrolysis. The maximum rate of effluent production will be 0.00054 m^3/s.

A surface water risk assessment is required when applying for an environmental permit or variation that includes discharging hazardous chemicals and elements to surface water.

14 substances were assessed via the estuarine and coastal waters screening tests. A total of 12 substances were screened out via test 1. No further tests could be applied due to the nature of the discharge location.

Of the remaining substances:

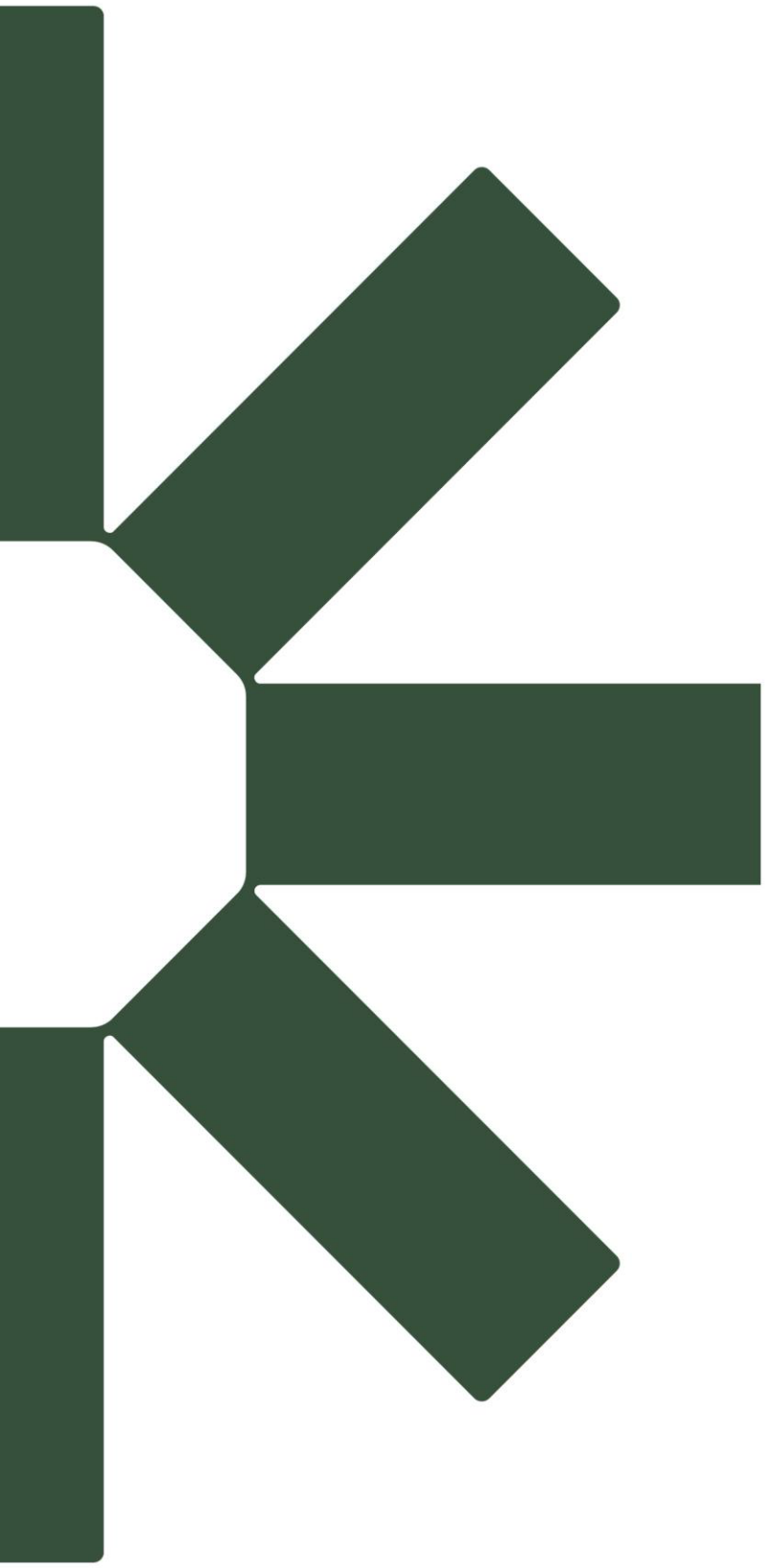
- Average Copper was estimated to exceed the annual average EQS. Limitations in the data mean that average Copper is expected to be lower than estimated. As such, BGH proposed an ELV is set as the AA-EQS with monthly monitoring proposed for the first 12 months of operation to demonstrate compliance.
- Benzo(ghi)pyrene was identified as exceeding the MAC-EQS as non-detect values were taken at face value. The detection limit exceeded the MAC-EQS however. Given there will be no source of PAHs, this substance has been discounted.

The pH of the effluent is expected to be within the MAC-EQS range of 6 - 9.

Following the surface water pollution risk assessment, it is not considered that the discharge of the effluent from BGHP will pose a significant risk to the environment

Appendix A Screening Tool Results

| Sample Date | Time | Sample Location | Alkalinity | Aluminium (ug/l) | Ammonium (ammonia and ammonium | Antimony (ug/l) | Arsenic (ug/l) | Benzo(b) fluoranthene | Bromodichloromethane | Benzo (ghi) perylene | Benzo(a)pyrene (ug/l) | Benzo(b)fluoranthene (ug/l) | Bromate (ug/l) | Cadmium (ug/l) | Calcium (ug/l) | Chromium (ug/l) | Total Chlorine (mg/l) | Free Chlorine (mg/l) | Colony 3 Day at 22 degrees (number/ml) | Coliform bacteria (number/100 ml) | Colour (Hazen) | Conductivity (uS/cm) | Copper (ug/l) | Clostridium perfringens (number/100 ml) | Dibromochloromethane (ug/l) | E.coli (number/100 ml) | Enterococci (number/100 ml) | Total Hardness as calcium carbonate (mg/l) | Indeno(1,2,3-cd)pyrene (ug/l) | Iron (ug/l) | Lead (ug/l) | Magnesium (mg/l) | Manganese (ug/l) | Nickel (ug/l) | Nitrite as nitrogen (mg/l) | Nitrate as nitrogen (mg/l) | Nitrate/50+Nitrite/3 | Total oxidised nitrogen | Odour (quantitative) | Polycyclic aromatic | Hydrogen ions (pH) | Phosphate as P (ug/l) | Selenium (ug/l) | Sodium (mg/l) | Taste (quantitative) | Tribromomethane (ug/l) | Tetrachloroethene (ug/l) | Tetrachloroethane (ug/l) | Trihalomethanes (ug/l): Total | Trichloromethane (ug/l) | Trichloroethene (ug/l) | Trichloroethene plus tetrachloroethene | Turbidity (NTU) |
|---|---|---



Making Sustainability Happen

Appendix D Amenity Risk Assessment

Environmental Risk Assessment

Barrow Green Hydrogen Plant

Barrow Green Hydrogen Limited

Prepared by:

SLR Consulting Limited

3rd Floor, Brew House, Jacob Street, Tower Hill,
Bristol, BS2 0EQ

SLR Project No.: 416.066073.00001

19 January 2026

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1	19 January 2026	RS	GA	GA
	Click to enter a date.			
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Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Barrow Green Hydrogen Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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1.0 Introduction

SLR Consulting Limited (SLR) has been instructed by Barrow Green Hydrogen Limited to prepare an environmental permit (EP) application for their proposed Barrow Green Hydrogen Plant (BGHP), located Meetings Industrial Estate, Park Road, Barrow-in-Furness, LA14 4TL (hereafter referred to as 'the Site').

This Environmental Risk Assessment has been undertaken in accordance with the Environment Agency's (EA) guidance 'Risk assessments for your environmental permit' (December 2025).

It is a simple assessment of the risks to the environment and human health from odour, noise, and fugitive emissions that may be associated with the proposed operations at the site. The aim of the assessment is to identify any significant risks and demonstrate that the risk of pollution or harm will be acceptable by implementing appropriate measures to manage these risks.

The risk assessments for your EP guidance requires that all receptors that are near to the site and could reasonably be affected by the activities are identified and considered as part of the Amenity Risk Assessment. Therefore, for the purpose of this report:

- A 2km radius has been adopted in reviewing potentially sensitive receptors of cultural and ecological importance with the exception of Ramsar sites, Special Protection Areas (SPA) and Special Areas of Conservation (SAC) for which 10km is adopted; and
- A radius of 500m from the proposed permit boundary has been adopted for all other potentially sensitive receptors (for example, residential, commercial, industrial, agricultural, and surface water receptors).

1.1 Overview and Approach

The assessment is based on the risk assessment for a bespoke EP. This section outlines the procedure that has been followed in the undertaking of the risk assessment for the site:

Step One	Identify risks and their sources for the site
Step Two	Identify receptors at risk from the site
Step Three	Identify pathways between sources and receptors
Step Four	Assess risks relevant to the site activities and determine if they can be screened out
Step Five	State measures proposed to control unacceptably high risks
Step Six	Present your assessment

2.0 Identify Risks

Step One is a screening step to identify the potential risks to the environment from the proposed development. The EA Guidance identifies areas that the EA considers would likely require assessment for most sites as follows:

- Odour;
- Noise & vibrations;
- Visible emissions;
- Discharges such as to surface or groundwater;
- Release of bioaerosols;
- Fugitive emissions (including dust, mud, litter and pests); and
- Accidents.

Production of hydrogen from electrolysis is not a source of visible plumes and there will be no discharges to groundwater. There is also no biological processes or materials used as part of the process as such there will be no risk associated with bioaerosols. Accordingly, these aspects are screened out from further assessment.

The following risks will however be present and are therefore considered further:

- Odour;
- Noise and vibrations;
- Discharges to surface water;
- Fugitive emissions; and
- Accidents.

Discharges to surface water are considered in Appendix C of the application in the Surface Water Pollution Risk Assessment. Risks associated accidents are assessed in the Accident Risk Assessment and Management Plan in Appendix E to the application. Noise and vibrations and fugitive emissions go on to be considered in this risk assessment. A Noise Impact Assessment and Noise Management Plan have also been developed and presented in Appendices G and H, respectively.

3.0 Site Setting and Receptors

Step Two identifies people or parts of the environment that could be affected (at potentially significant risk) by the activity. This section identifies the Site setting and potentially sensitive receptors in the vicinity of the Site.

3.1 Site Setting

The Site is centred on National Grid Reference (NGR) SD 19436 72080. Barrow-in-Furness town centre lies 3km to the south-east. The Site sits in an industrial estate with residential areas located to the east, a solar farm and agricultural fields to the west with the Walney Channel beyond. The closest residential properties are approximately 110m to the east of the Site. The nearest designated habitat site is 330m west of the Site (Morecambe Bay Special Area of Conservation and Special Marine Protection Area and the Duddon Estuary Ramsar, Site of Special Scientific Interest and Special Marine Protection Area).

The Site location is illustrated on Drawing 01, the Site Layout is illustrated in Drawing 02, and the Environmental Site setting can be found on Drawing 03A and 03B.

A summary of the immediate land uses in the vicinity of the Site are as follows:

Table 1 Immediate Land Uses Surrounding the Site

Direction	Land-Use
North	Industrial and commercial premises, agricultural land.
East	Industrial premises, Park Road (A590) with residential properties beyond.
South	Commercial / industrial premises and agricultural land.
West	Railway line, solar farm, agricultural land and the Duddon Estuary and Walney Channel.

3.1.1 Agricultural Land

The nearest agricultural land lies adjacent to the north of the proposed EP boundary.

3.1.2 Commercial and Industrial

There are a number of commercial and industrial units within 500m of the proposed EP boundary. The closest are a number of commercial units located within the Meetings Industrial Estate, adjacent to the east of the Site.

3.1.3 Local Transport Network

The A590 Park Road from which the Site is accessed lies to the east of the Site. Adjacent to the west of the Site is the Cumbrian Coast Railway. Bank Lane also runs across from the east to the west near the Site and intersects with Park Road 300m to the north of the proposed EP boundary.

3.1.4 Surface Water Features

There are a number of surface water receptors within 500m of the Site. The largest is the Walney Channel, lying 330m to the west of the proposed EP boundary. The closest surface water receptor is a land drain to the north of the proposed EP boundary. This land drain will receive combined surface water and wastewater from the Site's attenuation pond and drains in a westerly direction before outfalling into the Walney Channel.

3.1.5 Woodland

The closest area of woodland lies approximately 360m south of the Site.

3.1.6 Residential

Residential properties associated with Ormsgill are situated the other side of the A590 from the Site. The closest residential property is 110m east of the Site on Park Road.

3.1.7 Educational and Recreational

Ormsgill Nursery and Primary School is located approximately 400m southeast of the Site.

3.2 Geology, Hydrogeology and Hydrology

3.2.1 Geology

A review of the British Geological Survey (BGS)[1] mapping reveals that the Site is underlain by bedrock of the St Bees Sandstone Member and superficial deposits of Sedimentary Till, Devensian - Diamicton.

3.2.2 Hydrogeology

3.2.2.1 Aquifer Designations

The bedrock underlying the site is identified as a Principal aquifer on the Multi-Agency Geographical Information for the Countryside (MAGIC) map[2].

Superficial deposits underlying the site are designated as a Secondary (undifferentiated) aquifer.

[1] British Geological Survey (BGS), available at www.bgs.ac.uk, accessed in April 2025

[2] Multi-Agency Geographical Information for the Countryside Map, available at www.magic.gov.uk, accessed in April 2025

3.2.2.2 Source Protection Zones (SPZ)

The Site is located within a SPZ Zone 3 (total catchment).

3.2.3 Groundwater Vulnerability

MAGIC map shows that the Site lies in an area of medium-low groundwater vulnerability.

3.2.4 Hydrology

Flood Risk

The Flood Map for Planning[3] identifies the site as lying within a Flood Zone 1, defined as locations that have a low probability of flooding. Developments in flood zone 1 that are more than 1 hectare require a flood risk assessment. A 2022 Flood Risk Assessment[4] (FRA) found that the risk of surface water flooding to and from the site is low. A copy of the FRA is enclosed as Annex A.

Connectivity

BGH propose to discharge Process Wastewater from the Wastewater Collection & Disposal System along with Site Surface Water into an existing drain to the north of the Site at SW1 as shown on Drawing 02 at approximately NGR SD 19285 72167. The discharge of the combined Process Wastewater and Site Surface Water would be made via a Flow Control Chamber at greenfield run off rates (7.7l/s). The drain flows westwards under the railway before ultimately outfalling into the Walney Channel at approximately. NGR SD 18943 72196 as illustrated in Figure 1.

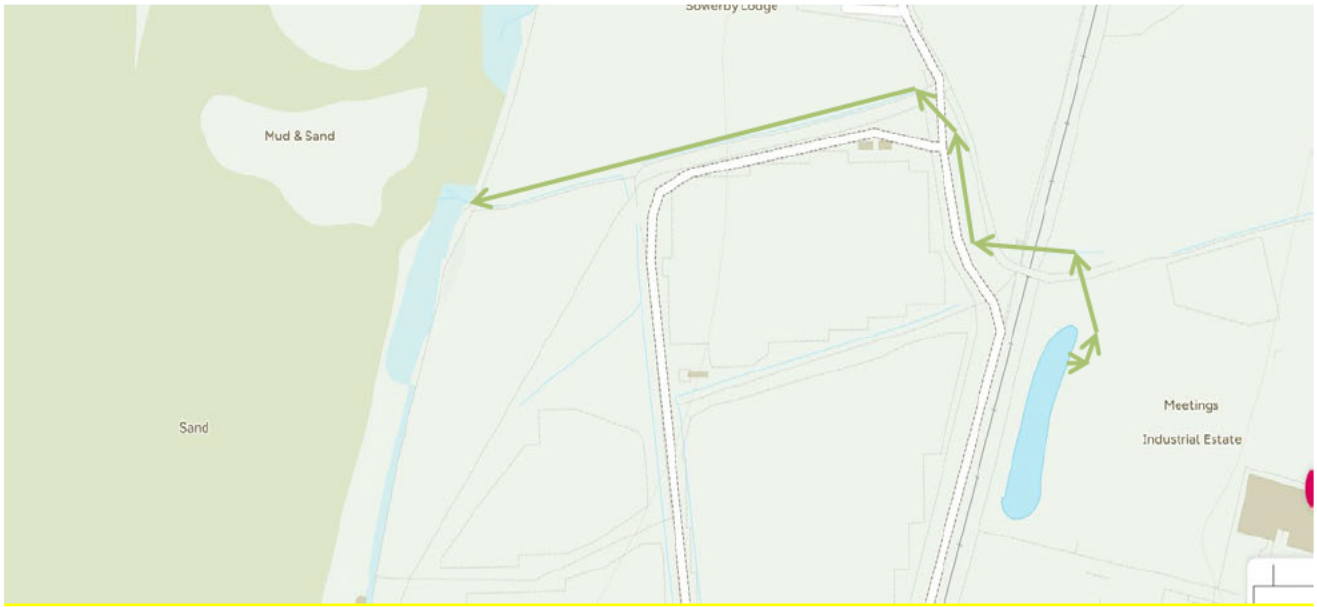


Figure 1 Connectivity of Site, local drainage and Walney Channel

The Walney Channel is a coastal and tidally influenced water body separating Walney Island from the British Mainland. To the north connects to the Duddon Estuary and to the south Morecambe Bay. The Walney Channel, including at the point of discharge, is located

[3] Flood Map for Planning, available at https://flood-map-for-planning.service.gov.uk/, accessed April 2025

[4] Curtins (2022) – Flood Risk Assessment and Drainage Strategy. Ref. 082665-CUR-ZZ-XX-T-92001

within the Morecambe Bay SAC, Morecambe Bay and Duddon Estuary Marine SPA, Duddon Estuary Ramsar site and SSSI and North Walney National Nature Reserve (NNR).

3.3 Ecology

The following radius were used for identifying nearby designated habitat sites and protected species;

- SAC, SPA and Ramsar within 10km;
- SSSI, Ancient Woodland, Biosphere Reserves, RSPB Reserves, National Nature Reserve, Local Nature Reserves, and Protected Species within 2km.

3.3.1 European/ Internationally Designated Sites

A review of MAGIC confirmed that the following receptors are present in the relevant radius of the Site:

3.3.1.1 Special Areas of Conservation (SAC)

The following SAC sites were identified within 10km of the Site:

- The Morecambe Bay SAC is located 330m west of the proposed EP boundary. This designated area also contains the Duddon Estuary Ramsar site and SSSI as well as the Morecambe Bay and Duddon Estuary SPA (Marine Components GB). The Morecambe Bay SAC is primarily designated owing to the presence of Annex I Habitats in the EU Habitats Directive (92/43/EEC) and Annex II Species[5] including:
    - Estuaries;
    - Mudflats and sandflats not covered by seawater at low tide;
    - Large shallow inlets and bays;
    - Perennial vegetation of stony banks;
    - Salicornia and other annuals colonizing mud and sand;
    - Atlantic salt meadows;
    - Shifting dunes along the shoreline with Ammophila areniaria;
    - Fixed coastal dunes with herbaceous vegetation;
    - Humid due slacks; and
    - Great Crested Newts.

3.3.1.2 Special Protection Areas (SPA)

The Morecambe Bay and Duddon Estuary SPA is located 330m west of the Site. The Site is designated as it is used regularly by more than 1% of the Great Britain population of a number of species listed in Annex I of the Birds Directive during both breeding and non-breeding seasons.[6]

3.3.1.3 Ramsar Sites

The following Ramsar sites were identified within 10km of the Site:

[5] Morecambe Bay - Special Areas of Conservation, accessed July 2025.
[6] morecambe-duddon-citation.pdf, accessed July 2025.

- The Duddon Estuary Ramsar site lies 330m west of the proposed site boundary. The Duddon Estuary Ramsar is designated due to its inclusion of 'marine and coastal wetlands with intertidal sand, mudflats, and saltmarsh. It supports more than 20,000 waterfowl including Caldiris canutus (1% of the population) and Anas acuta (2.1% of the population), and the rare natterjack toad Bufo Calamita. The site is used for nature conservation, tourism, recreation, fishing, grazing, and hunting'[7].
- The Morecambe Bay Ramsar site lies 3.3km south of the proposed EP boundary. The Morecambe Bay Estuary Ramsar is designated due to 'representing the largest continuous intertidal area in Britain, the site comprises the estuaries of five rivers, intertidal mud and sandflats, associated saltmarshes, shingle beaches, and other coastal habitats. It is part of a series of west coast estuaries of outstanding importance for numerous species of passage, breeding and wintering waterbirds. The site supports the third largest number of wintering wildfowl in Britain. Breeding birds include gulls and terns. Human activities include recreation, hunting, fishing, and livestock grazing'.[8]

3.3.1.4 Sites of Special Scientific Interest (SSSIs England)

The following SSSI's were identified within 2km of the Site:

- The Duddon Estuary SSSI is located 330m west of the proposed EP Boundary. The Duddon Estuary is designated as an SSSI due to sand dune systems on the north and south sides of the mouth of the estuary. The sand dune systems are important for a diverse range of community types, supporting a number of rare and uncommon plants, as well as a variety of nationally rare and scarce invertebrate species. It is also of international and national importance for wintering wildfowl and waders and provides a vital link in the chain of west coast estuaries used by migrating birds and is one the estuaries where the majority of Natterjack Toads occur.

3.3.2 Nationally/Locally Designated Sites

3.3.2.1 Ancient Woodlands

There is ancient and semi-natural woodland 1520m north of the proposed EP boundary.

3.3.2.2 National Nature Reserves (England)

The following National Nature Reserves were identified within 2km of the Site:

- The North Walney NNR is located 390m west of the proposed EP boundary. It is designated due to featuring nationally rare and important habitats such as sand dunes, dune heath, hay meadows, inter-tidal mudflats, and salt marsh.
- The Sandscale Haws NNR is located 1640m north of the proposed EP boundary and is designated due to the dune grasslands of Sandscale Haws supporting rich flora such as the very rare Dune Helleborine. Sandscale Haws is also a significant area for Natterjack Toads.

3.3.2.3 Protected Species

The following Protected Species were identified within 2km of the proposed EP boundary:

- Great Crested Newt are located 1.7km north-east of the proposed EP boundary.

[7] Duddon Estuary | Ramsar Sites Information Service, accessed July 2025.
[8] Morecambe Bay | Ramsar Sites Information Service, accessed July 2025.

3.3.3 Cultural Heritage

3.3.3.1 Listed Building

A review of MAGIC maps identified 18 listed buildings within 2km of the Site:

- 16 Grade II Listed Buildings were identified, the closest being Sowerby Lodge Farmhouse, located 190m north-west of the proposed EP boundary.
- 2 Grade II* Listed Buildings, the closest being the Barn to the rear of Sowerby Hall Farmhouse, located 500m north-east of the proposed EP boundary.

3.3.3.2 Registered Parks and Gardens (England)

The following Registered Parks and Gardens were identified within 2km of the Site:

- Barrow Municipal Cemetery lies 680m south-east of the proposed EP boundary. It is designated as it is a good example of a municipal cemetery, reflecting Barrow's military, social, and economic history, and was designed by Edward Kemp, the nationally renowned landscape designer.

3.3.4 Other Receptors

A review of MAGIC maps confirmed none of the following receptors are present in a 2km radius of the proposed EP boundary:

- Biosphere Reserves;
- Local Nature Reserves;
- RSPB Reserves;
- Scheduled Monuments;
- Registered Battlefields; and
- World Heritage Sites.

3.4 Receptors

Table 2 and Drawings 03A and 03B identify receptors which are considered to be potentially sensitive and could reasonably be affected by activities at the Site.

Table 2 Identified Receptors

Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary at closest point (in metres)
Human Receptors within 500m of the EP boundary as shown on Drawing 03A			
Commercial properties on Meetings Industrial Estate	Commercial premises	East	Adjacent
Park Road	Local Transport Network	East	Adjacent
Cumbrian Coast Railway Line	Local Transport Network	West	Adjacent
Land drains	Hydrology	North	Adjacent
Agricultural land	Agricultural receptor	North & South	Adjacent
BAE Systems Manufacturing Facility	Commercial premises	South	15m
Sowerby Lodge Solar Farm	Industrial premises	West	30m

Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary at closest point (in metres)
Residential properties	Residential area	North-east, east, south-east	110-500m
Playing Field	Recreational facility	East	110m
Playing Space	Recreational facility	East	110m
Ormsgill Community Centre	Recreational facilities	East	150m
Barrow AFC	Recreational facilities	North-east	280m
Sewage Works	Industrial premises	South-west	305m
Playground Lodge Green	Recreational facilities	East	320m
Walney Channel	Surface water receptor	West	330m
Ormsgill Nursery and Primary School	Educational facilities	South-east	400m
Kimberly-Clark Paper Mill	Industrial premises	North	420m
Cultural and Ecological Receptors within 2km of the proposed EP boundary and International and European Designations within 10km of the proposed EP boundary as shown on Drawing 03B			
Sowerby Lodge Farmhouse	Grade II Listed Building	North-west	190m
Barn north-east of Sowerby Lodge Farmhouse	Grade II Listed Building	North-west	200m
Morecambe Bay and Duddon Estuary	Special Protections Areas (Marine Components GB)	West	330m
Duddon Estuary SSSI	SSSI's (England)	West	330m
Duddon Estuary	Ramsar Sites (England)	West	330m
Morecambe Bay	Special Areas of Conservation	West, south, south-east	330m
North Walney	National Nature Reserve	West	390m
Listed Buildings	Listed Buildings	North-east	490m
Barrow Municipal Cemetery	Registered Parks and Gardens	South-east	680m
Sandscale Haws	National Nature Reserve	North	1640m
Morecambe Bay	Ramsar Sites (England)	South	3300m

3.5 Windrose

Figure 1 shows the wind patterns between 2012 and 2016 as identified by Walney Island Met station, located approximately 2km west of the Site. The most prominent wind directions are from the north-west and south-west, from the Irish Sea. Winds from the east are also somewhat prominent, whereas northern and southern winds are relatively infrequent by comparison.

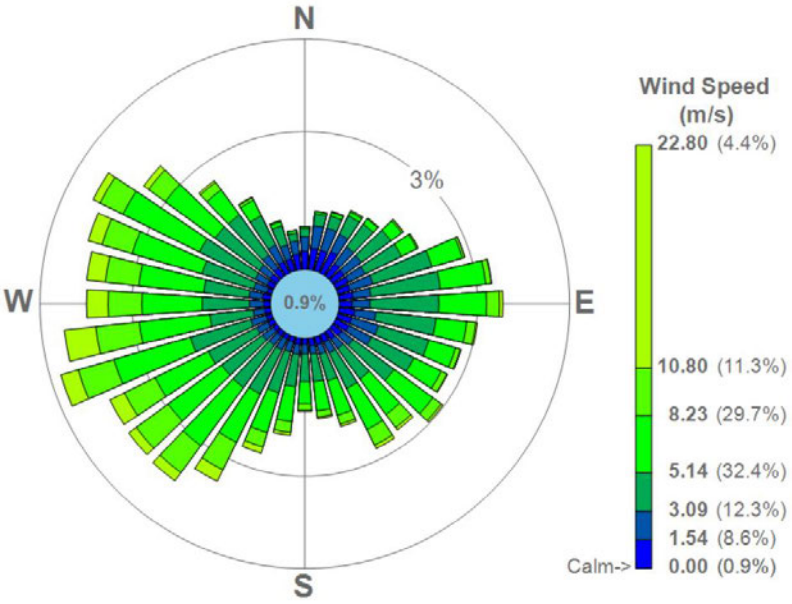


Figure 2 Windrose Walney Island Met Station (2012-2016)

4.0 Environmental Risk Assessment

Step Three identifies the potential pathways between source and receptor and where appropriate, the assessment demonstrates how the risk of pollution or harm can be mitigated by measures to manage these risks and/or block the pathways (Steps Four and Five). The following tables in accordance with EA guidance present the assessment in terms of hazards posed, receptors and pathways, along with management and residual risks for the following hazards:

- Odour;
- Noise & vibrations; and
- Fugitive Emissions (including dust, mud, litter and pests).

Table 3 Odour Risk Assessment and Management Plan

AT DO YOU DO THAT CAN HARM AND WHAT COULD BE HARMED			MANAGING THE RISK	ASSESSING THE RISK		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequences	What is the overall risk
What has the potential to cause harm?	What is at risk/What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is the contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Odour from the production of hydrogen on site, including venting of hydrogen and oxygen to atmosphere.	Sensitive receptors listed in Table 2 including residential, commercial, agricultural and ecological receptors.	Air	Hydrogen and oxygen are odourless gases, as such there will be no odour emissions from the production, storage, or handling of hydrogen at the facility and so odour abatement or treatment will not be required. Hydrogen will not be dosed with odorant. BGH will: • Have procedures for planned preventative maintenance to minimise the likelihood of a leak occurring; and • Conduct remote monitoring and in-person inspections for the purposes of identifying and remediating leaks. The Site Manager is responsible for managing emissions of odour on site.	Low	Odour Nuisance and loss of amenity.	Negligible

Table 4 Noise Risk Assessment and Management Plan

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequences	What is the overall risk
What has the potential to cause harm?	What is at risk/What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is the contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Noise emissions from equipment on site (e.g. motors, compressors, venting).	Sensitive receptors listed in Table 2 including residential receptors.	Air	The Site is located in a medium sensitivity setting with respect to noise. The surrounding landscape is comprised of commercial / industrial premises screened from the residential areas located approximately 110m to the east. The setting of the hydrogen plant within the plot has been located away from the most impacted noise sensitive receptor to the northeast (Houses on Bank Lane). While there will be noise generated by the facility by components such as air compressors, pumps, cooling fans, vents, and transformers during normal operation on a 24-hour basis and sources such as maintenance, pressure	Medium	Noise disturbance and loss of amenity.	Low

			release valves in abnormal scenarios, it is not anticipated that emissions will be at a level likely to cause pollution or nuisance outside of the Site. BGH have sought to minimise emissions of noise as follows: • Implementing a Noise Management Plan; • Housing of electrolysers within acoustic containers; • Minimising of start-up and shut down periods; • Use of silencers on oxygen vents; • Use of acoustic hoods on process unit and utility unit air vents; • Selection of low noise generating equipment; • Facility will be unmanned with low number of vehicle movements and deliveries; and • Maintaining and operation of equipment in accordance with manufacturer's specifications. A Noise Impact Assessment undertaken in 2025[9] (enclosed as Appendix G) predicts that that the specific sound level will be equal to or less than the baseline background sound level. With appropriate measures implemented to prevent or where that it is not practicable to minimise noise impact, the rating level is below the background level at all but one nearby sensitive receptor. At the Properties on Bank Lane to the northwest of the site a +1dB difference during the day is predicted, and during the night a +2dB difference is predicted. A level difference between the rating level and the baseline background sound level of up to 5dB is, in accordance with BS4142, likely to be an indication of an adverse impact, depending on the context. It should be noted that the results of the NIA are considered to be conservative. It is based on sound power levels provided by the equipment manufacturers which are at guaranteed levels or based on applicable standards, rather than measured sound power levels. They are therefore conservative. SLR considers that the sound power levels provided are high compared to our experience. It is therefore proposed that noise monitoring as outlined in the Noise Management Plan is undertaken following commencement of operations to review the impacts. The Site Manager will be responsible for managing emissions of noise on site.			
Noise from traffic movements.	Sensitive receptors listed in Table 2 including residential, commercial, agricultural, recreational, and ecological receptors.	Air	The Site is located in a medium sensitivity setting with respect to noise. The surrounding landscape is comprised of commercial / industrial premises and residential areas from approximately 110m away. Traffic movements associated with the proposed facility will be minimal. Hydrogen produced at the site will be transported from site in pipework, as such no traffic movements to site will be associated with offloading hydrogen. Traffic movements associated with the facility will be limited to maintenance, inspection, and deliveries. As such, noise emissions associated with traffic movements to the site are expected to be low. Despite this, the following management techniques will be in place to ensure noise emissions from vehicles movements are eliminated:	Low	Noise disturbance and loss of amenity.	Low

[9] SLR Consulting (2025). Barrow Green Hydrogen Plant – Noise Impact Assessment. SLR ref. 416.066073.00001.

			• Vehicles will be required to adhere to a speed limit on site; and • Site surfaces will be kept in good repair to minimise noise associated with uneven roads. A record of the inspection findings will be made in the site diary. Remedial action will be taken in the event that noise from the site is detected at nearby sensitive receptor locations. The Site Manager will be responsible for managing emissions of noise on site.			

Table 5 Fugitive Emissions Risk Assessment and Management Plan

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequences	What is the overall risk
What has the potential to cause harm?	What is at risk/What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is the contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
To Air:						
Dust from vehicle movements	Sensitive receptors listed in Table 2 including commercial, agricultural and ecological receptors.	Air	The facility will be located within an industrial area, with tarmacked roadways on site. As such, vehicles will not be tracking over dusty roads. Vehicle movements to and from the facility will be limited due to the nature of the operations, limited largely to inspections, maintenance, and deliveries. Visual inspections will be conducted in response to any complaints. If dust is deemed a nuisance from any of these inspections, mitigation measures will be enforced to reduce any dust emissions. The result of any inspections or investigations as a result of complaints will be recorded in the Site Diary. The Site Manager will be responsible for managing emissions of dust on site.	Negligible	Nuisance and harm to human health	Negligible
To Water:						
Contaminated runoff.	Sensitive receptors listed in Table 2 including commercial, agricultural and ecological receptors. Groundwater.	Land	The drainage system on Site has been designed to prevent fugitive emissions to surface water or groundwater on Site in the event of accidental spillage or leakage. In addition to this, to prevent fugitive emissions to surface water or groundwater, BGH will: • Place spill kits at appropriate locations around the Site for use in absorbing and disposing of minor leaks and spills; • Implement a planned preventative maintenance and inspection regime including site surfacing, drainage and pollution control features such as full retention separator;	Low	Contamination	Very Low

			• Maintain procedures for the handling of deliveries to the Site; • Deliver training to staff on the safe handling of chemicals and the undertaking of inspections as relevant to their duties; and • Have procedures for responding to an incident involving a leak or spill. • Provide secondary containment for chemicals stored on Site. The Site Manager will be responsible for ensuring appropriate management techniques are employed on site to reduce the risk of contaminated run-off.			
Leakage of fuel, oil, and chemicals	Sensitive receptors listed in Table 2 including commercial, agricultural and ecological receptors.	Land	All site surfacing and operational areas will be lain with hard-standing or impermeable surfacing, with an engineered drainage system for pollution prevention control purposes. Tanks used for the storage of chemicals, will be constructed so that any leaks/spillages will be contained. Tanks will be surrounded by a leakage containment bund capable of containing at least 110% of the volume of the largest tank within the bund or 25% of the total tank volume within the bund, whichever is the greater. Fill points will be located within the secondary contained area to capture leaks during filling. Storage tanks will be constructed to the appropriate British Standard. Tanks will be regularly inspected visually by the site staff to ensure the continued integrity of the tanks and identify the requirement for any remedial action. Minor spillages will be cleaned up immediately, using sand or proprietary absorbent to clean up liquids and placed in alternative containers. Materials suitable for absorbing and containing minor spillages will be maintained on site. The site staff will undertake scheduled monitoring for evidence of spillage and leakage. Alongside regular visual inspections, the tanks will be fitted with level indicators to prevent overfilling. In the event of a major spillage immediate action will be taken to contain the spillage and prevent liquid from entering surface water drains and the unsurfaced ground. The spillage will be cleared immediately and placed in containers for off-site disposal and the EA will be notified. The site will be monitored for any spillages associated with vehicle movements and any identified incidents are cleaned up as soon as they are identified. The result of any inspections or investigations as a result of complaints will be recorded in the Site Diary. The Site Manager will be responsible for implementing risk management measures to ensure leakage of fuels and oil is minimised.	Low	Nuisance, potential risk to health	Low
Pests						

Birds, pests and insects.	Sensitive receptors listed in Table 2 including residential, commercial, agricultural recreational and ecological receptors.	Land, Water and Air	No putrescible waste will be brought to site or produced at the facility as a result of the hydrogen production process or any associated activities. As such, the risk of birds, pests or insects at the site is low. Visual inspections for pests will be conducted in response to any complaints. If pests are deemed a nuisance from any of these inspections, mitigation measures will be enforced to reduce any dust emissions. The result of any inspections or investigations as a result of complaints will be recorded in the Site Diary. The Site Manager is responsible for management of litter at the facility.	Low	Nuisance, potential risk to health	Negligible
Mud/Litter						
Litter	Sensitive receptors listed in Table 2 including residential, commercial, agricultural recreational and ecological receptors.	Air	No waste will be brought to site and waste which will be produced as a result of the hydrogen production process will not be capable of being wind blown. As such, the risk of litter at the site is low. Visual inspections for litter will be conducted in response to any complaints. If litter is deemed a nuisance from any of these inspections, appropriate litter picking will be introduced on site. The result of any inspections or investigations as a result of complaints will be recorded in the Site Diary. The Site Manager is responsible for management of litter.	Low	Nuisance from litter. Dangerous conditions on roads.	Negligible
Mud from vehicle movements	Local Road Network	Transferral of mud on vehicles wheels	The access roads to the site are all tarmacked and therefore present low risk in terms of transferring mud. All site vehicles will be checked to ensure that they are clear of mud prior to leaving the site. Good housekeeping will be put in place by the site manager, including regular cleaning and inspections. The site will be inspected regularly for signs of litter, mud or waste. Any identified instances of mud, litter or waste will be cleared immediately. The Site Manager is responsible for managing emissions of litter and mud on site.	Low	Nuisance from mud. Dangerous conditions on roads.	Negligible
Flooding	Sensitive receptors listed in Table 2 including residential, commercial, agricultural recreational and ecological receptors. Site personnel.	Land	The site lies in a Flood Zone 1, which is classified as having a 'low probability of flooding from rivers and the sea'. A Flood Risk Assessment (FRA) and Surface Water Management Plan was produced in 2022. This FRA details a number of measures which are in place across the wider industrial park, to minimise and control flood risk across the site. The FRA can be found in Appendix I. In the event of a flood, all Site Operatives will be evacuated from the site following an official evacuation procedure. The Site Manager is responsible for the management of the site in the event of flooding.	Low	Harm to human health, contamination of groundwater and surface water.	Very low

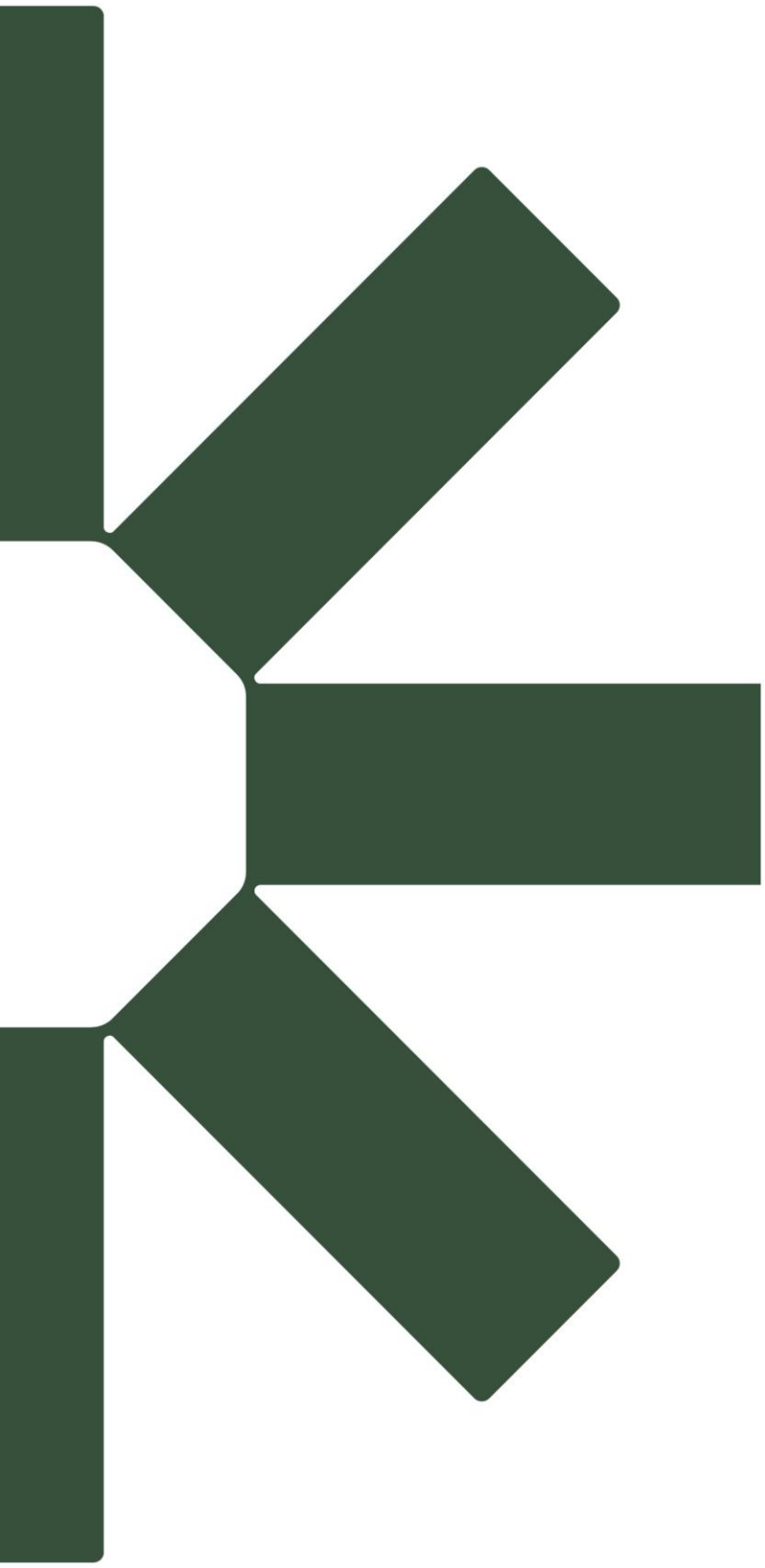
Security and Vandalism	Sensitive receptors listed in Table 2 including residential, commercial, agricultural recreational and ecological receptors.	Air, Land and Water	In order to prevent unauthorised access, the Site will be located within a fenced compound provided with access gates, 24 hour CCTV and an intruder detection system. Only authorised personnel will have access to the facility and operational areas. The Site will be inspected for damages to fencing. Any defects or damage which compromise the integrity of the compound will be made secure by temporary repair by the end of the working day. If suitable repairs are not possible before the end of the working day, suitable measures will be taken to prevent any unauthorised access to the site and permanent repairs will be affected as soon as practicable. The Site Manager will be responsible for managing security on site. This includes daily site inspections. All inspections, any defects, damage or repairs will be recorded in the Site diary.	Low	Nuisance, Contamination and harm to human health.	Low

5.0 Conclusion

To conclude, this ERA has been undertaken in accordance with EA guidance. The assessment is provided as part of the environmental permit application for Barrow Green Hydrogen Plant.

The qualitative risk assessment has considered that the proposed development will not pose a significant risk of harm to sensitive receptors in the vicinity of the site.

The assessment concludes that with the implementation of the risk management measures described above, potential hazards from the proposed variations are not likely to be significant and no further assessment is required.



Making Sustainability Happen

Appendix E Accident Risk Assessment and Management Plan

Accident Risk Assessment & Management Plan

Barrow Green Hydrogen Plant

Barrow Green Hydrogen Limited

Prepared by:

SLR Consulting Limited

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SLR Project No.: 416.066073.00001

19 January 2026

Revision: 1

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Barrow Green Hydrogen Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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1.0 INTRODUCTION

SLR Consulting Limited (SLR) has been instructed by Barrow Green Hydrogen Ltd (BGH) to prepare an environmental permit application for their proposed Barrow Green Hydrogen Project to be located on land at Meeting Industrial Estate, Barrow-in-Furness, LA14 4TL (hereafter referred to as 'the Site').

This Accident Risk Assessment & Management Plan has been undertaken in accordance with the Environment Agency's (EA) guidance 'Risk assessments for your environmental permit' (December 2025). The assessment considers risks posed to the environment and human health by the facility in the event of abnormal operating conditions and accidents. The risk assessment carried out includes an estimate, for each potential environmental accident scenario, of:

- Likelihood – the probability of the event taking place;
- Severity – the potential environmental impact as a result of the event occurring; and
- Overall risk to the environment – through a combination of likelihood and severity.

A ranking system has been used that attempts to objectively quantify each of these parameters. Tables 1, 2 and 3 describe the ranking systems for the likelihood, severity and overall risk, respectively.

Table 1 Likelihood Scoring System

Score	Category	Range
1	Extremely unlikely	Incident occurs less than once in a million years
2	Very unlikely	Incident occurs between once per million and once every 10,000 years
3	Unlikely	Incident occurs between once per 10,000 years and once every 100 years
4	Somewhat unlikely	Incident occurs between once per hundred years and once every 10 years
5	Fairly probable	Incident occurs between once per 10 years and once per year
6	Probable	Incident occurs at least once per year

Table 2 Severity Scoring System

Score	Category	Definition
1	Minor	Nuisance on site only (no off-site effects) No outside complaint
2	Noticeable	Noticeable nuisance off-site e.g. Discernible odours Minor breach of permitted emission limits, but no environmental harm One or two complaints from the public
3	Significant	Severe and sustained nuisance, e.g. Strong offensive odours or noise disturbance

Score	Category	Definition
		Major breach of permitted emissions limits with possibility of prosecution Numerous public complaints
4	Severe	Hospital treatment required Public warning and off-site emergency plan invoked Hazardous substance releases into water course with ½ mile effect
5	Major	Evacuation of local populace Temporary disabling and hospitalisation Serious toxic effect on beneficial or protected species Widespread but not persistent damage to land Significant fish kill over 5-mile range
6	Catastrophic	Major airborne release with serious offsite effects Site shutdown Serious contamination of groundwater or watercourse with extensive loss of aquatic life

Table 3 Risk Magnitude Scoring System

Likelihood	Severity of consequence					
	Minor	Noticeable	Significant	Severe	Major	Catastrophic
Extremely unlikely	1	2	3	4	5	6
Very unlikely	2	4	6	8	10	12
Unlikely	3	6	9	12	15	18
Somewhat unlikely	4	8	12	16	20	24
Fairly probable	5	10	15	20	25	30
Probable	6	12	18	24	30	36

Following the scoring system identified, the scenarios have been placed in the following categories:

- Acceptable (or low risk) – unshaded;
- Acceptable if the risk is controlled as far as is practicable (medium risk) – pink; and
- Unacceptable (high risk) – red.

The estimated overall risks are assessed to determine the appropriate measures to be undertaken, such as design and development of operating procedures used, to reduce the risk of accidents and minimise any resulting environmental impact.

The management programme emerging from this analysis is focused on addressing the highest risk scenarios as a priority.

1.1 Techniques to Reduce Risks

Table 4 presents the principal accidents scenarios for the facility that have the potential to cause significant environmental harm, together with the measures that the Site implements to minimise the risks and to control the consequences.

Henceforth, this accident assessment will be revisited on at least an annual basis. This review will include a review of the BAT guidance for identifying hazards and identifying techniques necessary to reduce the risks and take into account any significant changes to the operations/ process conducted on Site.

The following general measures will be undertaken to minimise the risk and effects of accidents:

- Procedures will be in place to record all accidents and to mitigate their consequences. These will include procedures to:
  - manage and control raw materials and wastes;
  - control operations including start up;
  - address non-conformances (including emergencies) and implement corrective or preventative actions; and
  - control and respond to leaks, spills and emergencies.
- The site Health and Safety Policy will address:
  - Accident reporting;
  - Audits including environmental elements; and
  - Fire prevention and control and evacuation procedures.
- Specialised training needs will be reviewed and identified on an annual basis which will include selected personnel being trained in emergency preparedness and response. This will cover incident response techniques, including chemical and liquid spill containment, firefighting, control of releases to air and all activities with potentially significant environmental effects;
- Routine safety inspections will be undertaken to ensure that equipment is suitable for use;
- A preventative maintenance programme will be also implemented at the installation to minimise the risk of unplanned stoppages and potentially serious incidents; and
- Internal audits will be undertaken of all emergency and spill procedures.

1.2 Safety

Safe working practices will be ensured by adherence to company procedures and systems. Pertinent features of these are summarised below:

- Hazardous Materials – All materials used on Site will be assessed and controlled under the Control of Substance Hazardous to Health (COSHH) Regulations. BGH will maintain an up-to-date inventory of all substances present on Site which could have environmental consequences if they escape. Procedures will be place for checking raw materials and wastes to ensure compatibility with other substances with which they may accidentally come into contact.
- Operators – It is anticipated that the Site will have a stable workforce with low turnover of personnel. Training, which will include recognition and control of potential

environmental incidents, will mainly be task related and will be conducted and supervised by experienced senior staff.

- Process Control – Process equipment will be designed and operated to ensure that process parameters are controlled within acceptable limits. There will be safe shutdown procedures for key processes.
- Permits-to-Work – The Site will operate a comprehensive pre-authorisation procedure for work to be performed on Site by third parties, which will take into account the nature of the task and its location.
- Communication – Procedures will exist to avoid incidents occurring as a result of poor communication among operations staff during shift changes, maintenance or other engineering work that may be being performed.
- Incidents – Abnormal occurrences resulting in injury, loss of material, damage to buildings or equipment and 'near misses' will be subject to a reporting and investigating procedure that will be designed to establish the basic cause and to prevent future recurrence.
- Process Modifications – Proposed changes to plant and processes will be assessed for potential health, safety, and environmental impact by a Management of Change Procedure.
- Site Security – The Site will maintain a high level of security to reduce the risk of vandalism.

Table 4 Accident Risk Assessment & Management Plan

Accident or abnormal release scenario	Likelihood of occurrence	Consequences of occurrence	Severity of occurrence	Risk Rating	Actions taken or proposed to minimise the chances of it happening	Actions planned if the event does occur
Failure of hardstanding resulting in ground contamination	3	Potential ground contamination with organic oils, fuel and lubricating oils, liquid and soluble raw materials.	2	L	Inspection and maintenance of hard standing areas.	Invoke spill containment procedures. Clean up according to COSHH data sheets and appropriate disposal arrangements. Resurface as necessary. Inform EA in the event of a permit condition breach.
Vehicle collision	2	Damage to equipment and fire Loss of life / injury	6	M	Speed limit implemented on Site. Traffic signage on Site. Restricted access to the Site Collision protection barriers to be installed Laybys / passing areas provided on site Low traffic volume on Site	Emergency Shutdown System (ESD) procedures will be implemented. Invoke emergency procedures and business recovery plan. Inform EA in the event of a permit condition breach.
Major fire	2	Loss of containment of stored chemicals. Damage to equipment	3	L	Fire alarm detection and suppression systems will be installed, maintained and tested. The detection devices form part of an integrated Fire and Gas System (FGS) which shall, on detection of a fire or loss of containment of hydrogen, automatically initiate the appropriate active fire protection measures and initiate the appropriate level of shutdown. Confirmed fire or gas detection will implement electrical isolations in the affected area as required. Emergency procedures will be in place. Permit to work system to control hot work etc. No smoking on Site. Preventative maintenance on all electrical systems. Provision of manual extinguishers. Pressure release valves on equipment ICSS system (alarm and shutdown trips) Hazardous area classification and certification Restricted access on Site Use of fire rated architectural materials Escape plans and fire exits / signage to be in place	In the event of a confirmed fire or gas incident, the FGS will request the Emergency Shutdown System (ESD) to initiate an appropriate level of shutdown (e.g., Total, Production, per electrolyser, or Unit). Inform EA in the event of a permit condition breach.
Minor fire	2	Loss of containment of stored chemicals. Damage to equipment	3	L		
Failure to contain firewater	1	Contaminated waters from fire control entering surface water network	4	L	Surface water discharge from Site to be shut off in the event of a fire in Site. Firefighting approach to be based on letting fire be starved of fuel due to limited inventory of hydrogen to be stored on Site. Attenuated water would be tankered off-Site to suitably licensed wastewater treatment facility.	Surface water discharge from Site to be shut off in the event of a fire in Site. Attenuated water would be tankered off-Site to suitably licensed wastewater treatment facility. Inform EA in the event of a permit condition breach.
Vandalism / arson	2	Range of damage to equipment e.g. bulk storage and pipe work with consequent release to air / ground / surface water / sewer. Fire	3	L	Site security measures will be in place including: • Perimeter fence • Restricted access • 24-hour CCTV • Control room and substation buildings locked. • All visitors will be required to sign in and out. Regular inspection of perimeter fences. Any defects or damage which compromise the integrity of the fencing or access gates will be made secure	Emergency Shutdown System (ESD) procedures will be implemented in the event of unauthorised access to the Site. Address any specific equipment damage. Reinstate and review security measures. Inform EA in the event of a permit condition breach.

Accident or abnormal release scenario	Likelihood of occurrence	Consequences of occurrence	Severity of occurrence	Risk Rating	Actions taken or proposed to minimise the chances of it happening	Actions planned if the event does occur
					by temporary repair by the end of the working day. Permanent repairs will be affected as soon as practicable.	
Flood	2	Damage to equipment Contamination of water by chemicals stored on Site.	3	L	A Flood Risk Assessment (FRA) and Drainage Strategy is in place to manage the risk of flooding on the Site. These measures will minimise and control flood risk across the Site.	Take appropriate corrective and preventative actions to minimise environmental impact (such as sand bagging and removal of potentially polluting materials from Site). Inform EA in the event of a permit condition breach.
Fuel / oil spills from vehicles	5	Uncontrolled release to drainage system / surface water / sewer.	1	L	Maintenance vehicles to undergo regular inspection and maintenance No refuelling of vehicles on Site Full retention separators installed on Site.	Invoke spill containment procedures. Clean up according to COSHH data sheets and appropriate disposal arrangements. Shut off discharge from Site. Inform EA in the event of a permit condition breach.
Accidental activation of alarms / sirens	3	Noise complaints.	2	L	Preventative maintenance programmes.	Stop noise source, repair and review. Inform EA in the event of a permit condition breach.
Loss of containment of water treatment chemicals	2	Harmful to aquatic environment	3	L	Operating procedures in place for deliveries Containers to be provided with secondary containment Fill points to be provided with containment Spill control procedures and kits to be supplied	Invoke spill containment procedures. Clean up according to COSHH data sheets and appropriate disposal arrangements. Shut off discharge from Site. Inform EA in the event of a permit condition breach.
Lightning	2	Damage to equipment Ignition of hydrogen	3	L	Electrical earthing and lightning protection to be installed Design of venting considers risk of ignition	Emergency Shutdown System (ESD) procedures will be implemented. Address any specific equipment damage. Inform EA in the event of a permit condition breach.
Explosion	2	Damage to equipment Loss of life / injury	6	M	Hydrogen detection systems to be installed Ignition control on Site Building room designs to consider explosion and overpressure Pressure release valves on equipment ICSS system (alarm and shutdown trips) Hazardous area classification and certification	Emergency Shutdown System (ESD) procedures will be implemented. Invoke emergency procedures and business recovery plan. Inform EA in the event of a permit condition breach.
Power supply failure	5	Loss of power	1	L	Emergency shut-down procedures in place	Emergency Shutdown System (ESD) procedures will be implemented. Restart plant when power supply reinstated. Inform EA in the event of a permit condition breach.

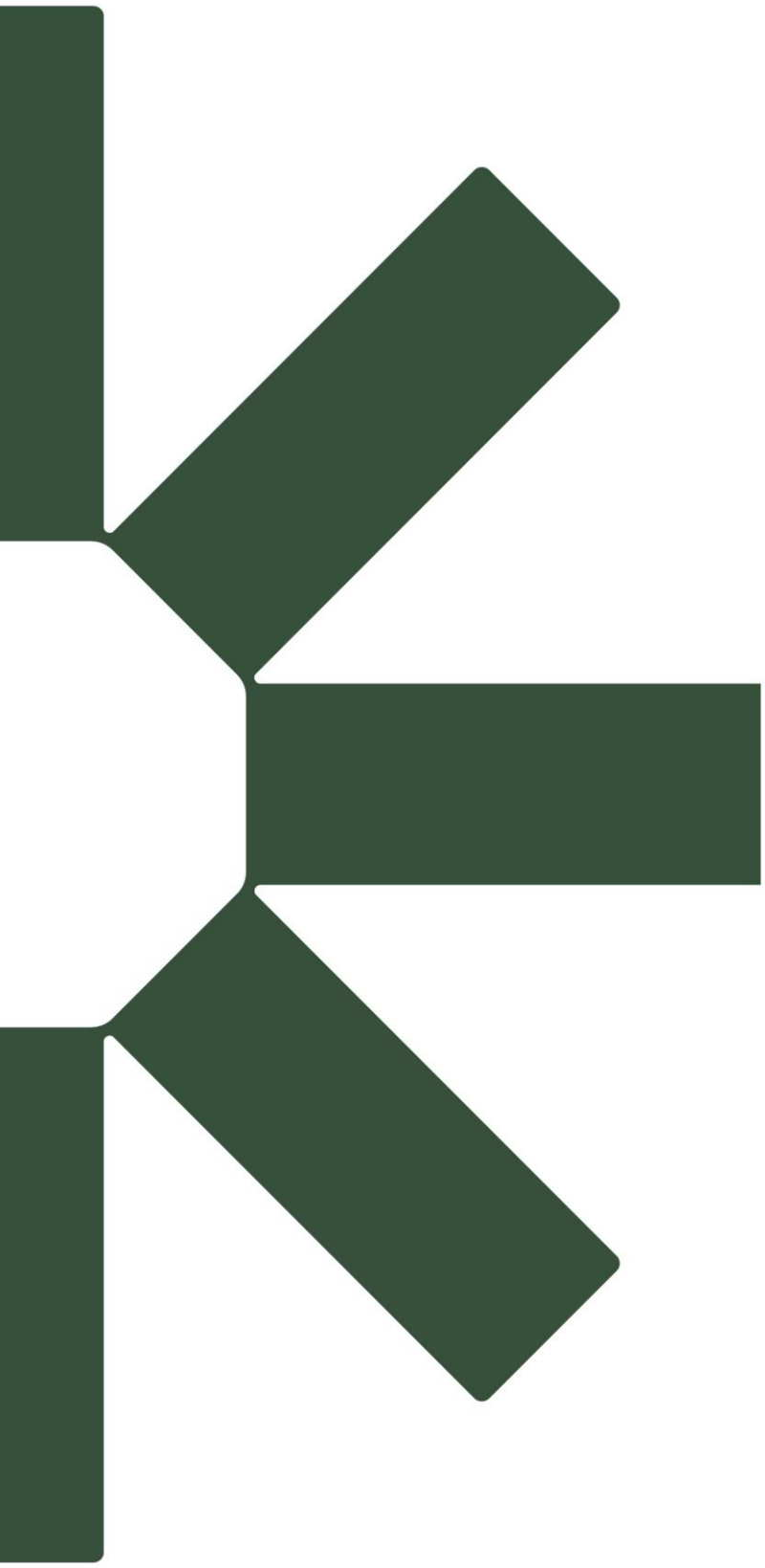
2.0 CONCLUSION

To conclude, this risk assessment has been undertaken in accordance with EA guidance. The assessment is provided as part of the environmental permit application for the Barrow Green Hydrogen Plant.

The qualitative risk assessment has considered risks posed to the environment and human health by the facility in the event of abnormal operating conditions and accidents.

The assessment identifies risk management measures to avoid, or where that is not possible, minimise the likelihood and severity of impacts from abnormal operating conditions and accidents.





Making Sustainability Happen

Appendix F Site Condition / Baseline Report

Site Condition and Baseline Report

Barrow Green Hydrogen Plant

Barrow Green Hydrogen Limited

Prepared by:

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Bristol, BS2 0EQ

SLR Project No.: 416.066073.00001

19 January 2026

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Revision Record

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1	19 January 2026	EL	CM	GA
	Click to enter a date.			
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Basis of Report

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C.1 Relevant Hazardous Substances Assessment

1.0 Introduction

SLR Consulting Limited (SLR) has been commissioned by Barrow Green Hydrogen Limited (BGH) to prepare a Site Condition and Baseline Report in support of an Environmental Permit (EP) application for their proposed Barrow Green Hydrogen Plant (BGHP) operated by Barrow Green Hydrogen Ltd (BGH), located at Meetings Industrial Estate, Park Road, Barrow-in-Furness, LA14 4TL (hereafter referred to as 'the Site').

This report combines both the requirements of a Site Condition Report and Baseline Report into a single document.

The following sections of this report introduce the Site, the assessment works undertaken and reporting of the baseline soil and groundwater conditions at the Site.

1.1 Scope of Work and Study Limitations

This Site Condition Report (SCR) aims to record and describe the condition of the land prior to the commencement of any operations within the proposed EP installation boundary. It has been prepared in accordance with the Environment Agency's (EA) Site Condition Report H5 guidance with regards to the requirements of a baseline report to meet the requirements of Article 22 (2) of Industrial Emissions Directive (IED).

This SCR will provide a point of reference and baseline environmental data so that when the EP is surrendered it can be demonstrated that there has been no deterioration in the condition of the land as a result of the Installation operations and ensure that the condition of the land is in a 'satisfactory state'.

Additionally, where an environmental permitted activity produces, uses or releases Relevant Hazardous Substances (RHS) (as detailed in Article 3(128) of the IED), a risk assessment is required in accordance with Article 22(2). This SCR also includes an assessment of potential risk from RHS.

The location of the site is illustrated in Drawing 01. The site layout; site boundary and proposed EP boundary and emission points are presented on Drawing 02.

Sections 1 to 3 of the EA's SCR template[1] (have been completed within this document and comprise the following aspects:

- Site details (Chapter 2);
- Condition of the land at permit issue (Chapter 2);
- Geology (Chapter 2);
- Hydrology (Chapter 2);
- Hydrogeology (Chapter 2);
- Pollution history (Chapter 2);
- Evidence of historic contamination (Chapter 2); and
- Permitted activities (Chapter 3).

Sections 4 to 7 of the SCR template will be maintained during the life of the EP and Sections 8 to 10 will be completed and submitted in support of the application to surrender the EP.

[1] EA Environmental Permitting Site Condition Report Guidance https://www.gov.uk/gov7ernment/publications/environmental-permitting-h5-site-condition-report accessed June 2025.

1.2 Sources of Information

SLR has collected and reviewed various reports and drawings to characterise the Site and its surrounds. These sources are as follows:

- Multi Agency Geographical Information for the Countryside[2] (MAGIC) map;
- Landmark Envirocheck Report;
- British Geological Survey[3];
- EA. Flood map for planning[4];
- ECHA: European Chemicals Agency Substance Information[5]; and
- Water Framework Directive Environmental Agency Confirmed Hazardous Substances List[6].

The following reports were also reviewed and are referred to, and should be read in conjunction with this report:

- Envirocheck Report (enclosed within Appendix A to this report); and
- Ground investigation at Gyrodata limited, Barrow in Furness, Cumbria, report no. 5651, November 2012 (enclosed within Appendix B to this report).

Information from the above sources is included within the following sections of this report.

2.0 Site Condition Report

The aim of this SCR is to describe and record the condition of the land and groundwater at the site at the point of applying for an environmental permit. This SCR will enable BGH to demonstrate that they have protected the land and groundwater by updating the SCR during the lifetime of the permit as appropriate.

Sections 1 to 3 of this SCR have been completed using an Envirocheck Report as presented in Appendix A and the Ground investigation at Gyrodata limited, Barrow in Furness, Cumbria, report no. 5651, November 2012 presented in Appendix B. This will be updated prior to development of the Site as further site investigations are planned prior to commencement of construction activities.

Throughout the lifetime of the site, records will need to be maintained for the purposes of completing Sections 4-7 of this SCR.

Upon cessation of the activities at the site, Sections 8-10 are to be completed to support an application to surrender the site's environmental permit.

[2] Multi-Agency Geographical Information for the Countryside Map, available at www.magic.defra.gov.uk, accessed in June 2025.

[3] British Geological Survey, available at http://www.bgs.ac.uk, accessed June 2025.

[4] Flood map for planning, available at https://flood-map-for-planning.service.gov.uk/, accessed June 2025.

[5] ECHA: European Chemicals Agency Substance Information. Accessed at: Homepage - ECHA (europa.eu). Accessed June 2025.

6 Water Framework Directive Environmental Agency Confirmed Hazardous Substances List. Accessed at '2018 01 31 Confirmed hazardous substances list_0.pdf (wfduk.org)'.

2.1 Site Details

Name of the applicant	Barrow Green Hydrogen Ltd
Activity address	Meeting Industrial Estate, Barrow-in-Furnace, LA14 4BB
National grid reference	SD 19312 72067
Document references for site plans (including location and boundaries)	Drawing 01 Site Location Plan, July 2025 Drawing 02 Site Layout & Environmental Permit Boundary, July 2025

2.2 Condition of the Land at Permit Issue

Environmental setting including: • geology • hydrogeology • surface waters	**Geology** The British Geological Survey (BGS) does not record Made Ground within the vicinity of the site. Superficial deposits beneath the site are recorded to comprise Till. The underlying bedrock comprises sandstone of the St Bees Sandstone Member. The ground investigation undertaken in 2012 (Appendix B) recorded Made Ground or topsoil overlying natural clay deposits. The ground conditions encountered during the 2012 site investigation are summarised below. Made ground was encountered at ground level in three locations in the east of the site. Boreholes BH1, BH2 and BH3 recorded Made Ground to depths of 0.30m, 0.10m and 1.10m, respectively. In BH2 and BH3 Made Ground was cohesive described as gravelly slightly sandy silty clay with gravel described as "fine to coarse stone and brick". In BH1 the Made Ground was granular and comprised brown clayey fine to coarse gravel and cobble sized fragments of stone, brick, concrete and pottery. Topsoil was encountered in boreholes BH4 to BH11 to depths of between 0.20m to 0.50m. Natural clay deposits were encountered in all of the boreholes beneath Made Ground or topsoil at depths of between 0.10m and 1.10m bgl to the base of the boreholes at approximately 6.5mbgl. Deposits comprised mainly firm becoming stiff slightly gravelly locally slightly sandy silty clay with localised sand lenses. The gravel comprised mainly fine to coarse quartz and siltstone.

	Off-site, approximately 300m southwest of the site is BGS borehole record for a deep groundwater monitoring borehole (Ref: SD17SE65) advanced in 1977 which recorded the following: • Topsoil at ground level to 0.5mbgl • Boulder Clay (Till) at depths of between 0.5mbgl an 14mbgl and between 23m and 40.25mbgl. • The two layers of Till were separated by a Gravel layer (9m thickness). • The St. Bees Sandstone was recorded at 40.25mbgl extending to c.170mbgl. **Hydrogeology** The Sandstone bedrock is classified as a Principal aquifer and the superficial deposits are classified as a secondary undifferentiated aquifer. The site is located within a Zone 3 Source Protection Zone (SPZ). There are no records of potable water abstraction licenses within 500m of the site. There are seven groundwater abstraction licenses recorded within 2,000m of the site: • Kimberley Clark- 119m North of the site, an active groundwater abstraction, Licence No: 2674811015 • Kimberley Clark- 605m North of the site, an active groundwater abstraction, Licence No: 2674811017 • United Utilities Water Ltd- 1119m South of the site, an active groundwater abstraction, Licence No: 2674811008 • Courtaulds Films & Packaging- 1230m North of the site, an active groundwater abstraction, Licence No: 2674811007 • United Utilities Water Ltd- 1289m Southeast of the site, an active groundwater abstraction, Licence No: 2674811009 • Courtaulds Films & Packaging- 1403m North of the site, an active groundwater abstraction, Licence No: 2674811014 The previous ground investigation did not encounter groundwater in the eleven boreholes drilled to approximately 6.5mbgl. The BGS monitoring borehole approximately 300m southwest of the site is monitored regularly. Monitoring records are held by DEFRA[7] (Ref: Ormsgill SD17_5) which records groundwater between approximately

[7]Hydrology Data Explorer, Accessed 20/06/2025: https://environment.data.gov.uk/hydrology/station/eb5981e3-643b-4505-b0e1-7d2fc8447236

	10.3mAOD (January 2025) to 7.0mAOD (June 2025), although in previous years groundwater was higher at approximately 12mAOD. The subject site lies at approximately 19mAOD, the groundwater levels recorded off-site correspond to around 9m and 12mbgl (below ground level). **Hydrology** There is a pond located on the western part of the site. The Walney Channel is located 330m to the west from the site's boundary. According to the EA's Flood Map for Planning[8] the site is located within a flood zone 1 (low probability of flooding).
Pollution history including: • pollution incidents that may have affected land • historical land-uses and associated contaminants • any visual/olfactory evidence of existing contamination • evidence of damage to pollution prevention measures	**Site Land Use** The site has remained largely un-developed according to historical maps dating back to 1850. A footpath and stream run along the north boundary of the site and a path that runs north to south on the western part of the site. In 1895, 'Park Road' is constructed that runs across the site from north to south and a railway line is seen on the west of the site. The site was predominantly used as agricultural land until the first uses were noted around 1956 when the northeast of the site began to be used for residential housing. A map from 2001 shows that an Industrial Estate is established which is named Haws View Industrial Estate in 2016 and later called Meetings Industrial Estate in 2024. A pond is seen on the west of the site on a map from 2024. Current aerial photography shows the site in use as a construction laydown area and car park with a temporary cabin on the northern side. **Surrounding Land Use** Historical maps dating back to 1850 show that the surrounding areas are used for agriculture. Bank Lane is located 130m to the north of the site. Sowerby Woodland is located 150m to the north. Sandstone quarries are located approximately 515m to the east as well as 620m northeast of the site. A Cemetery is seen 655m southeast of the site. A pond is seen 80m to the east of the site up until 1916 when it was likely infilled with Made Ground. A map from 1873 shows a brickworks and clay pit located 280m to the south. A residential estate is seen 375m to the south and 730m to the east of the site. Hawcoat Quarry is seen 515m to the southeast. Furness Railway runs approximately 620m southeast and south of the site. Ormsgill Farm is located 630m

[8] https://flood-map-for-planning.service.gov.uk/

	south of the site. Upper Ormsgill Reservoir (Barrow Hemalite Iron and Steel Works) is located 730m south of the site. In 1895, a Steel Casting Works is seen 725m south of the site. A map from 1913 shows a Slag Reduction Works 410m southwest of the site and Bakemoor Hospital 945m to the northeast. A residential estate is seen 885m southeast of the site. A 1931 map shows that there is now an allotment garden located 300m south of the site and within Sowerby Woodland approximately 285m north of the site. Barrow Golf Course is established 550m northeast of the site. In 1956, a clothing factory is seen at the southeastern boundary of the site. In 1989, the factory becomes a depot which later becomes part of an Industrial Estate in 2001. In 1966, a pond is seen 155m south of the site as well as a Sewage Disposal Works is seen 260m southwest of the site. An electrical works is seen 80m north of the site. An Industrial Waste Recovery Plant is seen 330m northwest of the site. The Woodland area to the north of the site is now a paper factory. A map from 2001 shows that the Slag Reduction Works in the southwest of the site is now a disused tip and the paper factory has become a mill. By 2016, Upper Ormsgill Reservoir becomes a playing field. The surrounding areas remain fairly similar from here to date based on historical maps and aerial photography. **Pollution History** <u>Pollution Incidents</u> There are several pollution incidents within 500m of the site recorded within the Envirocheck report (Appendix A). • The closest of which was a fire which occurred on 17/07/1995, 172m southwest of the site which involved chemicals like detergents and surfactants from fire water. It was classified as category 3 (minor incident) for the Walney Channel. • There was a mechanical failure incident on 07/01/1996, 211m north of the site which was classified as a category 2 – significant incident. The chemical pollutants from this mechanical

incident are unknown but were discharged into the Walney Channel.

Discharge Consents

There are several licensed discharge consents which have been permitted within 500m of the site, the closest of which are:

- Mr Dave Armer, 253m northwest of the site was consented (05/06/2009) to discharge sewage-final/treated effluent into a tributary of Scarth Channel.
- Scott Ltd for process water trade discharges into tributary Scarth Hole consented on 25/07/1988 and 23/06/1993, located 338m north of the site.
- United Utilities Water Limited, 372m southwest of the site was consented (12/01/1980) to discharge stormwater overflow into Walney Channel. This consent was revoked on 30/01/1985. United Utilities Water Limited have had several sewage discharge consents into the Walney Channel over the years.

Control of Major Accident Hazards (COMAH) Sites

- The Envirocheck Report states that CSI Wood Protection Ltd operate an Upper Tier COMAH site 179m northeast of the Site. There is no record of this establishment on the HSE's 'Public information on establishments subject to COMAH 2015' register however.

Integrated Pollution Prevention and Control sites

There are 2 Integrated Pollution Prevention and Control (IPPC) Part A permits or B permits within 500m of the site enclosed within the Envirocheck report in Appendix A, these are:

- County Coachbuilders (Barrow) Limited, a car body repair company, located 110m northeast of the site; and
- Kimberly-Clark Limited, a manufacturer and provider of essential, personal care products located 391m north of the site.

Active Landfills

There are no active landfill sites within 500m of the site.

Historical Landfills

The site does not lie within 500m of historical landfill sites.

Historical waste sites

	There are no historical waste sites located within 500m of the site. <u>Licensed Waste Sites</u> There are no licensed waste sites situated within 500m of the site. <u>Waste exemptions</u> There are no waste exemptions registered at sites located within 500m of the site.
Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	Based on a site investigation report for Gyrodata limited (Appendix B), no visual or olfactory indications of contamination were observed on site. However, the contaminants analysis is restricted to common contaminants in the absence of historical evidence of the source of the made ground and that the absence of other specific contaminants cannot be guaranteed. The contamination analysis determined no elevated levels of contaminants when compared with the guideline values for a standard land use of commercial and industrial. The findings of this report suggest that there is a low likelihood of the site being considered contaminated land as defined under Part 2A of the Environmental Protection Act.
Baseline soil and groundwater reference data	Refer to Appendix B. Note, further site investigations are planned for the Site prior to commencement of construction and this data will be supplemented with that obtained.
Supporting information	The environmental site setting information has been sourced from *Envirocheck* (Appendix A), Ground Investigation at Gyrodata Ltd Report no. 5651, November 2012 (Appendix B), MAGIC maps[9] and British Geological Survey[10].

2.3 Baseline Soil and Groundwater Reference Data

The European Commission Guidance concerning baseline reports under *Article 22(2) of Directive 2010/75/EU on industrial emissions 2014/C 136/03*[11], outlines that a number of key tasks should be undertaken to both determine whether a baseline report needs to be produced for a particular situation and in order to produce the baseline report itself. Eight stages have been identified in this process, covering the following main elements:

- Stages 1-3: to decide whether a baseline report is required;
- Stages 4-7: to determine how a baseline report has to be prepared;

[9] https://magic.defra.gov.uk/MagicMap.html

[10] https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/

[11] Communication from the Commission — European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions (europa.eu)

- Stage 8: to determine the content of the report

Where during stages 1-3 it is demonstrated on the basis of the available information that a baseline report is not required, the IED state the '*there is no need to progress to the later stages*'. However, a record of this decision should be provided to the competent authority.

2.3.1 Stages 1-3

- Stage 1: Identify which hazardous substances are used, produced or released at the installation and produce a list of these hazardous substances.

  Stage 2: Identify which of the hazardous substances from Stage 1 are 'relevant hazardous substances' (RHSs). Discard those hazardous substances that are incapable of contaminating soil or groundwater. Justify and record the decisions taken to exclude certain hazardous substances.

  Relevant hazardous substances' *are those substances or mixtures defined within Article 3 of Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) which, as a result of their hazardousness, mobility, persistence and biodegradability (as well as other characteristics), are capable of contaminating soil or groundwater and are used, produced and/or released by the installation.*

- Stage 3: For each relevant hazardous substance brought forward from Stage 2, identify the actual possibility for soil or groundwater contamination at the site of the installation, including the probability of releases and their consequences, and taking particular account of:
  - the quantities of each hazardous substance or groups of similar hazardous substances concerned;
  - how and where hazardous substances are stored, used and to be transported around the installation;
  - where they pose a risk to be released; and
  - in the case of existing installations also the measures that have been adopted to ensure that it is impossible in practice that contamination of soil or groundwater takes place.

2.3.2 Stages 4-7

Stages 4 to 6 involves the collation of site-specific data to outline the site history and environmental setting to outline the sensitivity of the site to potential risk from accidental releases of RHS.

Stage 7 outlines the requirement to collect intrusive soil and groundwater data to characterise the land at the start of permitted activities and set the 'baseline' land quality data.

2.3.3 Stage 8

Stage out outlines the requirement for a baseline report in line with Article 22(2) of the IED.

2.3.4 IED Baseline Assessment for the Site

Set out below in Table 1-5 are details of how Barrow Green Hydrogen Ltd will meet the baseline data requirements for the Site.

Table 1 Industrial Emissions Directive Baseline Data Requirements

Stage	Activity	Objective	How The Requirements Have Been Met
1	Identify which hazardous substances are used, produced or released at the installation.	Determine whether hazardous substances are used, produced or released in view of deciding whether a baseline report is required. If yes: produce a list of all potential hazardous substances.	Stage 2 within this table contains a list of chemicals used at the site. Where hazardous substances are stored internally on hard standing at the Site and the risk of pollution of soil and groundwater as a result of accidental release is considered to be negligible; these substances are not considered further in this assessment. A list of potentially hazardous substances used or produced onsite that are stored externally and /or have the potential to result in the contamination of soil and groundwater are presented below. The potential for RHS derived from historical sources is also considered as part of this assessment. As a result of the operation of the proposed activity: • Oils and greases. As a result of historical land use: Potential hazardous substances from the railway sidings: • TPH. • Polycyclic aromatic hydrocarbons (PAH). • Metals. General Made Ground present at the site means the presence of the following cannot be discounted: • Metals. • TPH. • Gases (including CO_2, H_2S, CH_4, CO) • Asbestos • Acidic/alkaline soil.

<table>
<tr><th>Stage</th><th>Activity</th><th>Objective</th><th>How The Requirements Have Been Met</th></tr>
<tr><td>2</td><td>Identify which of the hazardous substances from Stage 1 which, according to the evaluation by a suitably qualified and experienced person, and because of their hazardous potential (toxicity, mobility, persistence and biodegradability, as well as other characteristics), are capable of contaminating soil or groundwater.
Discard those hazardous substances that are incapable of contaminating soil or groundwater. Justify and record the decisions taken to exclude certain hazardous substances.</td><td>To restrict further consideration to only the relevant hazardous substances (RHS) that are capable of contaminating soil or groundwater in view of deciding on the need to prepare and submit a baseline report.</td><td>A review of the raw materials present at the site that are considered to be an RHS substance are presented below:
<table><tr><th>Hazardous Substance</th><th>Use of Material</th></tr><tr><td>Maintenance oils and greases</td><td>Maintenance</td></tr></table>
The risk phrases used in the RHS Assessment are presented in Appendix C.
The following RHS stored in quantities above 205 litres have been identified in the proposed production process:
• None.

The substance detailed above would be capable of contaminating soil and groundwater if there were no mitigation measures in place at the Installation.
However, mitigation measures will ensure that no contamination occurs as a result of the proposed activities to be undertaken at the site, refer to the following for a list of mitigation measures utilised onsite:
• Environmental Risk Assessment
• Best Available Techniques and Operating Techniques
The Facility will be managed by technically competent personnel in accordance with site procedures and the Environmental Management System (EMS). This will ensure good practice on site and minimise environmental risk throughout the operation.</td></tr>
<tr><td>3</td><td>Identify the possibility for soil or groundwater contamination at the site for each relevant hazardous substance brought forward from Stage 2 of the installation, including the probability and the</td><td>To identify which of the hazardous substances from Stage 2 represent a potential pollution risk at the site based on the likelihood of emissions of such substances occurring.</td><td>As detailed in Stage 2, mitigation measures in place will protect the groundwater, surface water and soil within the installation permit boundary from contamination from the existing and proposed site activities.
Appendix C presents the RHS Assessment for the site. This assessment outlines the RHS used on site and what controls are used to minimise these risks.
This assessment identifies the RHS stored and used at the site and the locations in which they are present. The assessment then assesses the adequacy of the containment and</td></tr>
</table>

Stage	Activity	Objective	How The Requirements Have Been Met
	consequences of releases, including - the quantities of each hazardous substance concerned; - how and where they are stored; - how they are to be transported around the installation; - how they are used - where they are emitted - measures that have been and, for new installations, will be adopted to protect soil and groundwater at the installation.	**These are the 'relevant' hazardous substances for which information must be included in the baseline report.** Note: Where it is found that there is **no possibility of soil and groundwater contamination, then a baseline report does not need to be prepared or submitted** (due to the quantities of the hazardous substances used, produced or released). However, in these cases it is expected that a record of such a decision, including the reasons for the decision, will be made and held by the competent authority.	pollution prevention measures used to prevent loss of potential pollutants to the soil and groundwater underlying the site. The assessment identifies those materials / activities where the pollution prevention measures are considered to be suitable and sufficient, and hence where no credible risk of pollution occurring exists. Where applicable, it also identifies those materials / activities where a credible risk of pollution occurring exists, and hence the presence of such pollution risk should be used to inform the scope of any intrusive site investigation required to collate baseline data on the site condition. The RHS Assessment (Appendix C) has concluded that there is no credible risk potential pollution impacting on soil and groundwater as a result of the activities proposed to be regulated under the EP.
4	Provide site history	Identify potential sources which may have resulted in the relevant hazardous substances identified in Stage 3 being already present on the site of the installation.	Please refer to Section 2 of this SCR for details of past land use and historic pollution incidents.

Stage	Activity	Objective	How The Requirements Have Been Met
5	Identify the site's environmental setting	Determine where hazardous substances may go if emitted and where to look for them. Also identify the environmental media and receptors that are potentially at risk and where there are other activities in the area which release the same hazardous substances and may cause them to migrate onto the site.	Refer to the ERA included with this EP application for details of the site's surroundings and details of present environmental settings.
6	Use the results of Stages (3) to (5) to describe the site, in particular, demonstrating the location, type, extent and quantity of historic pollution and potential future emissions noting the strata and groundwater bodies likely to be affected by those emissions – making links between sources of emissions, the pathways by which pollution may move and the receptors likely to be affected.	Identify the location, nature and extent of existing pollution on the site and determine which strata and groundwater bodies might be affected by such pollution. Compare with potential future emissions to see if areas are coincident.	The RHS Assessment (Appendix C) indicates that there is no credible risk of potential pollution impacting on soil and groundwater as a result of the activities proposed and management practices in place. However, there are potential historical sources of pollution located at the site: • The railway line to the west of the site. • Potential for Made Ground located below the site. There is no credible risk of pollution from the proposed onsite activities. However, SLR recommend that BGH undertake baseline soil and groundwater monitoring. Establishing baseline soil and ground conditions at the start of the EP will avoid potentially more stringent clean up criteria being applied by the EA at site surrender. Also as stated in the H5 Guidance: 'if you choose not to submit any monitoring data…. you will be accepting the risk that you may be required to clean up pre-existing contamination when you surrender your permit.'
7	If there is sufficient information to quantify the state of soil and	Collect additional data as is necessary to allow a quantified assessment	There is no credible risk of pollution from the proposed activities due to low number and small quantities of hazardous substances to be used, produced or released on site, combined with containment and environmental management procedures that will be

Stage	Activity	Objective	How The Requirements Have Been Met
	groundwater pollution by relevant hazardous substances on the basis of Stages (1) to (6) then go directly to Stage 8. If insufficient data exists, then intrusive investigation of the site will be required in order to gather such information.	of soil and groundwater pollution by relevant hazardous substances.	implemented. However, SLR recommend that BGH undertake baseline soil and groundwater monitoring as the current data set is insufficient to quantify the current state of soil and groundwater pollution by relevant hazardous substances. Establishing baseline soil and ground conditions at the start of the EP will avoid potentially more stringent clean up criteria being applied by the EA at site surrender. Also as stated in the H5 Guidance: *'if you choose not to submit any monitoring data…. you will be accepting the risk that you may be required to clean up pre-existing contamination when you surrender your permit.'*
8	Produce a baseline report for the installation that quantifies the state of soil and groundwater pollution by relevant hazardous substances	Provide a baseline report in line with the IED.	This report '416.066073.00001_Barrow_SCR' provides a baseline report in line with Article 22(2) of the IED.

2.3.5 RHS Assessment Conclusion

There is no credible risk of pollution incidents from RHS from the proposed onsite activities due to the low number and small quantities of hazardous substances to be used, produced or released on site in combination with containment and environmental management procedures in place. However, SLR recommend that BGH undertake baseline soil and groundwater monitoring as the current data set is insufficient to quantify the current state of soil and groundwater pollution by RHS from historical land use.

Establishing baseline soil and ground conditions at the start of the EP will avoid potentially more stringent clean up criteria being applied by the EA at site surrender.

3.0 Permitted Activities

Permitted activities	BGH will undertake the following 'installation' activity listed in Part 2 of the Environmental Permitting (England and Wales) Regulation 2016 (as amended): • Chapter 4, Section 4.2, Part A(1) – Producing inorganic chemicals such as… hydrogen. Activities which are directly associated to this listed activity can be summarised as follows: • Water demineralisation plant – including production of demineralised waste to consumption in the electrolysis process, including generation and discharge of reverse osmosis effluent; • Storage of gaseous hydrogen; • Hydrogen purification and compression; • Venting of oxygen and hydrogen to atmosphere; • Surface water collection and discharge; and • Operation of electrolyte and gas cooling systems.
Non-permitted activities undertaken	N/A
Document references for: • plan showing activity layout; and • environmental risk assessment.	• Drawing 02 Site Layout & Environmental Permit Boundary, July 2025 • Environmental Risk Assessment included as part of the environmental permit application package SLR ref. 416.066073.00001_Barrow_EP_Application.

4.0 Changes to the activity

Have there been any changes to the activity boundary?	To be maintained during the lifetime of the site

Have there been any changes to the permitted activities?	To be maintained during the lifetime of the site
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	To be maintained during the lifetime of the site
Checklist of supporting information	To be maintained during the lifetime of the site

5.0 Measures taken to protect the land

To be maintained during the lifetime of the site	
Checklist of supporting information	

6.0 Pollution Incidents and Remediation

To be maintained during the lifetime of the site	
Checklist of supporting information	

7.0 Soil Gas and Water Quality Monitoring

To be maintained during the lifetime of the site	
Checklist of supporting information	

8.0 Decommissioning and Removal of Pollution Risk

To completed upon surrender of the environmental permit	
Checklist of supporting information	

9.0 Reference Data and Remediation (where relevant)

To completed upon surrender of the environmental permit	
Checklist of supporting information	

10.0 Statement of Site Condition

To completed upon surrender of the environmental permit

Appendix A Envirocheck

Site Condition and Baseline Report

Barrow Green Hydrogen Plant

Barrow Green Hydrogen Limited

SLR Project No.: 416.066073.00001

19th January 2026

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	TFD	Tidal Flat Deposits	Clay and Silt	Not Supplied - Holocene
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene
	TILLD	Till, Devensian	Diamicton	Not Supplied - Devensian
	GFDUD	Glaciofluvial Deposits, Devensian	Sand and Gravel	Not Supplied - Devensian
	RMD	Raised Marine Deposits	Sand and Gravel	Not Supplied - Quaternary
	RTFD	Raised Tidal Flat Deposits	Clay and Silt	Not Supplied - Quaternary
	BSA	Blown Sand	Sand	Not Supplied - Quaternary
	STOB	Storm Beach Deposits	Gravel	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	KRM	Kirkham Mudstone Member	Mudstone	Not Supplied - Anisian
	PRSA	Preesall Halite Member	Halite	Not Supplied - Anisian
	TPSF	Tarporley Siltstone Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Olenekian
	SIM	Sidmouth Mudstone Formation	Mudstone	Not Supplied - Olenekian
	SBS	St Bees Sandstone Member	Sandstone	Not Supplied - Early Triassic
	SNM	Singleton Mudstone Member	Mudstone	Not Supplied - Early Triassic
	BK	Brockram	Breccia	Not Supplied - Cisuralian
	AG	Alston Formation	Mudstone, Calcareous	Not Supplied - Visean
	UL	Urswick Limestone Formation	Calcarenite	Not Supplied - Visean
	AG	Alston Formation	Sandstone	Not Supplied - Visean
	PKL	Park Limestone Formation	Calcarenite	Not Supplied - Visean
		Faults		

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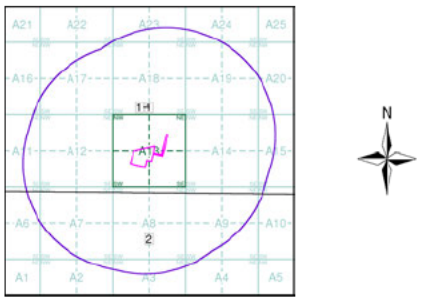
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	2	**Map ID:**	1
Map Sheet No:	058	**Map Sheet No:**	048
Map Name:	Barrow-In-Furne	**Map Name:**	Ulverston
Map Date:	1976	**Map Date:**	1997
Bedrock Geology:	Available	**Bedrock Geology:**	Available
Superficial Geology:	Available	**Superficial Geology:**	Not Available
Artificial Geology:	Available	**Artificial Geology:**	Not Available
Faults:	Not Supplied	**Faults:**	Not Supplied
Landslip:	Not Available	**Landslip:**	Not Available
Rock Segments:	Not Supplied	**Rock Segments:**	Not Supplied

Geology 1:50,000 Maps - Slice A



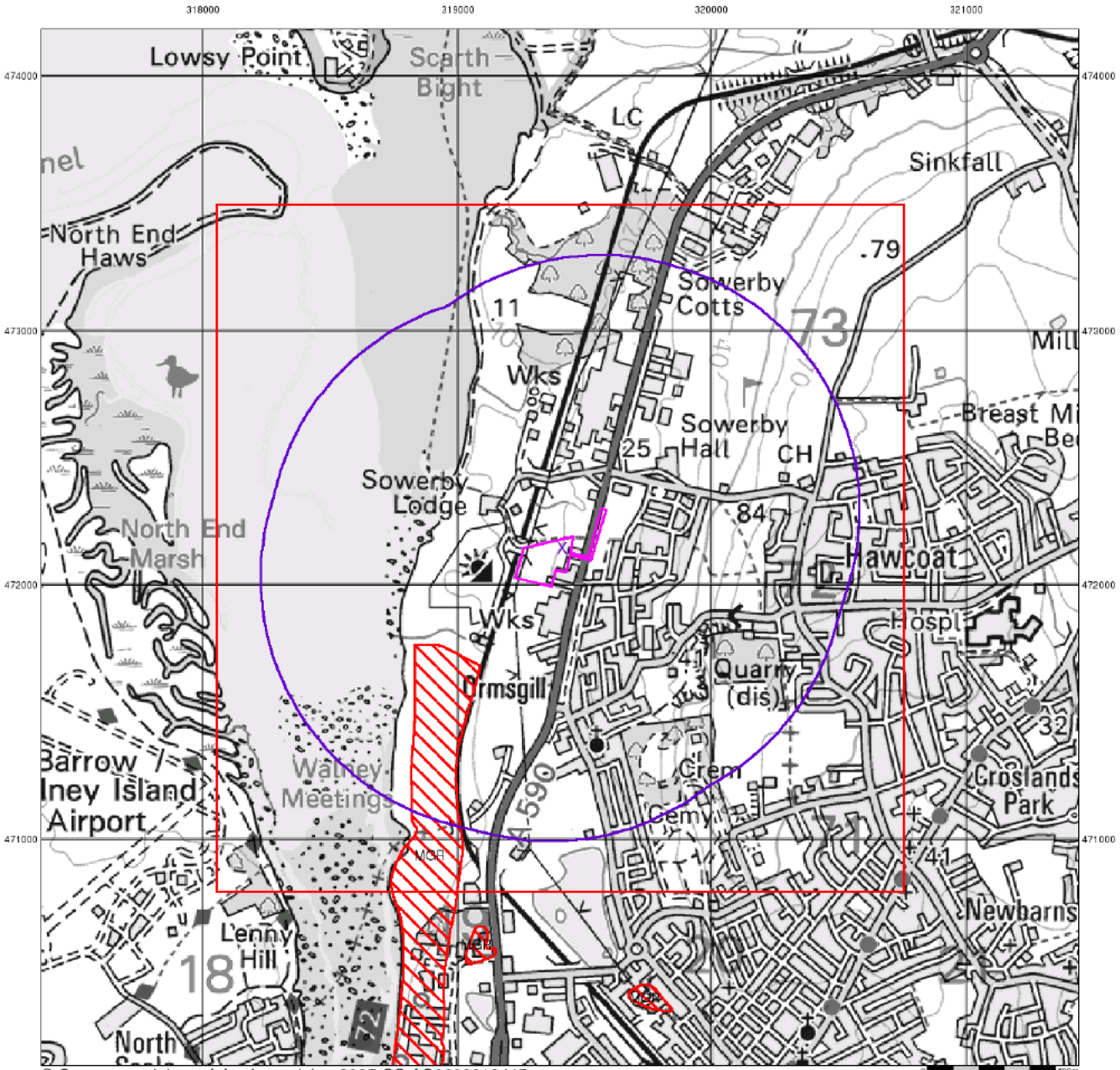
Order Details:

Order Number:	379674976_1_1
Customer Reference:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details:

Site at 319310, 472070

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Artificial Ground and Landslip

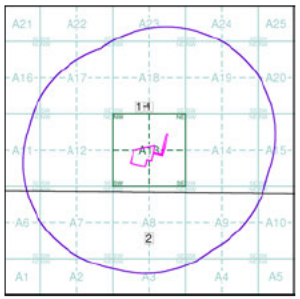
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



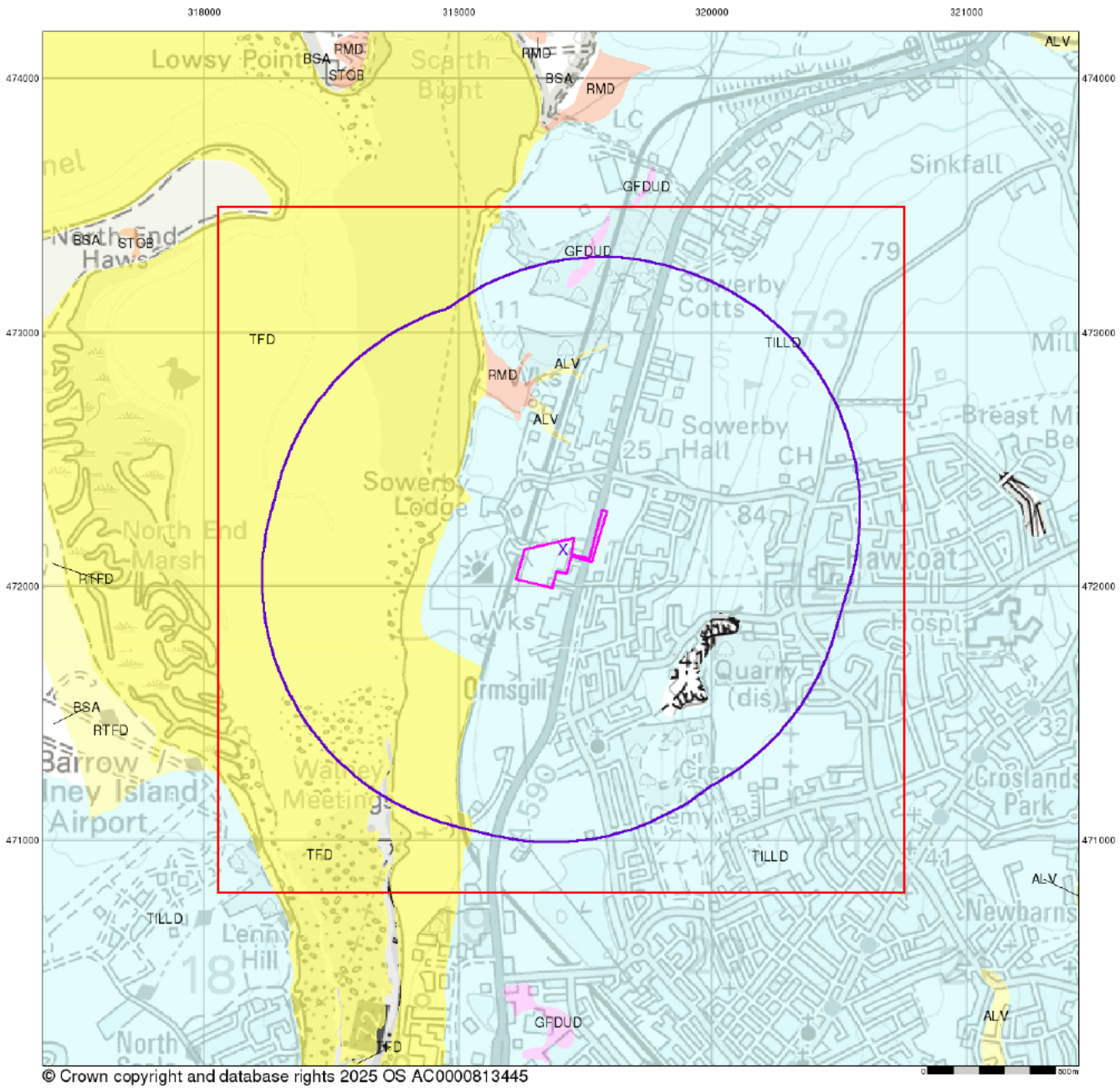
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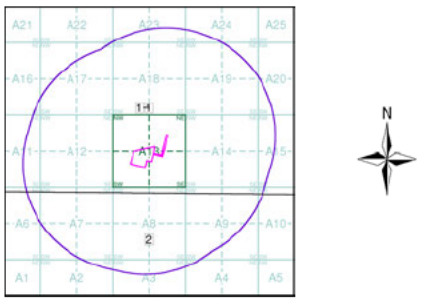
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



Order Details:

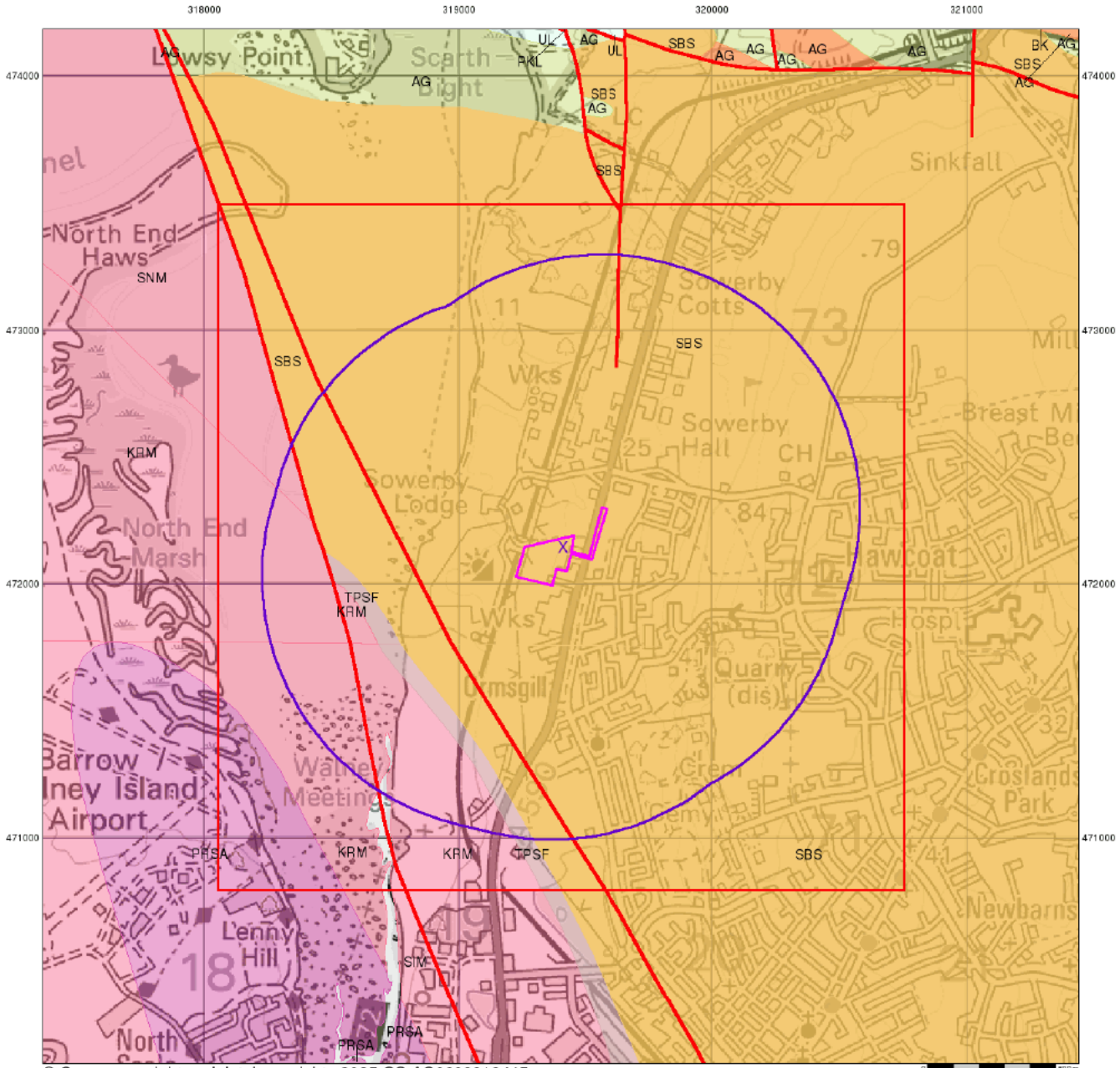
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Bedrock and Faults

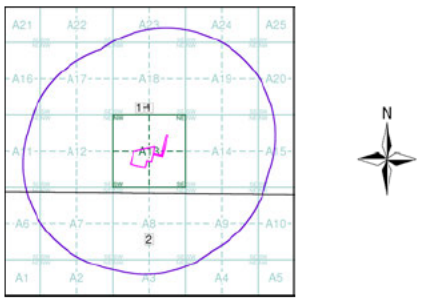
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



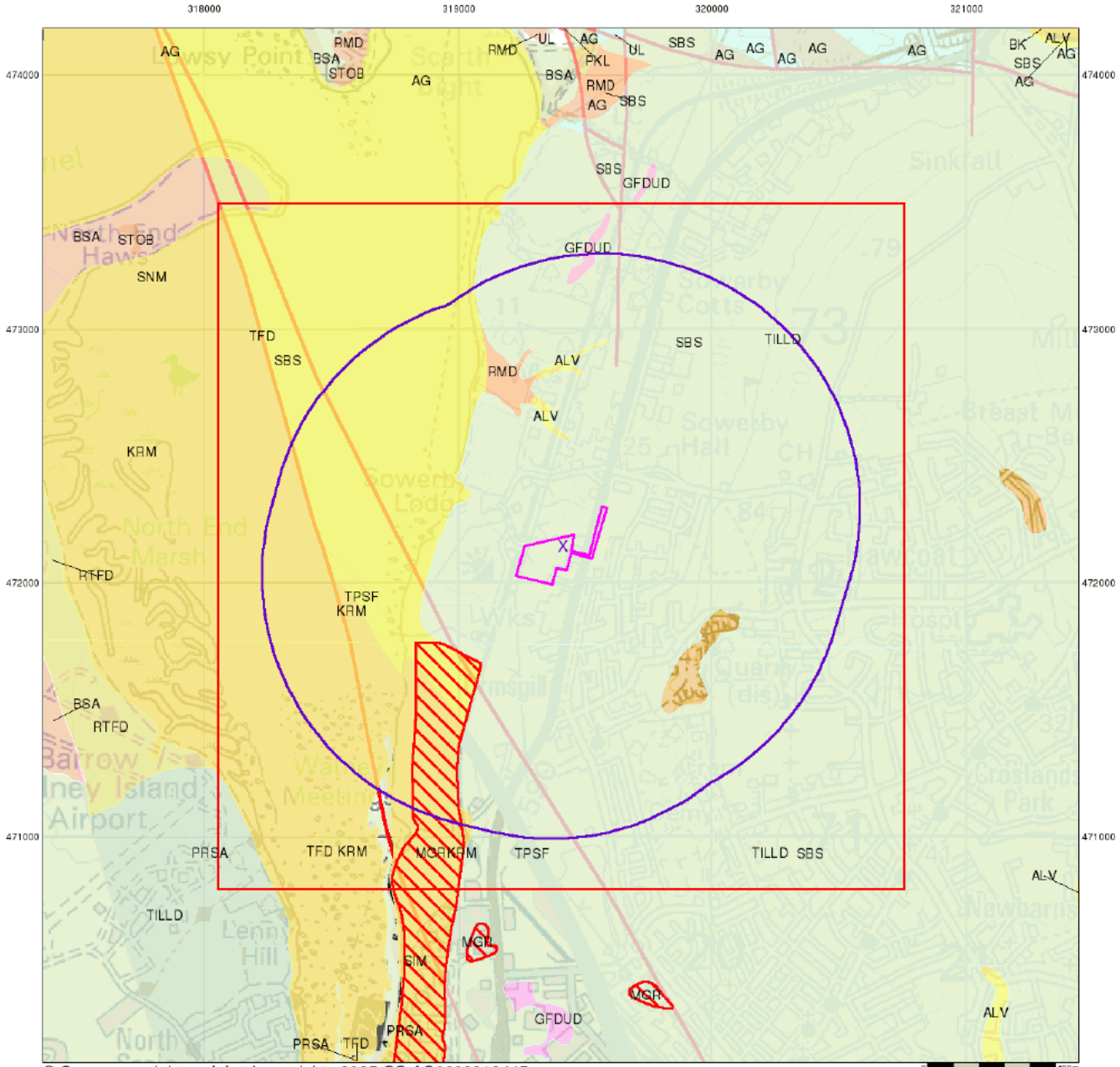
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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

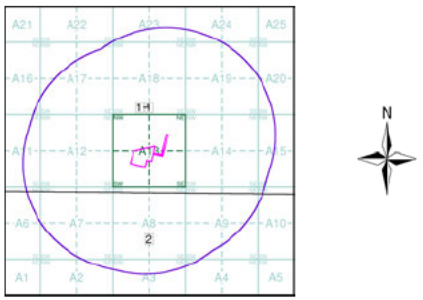
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



Order Details:

Order Number:	379674976_1_1
Customer Reference:	416.066073.00001
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Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details:

Site at 319310, 472070

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

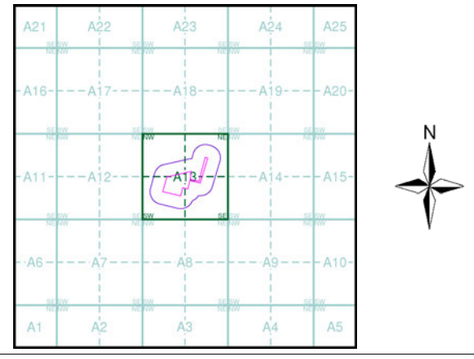
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1850 - 1851	3
Lancashire And Furness	1:10,560	1873 - 1892	4
Lancashire And Furness	1:10,560	1895	5
Lancashire And Furness	1:10,560	1916	6
Lancashire And Furness	1:10,560	1919	7
Lancashire And Furness	1:10,560	1919	8
Lancashire And Furness	1:10,560	1931	9
Lancashire And Furness	1:10,560	1938	10
Ordnance Survey Plan	1:10,000	1956	11
Ordnance Survey Plan	1:10,000	1973	12
Barrow-in-Furness	1:10,000	1975	13
Ordnance Survey Plan	1:10,000	1989	14
Ordnance Survey Plan	1:10,000	1990	15
10K Raster Mapping	1:10,000	2001	16
10K Raster Mapping	1:10,000	2006	17
VectorMap Local	1:10,000	2024	18

Historical Map - Slice A



Order Details

Order Number: 379674976_1_1
Customer Ref: 416.066073.00001
National Grid Reference: 319410, 472140
Slice: A
Site Area (Ha): 3.16
Search Buffer (m): 1000

Site Details

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Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Fireproof Building
- Prominent Fireproof Building
- Non-fireproof Building
- Non-fireproof Building (non-dwelling)
- Factory, mill, and flour mill, with chimneys
- Factory, mill, and flour mill, without chimneys
- Power Station, drawn to scale
- Hydroelectric Power Station
- Radio Station, drawn to scale
- Telephone Station, drawn to scale
- Abandoned Open-pit Mine or Quarry
- Open-pit Salt Mine
- Pit
- Oil Deposit or Well
- Oil Seepage
- Tailings Pile
- Fuel Storage Tanks
- Natural Gas Tank
- Bench Mark
- Drill Hole
- Burial Mound
- Triangulation Point on Burial Mound
- Single-track Railroad
- Double-track Railroad and Station Building
- Coniferous Forest
- Deciduous Forest
- Mixed Forest
- Lawns
- Citrus Orchard
- Wet Ground
- Scattered Vegetation

243,8 — Values for prominent elevations

186.0 — Numbers for spot elevations, depth soundings, contour lines, etc.

0,2 — Velocity of the current, width of river bed, depth of river

Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	ъ (–)
Д д (D)	Л л (L)	У у (U)	ы (Y)
Е е (E)	М м (M)	Ф ф (F)	ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Partly Demolished Buildings
- Demolished Buildings
- Built-Up Area with Fireproof Buildings Predominant
- Built-Up Area with Non-Fireproof Buildings Predominant
- Individual Fireproof Building
- Prominent Industrial Building
- Individual Dwelling, Fireproof
- Ruins of an Individual Dwelling
- Factory or Mill Chimney
- Factory or Mill with Chimney
- Factory or Mill without Chimney
- Mine or Open Pit Mine
- Operating Shaft or Mine
- Non-Operating Shaft or Mine
- Salt Mine
- Tailings Pile
- Pit
- Stone Quarry
- Gas Pump or Service Station
- Fuel Storage or Natural Gas Tank
- Oil or Natural Gas Derrick
- Small Hydroelectric Power Station
- Power Station
- Transformer Station
- Cemetery
- Burial Mound (height in metres)
- Triangulation Point on Burial Mound
- Triangulation Point
- Bench Mark
- Bench Mark (monumented)
- Telegraph Office
- Telephone Station
- Radio Station
- Radio Tower
- Airfield or Seaplane Base
- Landing Strip
- Main Highway
- Highway under Construction
- Improved Dirt Road (former truck road)
- Double-track Railroad with First Class Station
- Dismantled Railroad
- Railroad Under Construction
- Shore Embankment
- River or Ditch with Embankment
- Water Gauge
- Well
- Water Reservoir or Rain Water Pit
- Spring
- Isobath with value
- Heavy (Index) Contour Line
- Contour Line and Value
- Half Contour Line
- Spot Elevation Value
- Coniferous
- Deciduous
- Mixed
- Scrub

Key to Numbers on Mapping

SD17SE_Barrow_in_Furness

No.	Description
13	Factory (Slag Recycling)
24	Industrial Building (Use Unknown)

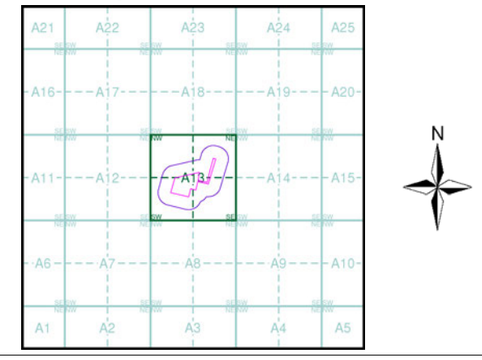
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Historical Mapping & Photography included:

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Lancashire And Furness	1:10,560	1873 - 1892	4
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Lancashire And Furness	1:10,560	1916	6
Lancashire And Furness	1:10,560	1919	7
Lancashire And Furness	1:10,560	1919	8
Lancashire And Furness	1:10,560	1931	9
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10K Raster Mapping	1:10,000	2001	16
10K Raster Mapping	1:10,000	2006	17
VectorMap Local	1:10,000	2024	18

Russian Map - Slice A



Order Details

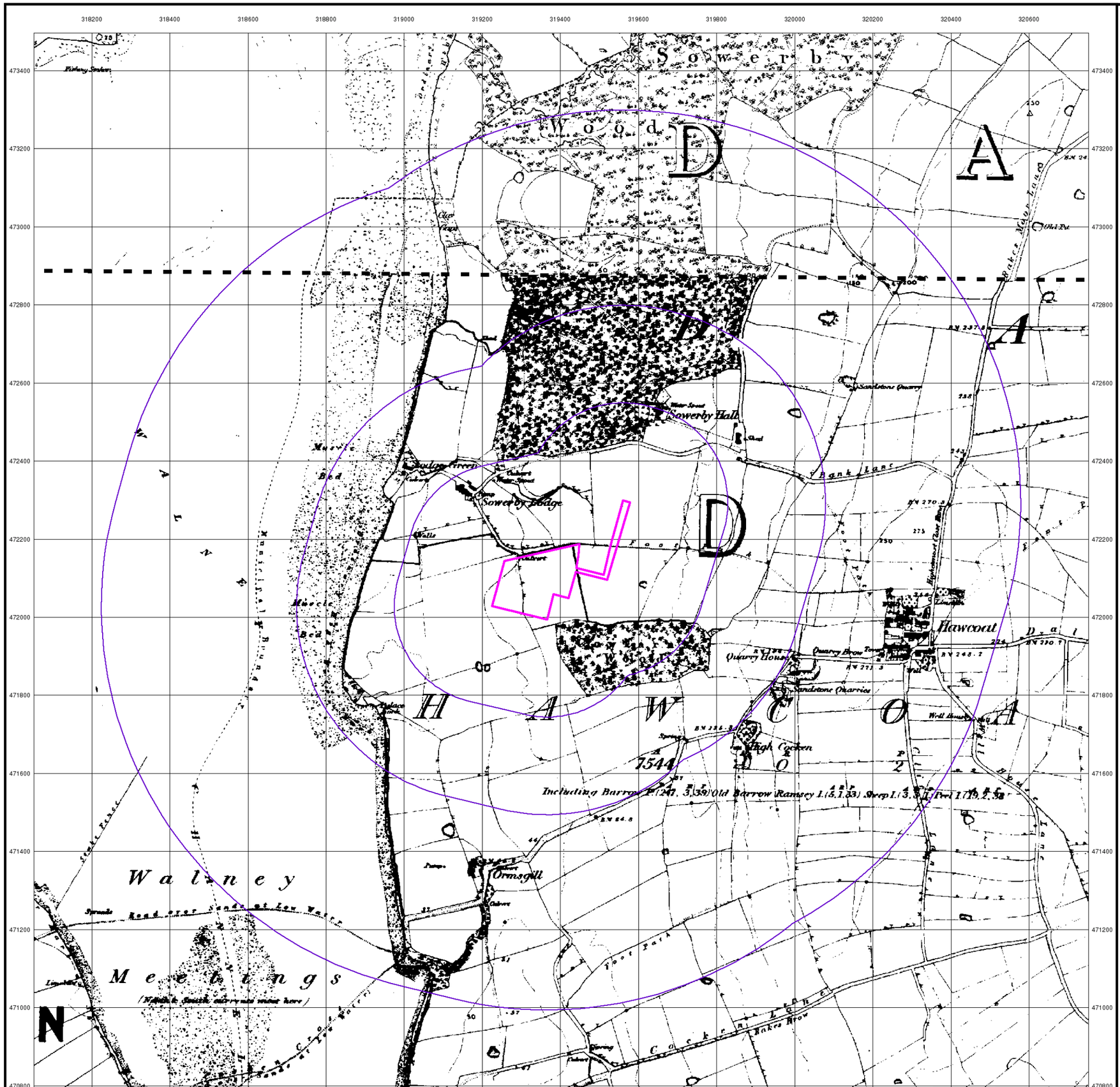
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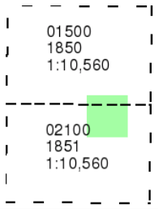
Lancashire And Furness

Published 1850 - 1851

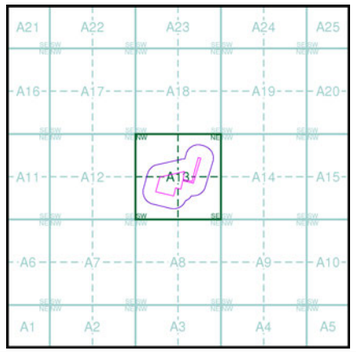
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

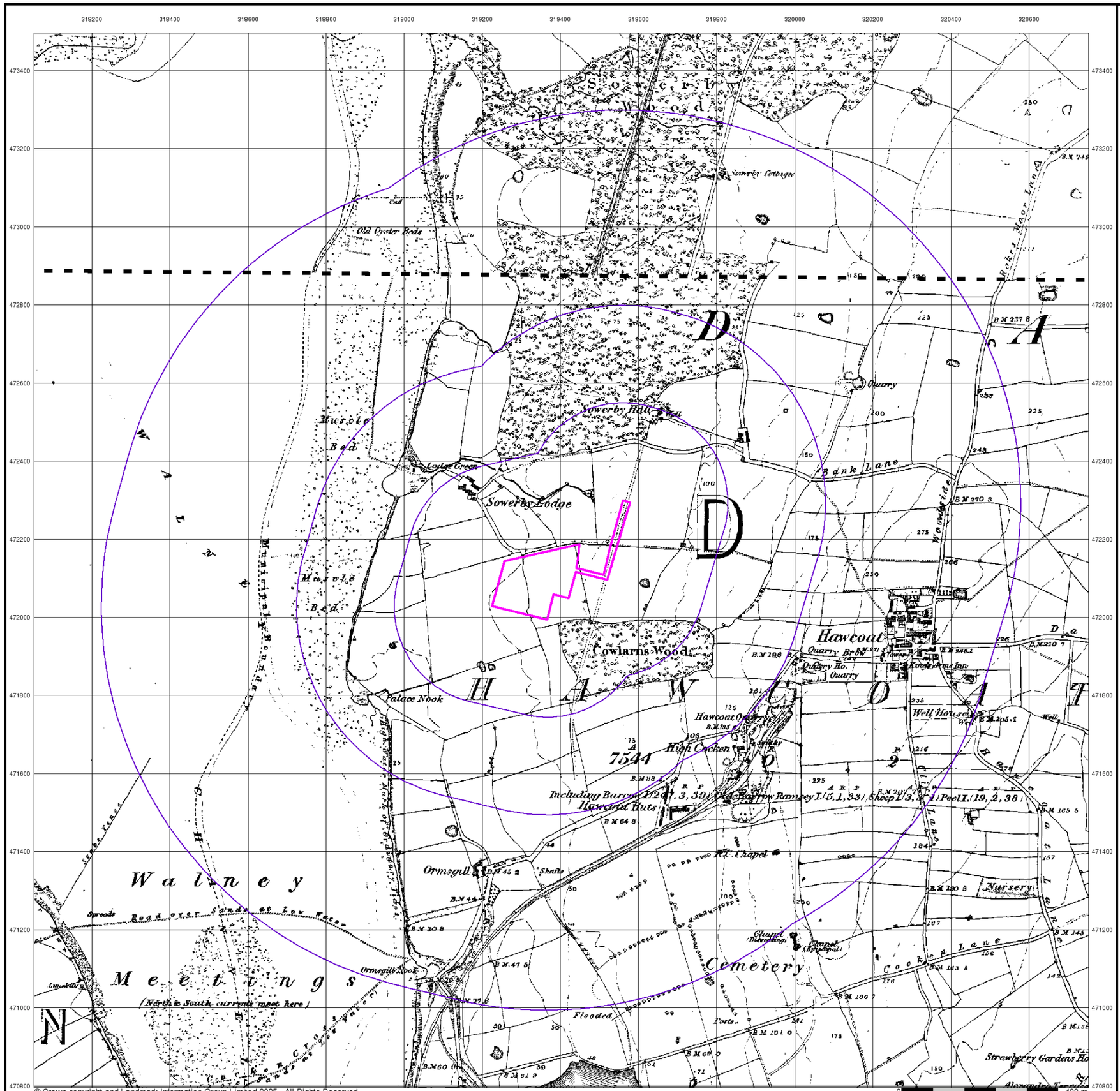
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Lancashire And Furness

Published 1873 - 1892

Source map scale - 1:10,560

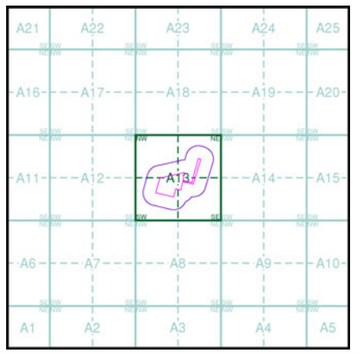
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Map Name(s) and Date(s)

01500
1892
1:10,560

02100
1873
1:10,560

Historical Map - Slice A



Order Details

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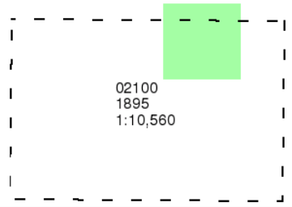
Lancashire And Furness

Published 1895

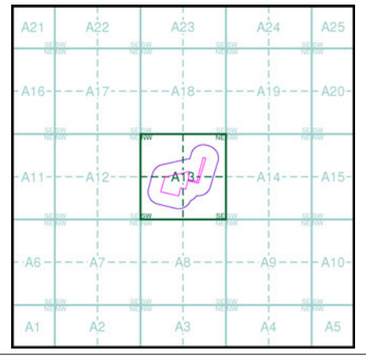
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



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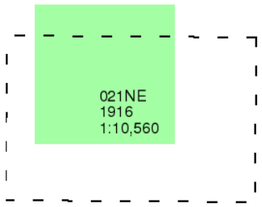
Lancashire And Furness

Published 1916

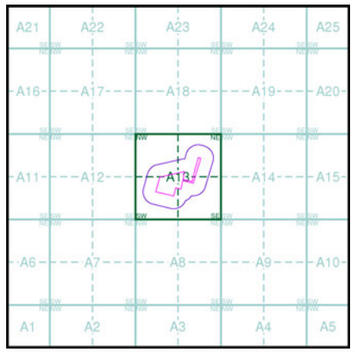
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

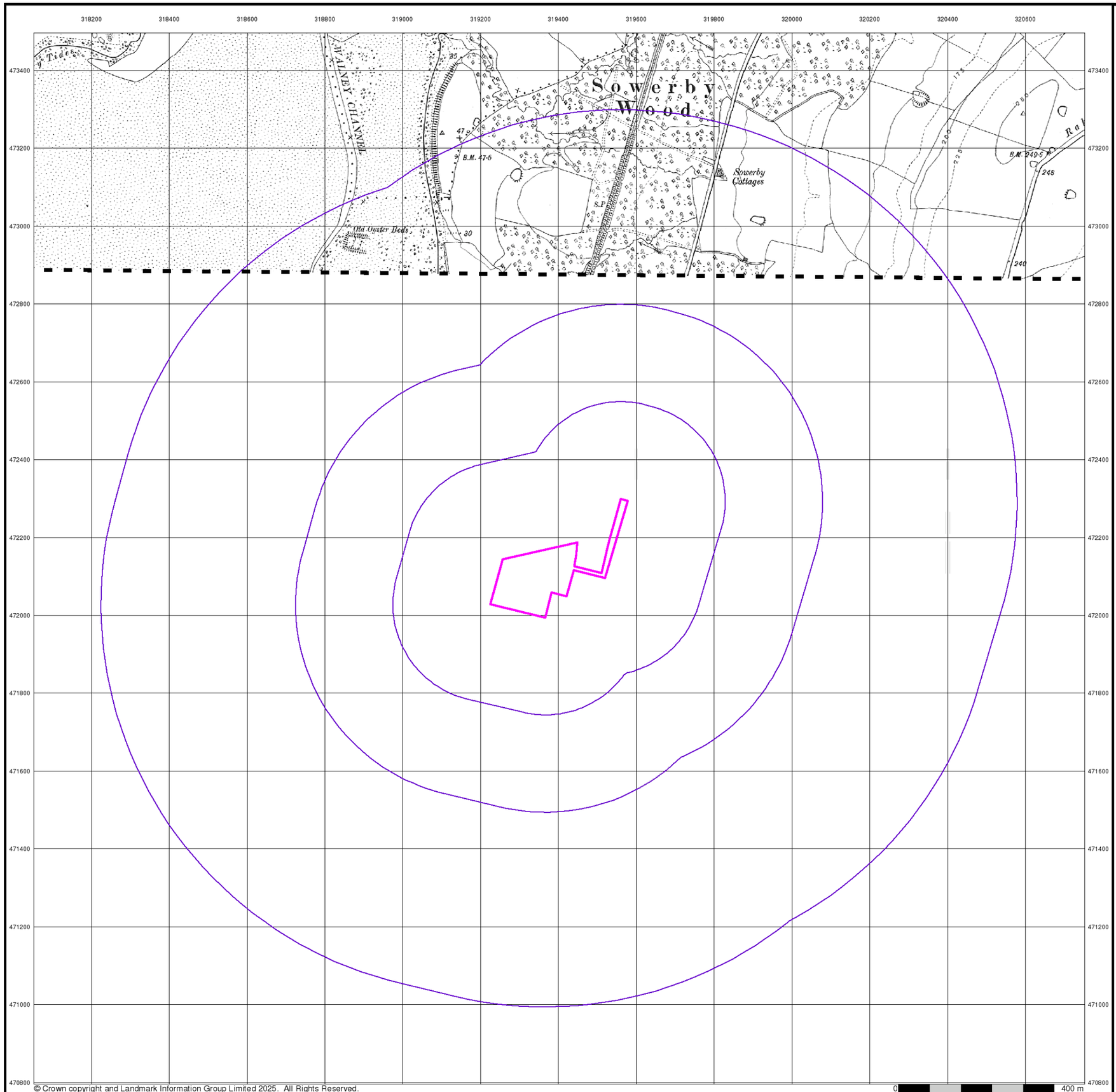
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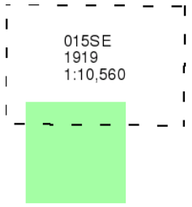
Lancashire And Furness

Published 1919

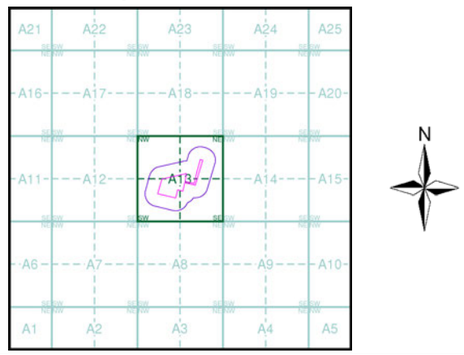
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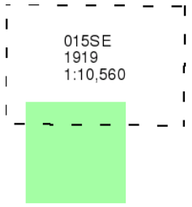
Lancashire And Furness

Published 1919

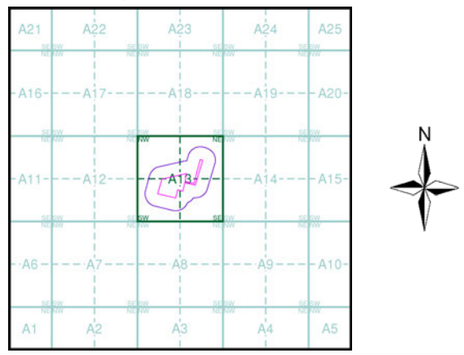
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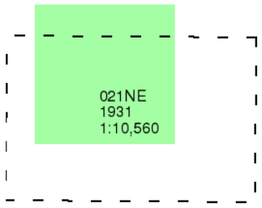
Lancashire And Furness

Published 1931

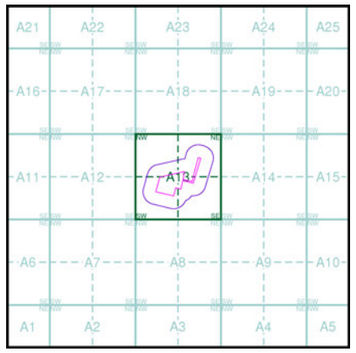
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Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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318200
318400
318600
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319200
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473400
473200
473000
472800
472600
472400
472200
472000
471800
471600
471400
471200
471000
470800
Barrow Golf Course
Allotment Gardens
Sowerby Hall
Sowerby Lodge
Lodge Green
Rakesmoor Lane
Club House
Bank Lane
L.M.S.R.
CARNFORTH & WHITEHAVEN LINE
Palace Nook
Slag Reduction Works
ORMSGILL
Ormsgill Hotel (P.H.)
Ormsgill Junction S.B.
Ormsgill Farm
Ormsgill Brick Works
Furness Works
Upper Ormsgill Reservoir
Walney Meetings
(North & South Currents meet here)
High Water Mark of Ordinary Tides
Ford
Ford
Wilkinsfield
Valley Well
CEMETERY
(Barrow in Furness Corporation)
HAWCOAT
Quarry Brow
Quarry House
Bay Horse Inn
Summer Hill
School
George Romney's Early Home
Hawcoat Quarry
Cliffe Lane
Hawcoat Park
Pavilion
Tennis Grounds
Bowling Greens
Nursery
High Service Resrs.
(Barrow in Furness Corpn. W.W.)
Infectious Diseases Hospital
(Barrow in Furness Corpn.)
Cricket Ground
Police S
Rakesmoor Ho
(Infectious Diseases Hospital)
Barrow in Furness Co
Mort. Chapel
Chapel
Allot.
Sch.
Ch.
P.O.
Tower
Lodge
Pond
Tanks
F.P.
S.P.
M.P.
L.B.
B.M. 19·82
B.M. 70·30
B.M. 40·27
B.M. 206·18
B.M. 238·67
B.M. 270·07
B.M. 236·24
B.M. 166·11
B.M. 5·26
B.M. 193·02
B.M. 249·58
B.M. 211·23
B.M. 115·58
B.M. 95·32
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B.M. 207·97
B.M. 182·16
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B.M. 170·61
B.M. 193·38
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B.M. 183·03
B.M. 72·85
B.M. 72·20
B.M. 54·50
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B.M. 0·85
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B.M. 76



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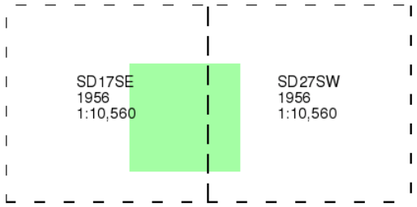
Ordnance Survey Plan

Published 1956

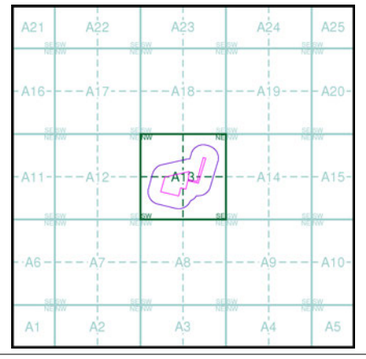
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070



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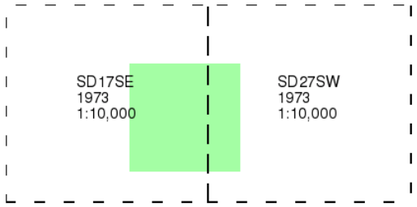
Ordnance Survey Plan

Published 1973

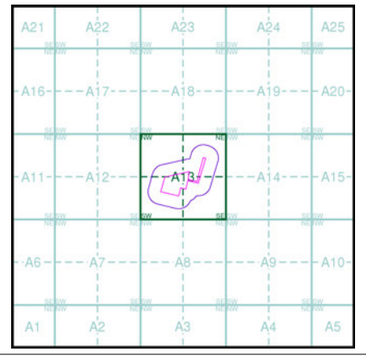
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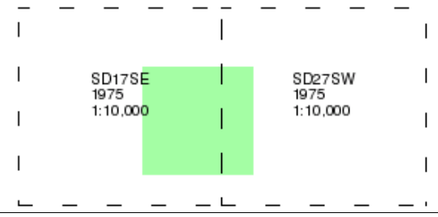
Barrow-in-Furness

Published 1975

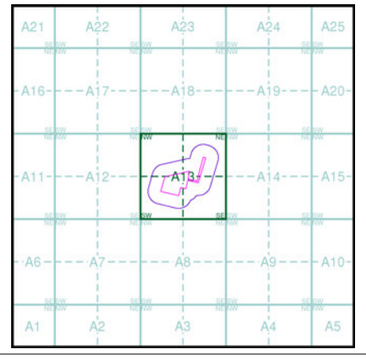
Source map scale - 1:10,000

These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.
They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

Map Name(s) and Date(s)



Russian Map - Slice A



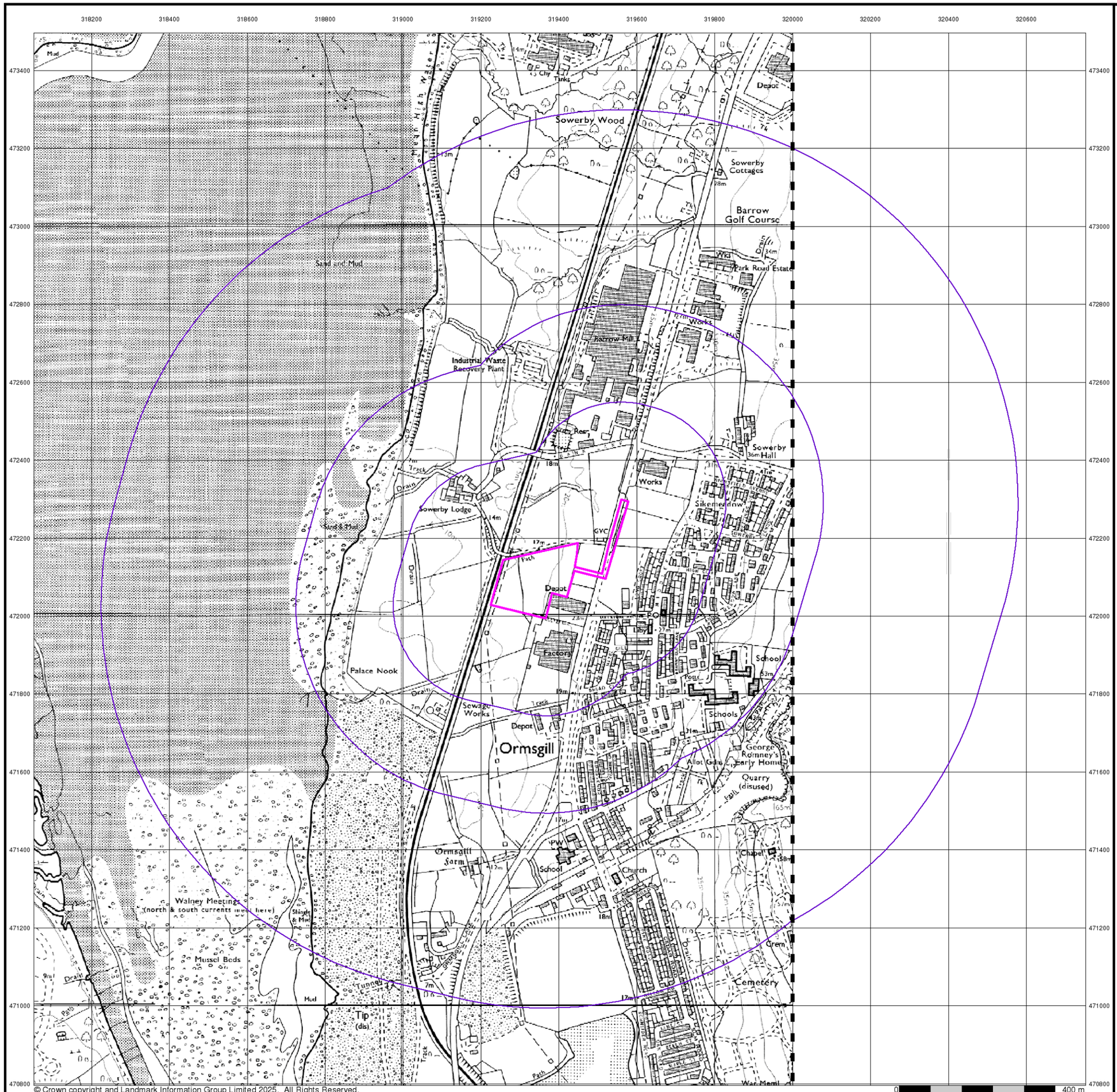
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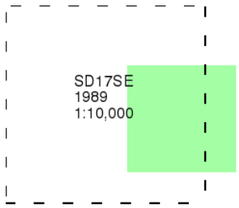
Ordnance Survey Plan

Published 1989

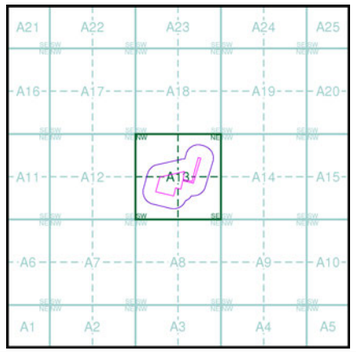
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

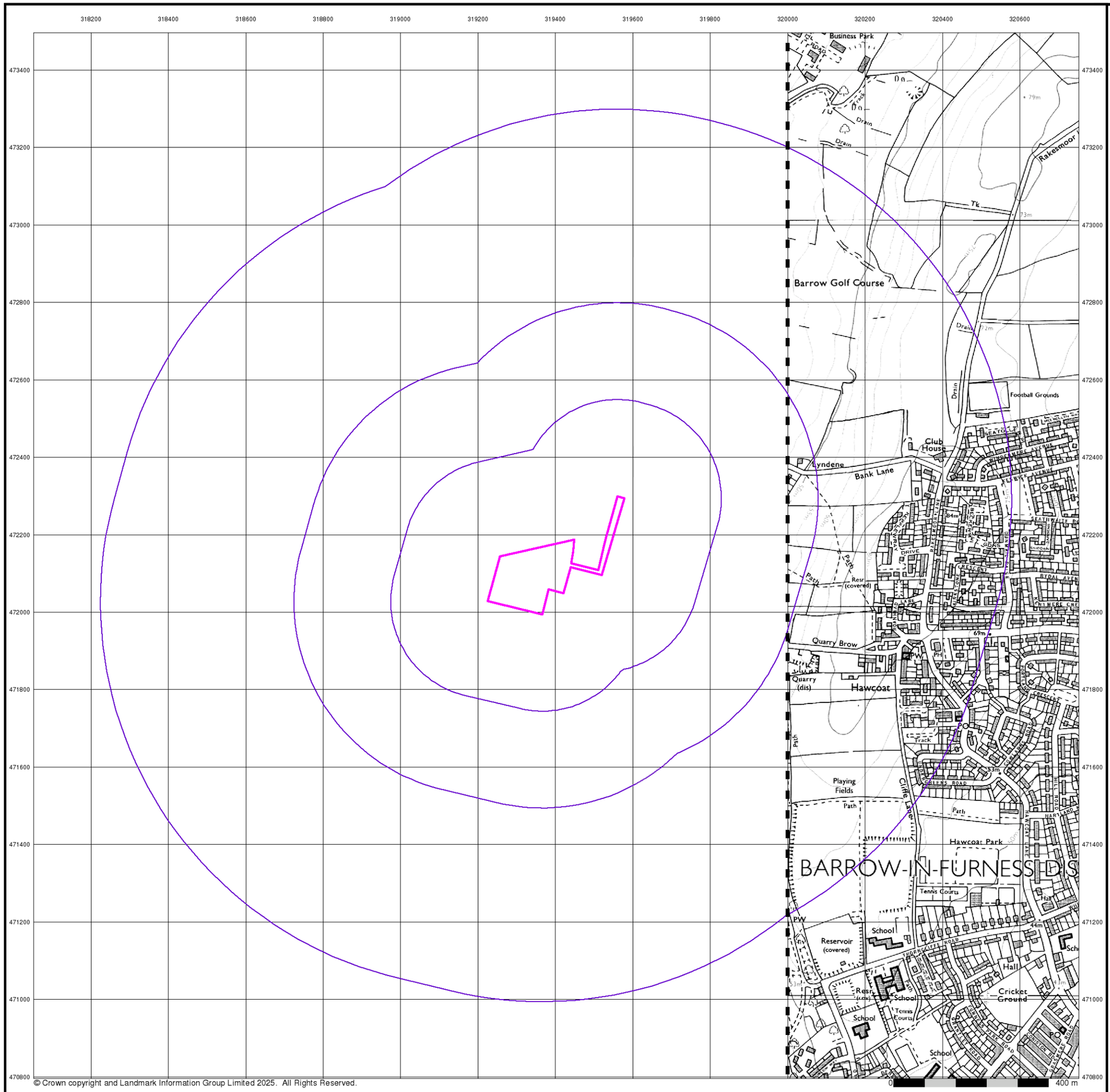
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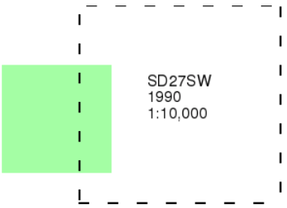
Ordnance Survey Plan

Published 1990

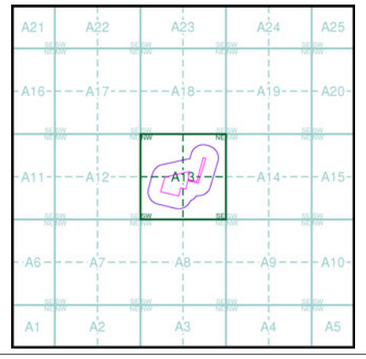
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

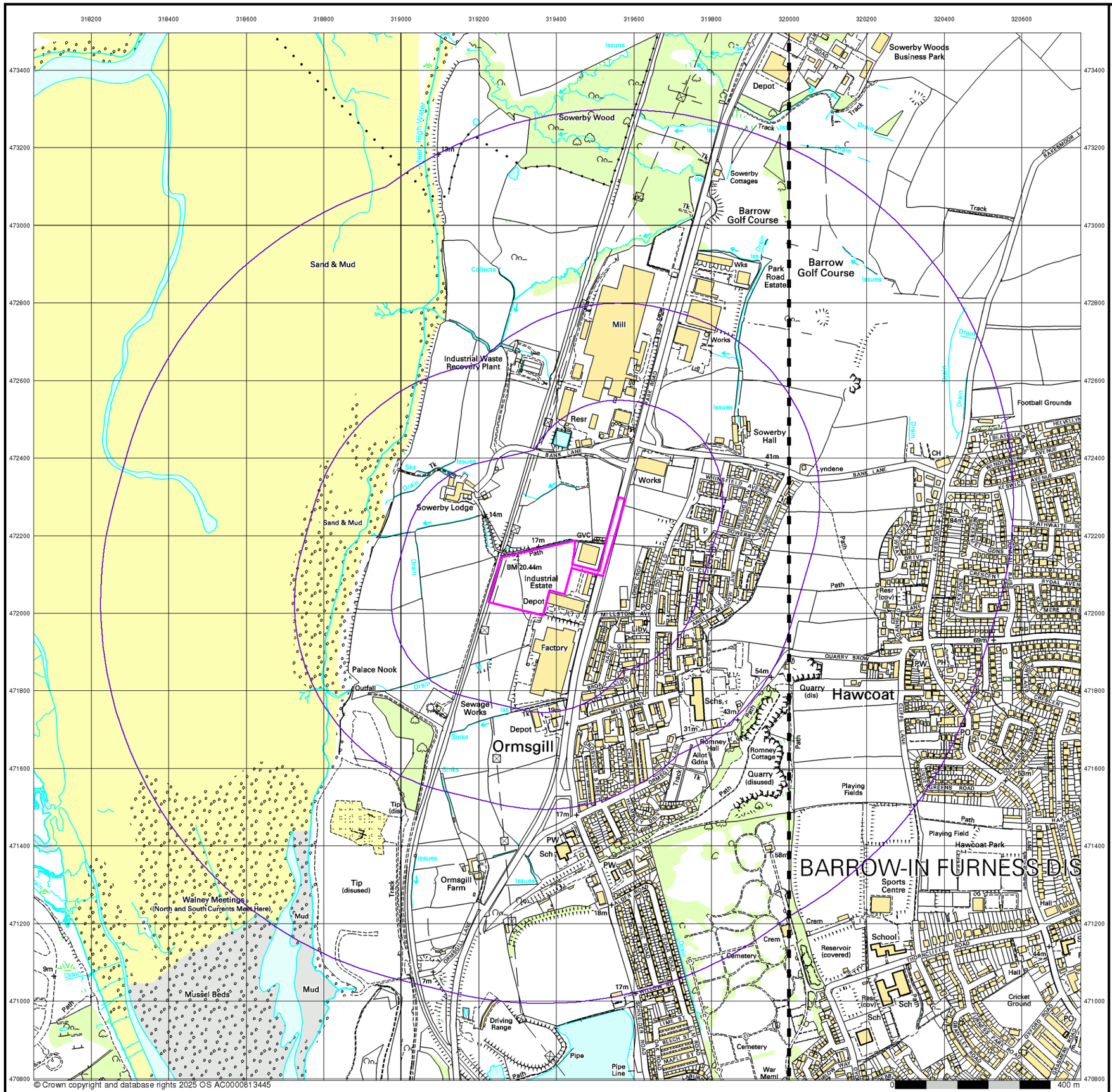
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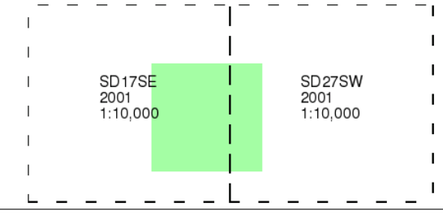
10k Raster Mapping

Published 2001

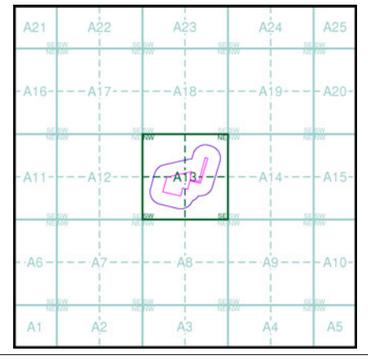
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

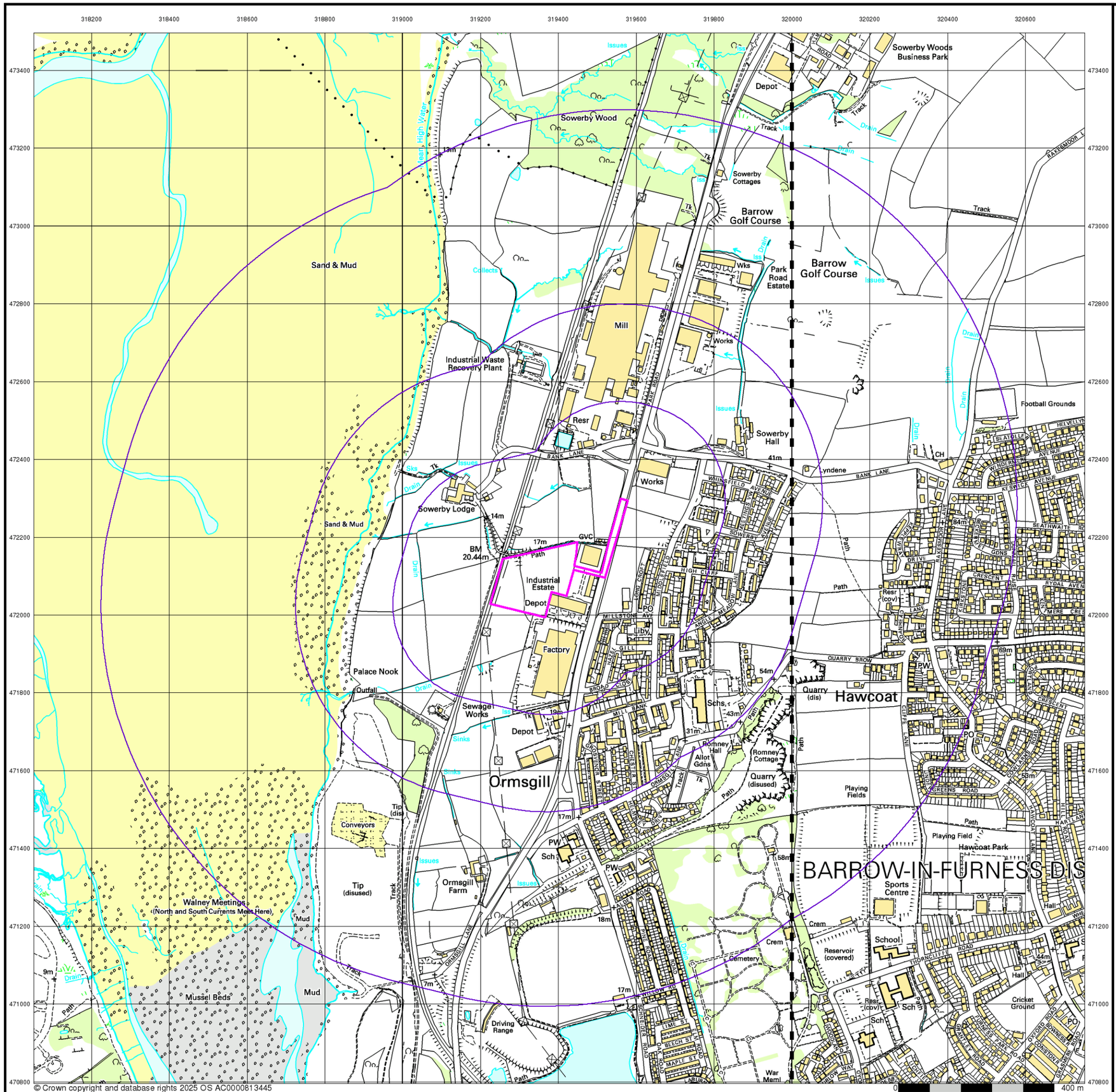
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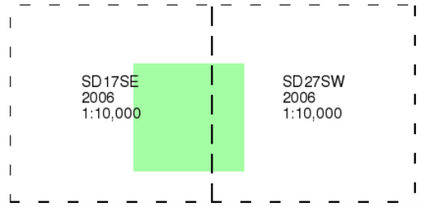
10k Raster Mapping

Published 2006

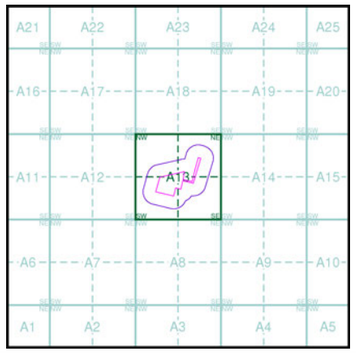
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

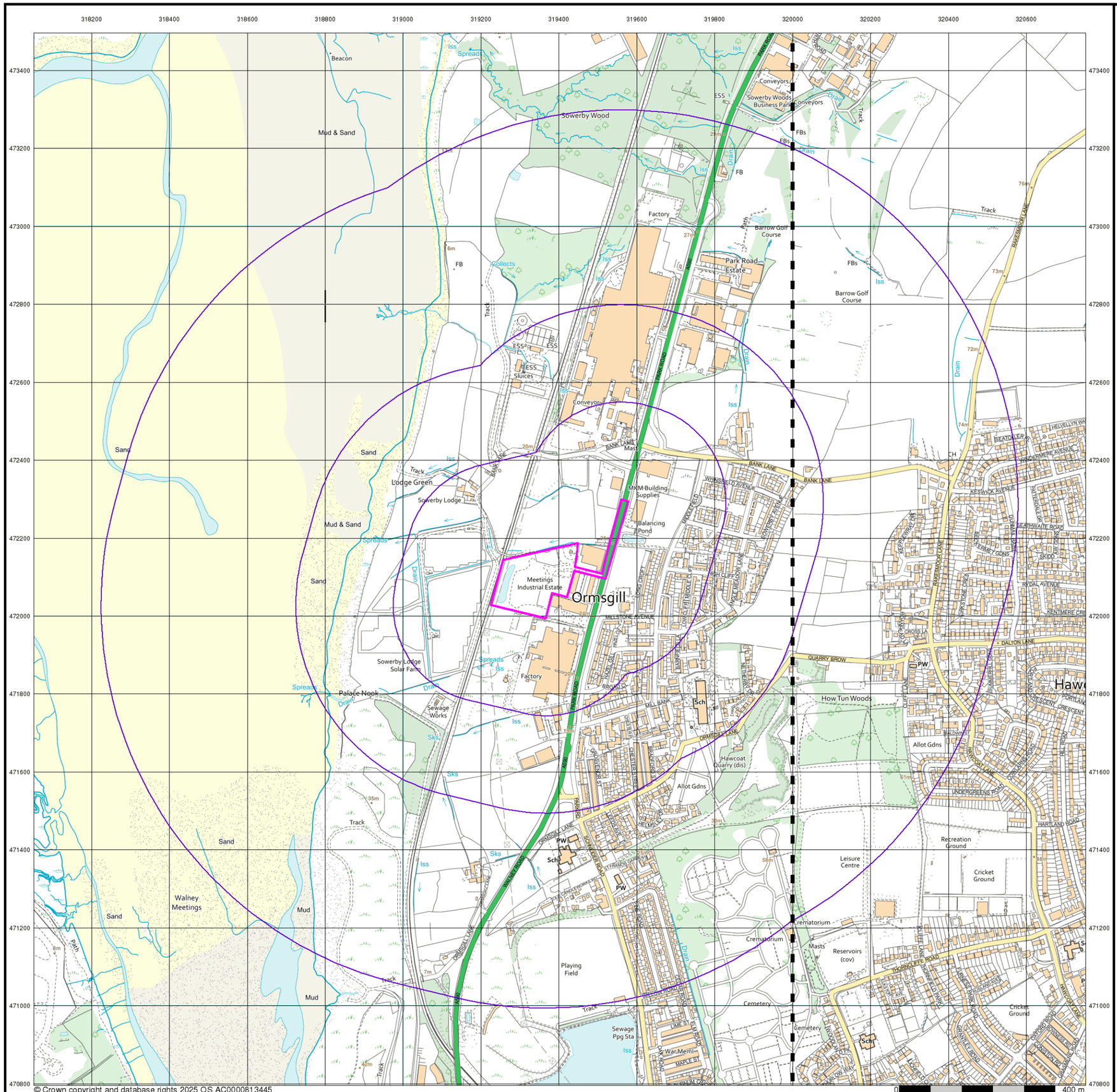
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Slice:	A
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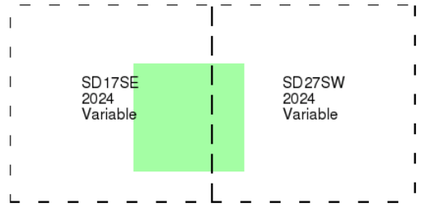
VectorMap Local

Published 2024

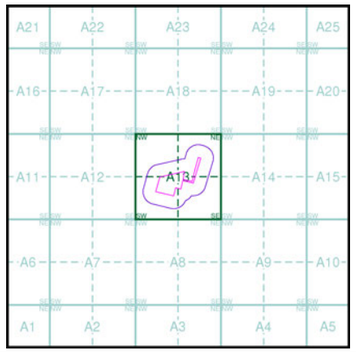
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



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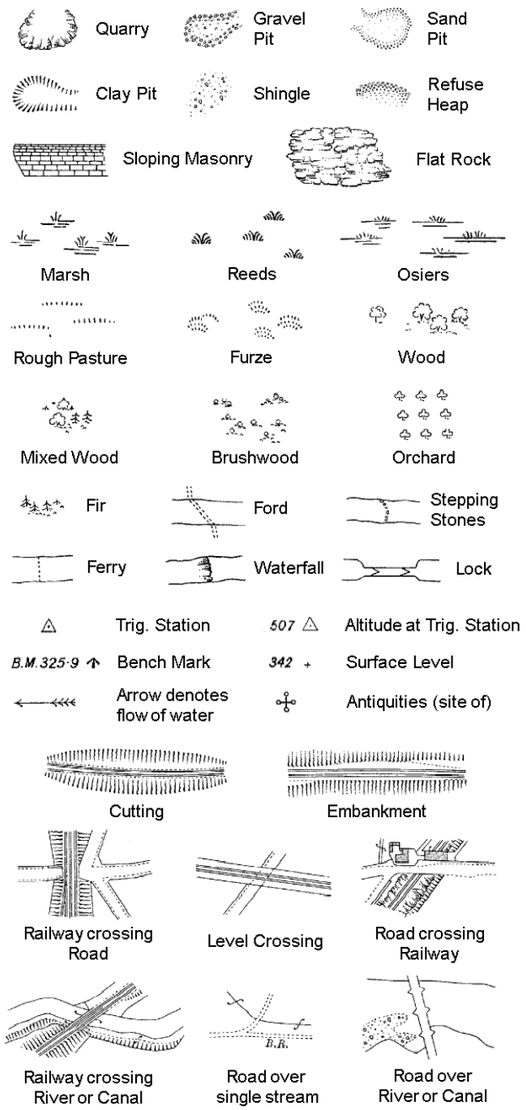
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Historical Mapping Legends

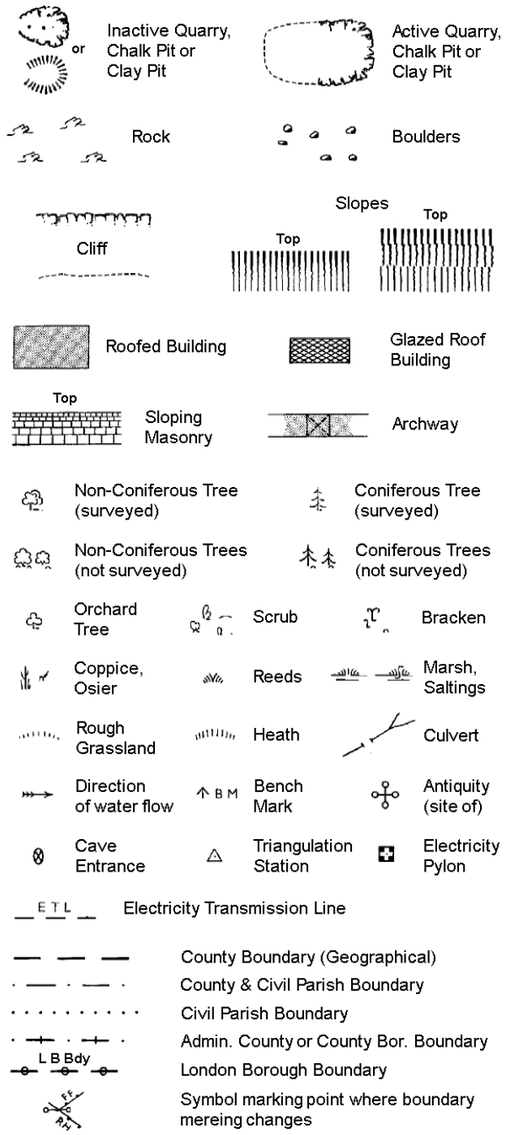
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy.
County Borough Boundary (England)
Co. Burgh Bdy.
County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

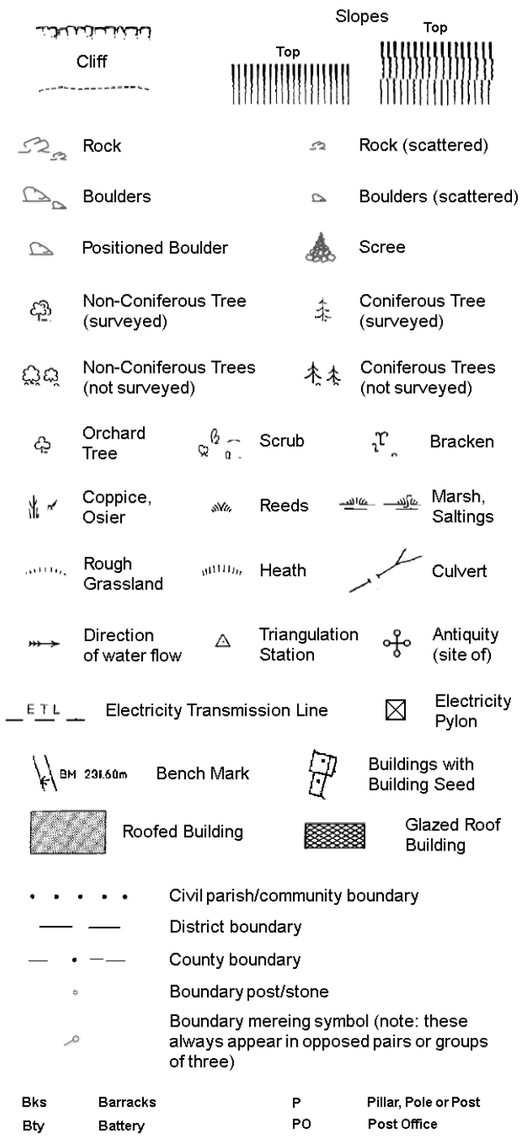
Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
L B Bdy
London Borough Boundary
Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

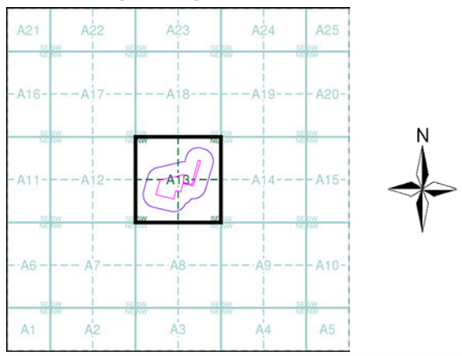
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1891	2
Lancashire And Furness	1:2,500	1913	3
Lancashire And Furness	1:2,500	1933	4
Historical Aerial Photography	1:1,250	1946	5
Ordnance Survey Plan	1:1,250	1956	6
Ordnance Survey Plan	1:2,500	1956	7
Additional SIMs	1:1,250	1956 - 1985	8
Ordnance Survey Plan	1:1,250	1970 - 1972	9
Ordnance Survey Plan	1:1,250	1985 - 1991	10
Additional SIMs	1:1,250	1986 - 1992	11
Additional SIMs	1:1,250	1992	12
Large-Scale National Grid Data	1:1,250	1994	13
Large-Scale National Grid Data	1:1,250	1996	14
Historical Aerial Photography	1:2,500	2000	15

Historical Map - Segment A13



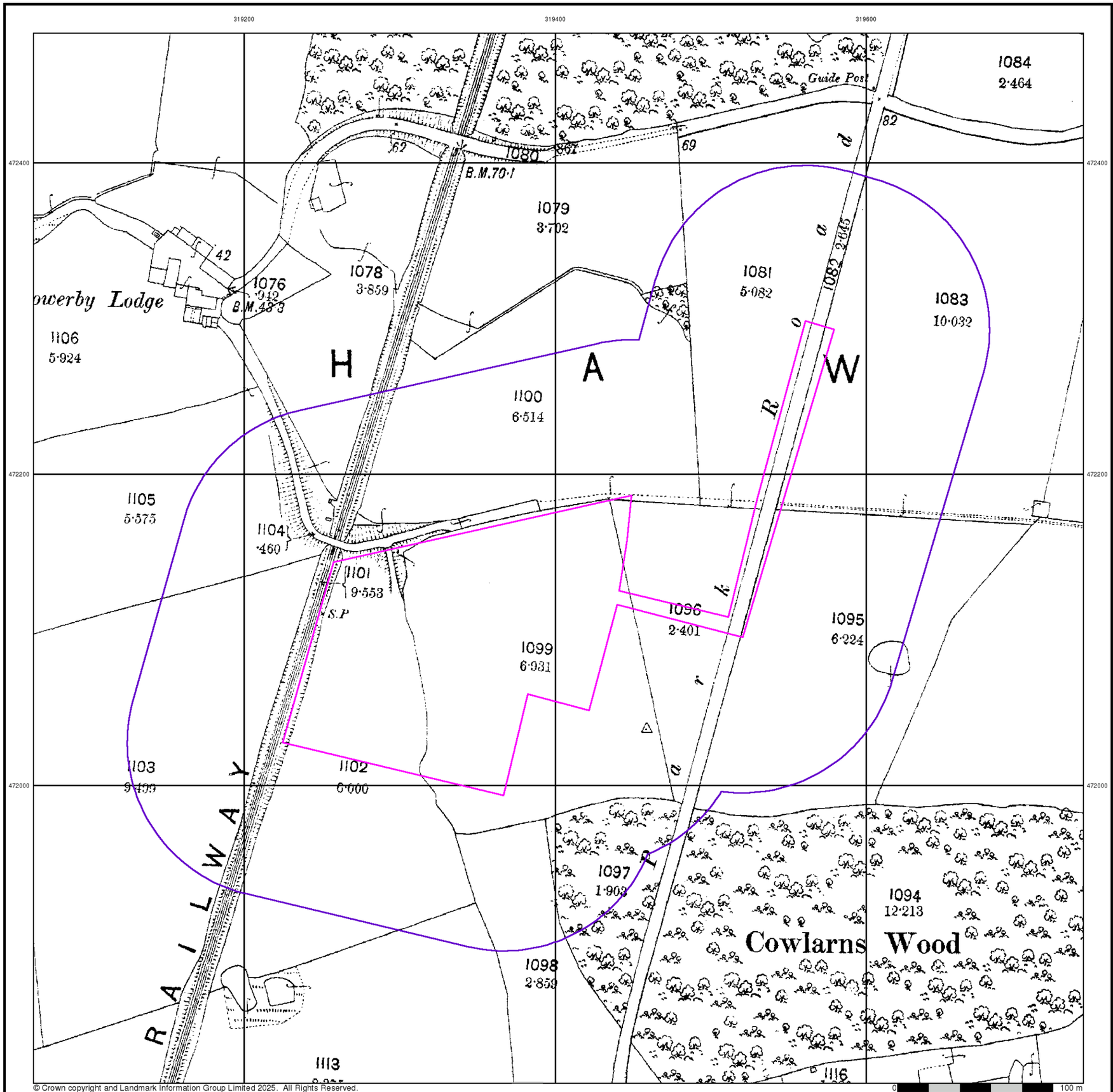
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National Grid Reference:	319410, 472140
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Site Area (Ha):	3.16
Search Buffer (m):	100

Site Details

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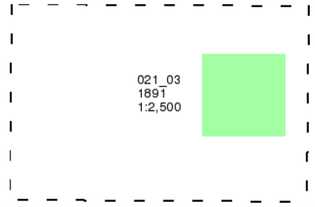
Lancashire And Furness

Published 1891

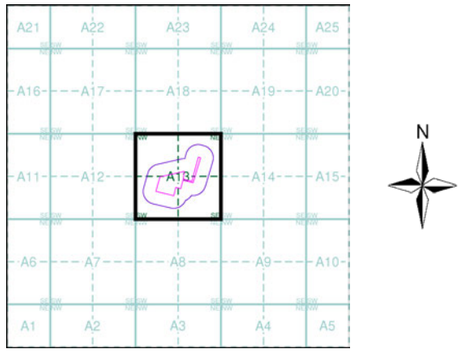
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

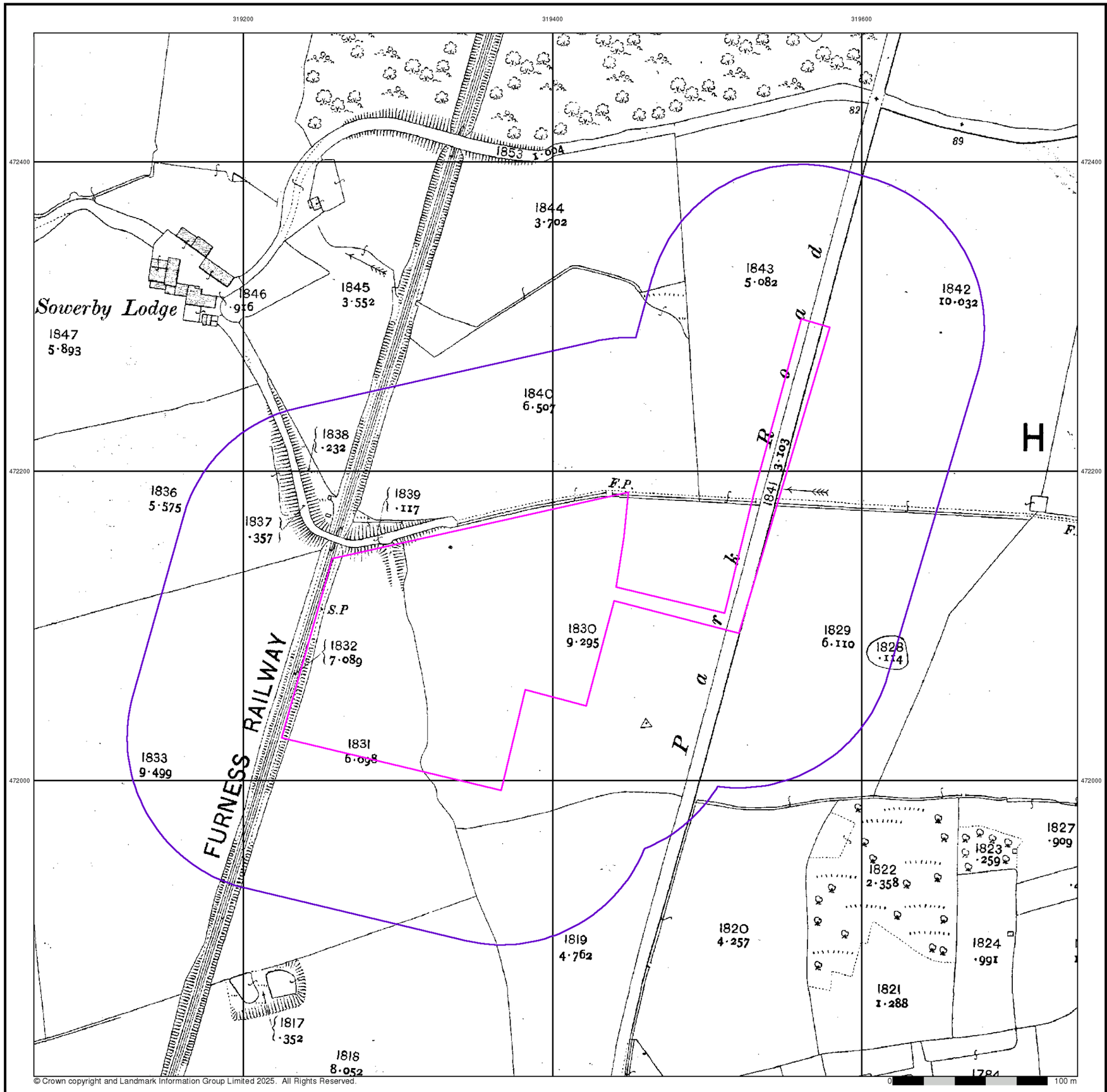
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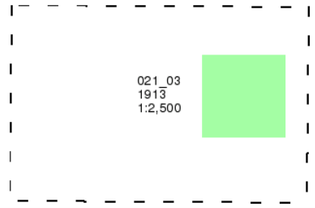
Lancashire And Furness

Published 1913

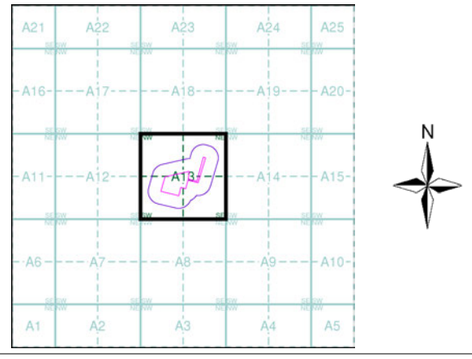
Source map scale - 1:2,500

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Historical Map - Segment A13



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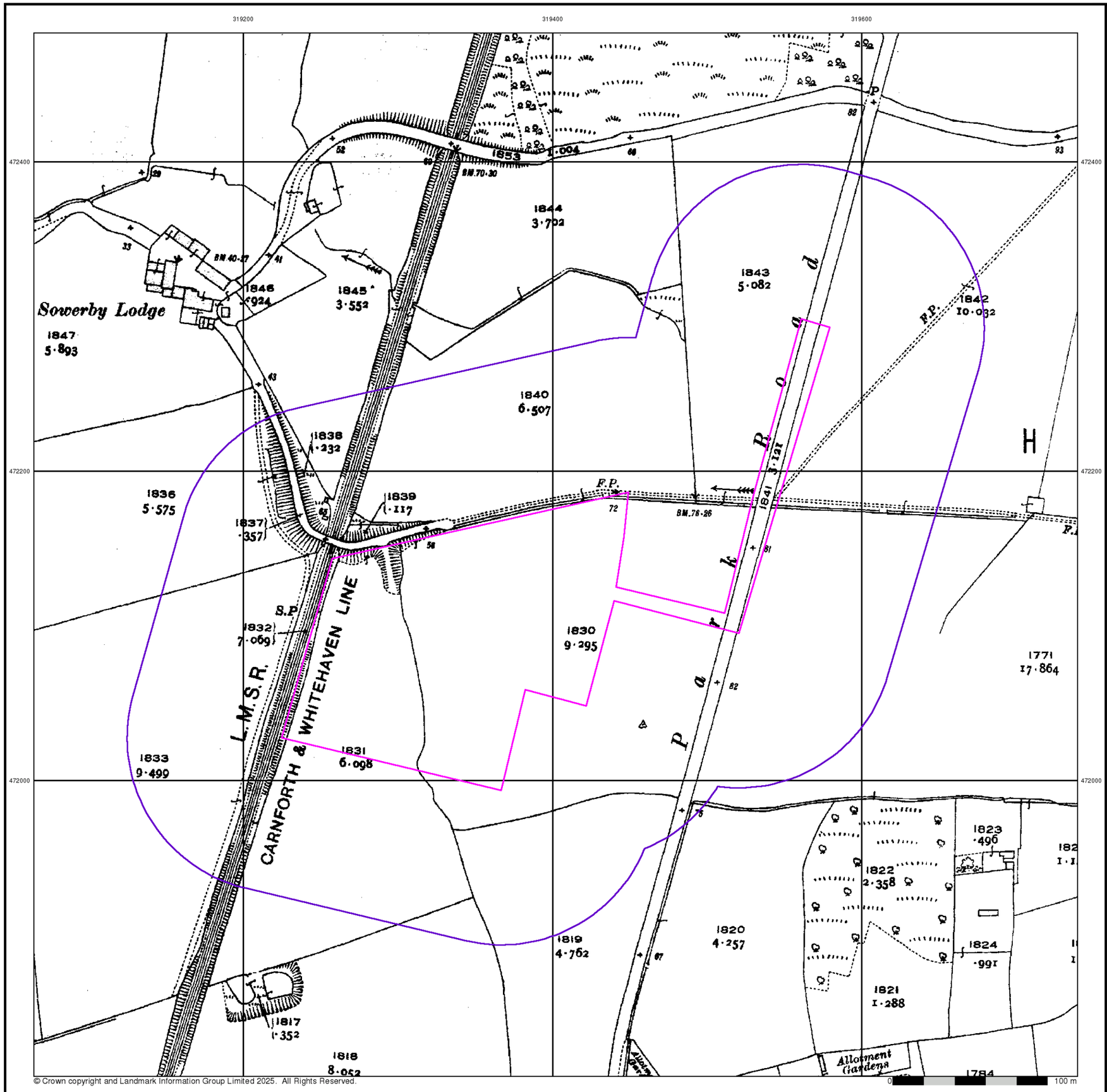
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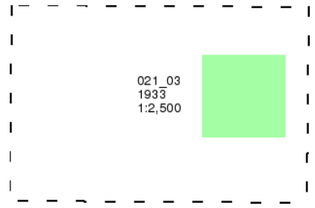
Lancashire And Furness

Published 1933

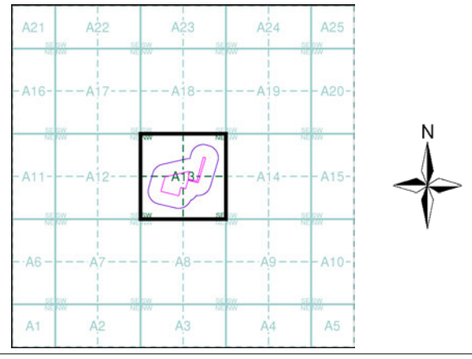
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



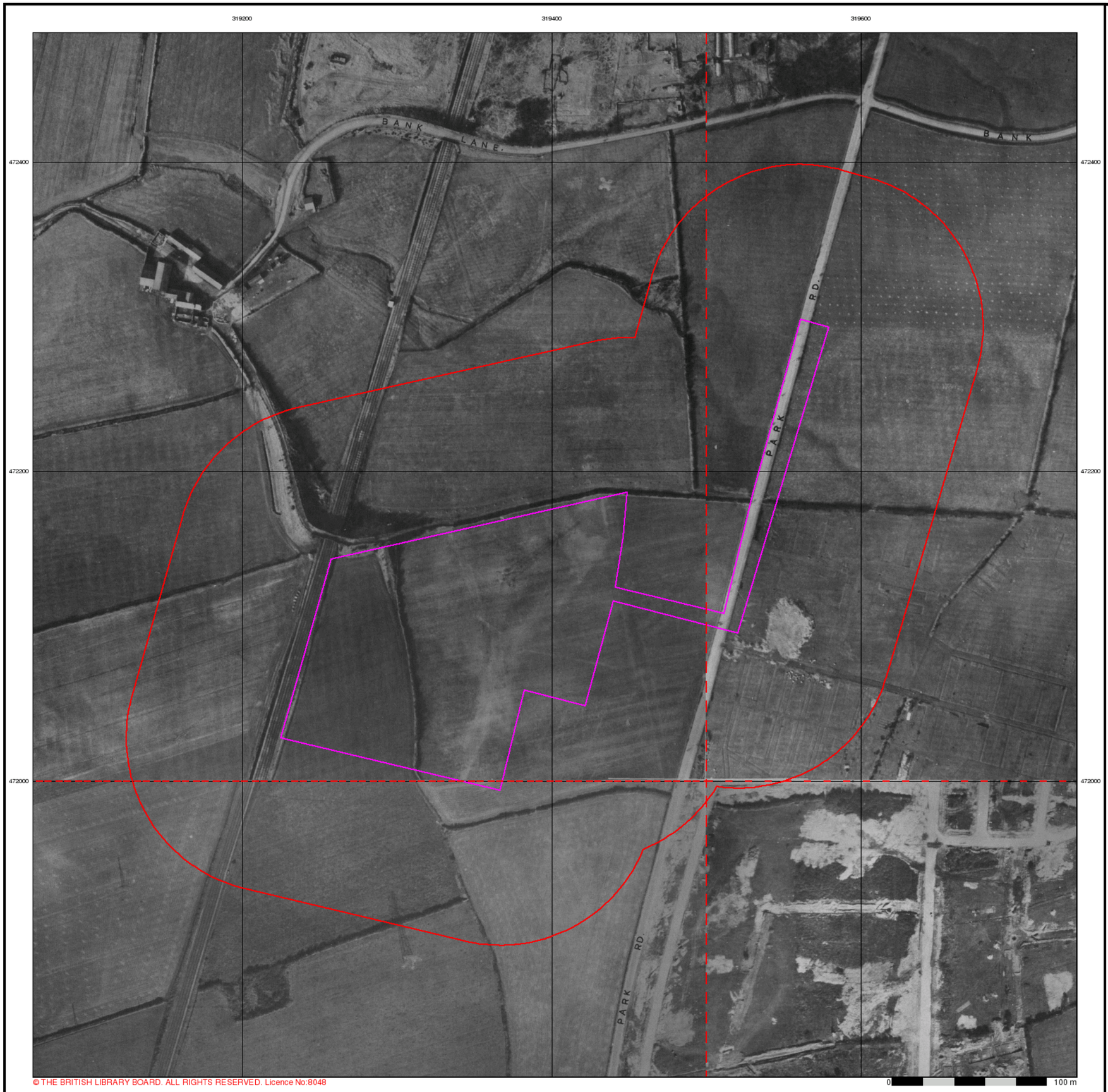
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Historical Aerial Photography

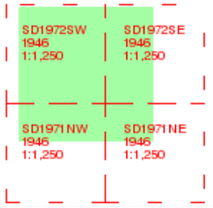
Published 1946

Source map scale - 1:1,250

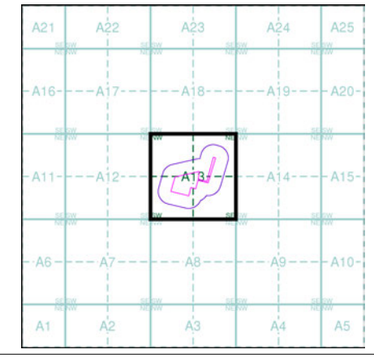
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

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Map Name(s) and Date(s)



Historical Aerial Photography - Segment A13



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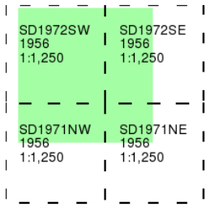
Ordnance Survey Plan

Published 1956

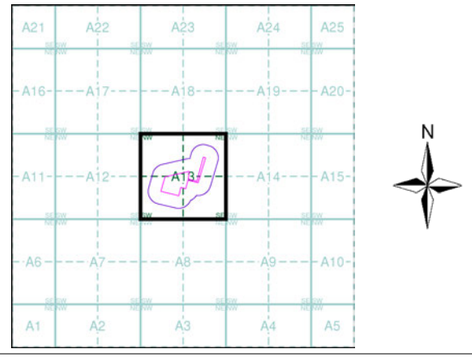
Source map scale - 1:1,250

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Historical Map - Segment A13



Order Details

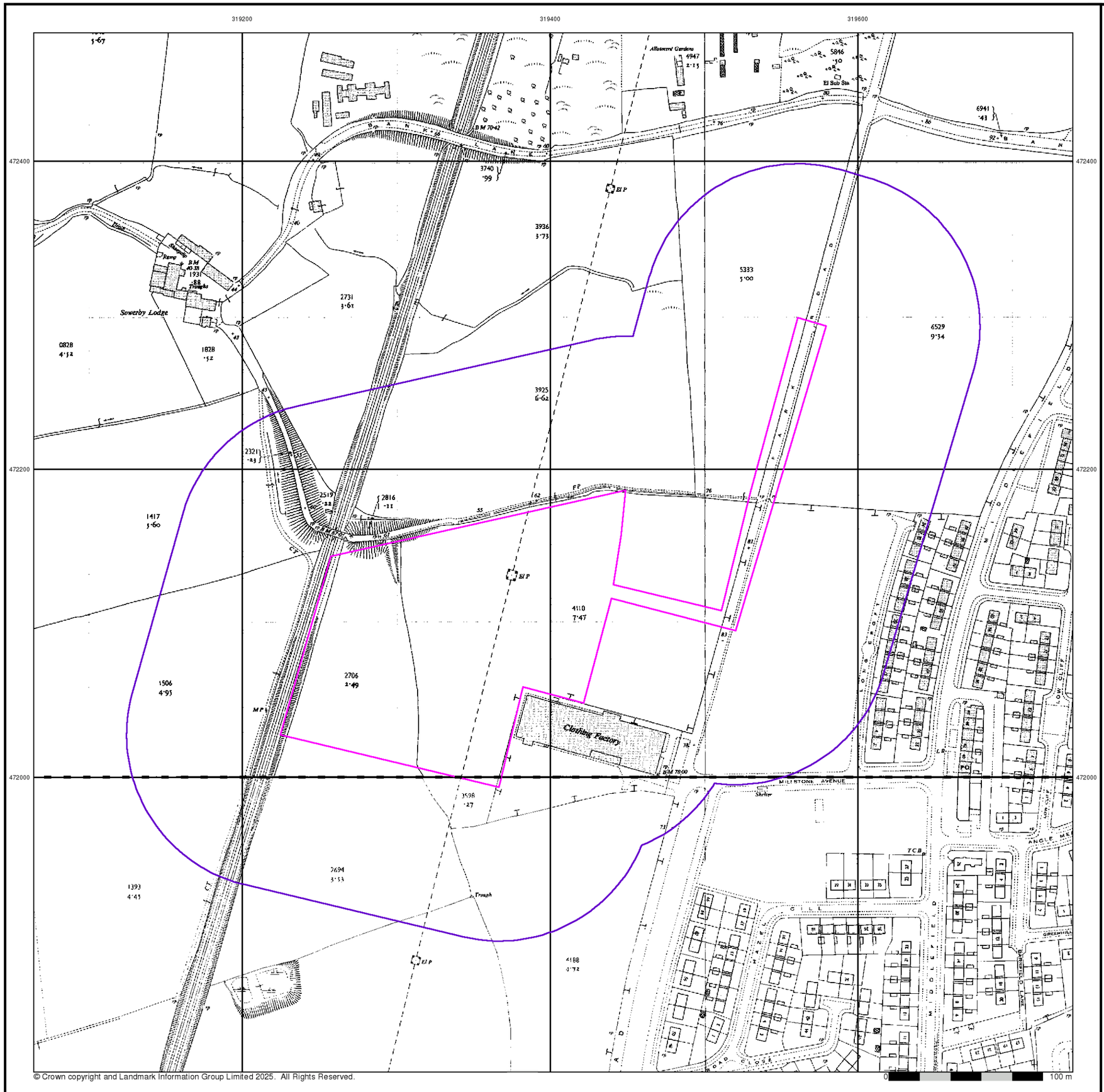
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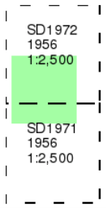
Ordnance Survey Plan

Published 1956

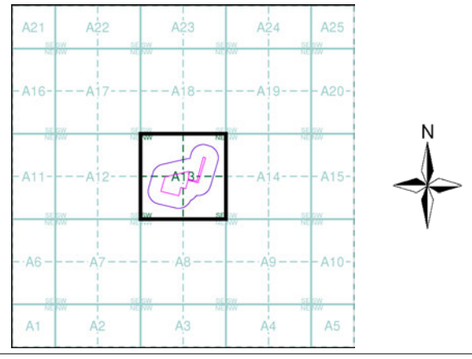
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



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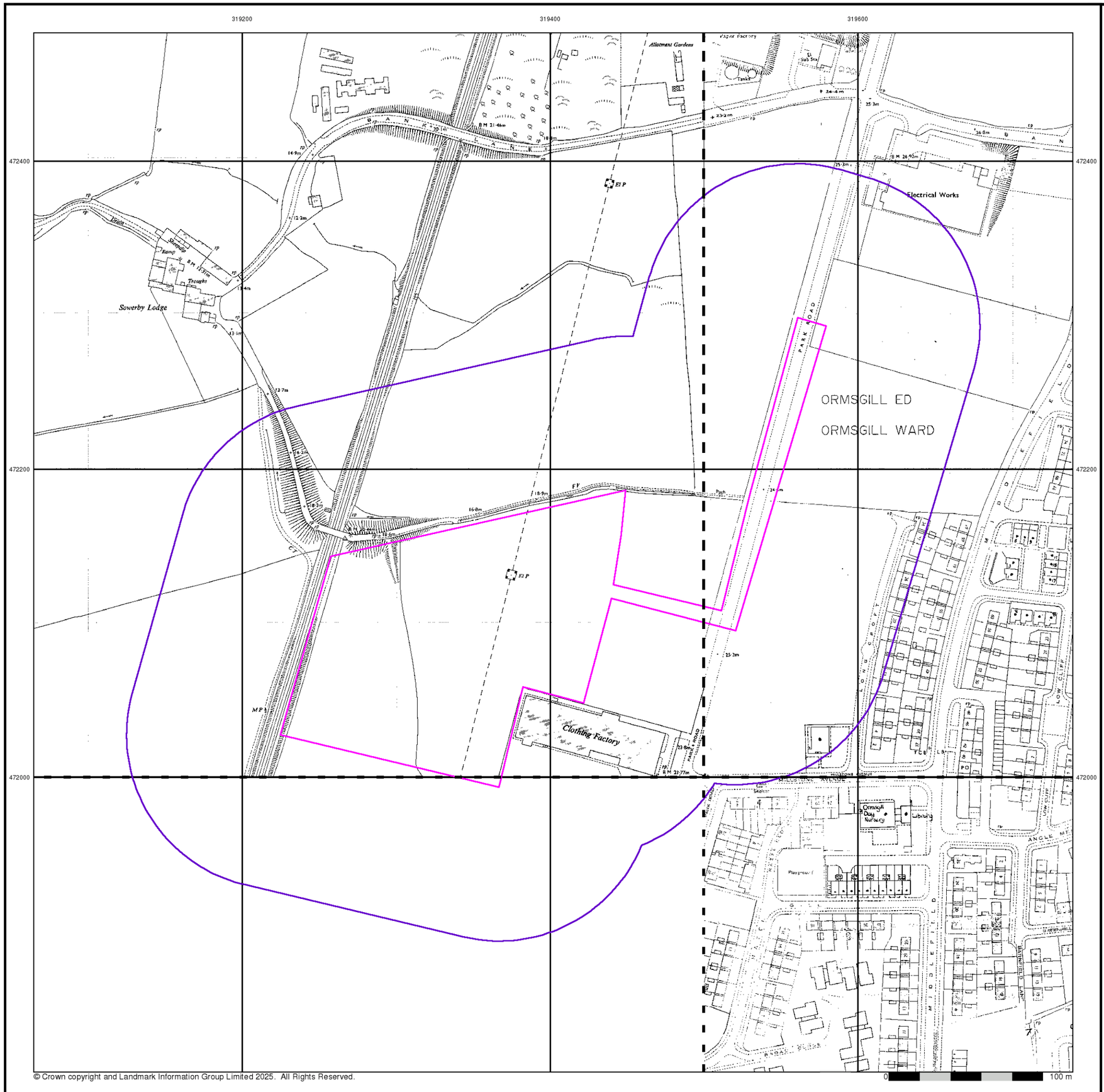
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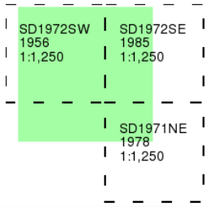
Additional SIMs

Published 1956 - 1985

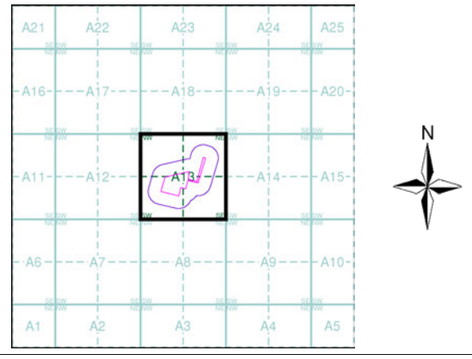
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

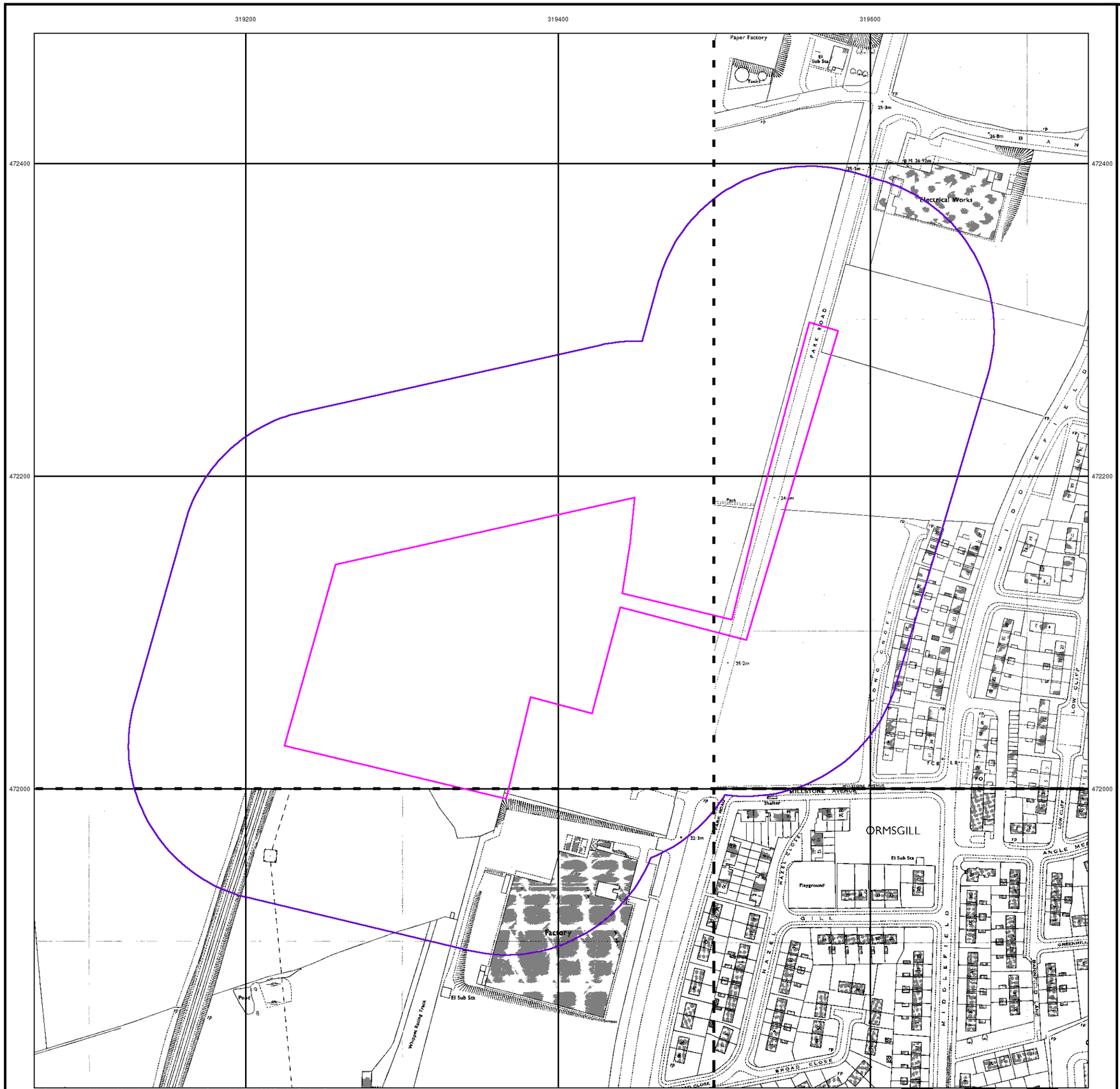
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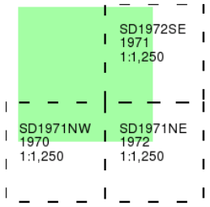
Ordnance Survey Plan

Published 1970 - 1972

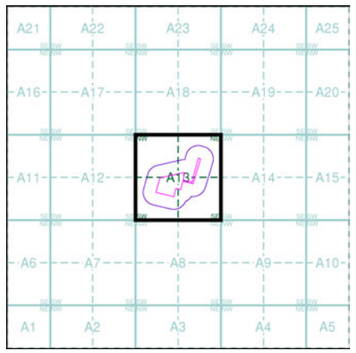
Source map scale - 1:1,250

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Historical Map - Segment A13



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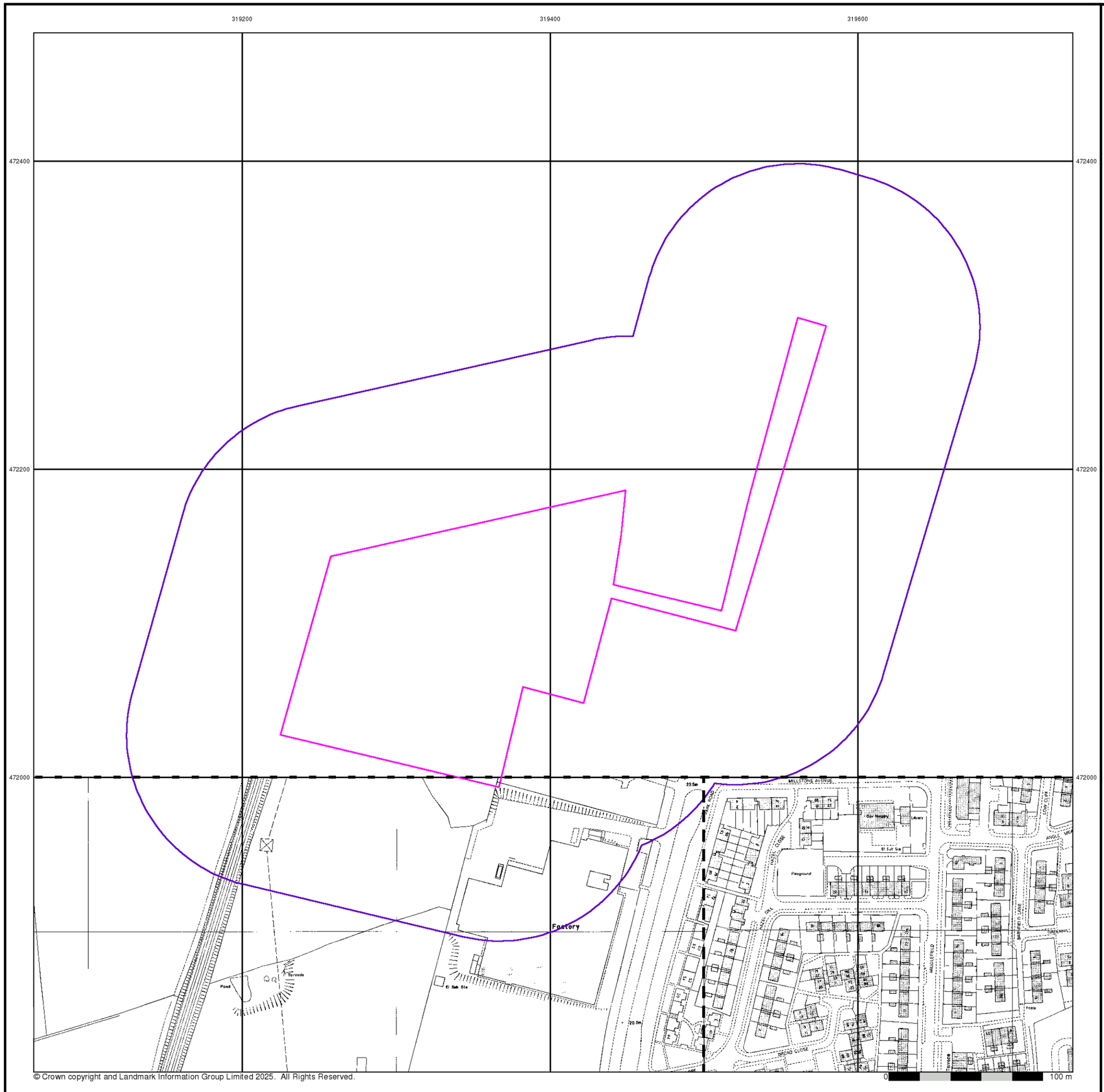
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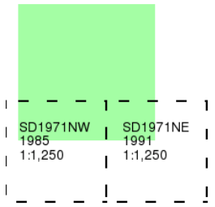
Ordnance Survey Plan

Published 1985 - 1991

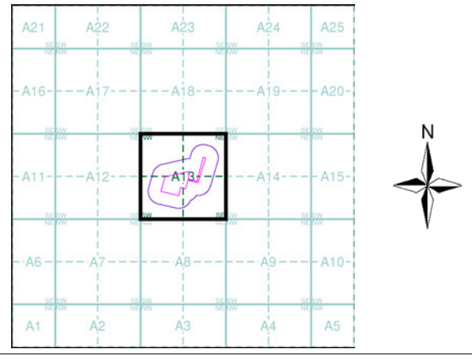
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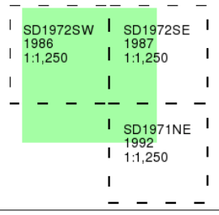
Additional SIMs

Published 1986 - 1992

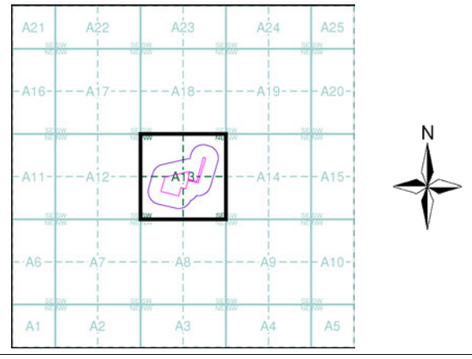
Source map scale - 1:1,250

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Map Name(s) and Date(s)



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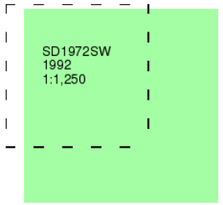
Additional SIMs

Published 1992

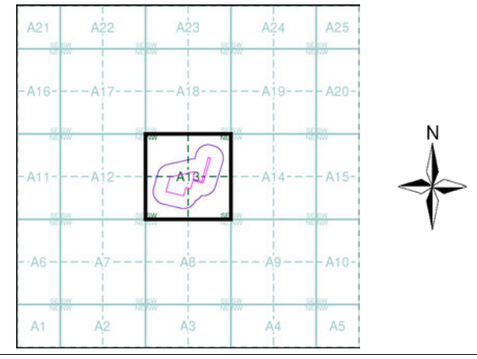
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	100

Site Details

Site at 319310, 472070

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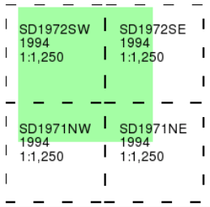
Large-Scale National Grid Data

Published 1994

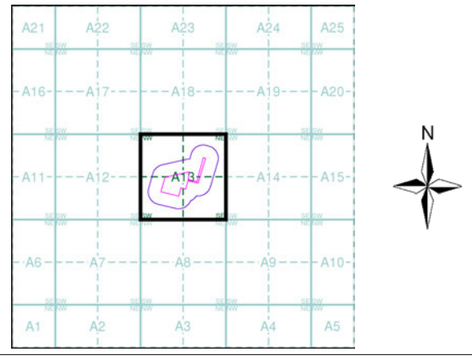
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

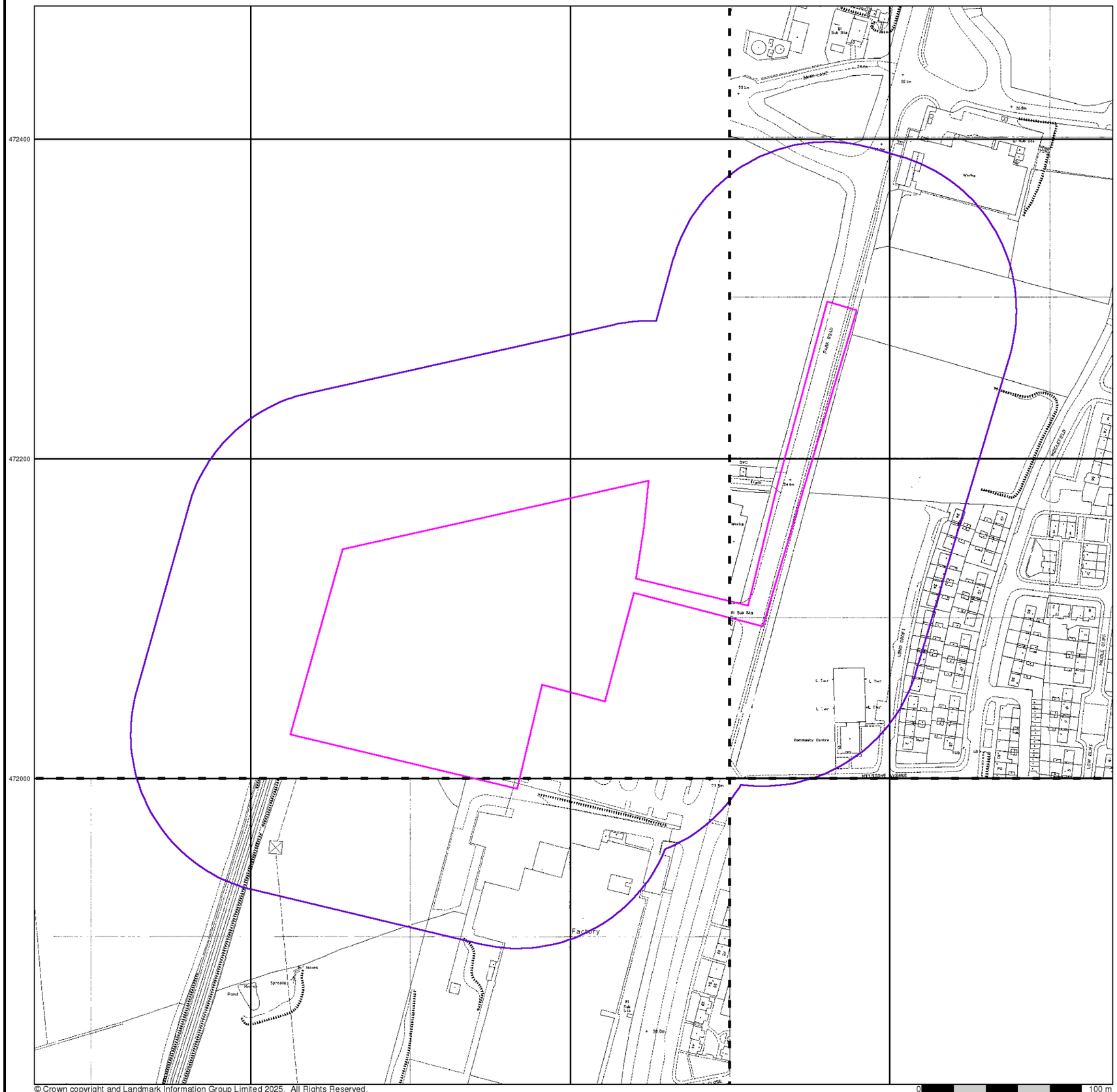
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	100

Site Details

Site at 319310, 472070

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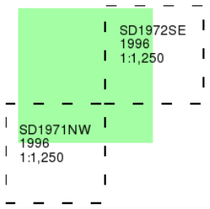
Large-Scale National Grid Data

Published 1996

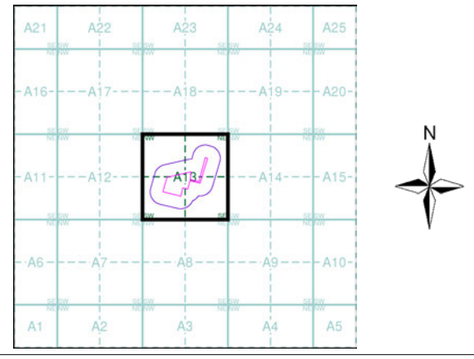
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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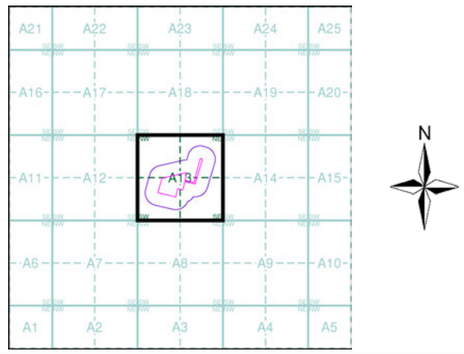
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Historical Aerial Photography

Published 2000

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

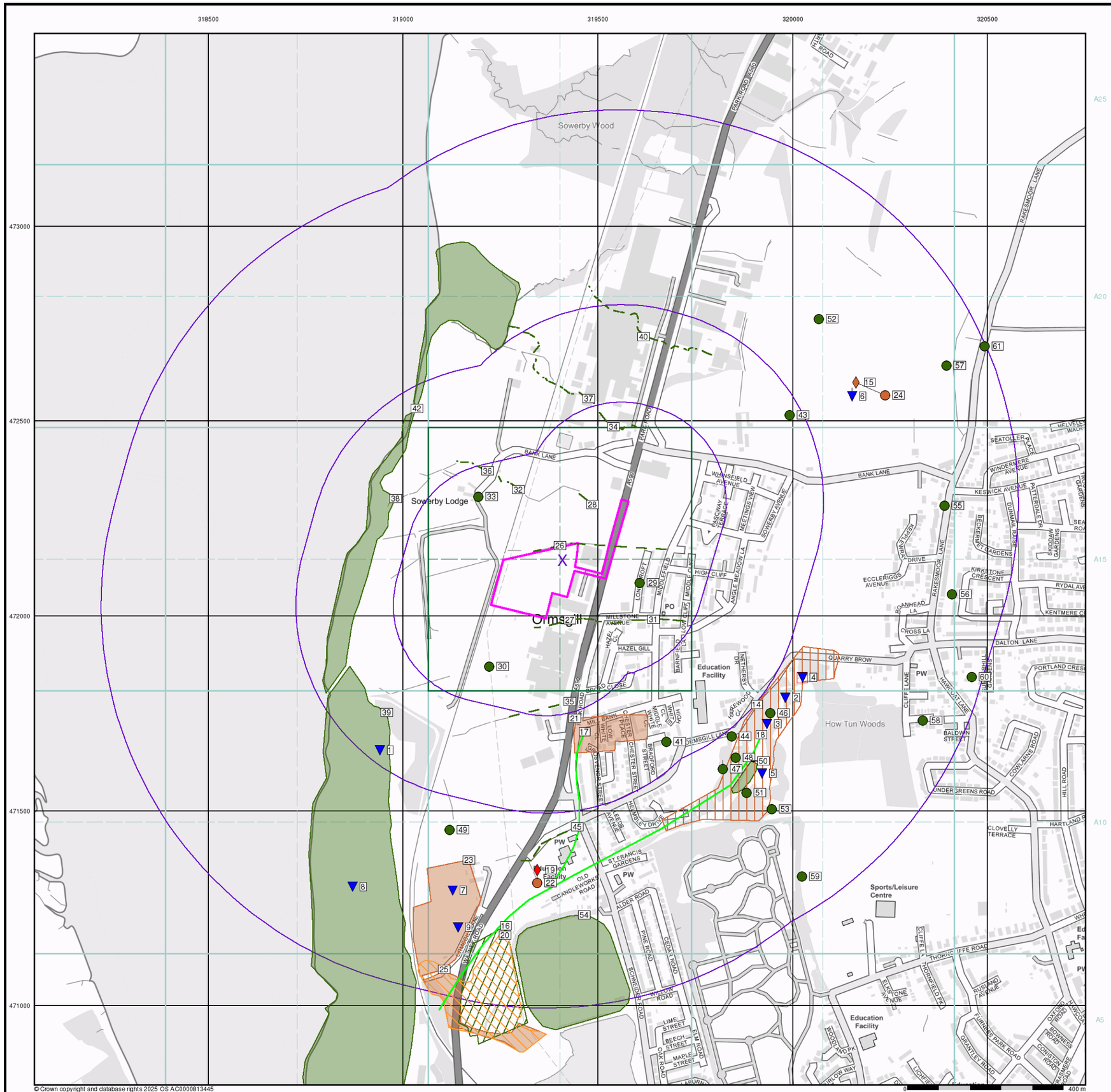
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National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	100

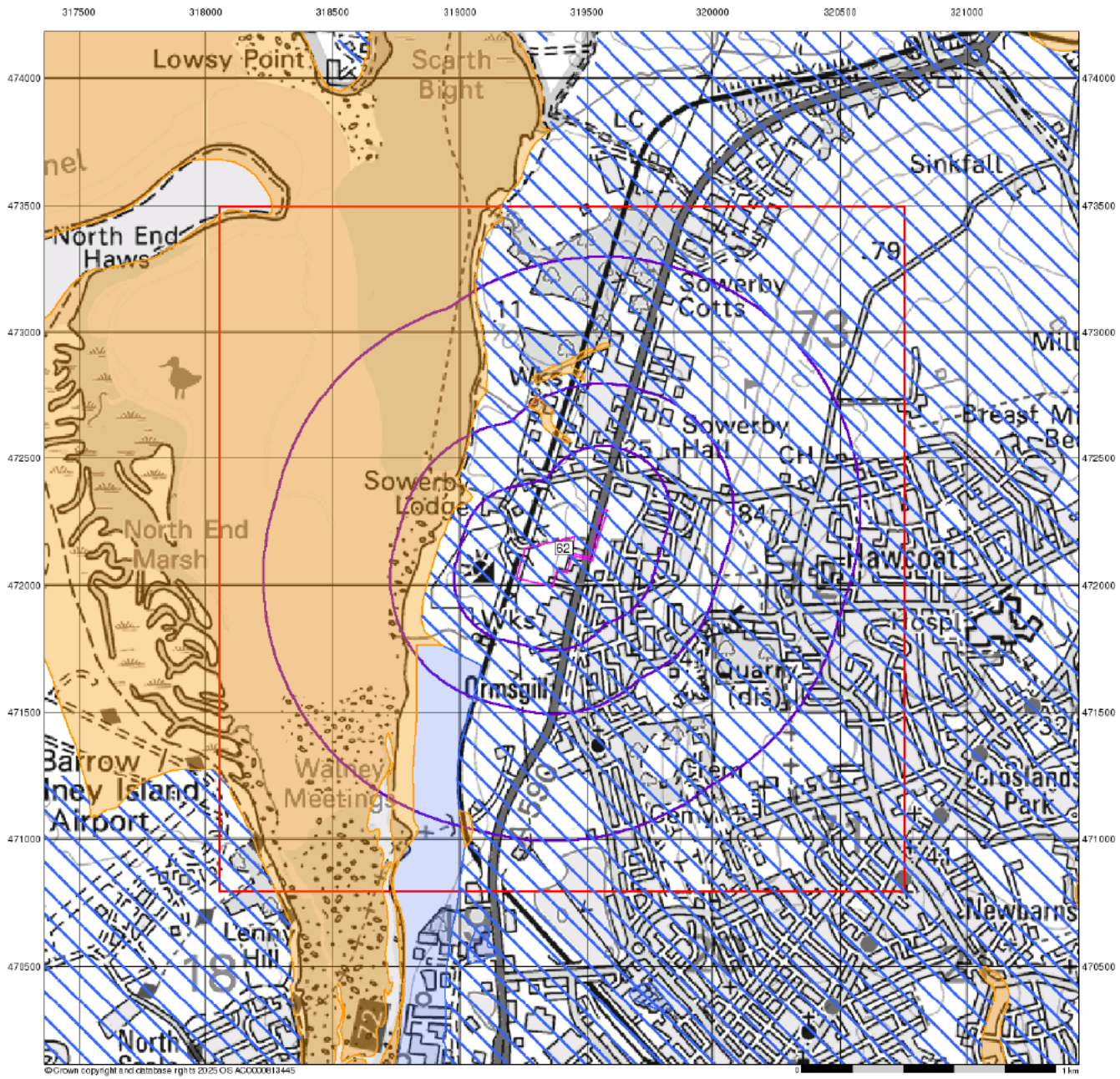
Site Details

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318500
319000
319500
320000
320500
473000
472500
472000
471500
471000
Sowerby Wood
How Tun Woods
Sowerby Lodge
Orms
Education Facility
Sports/Leisure Centre
PARK ROAD A650
BANK LANE
HAZEL GILL
QUARRY BROW
ST MAGILL LANE
SEATOLLER PLACE
WINDERMERE AVENUE
KESWICK AVENUE
ECCLERIGGS AVENUE
RAKESMOOR LANE
DALTON LANE
CLOVELLY TERRACE
UNDERGREENS ROAD
COWLARNE ROAD
HILL ROAD
BALDWIN STREET
CLIFFE LANE
HAWTHORN LANE
PORTLAND CRESCENT
KIRKSTONE CRESCENT
ROANHEAD LA
CROSS LA
DRIVE
HIGH CLIFF
MIDDLE CLIFF
LOW CLIFF
ANGLE MEADOW LA
MOORFIELDS
LONGCROFT
MILLSTONE AVENUE
HAZEL CL
BARNFIELD CL
NETHERBY DR
HORSEWOOD CL
MILL BANK
CHESTER CLOSE
CHESTER STREET
BRADFORD STREET
WHITE HIGH CL
WHITE LOW CL
WHITE MIDDLE CL
BRADFORD CLOSE
WHINSFIELD AVENUE
FASCIEW TERRACE
MEETINGS VIEW
COWERBY AVENUE
HEBDEN ROAD
HEBDEN GARDENS
DUNMAIL PARK
BECKSIDE
BECKSIDE PARK
BECKSIDE GARDENS
KENTMERE CR
KENTMERE DRIVE
MELVELLYN WALK
SILVERDALE GARDENS
SILVERDALE AVENUE
SILVERDALE CLOSE
SILVERDALE ROAD
SILVERDALE DRIVE
SILVERDALE GARDENS
SILVERDALE WALK
SILVERDALE CRESCENT
SILVERDALE PARK
SILVERDALE PARK ROAD
SILVERDALE PARK DRIVE
SILVERDALE PARK GARDENS
SILVERDALE PARK WALK
SILVERDALE PARK CRESCENT
SILVERDALE PARK CLOSE
SILVERDALE PARK AVENUE
SILVERDALE PARK GROVE
SILVERDALE PARK PLACE
SILVERDALE PARK TERRACE
SILVERDALE PARK MEWS
SILVERDALE PARK COURT
SILVERDALE PARK SQUARE
SILVERDALE PARK HILL
SILVERDALE PARK VIEW
SILVERDALE PARK RISE
SILVERDALE PARK LANE
SILVERDALE PARK STREET



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Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Potential for Compressible Ground Stability Hazards

High | Low | Moderate | Very Low

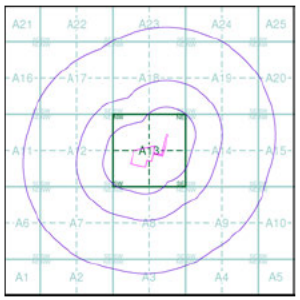
Potential for Collapsible Ground Stability Hazards

High | Low | Moderate | Very Low

Brine Pumping and Salt Mining

	Point	Polygon
Brine Pumping Related Feature	▲	▨
Salt Mining Related Feature	▲	▨

Mining and Ground Stability - Slice A



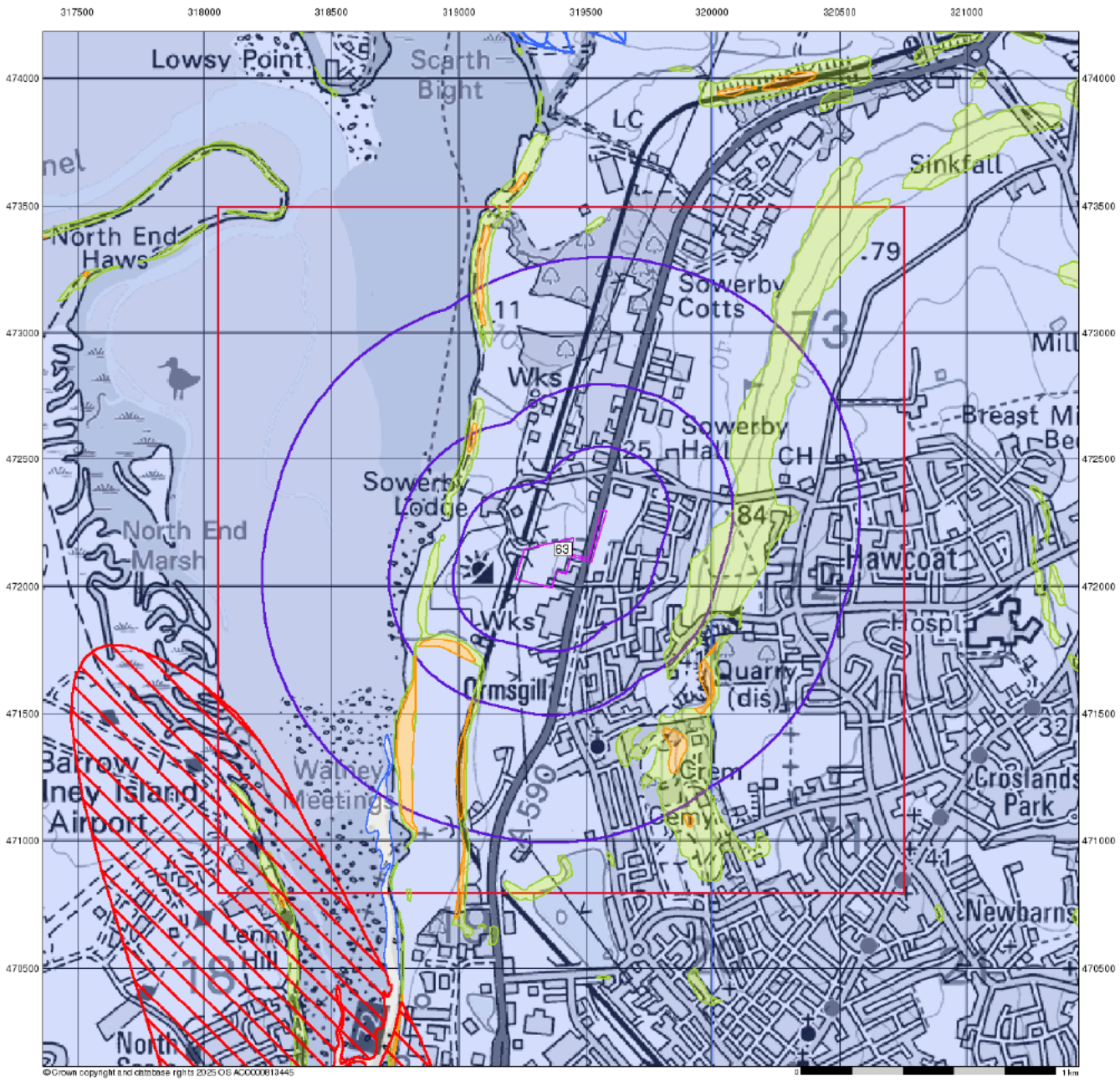
Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

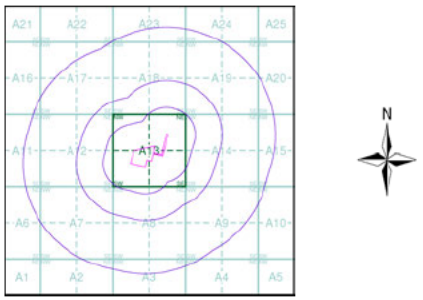
Potential for Landslide Ground Stability Hazards

High | Low
Moderate | Very Low

Potential for Ground Dissolution Stability Hazards

High | Low
Moderate | Very Low

Mining and Ground Stability - Slice A



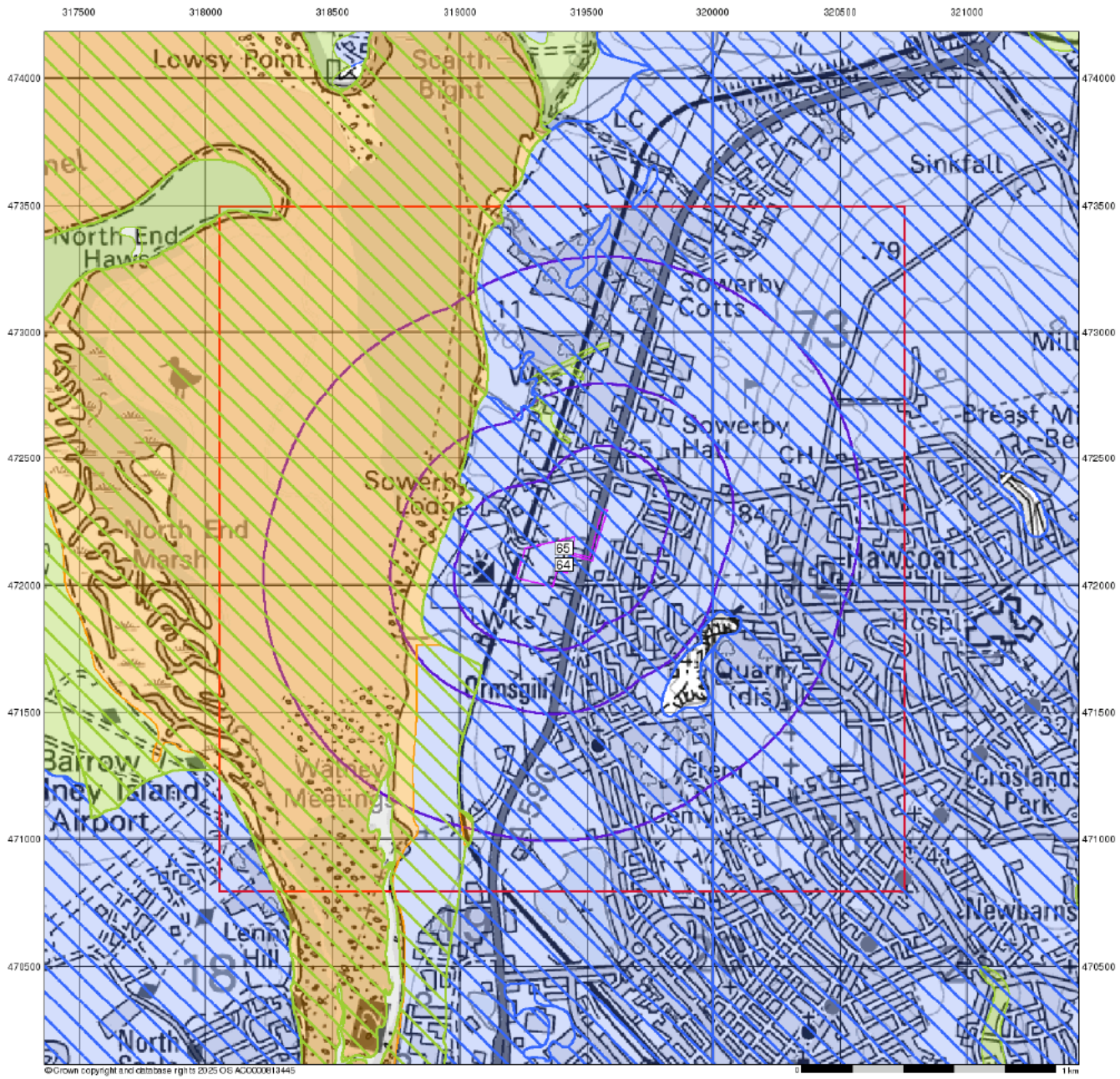
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

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Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

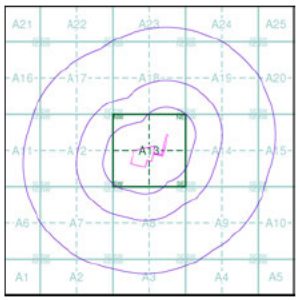
Potential for Running Sand Ground Stability Hazards

High | Low
Moderate | Very Low

Potential for Shrinking or Swelling Clay Ground Stability Hazards

High | Low
Moderate | Very Low

Mining and Ground Stability - Slice A



Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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Envirocheck® Report:

Mining and Ground Stability Datasheet

Order Details:

Order Number:
379674976_1_1

Customer Reference:
416.066073.00001

National Grid Reference:
319410, 472140

Slice:
A

Site Area (Ha):
3.16

Search Buffer (m):
1000

Site Details:

Site at 319310, 472070

Client Details:

Ms E Lovatt
SLR Consulting Ltd
3rd Floor, Brew House
Jacob Street
Tower Hill
Bristol
BS2 0EQ

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Contents

Report Section and Details	Page Number
Summary	-
The Summary section provides an overview of the data contained within the report, detailing the number of data set features or the existence of a data set in relation to the buffer selected. For ease of reference, the report is broken down into 4 sections of data; Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000) and Ground Stability Data (1:50,000).	
Mining and Natural Cavities Data	1
The Mining and Natural Cavities Data section features data sets related to the existence of mining areas and their potential hazards; and details of naturally formed cavities. Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map.	
Historical Land Use Information (1:2,500)	3
The Historical Land Use Information (1:2,500) section contains data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative. For the purpose of this Envirocheck module, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map. This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society.	
Historical Land Use Information (1:10,000)	4
The Historical Land Use (1:10,000) section covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses. For the purpose of this Envirocheck module, only data relating to mining and ground stability has been included and plotted on the accompanying Historical Land Use Information (1:10,000) map.	
Ground Stability Data (1:50,000)	7
The Ground Stability (1:50,000) section includes the BGS Geosure data suite, reporting features to 250m and plotted onto 3 separate maps. Also reported is brine subsidence, brine mining and salt mining data sets, of which Brine Pumping and Salt Mining Related Features are plotted, and subsidence insurance claims and insurance investigations data, which is not plotted.	
Historical Map List	8
The Historical Map List section details the historical mapping that has been analysed for your site, in relation to the Historical Land Use Information sections.	
Data Currency	9
Data Suppliers	10
Useful Contacts	11

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The brine subsidence data relating to the Driotwich area as provided in this report is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. For more detailed interpretation contact enquiries@jpb.co.uk. JPB retain the copyright and intellectual rights to this data and accept no liability for any loss or damage, including in direct or consequential loss, arising from the use of this data.

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Report Version v53.0

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m
Mining and Natural Cavities Data					
BGS Recorded Mineral Sites	pg 1			1	9
Coal Mining Affected Areas			n/a	n/a	n/a
Man Made Mining Cavities					
Mining Instability			n/a	n/a	n/a
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential Mining Areas					
Historical Land Use Information (1:2,500)					
Extractive Industries or Potential Excavations from 1855-1909 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1893-1915 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1906-1937 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1924-1949 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1950-1980 (100m)	pg 3	1	3	n/a	n/a
Subterranean Features (100m)				n/a	n/a
Historical Land Use Information (1:10,000)					
Air Shafts					
Disturbed Ground					
General Quarrying	pg 4				2
Heap, unknown constituents	pg 4				1
Mineral Railway	pg 4			1	1
Mining & quarrying general	pg 4				1
Mining of coal & lignite					
Quarrying of sand & clay, operation of sand & gravel pits	pg 4				1
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Potentially Infilled Land (Non-Water)	pg 4			1	4
Potentially Infilled Land (Water)	pg 4	1	10	7	18
Ground Stability Data (1:50,000)					
CBSCB Compensation District			n/a	n/a	n/a
Brine Pumping Related Features					
Brine Subsidence Solution Area					
Potential for Collapsible Ground Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 7	Yes		n/a	n/a
Salt Mining Related Features					

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Summary

Report Version v53.0

Mining and Natural Cavities Data

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**BGS Recorded Mineral Sites** Site Name: Barrow Slag Bank Location: Walney Road, Hindpool, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 253607 Type: Tip **Status: Ceased** Operator: Caird Environmental Operator Location: Not Supplied Periodic Type: Anthropogene Geology: Blast Furnace Slag Commodity: Slag (Including Basic Oxygen Slag and Electric Arc Furnace Slags) Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	466	1	318940 471660
2	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarry Location: Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 242375 Type: Opencast **Status: Ceased** Operator: G. H. Young Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	549	1	319980 471795
3	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarry Location: Hawcoat, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 255547 Type: Opencast **Status: Ceased** Operator: G. H. Young Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	553	1	319933 471727
4	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarries Location: Hawcoat, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 9150 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A14SW (SE)	562	1	320024 471847
4	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarries Location: Hawcoat, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 255546 Type: Opencast **Status: Ceased** Operator: G. H. Young Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A14SW (SE)	597	1	320066 471853
5	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarry Location: Hawcoat, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 1196 Type: Opencast **Status: Ceased** Operator: G. H. Young Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	637	1	319920 471600

Mining and Natural Cavities Data

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	**BGS Recorded Mineral Sites** Site Name: Rakes Moor Quarry Location: Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 144803 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	644	1	320152 472586
7	**BGS Recorded Mineral Sites** Site Name: Ormsgill Brick Works Location: Ormsgill, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 253606 Type: Opencast **Status: Ceased** Operator: Furness Brick & Tile Co., Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Till, Devensian Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A8SW (S)	731	1	319127 471300
8	**BGS Recorded Mineral Sites** Site Name: Barrow Slag Bank Location: Walney Road, Hindpool, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 253608 Type: Tip **Status: Ceased** Operator: Caird Environmental Operator Location: Not Supplied Periodic Type: Anthropogene Geology: Blast Furnace Slag Commodity: Slag (Including Basic Oxygen Slag and Electric Arc Furnace Slags) Positional Accuracy: Located by supplier to within 10m	A7SE (SW)	801	1	318870 471310
9	**BGS Recorded Mineral Sites** Site Name: Ormsgill Brick Works Location: Ormsgill, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 27595 Type: Opencast **Status: Ceased** Operator: Furness Brick & Tile Co., Ltd. Operator Location: Not Supplied Periodic Type: Quaternary, Devensian Geology: Till, Devensian Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A8SW (S)	820	1	319140 471205
	Coal Mining Affected Areas In an area which may not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				

Historical Land Use Information (1:2,500)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Extractive Industries or Potential Excavations from 1950-1980** Use: Railway Cutting First Map Published Date: 1956 Last Map Published Date: 1956	A13SW (W)	0	-	319250 472102
11	**Extractive Industries or Potential Excavations from 1950-1980** Use: Railway Embankment First Map Published Date: 1956 Last Map Published Date: 1956	A13NW (W)	27	-	319276 472186
12	**Extractive Industries or Potential Excavations from 1950-1980** Use: Railway Embankment First Map Published Date: 1956 Last Map Published Date: 1956	A13SW (SW)	66	-	319208 471965
13	**Extractive Industries or Potential Excavations from 1950-1980** Use: Railway Cutting First Map Published Date: 1956 Last Map Published Date: 1956	A13NW (NW)	93	-	319293 472246

Historical Land Use Information (1:10,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	**General Quarrying** Use: Not Supplied Date of Mapping: 1851 - 1956	A9NW (SE)	503	-	319907 471773
15	**General Quarrying** Use: Not Supplied Date of Mapping: 1851	A19SE (NE)	658	-	320161 472599
16	**Heap, unknown constituents** Use: Not Supplied Date of Mapping: 1989	A8SW (S)	797	-	319263 471204
17	**Mineral Railway** Use: Not Supplied Date of Mapping: 1895	A8NE (S)	307	-	319466 471703
18	**Mineral Railway** Use: Not Supplied Date of Mapping: 1851 - 1931	A9NW (SE)	565	-	319919 471696
19	**Mining & quarrying general** Use: Not Supplied Date of Mapping: 1851	A8SW (S)	646	-	319343 471349
20	**Quarrying of sand & clay, operation of sand & gravel pits** Use: Not Supplied Date of Mapping: 1956	A8SW (S)	816	-	319261 471185
21	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A8NE (S)	267	-	319440 471738
22	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A8SW (S)	646	-	319343 471349
23	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A8SW (S)	649	-	319169 471374
24	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A19SE (NE)	658	-	320161 472599
25	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A3NW (S)	937	-	319105 471093
26	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NE (N)	0	-	319402 472180
27	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13SE (S)	19	-	319427 471990
28	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NE (NE)	70	-	319486 472285
29	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1916	A13SE (E)	86	-	319607 472085
30	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13SW (SW)	155	-	319220 471870
31	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1931	A13SE (SE)	161	-	319642 471991
32	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NW (NW)	168	-	319296 472323
33	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NW (NW)	176	-	319192 472307
34	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1916	A18SE (N)	181	-	319539 472486

Historical Land Use Information (1:10,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
35	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8NE (S)	223	-	319427 471780
36	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NW (NW)	232	-	319217 472372
37	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A18SE (N)	273	-	319476 472557
38	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1851	A12NE (W)	310	-	318981 472301
39	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1851	A7NE (SW)	384	-	318957 471753
40	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A18SE (N)	409	-	319616 472717
41	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8NE (SE)	442	-	319675 471677
42	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SE (NW)	449	-	319035 472533
43	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A19SW (NE)	469	-	319991 472516
44	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	517	-	319843 471691
45	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8SE (S)	541	-	319446 471459
46	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	547	-	319942 471748
47	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	553	-	319820 471630
48	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	567	-	319853 471637
49	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8SW (SW)	586	-	319119 471451
50	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	599	-	319894 471628
51	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	657	-	319881 471547
52	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A19SW (NE)	676	-	320066 472762
53	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	728	-	319946 471505
54	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8SE (S)	766	-	319464 471232
55	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1895	A14NE (E)	810	-	320389 472283

Historical Land Use Information (1:10,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
56	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A14SE (E)	862	-	320407 472056
57	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A19SE (NE)	887	-	320393 472643
58	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1895	A9NE (SE)	891	-	320333 471732
59	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1851	A9SW (SE)	914	-	320023 471332
60	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1895	A15SW (E)	972	-	320459 471844
61	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A20SW (NE)	997	-	320492 472693

Ground Stability Data (1:50,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	CBSCB Compensation District The site does not fall within the brine compensation area.				
	Brine Subsidence Solution Area The site does not fall within the brine subsidence solution area.				
62	**Potential for Collapsible Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
63	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
64	**Potential for Running Sand Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
65	**Potential for Shrinking or Swelling Clay Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143

Historical Map List

The following mapping has been analysed for Historical Land Use Information (1:2,500):

1:2,500	Mapsheet	Published Date
Ordnance Survey Plan	SD1971	1956
Ordnance Survey Plan	SD1972	1956

The following mapping has been analysed for Historical Land Use Information (1:10,000):

1:10,560	Mapsheet	Published Date
Lancashire And Furness	015_00	1850
Cumberland	090A_00	1867
Lancashire And Furness	021_00	1873
Lancashire And Furness	015_00	1892
Lancashire And Furness	021_00	1895
Lancashire And Furness	021_NE	1916
Lancashire And Furness	015_SE	1919
Lancashire And Furness	021_NE	1931
Ordnance Survey Plan	SD17SE	1956
Ordnance Survey Plan	SD27SW	1956
1:10,000	**Mapsheet**	**Published Date**
Ordnance Survey Plan	SD17SE	1989
Ordnance Survey Plan	SD27SW	1990

Data Currency

Mining and Cavities Data	Version	Update Cycle
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	April 2025	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Property Searches	February 2023	
Man Made Mining Cavities Stantec UK Ltd	December 2023	Bi-Annually
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Natural Cavities Stantec UK Ltd	December 2023	Bi-Annually
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Historical Land Use Information (1:2,500)	**Version**	**Update Cycle**
Subterranean Features Landmark Information Group Limited	July 2023	Bi-Annually
Ground Stability Data (1:50,000)	**Version**	**Update Cycle**
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	 As notified
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Brine Subsidence Solution Area Johnson Poole & Bloomer	December 2020	

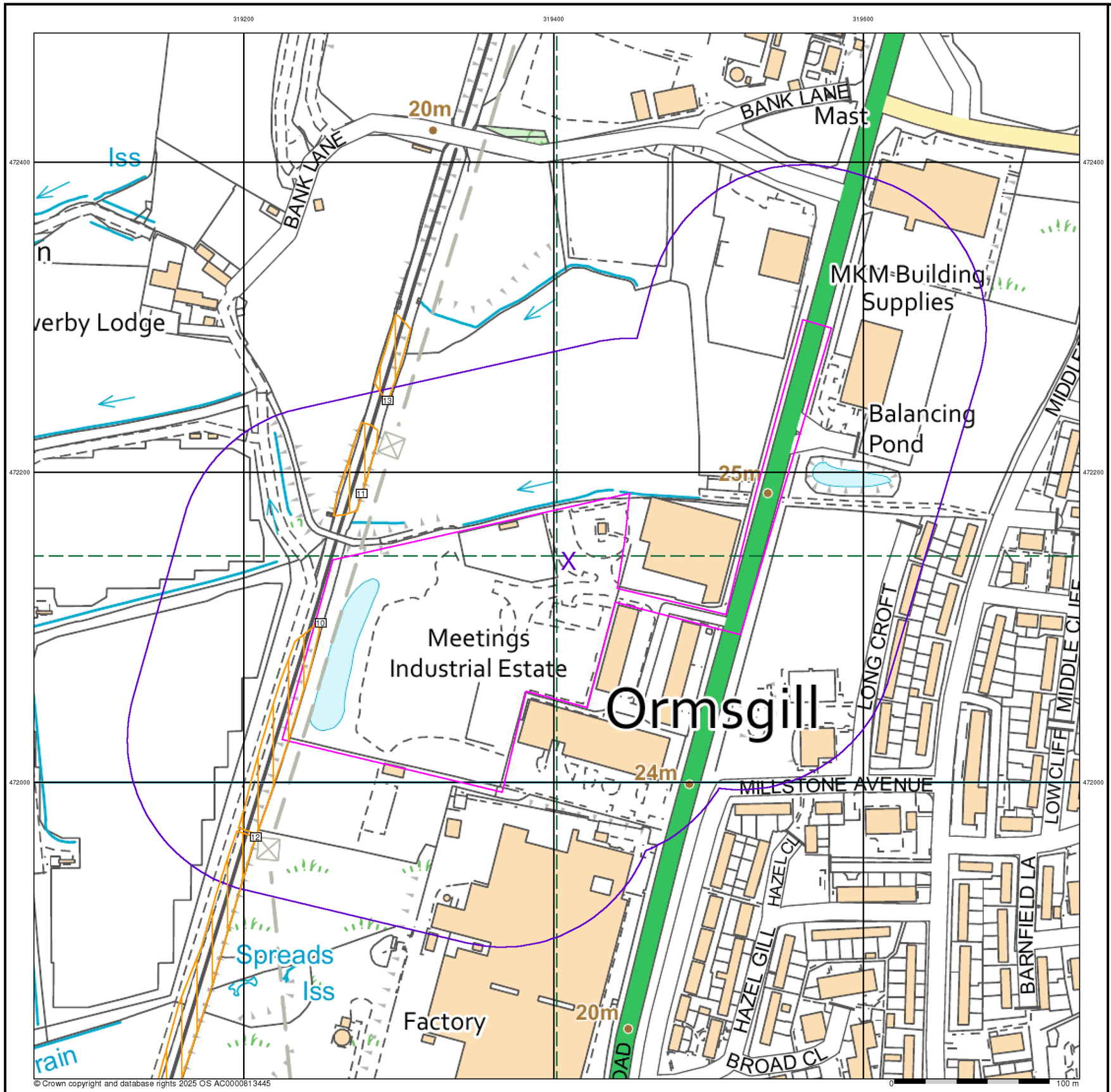
Data Suppliers

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
British Geological Survey	
The Coal Authority	
Ove Arup	
Stantec UK Ltd	
Wardell Armstrong	
Johnson Poole & Bloomer	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
-	**Landmark Information Group Limited** Landmark Information Group, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0330 036 6618 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk



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Historical Land Use Information (1:2,500)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

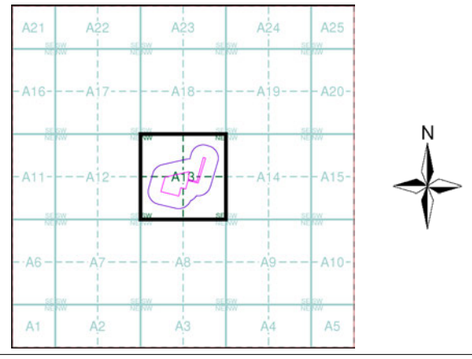
Potentially Contaminative Industrial Uses (Extractive Industries Activity)

	Point	Line	Polygon
Extractive Industries Activity from 1855 - 1909	▲	—	▭
Extractive Industries Activity from 1893 - 1915	▲	—	▨
Extractive Industries Activity from 1906 - 1937	▲	—	▤
Extractive Industries Activity from 1924 - 1949	▲	—	▨
Extractive Industries Activity from 1950 - 1980	▲	—	▥

Subterranean Features

	Point	Line	Polygon
Subterranean Features	▼	- - -	▭

Mining and Ground Stability - Segment A13



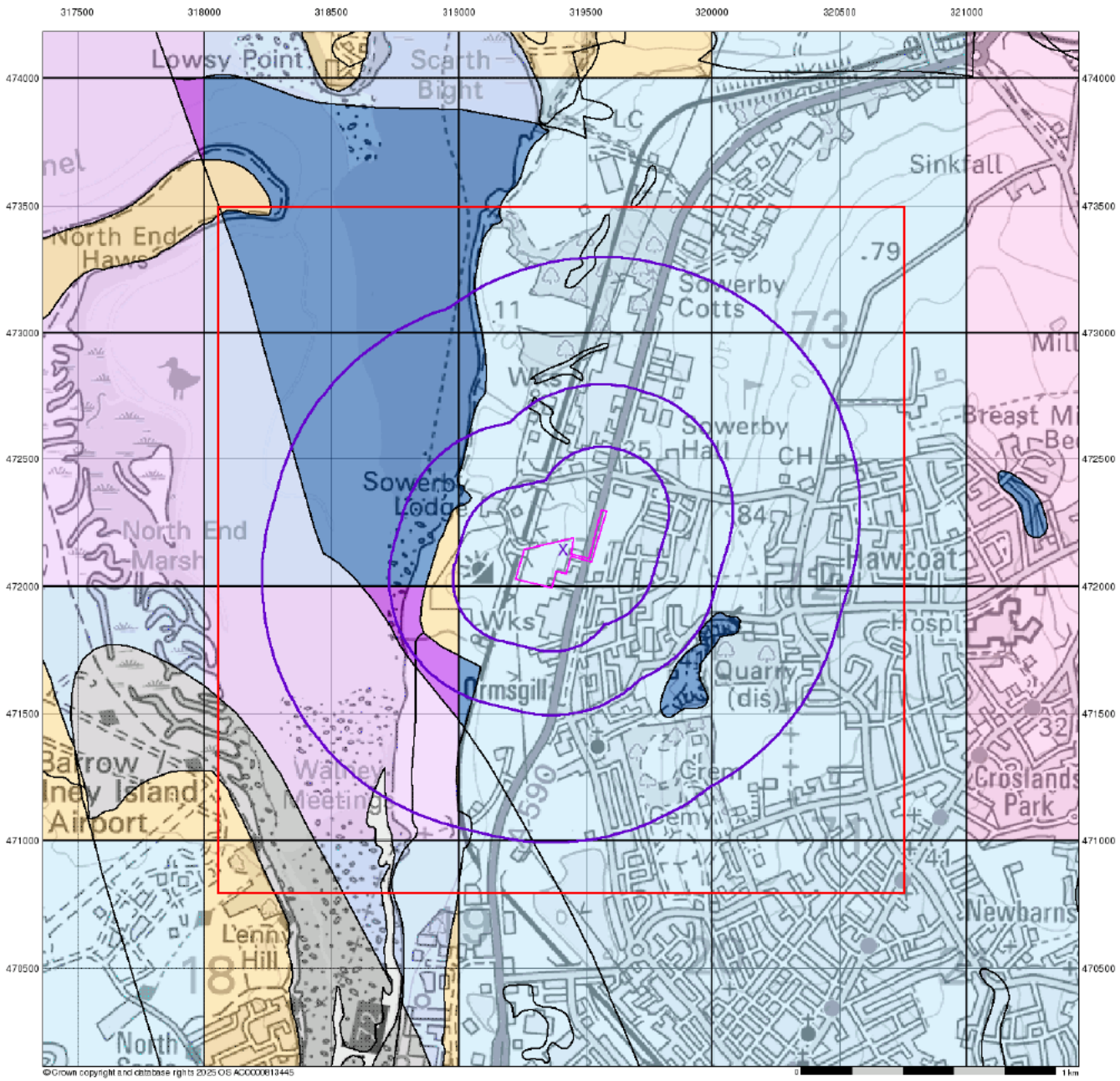
Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Plot Buffer (m):	100

Site Details

Site at 319310, 472070

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Groundwater Vulnerability

General

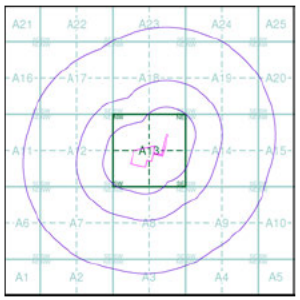
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer
Soluble Rock

Site Sensitivity Context Map - Slice A



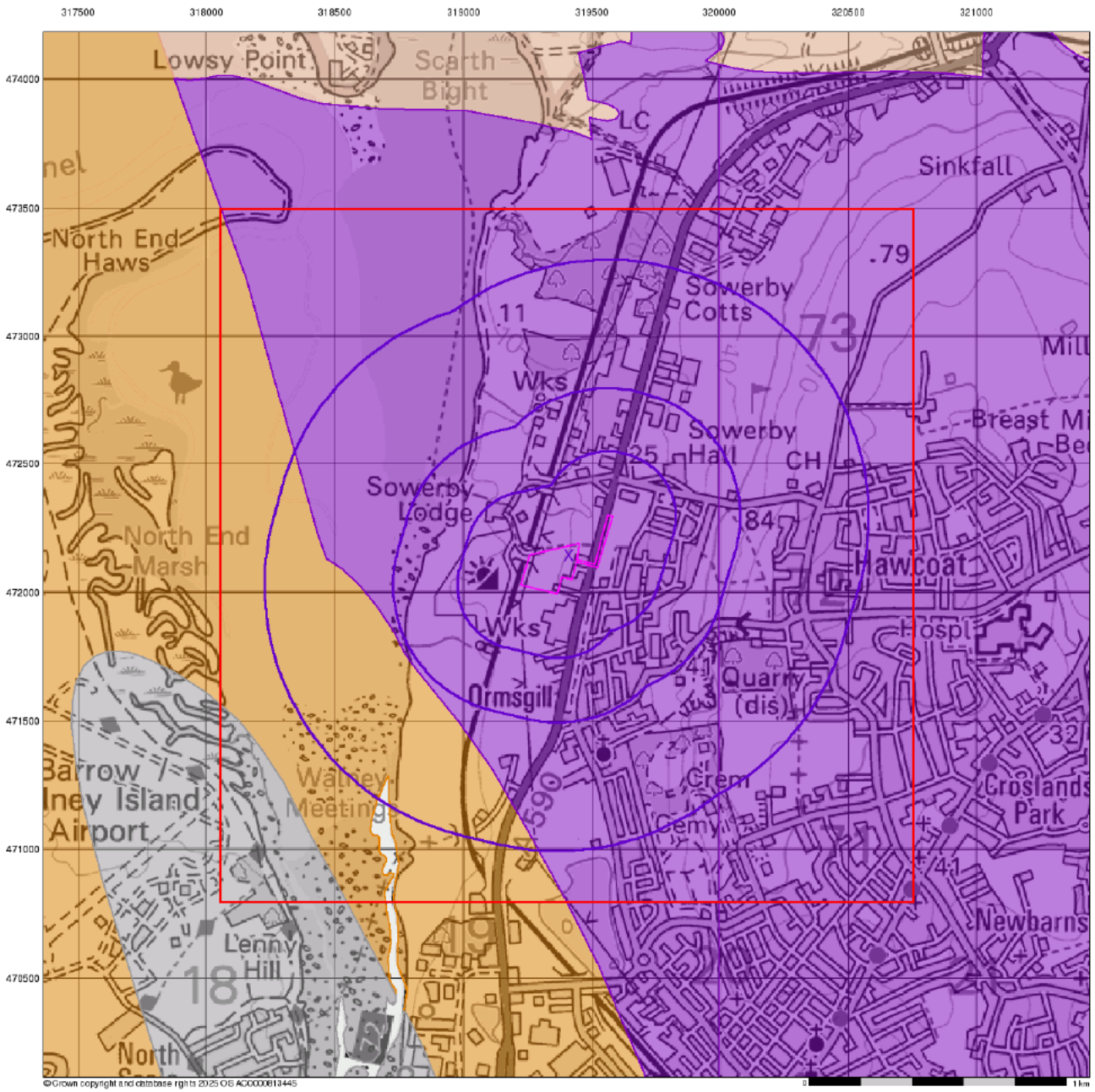
Order Details

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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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Bedrock Aquifer Designation

General

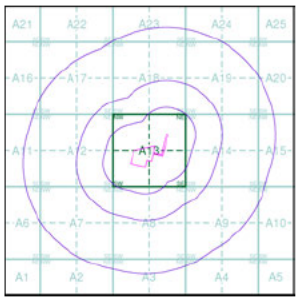
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



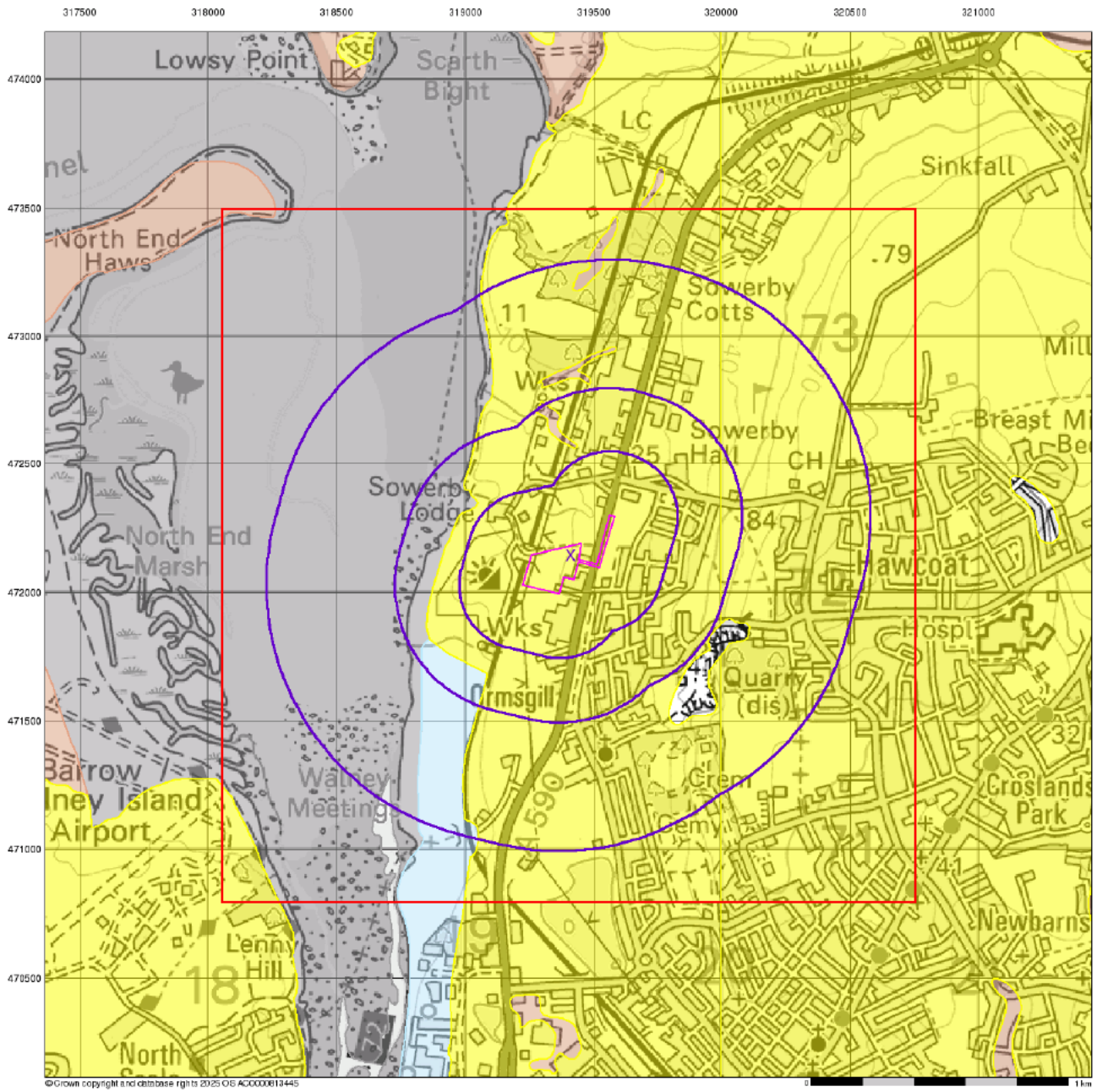
Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

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Superficial Aquifer Designation

General

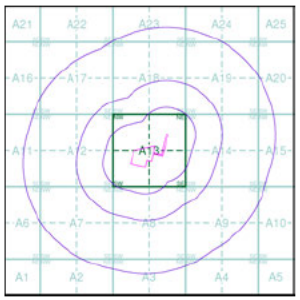
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



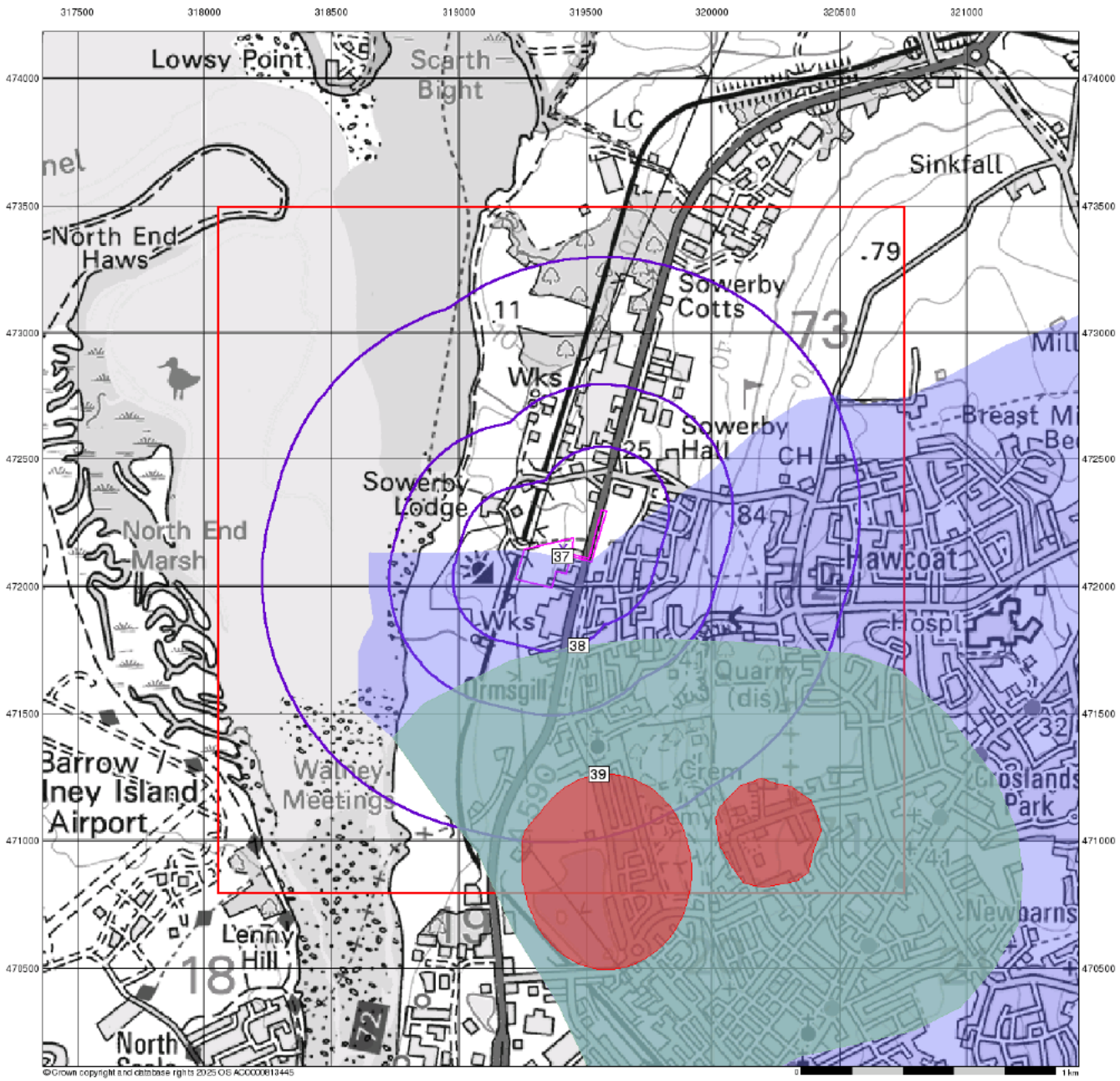
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Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

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Source Protection Zones

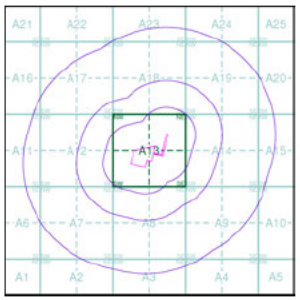
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



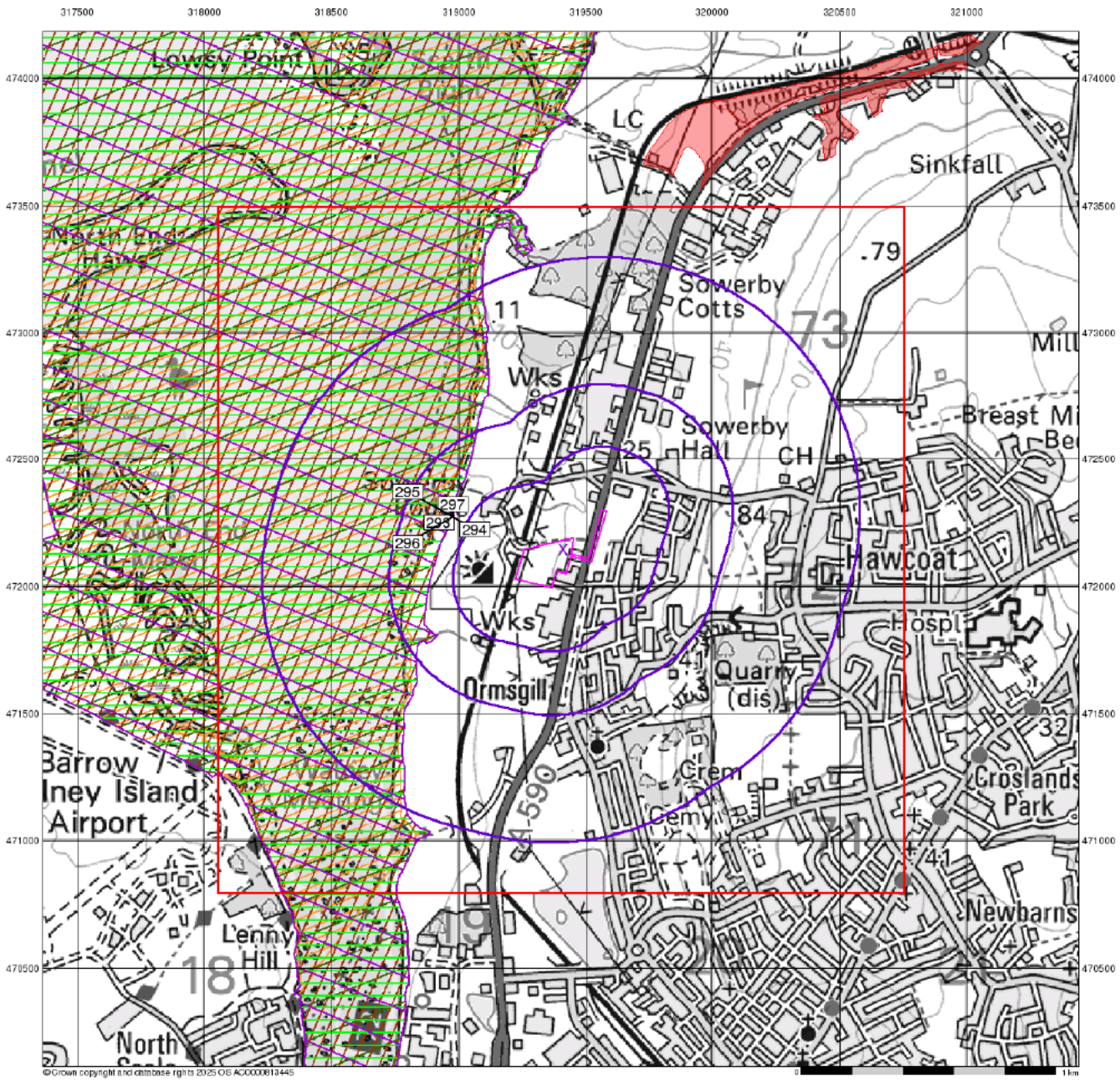
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Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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Sensitive Land Uses

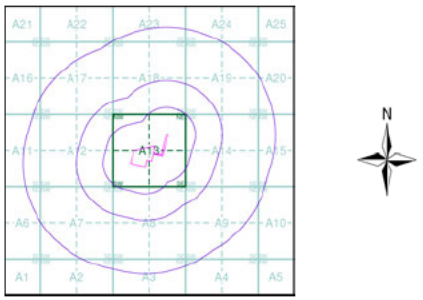
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



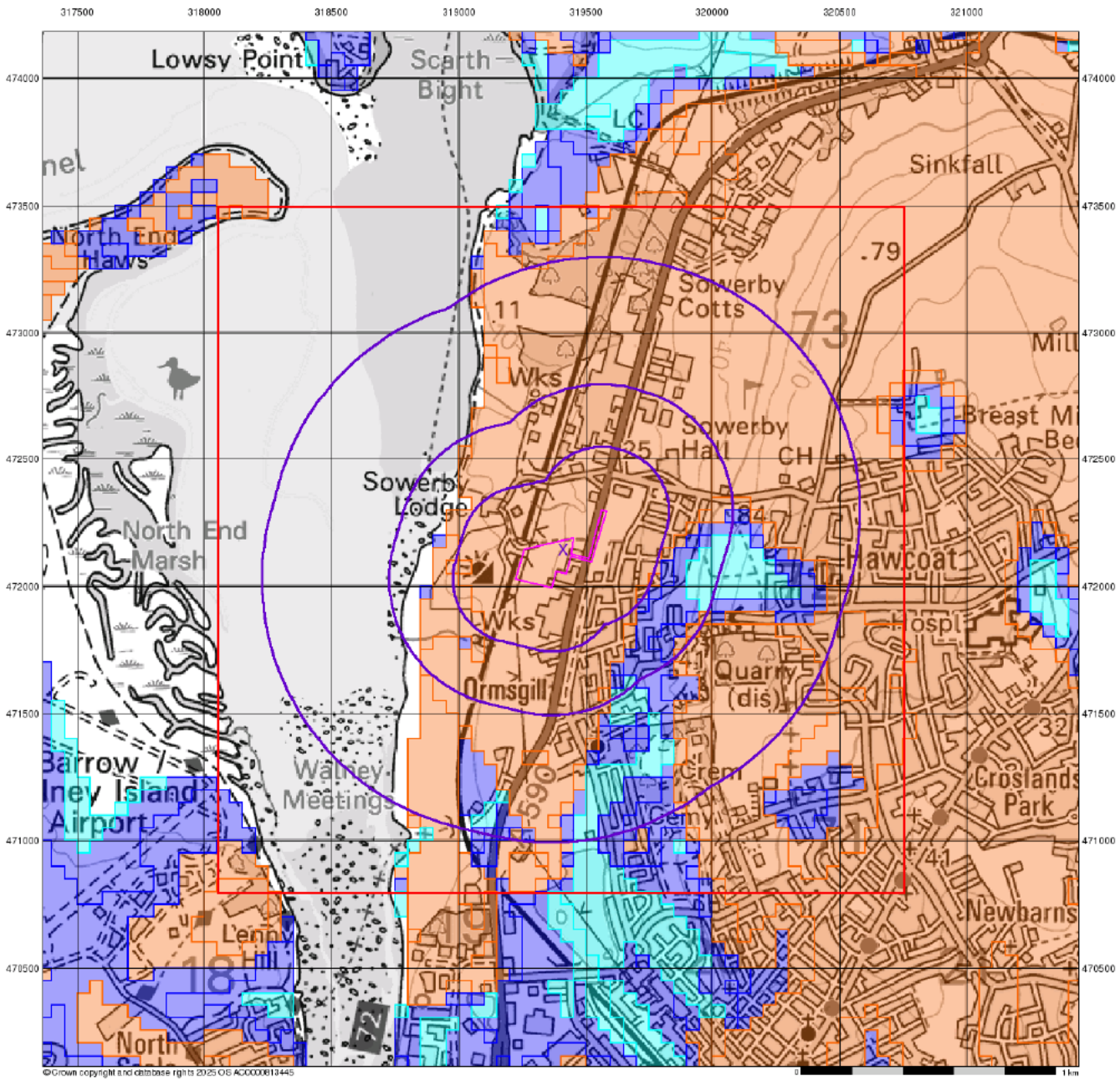
Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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BGS Flood GFS Data

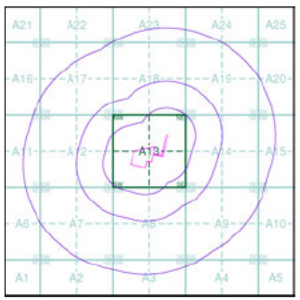
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

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Datasheet

Order Details:

Order Number:
379674976_1_1

Customer Reference:
416.066073.00001

National Grid Reference:
319410, 472140

Slice:
A

Site Area (Ha):
3.16

Search Buffer (m):
1000

Site Details:

Site at 319310, 472070

Client Details:

Ms E Lovatt
SLR Consulting Ltd
3rd Floor, Brew House
Jacob Street
Tower Hill
Bristol
BS2 0EQ

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Contents

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Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England. The probability result is only valid for properties above ground. All basement and cellar areas are considered to be at additional risk from high radon levels. If an underground room such as a cellar or basement makes up part of the living or working accommodation, the property should be tested regardless of Radon Affected Area status.

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Report Version v53.0

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Groundwater Vulnerability - Local Information			n/a	n/a	n/a
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Flooding from Rivers or Sea without Defences				n/a	n/a
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BGS 1:625,000 Solid Geology	pg 41	Yes	n/a	n/a	n/a
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BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
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Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 44	Yes		n/a	n/a
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Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 44	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 44	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 44	Yes		n/a	n/a
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Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
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Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
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	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (W)	177	1	319050 472100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (W)	178	1	319050 472000
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (SE)	204	1	319700 472000
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (W)	227	1	319000 472100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	231	1	319700 471950
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (E)	233	1	319750 472050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (SE)	249	1	319750 472000
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (E)	253	1	319800 472143
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	266	1	319700 471900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (E)	267	1	319800 472100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (SE)	278	1	319650 471850
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	287	1	319850 472150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A7NE (SW)	288	1	319050 471800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	298	1	318950 472150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	324	1	319900 472200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (W)	327	1	318900 472000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	335	1	319900 472150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14SW (E)	363	1	319900 472100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	371	1	319950 472250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A9NW (SE)	372	1	319750 471800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	374	1	319950 472200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (SE)	375	1	319600 471700
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	383	1	319950 472150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A17SE (NW)	413	1	319050 472500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (S)	416	1	319600 471650
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	421	1	320000 472250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	424	1	320000 472200
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	425	1	320000 472350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (SE)	427	1	319900 471900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14SW (E)	432	1	320000 472143
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8NE (S)	435	1	319550 471600
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A9NW (SE)	443	1	319850 471800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A8NE (SE)	446	1	319650 471650
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (SE)	452	1	319900 471850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	471	1	320050 472250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (SE)	472	1	319950 471900
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A9NW (SE)	478	1	319850 471750
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A7NE (SW)	499	1	318900 471650
1	**Discharge Consents** Operator: Mr Dave Armer Property Type: DOMESTIC PROPERTY (MULTIPLE) (INCL FARM HOUSES) Location: Sowerby Lodge Farm Bank Lane, Off Park Road, Barrow-In-Furness, ., La14 4qy Authority: Environment Agency, North West Region Catchment Area: Duddon Reference: Npswqd006583 Permit Version: 1 Effective Date: 5th June 2009 Issued Date: 5th June 2009 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: A Triutary Of Scarth Channel **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	253	2	319124 472358

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	**Discharge Consents** Operator: Scott Ltd Property Type: MAKING OF PAPER+PAPER PRODUCTS Location: Park Road, Barrow-In-Furness, Lancashire, La14 4ox Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017390188 Permit Version: 1 Effective Date: 25th July 1988 Issued Date: Not Supplied Revocation Date: 22nd June 1993 Discharge Type: Trade Discharge - Process Water Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Scarth Hole **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A18SE (N)	338	2	319410 472600
2	**Discharge Consents** Operator: Scott Ltd Property Type: MAKING OF PAPER+PAPER PRODUCTS Location: Park Road, Barrow-In-Furness, Lancashire, La14 4ox Authority: Environment Agency, North West Region Catchment Area: Kent/Leven Reference: 017390188 Permit Version: 2 Effective Date: 23rd June 1993 Issued Date: Not Supplied Revocation Date: 31st July 1996 Discharge Type: Trade Discharge - Process Water Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Scarth Hole **Status: Lapsed (under Environment Act 1995, Schedule 23)** Positional Accuracy: Located by supplier to within 100m	A18SE (N)	338	2	319410 472600
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 1 Effective Date: 12th January 1980 Issued Date: Not Supplied Revocation Date: 30th January 1985 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 2 Effective Date: 31st January 1985 Issued Date: Not Supplied Revocation Date: 12th October 1989 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 2 Effective Date: 31st January 1985 Issued Date: Not Supplied Revocation Date: 12th October 1989 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 3 Effective Date: 13th October 1989 Issued Date: Not Supplied Revocation Date: 1st November 1989 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 3 Effective Date: 13th October 1989 Issued Date: Not Supplied Revocation Date: 1st November 1989 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 4 Effective Date: 2nd November 1989 Issued Date: Not Supplied Revocation Date: 30th March 1992 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 5 Effective Date: 31st March 1992 Issued Date: Not Supplied Revocation Date: 22nd December 1992 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 5 Effective Date: 31st March 1992 Issued Date: Not Supplied Revocation Date: 22nd December 1992 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 017470051 Permit Version: 6 Effective Date: 23rd December 1992 Issued Date: Not Supplied Revocation Date: 1st April 1997 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Duddon Reference: 017470051 Permit Version: 6 Effective Date: 23rd December 1992 Issued Date: Not Supplied Revocation Date: 1st April 1997 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	372	2	318940 471790

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Duddon Reference: 017470051 Permit Version: 1 Effective Date: 12th January 1980 Issued Date: Not Supplied Revocation Date: 30th January 1985 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
3	**Discharge Consents** Operator: United Utilities Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Barrow Palace Nook Stw Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 017470051 Permit Version: 4 Effective Date: 2nd November 1989 Issued Date: Not Supplied Revocation Date: 30th March 1992 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	372	2	318940 471790
4	**Discharge Consents** Operator: United Utilities Water Limited Property Type: PUMPING STATION ON SEWERAGE NETWORK (WATER COMPANY) Location: Palace Nook Sewage Pumping Station, Ormsgill, Barrow-In-Furness, Cumbria, La14 4bq Authority: Environment Agency, North West Region Catchment Area: Duddon Reference: 017480314 Permit Version: 2 Effective Date: 17th December 2018 Issued Date: 17th December 2018 Revocation Date: Not Supplied Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Varied under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	422	2	318870 471800
4	**Discharge Consents** Operator: United Utilities Water Limited Property Type: PUMPING STATION ON SEWERAGE NETWORK (WATER COMPANY) Location: Palace Nook Sewage Pumping Station, Ormsgill, Barrow-In-Furness, Cumbria, La14 4bq Authority: Environment Agency, North West Region Catchment Area: Duddon Reference: 017480314 Permit Version: 2 Effective Date: 17th December 2018 Issued Date: 17th December 2018 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Varied under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	422	2	318870 471800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Discharge Consents** Operator: United Utilities Water Limited Property Type: PUMPING STATION ON SEWERAGE NETWORK (WATER COMPANY) Location: Palace Nook Sewage Pumping Station, Ormsgill, Barrow-In-Furness, Cumbria, La14 4bq Authority: Environment Agency, North West Region Catchment Area: Duddon Reference: 017480314 Permit Version: 1 Effective Date: 10th July 1996 Issued Date: 6th July 1995 Revocation Date: 16th December 2018 Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	422	2	318870 471800
5	**Discharge Consents** Operator: Scott Ltd Property Type: WWTW (NOT WATER CO) (NOT STP AT A PRIVATE PREMISES) Location: Tissue Mill Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 0167t Permit Version: 1 Effective Date: 1st April 1991 Issued Date: Not Supplied Revocation Date: 31st December 1994 Discharge Type: Non Water Company (Private) Sewage Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A18SW (N)	471	2	319260 472660
5	**Discharge Consents** Operator: Scott Ltd Property Type: WWTW (NOT WATER CO) (NOT STP AT A PRIVATE PREMISES) Location: Tissue Mill Park Road, Ormsgill, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 0167t Permit Version: 2 Effective Date: 1st January 1995 Issued Date: Not Supplied Revocation Date: 1st October 1996 Discharge Type: Non Water Company (Private) Sewage Discharge Environment: Saline Estuary Receiving Water: Walney Channel **Status: Lapsed (under Environment Act 1995, Schedule 23)** Positional Accuracy: Located by supplier to within 10m	A18SW (N)	471	2	319260 472660
6	**Discharge Consents** Operator: Bowater Scott Co Ltd Property Type: MAKING OF PAPER+PAPER PRODUCTS Location: Bowater Scott Co Ltd, Hawcoat, Barrow-In-Furness, Cumbria Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 017490002 Permit Version: 1 Effective Date: 1st September 1979 Issued Date: Not Supplied Revocation Date: 1st July 1991 Discharge Type: Trade Discharge - Process Water Discharge Environment: Into And/Or Watercourse Receiving Water: Scarth Hole(Walney Chan) **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A18SW (N)	479	2	319300 472700
7	**Prosecutions** Location: Sowerby Lodge Farm, Bank Lane Barrow In Furness, Cumbria La14 4qy Prosecution Text: Not Supplied Prosecution Act: ENVIRONMENTAL PERMITTING (E & W) REGULATIONS 2010, REGULATION 38 (1) (A) Hearing Date: 27th September 2012 Verdict: Not Supplied Fine: Not Supplied Cost: Not Supplied Positional Accuracy: Manually positioned to the road within the address or location	A13NW (NW)	125	2	319210 472258

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	**Prosecutions** Location: Walny Channel Barrow In Furness, Cumbria Prosecution Text: Not Supplied Prosecution Act: WATER RESOURCES ACT 1991, SECTION 85 (1) Hearing Date: 12th April 2000 Verdict: Guilty Fine: 2000 Cost: Not Supplied Positional Accuracy: Manually positioned within the geographical locality	A18SE (NE)	354	2	319660 472638
9	**Prosecutions** Location: Park Road, Barrow In Furness, Cumbria La14 4eq Prosecution Text: Not Supplied Prosecution Act: ENVIRONMENTAL PROTECTION ACT 1990, SECTION 33 (1) (C) Hearing Date: 23rd September 2003 Verdict: Not Supplied Fine: Not Supplied Cost: Not Supplied Positional Accuracy: Manually positioned to the address or location	A18SE (N)	391	2	319569 472689
9	**Prosecutions** Location: Park Road, Barrow In Furness, Cumbria La14 4eq Prosecution Text: Not Supplied Prosecution Act: ENVIRONMENTAL PROTECTION ACT 1990, SECTION 34 (1) (B) Hearing Date: 23rd September 2003 Verdict: Not Supplied Fine: Not Supplied Cost: Not Supplied Positional Accuracy: Manually positioned to the address or location	A18SE (N)	391	2	319569 472689
10	**Prosecutions** Location: Sandscales Park Road Barrow-In-Furness Cumbria La14 4qt Prosecution Text: Not Supplied Prosecution Act: Environmental Protection Act 1990 Section 33(1)(a) Hearing Date: 3rd December 2018 Verdict: Guilty Fine: 14000 Cost: Not Supplied Positional Accuracy: Automatically positioned to the address	A19NW (NE)	600	2	319853 472827
10	**Prosecutions** Location: Coopers Yard, Park Road Barrow, Cumbria La14 4eq Prosecution Text: Not Supplied Prosecution Act: ENVIRONMENTAL PERMITTING (E & W) REGULATIONS 2007, REGULATION 38 (1) (A) Hearing Date: 8th December 2010 Verdict: Guilty Fine: 7000 Cost: Not Supplied Positional Accuracy: Manually positioned to the address or location	A19NW (NE)	600	2	319853 472827
10	**Prosecutions** Location: Coopers Yard, Park Road Barrow, Cumbria La14 4eq Prosecution Text: Not Supplied Prosecution Act: ENVIRONMENTAL PERMITTING (E & W) REGULATIONS 2007, REGULATION 38 (1) (A) Hearing Date: 8th December 2010 Verdict: Guilty Fine: Not Supplied Cost: Not Supplied Positional Accuracy: Manually positioned to the address or location	A19NW (NE)	600	2	319853 472827
11	**Integrated Pollution Controls** Name: Kimberly Clark Ltd Location: P O Box 25, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: AF7070 Dated: 8th December 1993 Process Type: IPC new application Description: 1.3 A (C) Combustion processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Unknown	A18NE (N)	600	2	319500 472895
11	**Integrated Pollution Controls** Name: Kimberly Clark Ltd Location: P O Box 25, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: AN6078 Dated: 6th December 1994 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (C) Combustion processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Unknown	A18NE (N)	605	2	319500 472900

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
11	**Integrated Pollution Controls** Name: Kimberly Clark Ltd Location: P O Box 25, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: BC8732 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (C) Combustion processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Unknown	A18NE (N)	606	2	319495 472900
11	**Integrated Pollution Controls** Name: Kimberly Clark Ltd Location: P O Box 25, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: BB5304 Dated: 23rd June 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (C) Combustion processes within the Fuel & Power Industry **Status: Application has met the requirements for authorisation (but not yet authorised)** Positional Accuracy: Unknown	A18NE (N)	611	2	319495 472905
12	**Integrated Pollution Controls** Name: Se Energy Ltd (Dissolved) Location: Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QT Authority: Environment Agency, North West Region Permit Reference: BC2424 Dated: 12th March 1999 Process Type: IPC new application Description: 1.3 A (A) Combustion processes within the Fuel & Power Industry **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A19NW (N)	837	2	319800 473100
13	**Integrated Pollution Controls** Name: Kimberly Clark Ltd Location: Barrow Mill, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: BD4384 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 6.1 A (B) Paper and Pulp manufacturing processes within Miscellaneous Industries **Status: Revoked - Now IPPC** Positional Accuracy: Unknown	A14SE (E)	859	2	320374 471954
13	**Integrated Pollution Controls** Name: Kimberly Clark Ltd Location: Barrow Mill, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: AU7125 Dated: 18th July 1996 Process Type: IPC new application Description: 6.1 A (B) Paper and Pulp manufacturing processes within Miscellaneous Industries **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Unknown	A14SE (E)	860	2	320374 471949

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	**Integrated Pollution Prevention And Control** Name: Kimberly-Clark Limited Location: Barrow Paper Mill Epr/Bj7611iy, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QT Authority: Environment Agency, North West Region Permit Reference: AP3335AP Original Permit Ref: Bj7611iy Effective Date: 16th June 2016 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Automatically positioned to the address Activity Code: 5.4 A(1) a) (i) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING BIOLOGICAL TREATMENT Primary Activity: N Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Y Activity Code: 6.1 A(1) (A) Activity Description: Paper, Pulp And Board; Producing Pulp From Timber Etc Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A18SE (N)	391	2	319569 472689
15	**Integrated Pollution Prevention And Control** Name: Kimberly-Clark Limited Location: Barrow Paper Mill Epr/Bj7611iy, Barrow Paper Mill, Park Road,Barrow-In-Furness,, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: DP3407PY Original Permit Ref: Bj7611iy Effective Date: 8th October 2020 **Status: Effective** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Located by supplier to within 10m Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: 5.4 A(1) a) (i) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING BIOLOGICAL TREATMENT Primary Activity: N Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Y	A18SE (N)	422	2	319570 472720
15	**Integrated Pollution Prevention And Control** Name: Kimberly-Clark Limited Location: Barrow Paper Mill Epr/Bj7611iy, Barrow Mill, Park Road,,, Barrow-in-Furness, Cumbria, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: KP3438DY Original Permit Ref: Bj7611iy Effective Date: Not Supplied **Status: Valid** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Located by supplier to within 10m Activity Code: 5.4 A(1) a) (i) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING BIOLOGICAL TREATMENT Primary Activity: N Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Y Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A18SE (N)	422	2	319570 472720

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
15	**Integrated Pollution Prevention And Control** Name: Kimberly-Clark Limited Location: Barrow Paper Mill Epr/Bj7611iy, Barrow Paper Mill,Barrow Paper Mill Epr/Bj7611iy, Park Road,Barrow-In-Furness,, Surrey, LA14 4QX Authority: Environment Agency, North West Region Permit Reference: Bj7611iy Original Permit Ref: Bj7611iy Effective Date: 8th October 2020 **Status:** **Effective** Application Type: Variation (Normal) App. Sub Type: Not Supplied Positional Accuracy: Manually positioned to the address or location Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: DAA Activity Description: Directly Associated Activity (Included) Primary Activity: N Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Y Activity Code: 5.4 A(1) a) (i) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING BIOLOGICAL TREATMENT Primary Activity: N	A18SE (N)	452	2	319556 472750
15	**Integrated Pollution Prevention And Control** Name: Kimberly-Clark Limited Location: Barrow Paper Mill Epr/Bj7611iy, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QT Authority: Environment Agency, North West Region Permit Reference: JP3532EF Original Permit Ref: Bj7611iy Effective Date: 6th January 2014 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: 5.4 A(1) a) (i) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING BIOLOGICAL TREATMENT Primary Activity: N Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Y Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A18SE (N)	453	2	319557 472751
15	**Integrated Pollution Prevention And Control** Name: Kimberly-Clark Limited Location: Barrow Paper Mill Epr/Bj7611iy, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QT Authority: Environment Agency, North West Region Permit Reference: AP3930FG Original Permit Ref: Bj7611iy Effective Date: 13th December 2011 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Simple Standard Variation Positional Accuracy: Automatically positioned to the address Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Y	A18SE (N)	453	2	319557 472751

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
15	**Integrated Pollution Prevention And Control** Name: Kimberly-Clark Limited Location: Barrow Paper Mill Epr/Bj7611iy, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QT Authority: Environment Agency, North West Region Permit Reference: VP3335TV Original Permit Ref: Bj7611iy Effective Date: 20th September 2010 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Automatically positioned to the address Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Y	A18SE (N)	453	2	319557 472751
16	**Integrated Pollution Prevention And Control** Name: Kimberly Clark Ltd Location: Park Road, Barrow-In-Furness, Cumbria, La14 4qt Authority: Environment Agency, North West Region Permit Reference: Bj7611 Original Permit Ref: Bj7611 Effective Date: 25th March 2002 **Status: Superseded By Variation** Application Type: PPC APPLICATION App. Sub Type: Not Supplied Positional Accuracy: Manually positioned to the road within the address or location Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Not Supplied	A18SE (NE)	433	2	319682 472714
16	**Integrated Pollution Prevention And Control** Name: Kimberly-Clark Limited Location: Barrow Paper Mill Epr/Bj7611iy, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4QT Authority: Environment Agency, North West Region Permit Reference: Bu7723is Original Permit Ref: Bj7611iy Effective Date: 6th August 2003 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Manually positioned to the road within the address or location Activity Code: 6.1 A(1) (B) Activity Description: Paper, Pulp And Board; Producing Paper/Board Greater Than 20T/D Primary Activity: Y	A18SE (NE)	444	2	319682 472725
17	**Local Authority Pollution Prevention and Controls** Name: County Coachbuilders (Barrow) Limited Location: Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4EQ Authority: Barrow In Furness Borough Council (now part of Westmorland and Furness Council), Environmental Health Department Permit Reference: Ppc/B/09 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG6/34 Respraying of road vehicles **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A13NE (NE)	110	3	319613 472397
18	**Local Authority Pollution Prevention and Controls** Name: County Coachbuilders (Barrow) Ltd Location: Park Road Industrial Estate, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4EQ Authority: Barrow In Furness Borough Council (now part of Westmorland and Furness Council), Environmental Health Department Permit Reference: Epa/B/22 Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG6/34 Respraying of road vehicles **Status: Authorised** Positional Accuracy: Manually positioned to the road within the address or location	A19NW (NE)	633	3	319804 472884

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	**Local Authority Pollution Prevention and Controls** Name: Ray Steele Haulage Ltd Location: Park Road Industrial Estate, BARROW-IN-FURNESS, Cumbria, LA14 4EQ Authority: Barrow In Furness Borough Council (now part of Westmorland and Furness Council), Environmental Health Department Permit Reference: EPA/B/16 Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input **Status: Authorised** Positional Accuracy: Manually positioned within the geographical locality	A19NW (NE)	634	3	319807 472884
	Nearest Surface Water Feature	A13SW (W)	0	-	319287 472128
19	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Chemicals - Detergents/Surfactant Note: Walney Channel; Fire Water Incident Date: 17th July 1995 Incident Reference: 95220070 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Fire Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8NW (S)	204	2	319300 471800
20	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Cumbria Authority: Environment Agency, North West Region Pollutant: Other Chemicals Note: Scarth Hole; P V A Incident Date: 7th January 1996 Incident Reference: 96220001 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Mechanical Failure Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A18SE (N)	211	2	319500 472500
21	**Pollution Incidents to Controlled Waters** Property Type: Water Company Sewage: Sewage Treatment Works Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Crude Sewage Note: Scartch Hole Incident Date: 3rd October 1994 Incident Reference: 94220114 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Vandalism Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12SE (W)	227	2	319000 472000
22	**Pollution Incidents to Controlled Waters** Property Type: Farm Drainage Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Organic Wastes: Yard Washings Note: Scarth Hole Incident Date: 21st February 1994 Incident Reference: 94220016 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Poor/Inadequate Maintenance Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A14NW (NE)	246	2	319800 472400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
23	**Pollution Incidents to Controlled Waters** Property Type: Water Company Sewage: Sewage Treatment Works Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Unknown Sewage Note: Walney Channel Incident Date: 6th January 1993 Incident Reference: 93220001 Catchment Area: Ulverston Canal Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	321	2	319000 471800
24	**Pollution Incidents to Controlled Waters** Property Type: Farm Drainage Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Agricultural: General Note: Walney Channel Incident Date: 4th March 1992 Incident Reference: 92210044 Catchment Area: Ulverston Canal Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A19SW (NE)	382	2	319900 472500
25	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Natural Note: Scarth Hole Incident Date: 12th September 1994 Incident Reference: 94220105 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Inadequate Design/Capacity Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	396	2	319300 472595
25	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Colour Note: Scarth Hole; Trade Waste Incident Date: 1st February 1994 Incident Reference: 94220015 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Poor Operational Practice Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	399	2	319300 472600
26	**Pollution Incidents to Controlled Waters** Property Type: Spillage; Accident - Static Site Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Industrial Effluent Note: Not Supplied Incident Date: 5th December 1995 Incident Reference: 95220106 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Leaking Tank Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SE (NE)	425	2	319700 472700
27	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Organic Wastes: Other Suspended Solids Note: Scarth Hole Incident Date: 18th April 1995 Incident Reference: 95220033 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Poor Operational Practice Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	433	2	319400 472700

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
28	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Organic Wastes: Other Suspended Solids Note: Scarth Hole Incident Date: 7th May 1995 Incident Reference: 95220042 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Poor Operational Practice Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	472	2	319305 472695
28	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Industrial Effluent Note: Scarth Hole Incident Date: 10th October 1993 Incident Reference: 93220078 Catchment Area: Irish Sea Coastal Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	475	2	319300 472695
28	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Organic Wastes: Other Suspended Solids Note: Scarth Hole; Fire Water Incident Date: 12th November 1995 Incident Reference: 95220098 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Fire Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	477	2	319305 472700
28	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Industrial Effluent Note: Walney Channel; Paper Mill Effluent Incident Date: 29th January 1993 Incident Reference: 93220006 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	479	2	319300 472700
28	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Other Chemicals Note: Scarth Hole Incident Date: 31st March 1994 Incident Reference: 94220045 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Poor Operational Practice Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	481	2	319305 472705
29	**Pollution Incidents to Controlled Waters** Property Type: Water Company Sewage: Sewage Treatment Works Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Foam Note: Not Supplied Incident Date: 4th March 1994 Incident Reference: 94220019 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Deliberate Disposal To Drain Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	483	2	318800 471800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
30	**Pollution Incidents to Controlled Waters** Property Type: Manufacturing: Wood Products / Timber Treatment Location: Barrow In Furness, BARROW IN FURNESS, Cumbria Authority: Environment Agency, North West Region Pollutant: Inorganic Chemicals : Copper Compounds Note: Not Supplied Incident Date: 12th August 1999 Incident Reference: 32822 Catchment Area: Walney Channel South Receiving Water: Freshwater Stream/River Cause of Incident: Containment Failure : Overloading Incident Severity: Category 1 - Major Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	527	2	319400 472800
31	**Pollution Incidents to Controlled Waters** Property Type: Spillage; Accident - Static Site Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Oils - Unknown Note: No Watercourse Incident Date: 24th May 1995 Incident Reference: 95220053 Catchment Area: Walney Channel Receiving Water: Not Given Cause of Incident: Miscellaneous/Other Pollution Type Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	618	2	319200 472800
32	**Pollution Incidents to Controlled Waters** Property Type: Other Premises: Contaminated Land Location: Cooking Tunnel, Walney Island, WALNEY ISLAND, Cumbria Authority: Environment Agency, North West Region Pollutant: Thermal Mineral Residues : Blast Furnace Slag Note: Not Supplied Incident Date: 4th October 1999 Incident Reference: 33521 Catchment Area: Sea (Walney Channel To Workt) Receiving Water: Coastal Water Cause of Incident: Climatic Conditions : Localised High Rainfall Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 10m	A3NW (S)	932	2	319100 471100
33	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, North Area Incident Date: 15th November 2011 Incident Reference: 940915 Water Impact: Category 3 - Minor Incident Air Impact: Category 4 - No Impact Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: General Biodegradable : Other Pollutant: Inert : Construction / Demolition Material	A18SW (N)	547	2	319244 472744
34	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, North Area Incident Date: 20th February 2023 Incident Reference: 2131523 Water Impact: Category 2 - Significant Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Oils - Unknown	A19SW (NE)	558	2	319881 472762
35	**Water Abstractions** Operator: Kimberley Clark Licence Number: 2674811015 Permit Version: 100 Location: South Borehole At Park Road Mill Authority: Environment Agency, North West Region Abstraction: Paper And Printing: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 1637 Yearly Rate (m3): 572796 Details: Works At Park Rd, Barrow-In-Furness Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 26th November 2018 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A13NE (N)	119	2	319500 472400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
36	**Water Abstractions** Operator: Kimberley Clark Licence Number: 2674811017 Permit Version: 100 Location: North Borehole At Park Road Mill Authority: Environment Agency, North West Region Abstraction: Paper And Printing: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 655 Yearly Rate (m3): 238937 Details: Land & Premises At Park Road Mill Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 18th July 1997 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A18NE (N)	605	2	319500 472900
	Water Abstractions Operator: United Utilities Water Ltd Licence Number: 2674811008 Permit Version: 100 Location: 4 Boreholes At Schneider Rd, Barrow-In-Furness Authority: Environment Agency, North West Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 13092 Yearly Rate (m3): 4778755 Details: 4 Boreholes Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 26th November 2018 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A3NE (S)	1119	2	319600 470900
	Water Abstractions Operator: Courtaulds Films & Packaging Licence Number: 2674811007 Permit Version: Not Supplied Location: Borehole, Sandscale Factory, Park Road, BARROW-IN-FURNESS Authority: Environment Agency, North West Region Abstraction: Cooling Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 3273 Yearly Rate (m3): 1197962 Details: Licence Status: Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A23NW (N)	1230	2	319300 473500
	Water Abstractions Operator: United Utilities Water Ltd Licence Number: 2674811009 Permit Version: 100 Location: Borehole At Thorncliffe Rd Barrow-In-Furness Authority: Environment Agency, North West Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 4546 Yearly Rate (m3): 1659290 Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 26th November 2018 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A4NE (SE)	1289	2	320200 471000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Courtaulds Films & Packaging Licence Number: 2674811014 Permit Version: Not Supplied Location: Borehole, Sandscale Factory, Park Road, BARROW-IN-FURNESS Authority: Environment Agency, North West Region Abstraction: Industrial Cooling (Miscellaneous) Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 3273 Yearly Rate (m3): 1194689 Details: Additional Purpose: Cooling; Licence Status: Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A23NE (N)	1403	2	319500 473700
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - Low Vulnerability Combined Vulnerability: Low Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: Low Bedrock Flow: Well Connected Fractures Dilution: 300-550 mm/year Baseflow Index: <40% Superficial Patchiness: >90% Superficial Thickness: >10m Superficial Recharge: Low	A13SE (S)	0	2	319410 472000
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - Low Vulnerability Combined Vulnerability: Low Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: Low Bedrock Flow: Mixed Dilution: 300-550 mm/year Baseflow Index: <40% Superficial Patchiness: >90% Superficial Thickness: >10m Superficial Recharge: Low	A13SE (SW)	0	2	319410 472143
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Principal Aquifer	A13SE (SW)	0	4	319410 472143
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13SE (SW)	0	4	319410 472143
37	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.	A13SE (S)	0	2	319406 472115
38	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A8NE (S)	245	2	319469 471766
39	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone I (Inner Protection Zone): Travel time of 50 days or less to the groundwater source.	A8SE (S)	754	2	319548 471260

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
40	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 51.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NE (NE)	1	5	319443 472187
41	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NE (NE)	3	5	319438 472188
42	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 38.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (W)	4	5	319341 472166
43	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 99.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NE (N)	4	5	319403 472181
44	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 33.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (W)	14	5	319303 472167
45	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (W)	21	5	319269 472168
46	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 169.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13SW (W)	35	5	319221 472142

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
47	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (W)	41	5	319228 472171
48	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	92	5	319216 472225
49	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 160.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (N)	110	5	319350 472293
50	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 161.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	123	5	319197 472251
51	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13SW (SW)	141	5	319233 471882
52	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 147.1 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	150	5	319314 472310
53	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 153.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12SE (W)	150	5	319057 472099
54	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 255.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12SE (W)	172	5	319046 472098
55	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 0.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12SE (W)	181	5	319057 472099

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
56	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12SE (W)	182	5	319057 472099
57	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 49.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12SE (W)	192	5	319044 472118
58	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 89.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	209	5	319042 472147
59	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 39.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	209	5	319042 472147
60	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 155.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13SW (SW)	211	5	319120 471845
61	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	225	5	319037 472186
62	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 74.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	229	5	319174 472356
63	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	230	5	319040 472216
64	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	232	5	319033 472200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
65	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 82.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	239	5	319029 472211
66	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	246	5	319129 472353
67	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8NW (S)	269	5	319274 471739
68	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 34.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	274	5	319102 472368
69	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	275	5	319107 472373
70	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 36.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	276	5	319136 472390
71	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	279	5	319103 472375
72	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 70.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	280	5	319070 472354
73	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A13NW (NW)	281	5	319100 472375

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
74	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8NW (SW)	290	5	319230 471729
75	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 106.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8NW (SW)	293	5	319225 471727
76	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (NW)	295	5	319016 472312
77	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 64.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (NW)	298	5	319012 472311
78	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	312	5	318948 472196
79	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	317	5	318944 472198
80	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A12NE (W)	327	5	318961 472280
81	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SE (N)	336	5	319407 472596
82	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 172.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8NW (SW)	337	5	319093 471707

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
83	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SE (N)	339	5	319404 472598
84	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A7NE (SW)	341	5	318971 471800
85	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 53.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A7NE (SW)	346	5	318966 471799
86	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 68.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	351	5	319387 472603
87	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 117.8 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8NW (SW)	351	5	319106 471698
88	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8NW (SW)	351	5	319108 471697
89	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8NW (SW)	351	5	319126 471691
90	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 91.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19SW (NE)	375	5	319863 472537
91	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 51.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A7NE (SW)	377	5	318927 471798

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
92	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	410	5	319313 472624
93	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	412	5	319311 472625
94	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	412	5	319311 472625
95	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	413	5	319309 472626
96	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 33.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	413	5	319309 472626
97	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	417	5	319361 472663
98	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 68.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A7NE (SW)	418	5	318875 471800
99	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 54.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	421	5	319357 472667
100	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	429	5	319318 472651

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
101	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 22.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	436	5	319315 472658
102	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 29.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19SW (NE)	446	5	319872 472628
103	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 138.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19SW (NE)	449	5	319878 472628
104	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 407.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SE (NE)	451	5	319725 472726
105	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19SW (NE)	454	5	319844 472662
106	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 50.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	458	5	319304 472677
107	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	458	5	319304 472677
108	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 125.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19SW (NE)	463	5	319866 472656
109	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 107.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8NW (SW)	464	5	319105 471580

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
110	**OS Water Network Lines** Watercourse Form: Tidal river Watercourse Length: 52.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Not Supplied Primacy: 1	A7NE (SW)	473	5	318813 471796
111	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 27.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	498	5	319249 472686
112	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	498	5	319249 472686
113	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 122.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	499	5	319257 472693
114	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 149.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	525	5	319226 472702
115	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 172.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SW (S)	558	5	319153 471469
116	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	563	5	319485 472856
117	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	564	5	319484 472857
118	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	572	5	319465 472862

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
119	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	576	5	319461 472866
120	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 98.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	577	5	319294 472809
121	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 76.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (N)	577	5	319294 472809
122	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	582	5	319460 472871
123	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 89.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NW (N)	582	5	319358 472849
124	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SW (S)	583	5	319291 471416
125	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	585	5	319457 472873
126	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	585	5	319457 472873
127	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 36.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	585	5	319418 472865

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
128	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	594	5	319446 472881
129	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 46.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	595	5	319454 472884
130	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	596	5	319450 472884
131	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	597	5	319448 472884
132	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SW (S)	598	5	319305 471400
133	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	601	5	319431 472885
134	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	602	5	319427 472884
135	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	603	5	319430 472886
136	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	613	5	319501 472908

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
137	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 53.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SW (S)	613	5	319290 471386
138	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	615	5	319499 472910
139	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	621	5	319478 472913
140	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 74.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SW (S)	623	5	319321 471373
141	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 80.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	630	5	319508 472926
142	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	630	5	319507 472926
143	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (NW)	647	5	319096 472769
144	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 200.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	651	5	319568 472951
145	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 35.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18SW (NW)	652	5	319092 472774

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
146	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 161.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NW (NE)	669	5	319768 472935
147	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 126.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A7SE (SW)	687	5	319038 471367
148	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NW (NE)	705	5	319923 472909
149	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 36.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NW (NE)	711	5	319927 472912
150	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NW (NE)	745	5	319935 472948
151	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NW (NE)	745	5	319935 472948
152	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 61.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A14NE (E)	748	5	320311 472444
153	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 192.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NW (NE)	761	5	319945 472960
154	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 2	A8SE (S)	824	5	319689 471236

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
155	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 88.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	849	5	319718 473133
156	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	849	5	319713 473133
157	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 164.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A18NE (N)	849	5	319630 473149
158	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 73.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NE (NE)	855	5	320157 472922
159	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NE (NE)	861	5	320196 472893
160	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NE (NE)	861	5	320194 472896
161	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SE (S)	866	5	319700 471194
162	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SE (S)	866	5	319713 471200
163	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 43.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A15NW (E)	866	5	320424 472483

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
164	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 118.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A19NW (NE)	866	5	319838 473119
165	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A15NW (E)	867	5	320432 472448
166	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A20SW (E)	868	5	320422 472500
167	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 290.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A20SW (E)	869	5	320421 472505
168	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A15NW (E)	877	5	320439 472462
169	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A23SE (N)	888	5	319586 473186
170	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 110.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A20SW (E)	896	5	320450 472503
171	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 35.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A23SE (N)	896	5	319529 473193
172	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A23SE (N)	900	5	319536 473200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
173	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 295.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SE (S)	904	5	319709 471158
174	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A8SE (S)	904	5	319709 471158
175	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 289.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A23SW (N)	912	5	319396 473213
176	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 226.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A23SE (N)	957	5	319674 473249
177	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A20SW (NE)	962	5	320444 472714
178	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 33.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A24SW (N)	971	5	319835 473230
179	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Duddon Primacy: 1	A23SE (N)	998	5	319618 473294
	Water Framework Directive - Catchment Class Code: Coastal Catchment WaterBody Name: Not Supplied WaterBody ID: 344 Operational Catchment: Duddon Management Catchment: South West Lakes Catchment Name: Not Supplied	A13SE (SW)	0	2	319410 472143
	Water Framework Directive - Catchment Class Code: River Catchment WaterBody Name: Mill Beck (Poaka Beck) WaterBody ID: GB112074069790 Operational Catchment: Duddon Management Catchment: South West Lakes Catchment Name: South Cumbria	A14NE (E)	792	2	320370 472240

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Framework Directive - Groundwater Waterbody Name: Furness Permo-Triassic sandstone aquifers Waterbody ID: GB41201G101900 URL Address: https://environment.data.gov.uk/catchment-planning/WaterBody/GB41201G101900 Overall Rating: Good Chemical Rating: Good Quantitative Measure: Good Year: 2019	A13SE (SW)	0	2	319410 472143
180	**Water Framework Directive - Surface Waters** Class Code: Coastal Waterbody Name: Duddon Sands Waterbody ID: GB641211172000 URL Address: https://environment.data.gov.uk/catchment-planning/WaterBody/GB641211172000 Overall Rating: Moderate Chemical Rating: Fail Classification Year: 2019	A12NE (W)	349	2	318928 472262

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
181	**BGS Recorded Landfill Sites** Site Name: Clay Pit Location: BARROW-IN-FURNESS, Cumbria Authority: British Geological Survey, National Geoscience Information Service Ground Water: No threat to ground water Surface Water: No threat to surface water Geology: Clay Pit Positional Accuracy: Positioned by the supplier Boundary Accuracy: Moderate	A8SW (S)	796	-	319263 471205
182	**Historical Landfill Sites** Licence Holder: Barrow In Furness Borough Council Location: Schneider Road, Barrow In Furness, Cumbria Name: Upper Ormsgill Reservoir Operator Location: Town Hall, Barrow-in-Furness Boundary Accuracy: As Supplied Provider Reference: EAHLD07734 First Input Date: 1st August 1976 Last Input Date: 31st December 1984 Specified Waste Type: Deposited Waste included Inert Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 0900/0124 BGS Ref: Not Supplied Other Ref: 1	A8SE (S)	744	2	319530 471269
183	**Historical Landfill Sites** Licence Holder: Caird Environmental Limited Location: Lower Ormsgill Clay Pit, Walney Road, Barrow In Furness, Cumbria Name: Lower Ormsgill Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD07735 First Input Date: 31st December 1982 Last Input Date: Not Supplied Specified Waste Type: Deposited Waste included Inert, Industrial, Commercial, Household and Special Waste, and Liquid Sludge EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 0900/0058 BGS Ref: Not Supplied Other Ref: 112, 92	A8SW (S)	785	2	319233 471221
184	**Historical Landfill Sites** Licence Holder: Not Supplied Location: Barrow-in-Furness, Cumbria Name: Clay Pit Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD31923 First Input Date: 8th March 1972 Last Input Date: Not Supplied Specified Waste Type: Deposited Waste included Inert and Industrial Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: Not Supplied BGS Ref: 1624 Other Ref: Not Supplied	A8SW (S)	796	2	319264 471205
185	**Licensed Waste Management Facilities (Locations)** Licence Number: 101264 Location: Coopers Yard, Park Road, Barrow In Furness, Cumbria, LA14 4EQ Operator Name: H. WICKS (LINDAL) LIMITED Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status: Issued** Issued: 23rd June 2010 Last Modified: 23rd June 2010 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	600	2	319862 472822

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
186	**Licensed Waste Management Facilities (Locations)** Licence Number: 101902 Location: Barrow Golf Club, Rakesmoor Lane, Barrow In Furness, Cumbria, LA14 4QB Operator Name: Biffa Treatment Services Limited Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Use of waste in construction <50,000 tps **Licence Status: Surrendered** Issued: 10th December 2010 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 10th December 2010 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NE (E)	837	2	320410 472390
	Local Authority Landfill Coverage Name: Barrow In Furness District Council - Has no landfill data to supply		0	3	319410 472143
	Local Authority Landfill Coverage Name: Cumbria County Council - Had landfill data but passed it to the relevant environment agency		0	6	319410 472143
187	**Potentially Infilled Land (Non-Water)** Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A8NE (S)	267	-	319440 471738
188	**Potentially Infilled Land (Non-Water)** Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A8SW (S)	646	-	319343 471349
189	**Potentially Infilled Land (Non-Water)** Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A8SW (S)	649	-	319169 471374
190	**Potentially Infilled Land (Non-Water)** Bearing Ref: NE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A19SE (NE)	658	-	320161 472599
191	**Potentially Infilled Land (Non-Water)** Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A3NW (S)	937	-	319105 471093
192	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NE (N)	0	-	319402 472180
193	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13SE (S)	19	-	319427 471990
194	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NE (NE)	70	-	319486 472285
195	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1916	A13SE (E)	86	-	319607 472085
196	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13SW (SW)	155	-	319220 471870
197	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1931	A13SE (SE)	161	-	319642 471991
198	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NW (NW)	168	-	319296 472323
199	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NW (NW)	176	-	319192 472307

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
200	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1916	A18SE (N)	181	-	319539 472486
201	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8NE (S)	223	-	319427 471780
202	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A13NW (NW)	232	-	319217 472372
203	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A18SE (N)	273	-	319476 472557
204	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1851	A12NE (W)	310	-	318981 472301
205	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1851	A7NE (SW)	384	-	318957 471753
206	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A18SE (N)	409	-	319616 472717
207	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8NE (SE)	442	-	319675 471677
208	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SE (NW)	449	-	319035 472533
209	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A19SW (NE)	469	-	319991 472516
210	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	517	-	319843 471691
211	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8SE (S)	541	-	319446 471459
212	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	547	-	319942 471748
213	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	553	-	319820 471630
214	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	567	-	319853 471637
215	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8SW (SW)	586	-	319119 471451
216	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	599	-	319894 471628
217	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	657	-	319881 471547
218	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A19SW (NE)	676	-	320066 472762
219	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A9NW (SE)	728	-	319946 471505
220	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A8SE (S)	766	-	319464 471232

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
221	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1895	A14NE (E)	810	-	320389 472283
222	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A14SE (E)	862	-	320407 472056
223	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A19SE (NE)	887	-	320393 472643
224	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1895	A9NE (SE)	891	-	320333 471732
225	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1851	A9SW (SE)	914	-	320023 471332
226	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1895	A15SW (E)	972	-	320459 471844
227	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A20SW (NE)	997	-	320492 472693
228	**Registered Landfill Sites** Licence Holder: Barrow-In-Furness B.C. Licence Reference: 1 Site Location: Upper Ormsgill Reservoir, Barrow In Furness, Cumbria Licence Easting: Not Supplied Licence Northing: Not Supplied Operator Location: As Site Address Authority: Environment Agency - North West Region, North Area Site Category: Landfill Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 2nd November 1976 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Positioned by the supplier Boundary Accuracy: Moderate Authorised Waste: Concrete Waste Excavated Natural Materials $ Hardcore And Rubble Sand	A8SE (S)	745	2	319527 471267

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
229	**Control of Major Accident Hazards Sites (COMAH)** Name: Csi Wood Protection Limited Location: Park Road, BARROW IN FURNESS, Cumbria, LA14 4QU Reference: Not Supplied Type: Upper Tier **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A13NE (NE)	179	7	319614 472469

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Triassic Rocks (Undifferentiated)	A13SE (SW)	0	1	319410 472143
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (SW)	0	1	319410 472143
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12NE (NW)	289	1	319050 472347
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SE (N)	294	1	319426 472561
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (SE)	509	1	319951 471825
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SW (N)	520	1	319298 472798
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: no data Chromium Concentration: 60 - 90 mg/kg Lead Concentration: no data Nickel Concentration: 15 - 30 mg/kg	A17SW (W)	838	1	318500 472500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: no data Cadmium Concentration: <1.8 mg/kg Chromium Concentration: no data Lead Concentration: <100 mg/kg Nickel Concentration: no data	A7SW (SW)	904	1	318708 471287
230	**BGS Recorded Mineral Sites** Site Name: Barrow Slag Bank Location: Walney Road, Hindpool, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 253607 Type: Tip **Status: Ceased** Operator: Caird Environmental Operator Location: Not Supplied Periodic Type: Anthropogene Geology: Blast Furnace Slag Commodity: Slag (Including Basic Oxygen Slag and Electric Arc Furnace Slags) Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	466	1	318940 471660
231	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarry Location: Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 242375 Type: Opencast **Status: Ceased** Operator: G. H. Young Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	549	1	319980 471795
232	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarry Location: Hawcoat, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 255547 Type: Opencast **Status: Ceased** Operator: G. H. Young Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	553	1	319933 471727
233	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarries Location: Hawcoat, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 9150 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A14SW (SE)	562	1	320024 471847
233	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarries Location: Hawcoat, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 255546 Type: Opencast **Status: Ceased** Operator: G. H. Young Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A14SW (SE)	597	1	320066 471853

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
234	**BGS Recorded Mineral Sites** Site Name: Hawcoat Quarry Location: Hawcoat, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 1196 Type: Opencast **Status: Ceased** Operator: G. H. Young Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	637	1	319920 471600
235	**BGS Recorded Mineral Sites** Site Name: Rakes Moor Quarry Location: Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 144803 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Triassic Geology: St Bees Sandstone Member Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	644	1	320152 472586
236	**BGS Recorded Mineral Sites** Site Name: Ormsgill Brick Works Location: Ormsgill, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 253606 Type: Opencast **Status: Ceased** Operator: Furness Brick & Tile Co., Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Till, Devensian Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A8SW (S)	731	1	319127 471300
237	**BGS Recorded Mineral Sites** Site Name: Barrow Slag Bank Location: Walney Road, Hindpool, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 253608 Type: Tip **Status: Ceased** Operator: Caird Environmental Operator Location: Not Supplied Periodic Type: Anthropogene Geology: Blast Furnace Slag Commodity: Slag (Including Basic Oxygen Slag and Electric Arc Furnace Slags) Positional Accuracy: Located by supplier to within 10m	A7SE (SW)	801	1	318870 471310
238	**BGS Recorded Mineral Sites** Site Name: Ormsgill Brick Works Location: Ormsgill, Barrow-In-Furness, Cumbria Source: British Geological Survey, National Geoscience Information Service Reference: 27595 Type: Opencast **Status: Ceased** Operator: Furness Brick & Tile Co., Ltd. Operator Location: Not Supplied Periodic Type: Quaternary, Devensian Geology: Till, Devensian Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A8SW (S)	820	1	319140 471205
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SE (SW)	0	1	319410 472143

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
239	**Contemporary Trade Directory Entries** Name: Copy Cats Location: Unit 13,14,Haws View Ind Est,Park Rd, Barrow-in-Furness, Cumbria, LA14 4TN Classification: Printers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A13SE (SE)	21	-	319451 472080
239	**Contemporary Trade Directory Entries** Name: Duddon Hire Location: Meeting Ind Est,Park Rd, Barrow-in-Furness, Cumbria, LA14 4TL Classification: Crane Hire, Sales & Service **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A13SE (SE)	22	-	319484 472083
239	**Contemporary Trade Directory Entries** Name: Furness M O T Centre Location: Unit 11-12, Meeting Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4TL Classification: Mot Testing Centres **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	35	-	319481 472071
239	**Contemporary Trade Directory Entries** Name: Furness M O T Centre Location: Unit 11-12, Meeting Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4TL Classification: Mot Testing Centres **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	35	-	319481 472071
239	**Contemporary Trade Directory Entries** Name: Cumbria Car Centre Ltd Location: Unit 16, Haws View Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4TN Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	49	-	319471 472045
240	**Contemporary Trade Directory Entries** Name: M K M Barrow Location: PARK ROAD, BARROW-IN-FURNESS, LA14 4DE Classification: Builders' Merchants **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NE (NE)	41	-	319612 472263
241	**Contemporary Trade Directory Entries** Name: J T Atkinson Location: BUILDERS SUPPLY BARROW, BANK LANE, BARROW-IN-FURNESS, LA14 4QY Classification: Builders' Merchants **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NE (NE)	44	-	319547 472340
242	**Contemporary Trade Directory Entries** Name: Gilmour Fabrications Ltd Location: Bouthwood Road, Sowerby Woods Industrial Estate, Barrow-in-Furness, Cumbria, LA14 4HB Classification: Sheet Metal Work **Status: Active** Positional Accuracy: Manually positioned to the address or location	A13SE (S)	48	-	319458 472018
242	**Contemporary Trade Directory Entries** Name: Drew Marine Location: Meeting Ind Est,Park Rd, Barrow-in-Furness, Cumbria, LA14 4TL Classification: Medical Equipment Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A13SE (S)	48	-	319410 471974
242	**Contemporary Trade Directory Entries** Name: H P T Engineering Ltd Location: Unit 5, Meeting Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4TL Classification: Hydraulic Engineers **Status: Inactive** Positional Accuracy: Automatically positioned in the proximity of the address	A13SE (S)	52	-	319418 471989
243	**Contemporary Trade Directory Entries** Name: Gyrodata Drilling Automation Location: Meeting Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4TL Classification: Drilling & Boring Equipment & Supplies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	56	-	319469 472019

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
244	**Contemporary Trade Directory Entries** Name: Mcbride Plc Location: Park Road, Barrow-in-Furness, Cumbria, LA14 4BN Classification: Cleaning Materials & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	92	-	319408 471912
245	**Contemporary Trade Directory Entries** Name: County Coachbuilders Automotive Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NE (NE)	110	-	319613 472397
245	**Contemporary Trade Directory Entries** Name: Joss Engineering Barrow Ltd Location: Unit 1-3 Powder Works Park Road Industrial Estate,Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Precision Engineers **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A13NE (NE)	113	-	319650 472380
246	**Contemporary Trade Directory Entries** Name: Carsmetics Location: Unit 4,Meeting Ind Est,Park Rd, Barrow-in-Furness, Cumbria, LA14 4TL Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A13SE (S)	118	-	319472 471941
247	**Contemporary Trade Directory Entries** Name: Christies Garage Location: 1, County Park Road, Barrow-in-Furness, LA14 4BQ Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	172	-	319669 472010
248	**Contemporary Trade Directory Entries** Name: Cumbria Van Conversions Location: Unit 5 County Park Trading Estate,County Park Road, Barrow-in-Furness, Cumbria, LA14 4BQ Classification: Commercial Vehicle Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A8NW (S)	251	-	319343 471745
248	**Contemporary Trade Directory Entries** Name: M B R Motorsports Ltd Location: 3, County Park Road, Barrow-in-Furness, Cumbria, LA14 4BQ Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NW (S)	271	-	319346 471724
249	**Contemporary Trade Directory Entries** Name: Lumier Location: County Park Road, Barrow-in-Furness, Cumbria, LA14 4BQ Classification: Lighting Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NW (S)	278	-	319398 471718
249	**Contemporary Trade Directory Entries** Name: P R W Leisure Location: Unit 5 County Park Trading Estate,County Park Road, Barrow-in-Furness, Cumbria, LA14 4BQ Classification: Caravans - Servicing & Repairs **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A8NW (S)	285	-	319354 471710
249	**Contemporary Trade Directory Entries** Name: Monx Location: County Park Road, Barrow-in-Furness, Cumbria, LA14 4BQ Classification: Electronic Engineers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A8NW (S)	305	-	319392 471690
250	**Contemporary Trade Directory Entries** Name: C S I Wood Protection Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Classification: Timber Preservation Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19SW (NE)	422	-	319804 472650

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
251	**Contemporary Trade Directory Entries** Name: Sovereign Chemical Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Classification: Chemical Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (NE)	438	-	319731 472704
251	**Contemporary Trade Directory Entries** Name: Soverign Chemical Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Classification: Damp & Dry Rot Control **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (NE)	438	-	319731 472704
251	**Contemporary Trade Directory Entries** Name: Sovereign Chemical Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Chemical Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19SW (NE)	462	-	319760 472718
251	**Contemporary Trade Directory Entries** Name: Sovereign Chemical Industries Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Chemicals - Distributors & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19SW (NE)	462	-	319760 472718
252	**Contemporary Trade Directory Entries** Name: Kimberly Clark Ltd Location: Park Road, Barrow-in-Furness, Cumbria, LA14 4TR Classification: Hygiene & Sanitary Appliance Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SE (N)	453	-	319557 472751
253	**Contemporary Trade Directory Entries** Name: Joss Ltd Location: Unit 2-3 Park Road Industrial Estate,Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Precision Engineers **Status: Active** Positional Accuracy: Manually positioned to the address or location	A19SW (NE)	537	-	319766 472796
253	**Contemporary Trade Directory Entries** Name: Waites Pressings Location: Park Road Industrial Estate, Park Road, BARROW-IN-FURNESS, Cumbria, LA14 4EQ Classification: Press Tool Manufacturers & Distributors **Status: Active** Positional Accuracy: Automatically positioned to the address	A19SW (NE)	572	-	319805 472818
254	**Contemporary Trade Directory Entries** Name: Steel In Art Location: Park Rd Ind Est,Park Rd, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Steel Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A19NW (NE)	623	-	319825 472865
254	**Contemporary Trade Directory Entries** Name: Vela Engineering Ltd Location: Park Rd Ind Est,Park Rd, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Engineers - General **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A19NW (NE)	625	-	319822 472868
254	**Contemporary Trade Directory Entries** Name: Raydoncliff Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned in the proximity of the address	A19NW (NE)	631	-	319805 472882
254	**Contemporary Trade Directory Entries** Name: Freelance Mechanics Location: Unit 3d, Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	659	-	319816 472908

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
254	**Contemporary Trade Directory Entries** Name: Etyres - Freelance Mechanics (Fml Cumbria Ltd) Location: UNIT 3D, PARK ROAD INDUSTRIAL ESTATE, PARK ROAD, BARROW-IN-FURNESS, LA14 4EQ Classification: Tyre Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	659	-	319816 472908
254	**Contemporary Trade Directory Entries** Name: Handmark Engineering Location: Unit 4, Park Road Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	662	-	319805 472915
254	**Contemporary Trade Directory Entries** Name: Nicholson Ltd Location: Park Rd Ind Est,Park Rd, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Blast Cleaning **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A19NW (NE)	665	-	319870 472891
254	**Contemporary Trade Directory Entries** Name: Larkin Eng Services Ltd Location: Unit 3e, Park Road Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Engineers - General **Status: Active** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	667	-	319834 472909
254	**Contemporary Trade Directory Entries** Name: Park Road Auto Body Location: Unit 3e, Park Road Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	667	-	319834 472909
255	**Contemporary Trade Directory Entries** Name: Telemeter Engineering Location: Park Road Indust Est,Park Rd, Barrow In Furness, Lancashire, LA14 4EQ Classification: Blast Cleaning **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A19NW (NE)	627	-	319742 472898
255	**Contemporary Trade Directory Entries** Name: Motor Service Centre Location: Unit 3a, Park Road Industrial Estate, Park Road, Barrow-in-Furness, Cumbria, LA14 4EQ Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	658	-	319768 472923
256	**Contemporary Trade Directory Entries** Name: Victoria Motors Location: Schneider Road, Barrow-in-Furness, LA14 5ER Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A8SE (S)	732	-	319516 471278
256	**Contemporary Trade Directory Entries** Name: Tallyho Car Sales Location: Schneider Rd, Barrow In Furness, Lancashire, LA14 5ER Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A8SE (S)	748	-	319537 471266
257	**Contemporary Trade Directory Entries** Name: M Fleming Location: 44, Rakesmoor Lane, Barrow-in-Furness, Cumbria, LA14 4LQ Classification: Washing Machines - Servicing & Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SE (E)	832	-	320396 472140
258	**Contemporary Trade Directory Entries** Name: Gatehouse Carpet & Upholstery Cleaning Location: 13, Pine Road, Barrow-in-Furness, Cumbria, LA14 5EL Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A3NE (S)	931	-	319626 471100

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
259	**Points of Interest - Commercial Services** Name: Cumbria Car Centre Ltd Location: 16 Meetings Industrial Estate, Park Road, Barrow-in-Furness, LA14 4TN Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SE (SE)	6	8	319487 472098
259	**Points of Interest - Commercial Services** Name: Furness M O T Centre Location: Unit 11-12 Meeting Industrial Estate, Park Road, Barrow-in-Furness, LA14 4TL Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SE (SE)	35	8	319481 472071
259	**Points of Interest - Commercial Services** Name: Furness M O T Centre Location: Unit 11-12 Meeting Industrial Estate, Park Road, Barrow-in-Furness, LA14 4TL Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SE (SE)	35	8	319480 472070
260	**Points of Interest - Commercial Services** Name: County Coachbuilders Automotive Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NE (NE)	109	8	319612 472397
260	**Points of Interest - Commercial Services** Name: County Coachbuilders Automotive Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NE (NE)	110	8	319613 472397
260	**Points of Interest - Commercial Services** Name: County Coachbuilders Automotive Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NE (NE)	110	8	319613 472397
261	**Points of Interest - Commercial Services** Name: M B R Motorsports Ltd Location: Unit 3, County Park Road, Barrow-in-Furness, LA14 4RD Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A8NW (S)	271	8	319345 471724
262	**Points of Interest - Commercial Services** Name: Carsmetics Car Body Repairs Location: 4 Park Road, Barrow-in-Furness, LA14 4RH Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A8NE (S)	432	8	319462 471572
263	**Points of Interest - Commercial Services** Name: C S I Wood Protection Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A19SW (NE)	438	8	319814 472663
264	**Points of Interest - Commercial Services** Name: Motor Service Centre Location: Unit 3a Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A19NW (NE)	658	8	319768 472923
264	**Points of Interest - Commercial Services** Name: Motor Service Centre Location: Unit 3a Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A19NW (NE)	658	8	319768 472923

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
264	**Points of Interest - Commercial Services** Name: Freelance Mechanics Location: Unit 3d Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A19NW (NE)	659	8	319816 472908
264	**Points of Interest - Commercial Services** Name: Park Road Auto Body Location: Unit 3e Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A19NW (NE)	667	8	319834 472909
264	**Points of Interest - Commercial Services** Name: Park Road Auto Location: Unit 3e Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A19NW (NE)	667	8	319834 472909
265	**Points of Interest - Commercial Services** Name: Victoria Motors Location: Schneider Road, Barrow-in-Furness, LA14 5ER Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A8SE (S)	732	8	319516 471278
265	**Points of Interest - Commercial Services** Name: Victoria Motors Location: Schneider Road, Barrow-in-Furness, LA14 5ER Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A8SE (S)	736	8	319514 471273
265	**Points of Interest - Commercial Services** Name: Barrow Service Centre Location: Schneider Road, Barrow-in-Furness, LA14 5ER Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A8SE (S)	736	8	319514 471273
266	**Points of Interest - Manufacturing and Production** Name: Haws View Industrial Estate Location: LA14 Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	4	8	319453 472109
266	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13NE (E)	22	8	319501 472158
266	**Points of Interest - Manufacturing and Production** Name: Meetings Industrial Estate Location: LA14 Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	26	8	319453 472066
267	**Points of Interest - Manufacturing and Production** Name: Sowerby Lodge Solar Farm Location: LA14 Category: Industrial Features Class Code: Energy Production Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	94	8	319132 472025
268	**Points of Interest - Manufacturing and Production** Name: Factory Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13SE (S)	101	8	319411 471903

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
268	**Points of Interest - Manufacturing and Production** Name: Factory Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to address or location	A13SW (S)	120	8	319399 471879
269	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13NE (NE)	106	8	319646 472375
270	**Points of Interest - Manufacturing and Production** Name: Sowerby Lodge Farm - Solar Photovoltaics (BEIS) Location: Sowerby Lodge Farm, Bank Lane, Barrow-In-Furness, LA14 4QY Category: Industrial Features Class Code: Energy Production Positional Accuracy: Positioned to address or location	A13NW (W)	167	8	319090 472162
271	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18SE (N)	257	8	319542 472554
271	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18SE (N)	274	8	319532 472570
271	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A18SE (N)	299	8	319596 472595
271	**Points of Interest - Manufacturing and Production** Name: Tanks Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18SE (N)	299	8	319596 472595
272	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	400	8	319336 472628
272	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	408	8	319338 472639
272	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	418	8	319305 472628
273	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A19SW (NE)	401	8	319758 472651
273	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A18SE (NE)	448	8	319732 472714

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
273	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A18SE (NE)	450	8	319736 472714
273	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A19SW (NE)	468	8	319779 472716
274	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A14SW (SE)	490	8	319934 471833
275	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19SW (NE)	529	8	319786 472780
275	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19SW (NE)	531	8	319789 472780
275	**Points of Interest - Manufacturing and Production** Name: Genasys Power Systems Ltd Location: Park Road Industrial Estate, Park Road, Barrow-in-Furness, LA14 4EQ Category: Industrial Features Class Code: Energy Production Positional Accuracy: Positioned to address or location	A19SW (NE)	572	8	319805 472818
275	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	583	8	319778 472841
275	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	585	8	319782 472841
275	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	655	8	319798 472910
275	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	657	8	319802 472911
275	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	658	8	319813 472908
275	**Points of Interest - Manufacturing and Production** Name: Factory Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	661	8	319842 472899

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
275	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	661	8	319817 472909
275	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	661	8	319828 472905
275	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	663	8	319831 472906
275	**Points of Interest - Manufacturing and Production** Name: Works Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	664	8	319843 472902
276	**Points of Interest - Manufacturing and Production** Name: Tank Location: LA14 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18NE (N)	613	8	319549 472911
277	**Points of Interest - Manufacturing and Production** Name: Pit (Sand) Location: LA14 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A7NE (SW)	632	8	318864 471509
277	**Points of Interest - Manufacturing and Production** Name: Pit (Sand) Location: LA14 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A7SE (SW)	658	8	318879 471468
278	**Points of Interest - Manufacturing and Production** Name: Hawcoat Quarry (Disused) Location: LA14 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A9NW (SE)	634	8	319919 471603
278	**Points of Interest - Manufacturing and Production** Name: Hawcoat Quarry (Disused) Location: LA14 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A9NW (SE)	635	8	319919 471601
278	**Points of Interest - Manufacturing and Production** Name: Hawcoat Quarry (Disused) Location: LA14 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to address or location	A9NW (SE)	663	8	319971 471609
278	**Points of Interest - Manufacturing and Production** Name: Hawcoat Quarry (Disused) Location: LA14 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A9NW (SE)	694	8	319948 471549
279	**Points of Interest - Manufacturing and Production** Name: Factory Location: LA14 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	655	8	319887 472871

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
279	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	666	8	319847 472902
280	**Points of Interest - Public Infrastructure** Name: Sewage Disposal Works Location: LA14 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to address or location	A8NW (SW)	290	8	319090 471772
280	**Points of Interest - Public Infrastructure** Name: Sewage Disposal Works Location: LA14 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A7NE (SW)	315	8	319032 471779
281	**Points of Interest - Public Infrastructure** Name: Slurry Bed Location: LA14 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A14NW (NE)	322	8	319847 472471
282	**Points of Interest - Public Infrastructure** Name: Industrial Waste Recovery Plant Location: Not Supplied Category: Infrastructure and Facilities Class Code: Recycling Centres Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	368	8	319370 472613
282	**Points of Interest - Public Infrastructure** Name: Sluices Location: LA14 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	404	8	319318 472621
282	**Points of Interest - Public Infrastructure** Name: Sluices Location: LA14 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	406	8	319312 472619
283	**Points of Interest - Public Infrastructure** Name: Outfall Location: LA14 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A7NE (SW)	414	8	318882 471796
283	**Points of Interest - Public Infrastructure** Name: Outfall Location: LA14 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A7NE (SW)	415	8	318881 471796
284	**Points of Interest - Public Infrastructure** Name: Recycling Business Location: LA14 Category: Infrastructure and Facilities Class Code: Recycling Centres Positional Accuracy: Positioned to an adjacent address or location	A19SW (NE)	575	8	319845 472803
285	**Points of Interest - Public Infrastructure** Name: Refuse Tip (Disused) Location: LA14 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A7NE (SW)	592	8	318977 471491
286	**Points of Interest - Public Infrastructure** Name: Tip (Disused) Location: LA14 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A7NE (SW)	629	8	318855 471520

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
287	**Points of Interest - Public Infrastructure** Name: Tip (Disused) Location: LA14 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A7SE (SW)	825	8	318895 471272
287	**Points of Interest - Public Infrastructure** Name: Refuse Tip (Disused) Location: LA14 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A7SE (SW)	836	8	318877 471268
288	**Points of Interest - Public Infrastructure** Name: Cemetery Location: LA14 Category: Infrastructure and Facilities Class Code: Cemeteries and Crematoria Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	859	8	319810 471258
288	**Points of Interest - Public Infrastructure** Name: Cemetery Location: Not Supplied Category: Infrastructure and Facilities Class Code: Cemeteries and Crematoria Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	866	8	319826 471260
289	**Points of Interest - Recreational and Environmental** Name: Skatepark Location: LA14 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	53	8	319517 472043
290	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	164	8	319563 471937
290	**Points of Interest - Recreational and Environmental** Name: Playground Location: Hazel Close, LA14 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	165	8	319563 471936
291	**Points of Interest - Recreational and Environmental** Name: Playground Location: Middle Cliff, LA14 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A14SW (E)	220	8	319765 472146
291	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14SW (E)	221	8	319766 472146
292	**Points of Interest - Recreational and Environmental** Name: Play Area Location: LA14 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14SE (E)	715	8	320253 472052

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
293	**National Nature Reserves** Name: North Walney Multiple Areas: N Total Area (m2): 6465427.75 Source: Natural England Reference: 1006114 Designation Date: Not Supplied	A12NE (W)	354	9	318919 472251
294	**Ramsar Sites** Name: Duddon Estuary Multiple Areas: N Total Area (m2): 67797115.58 Source: Natural England Reference: UK11022 Designation Date: Not Supplied	A12NE (W)	308	9	318975 472270
295	**Sites of Special Scientific Interest** Name: Duddon Estuary Multiple Areas: N Total Area (m2): 67859465.7 Source: Natural England Reference: 1000104 Designation Details: Nature Conservation Review Designation Date: 27th February 1991 Date Type: Notified Designation Details: National Nature Reserve Designation Date: 27th February 1991 Date Type: Notified Designation Details: National Park Designation Date: 27th February 1991 Date Type: Notified Designation Details: National Trust Reserve Designation Date: 27th February 1991 Date Type: Notified Designation Details: Ramsar Site Designation Date: 27th February 1991 Date Type: Notified Designation Details: RSPB Reserve Designation Date: 27th February 1991 Date Type: Notified Designation Details: Special Area Of Conservation Designation Date: 27th February 1991 Date Type: Notified Designation Details: Special Protection Area Designation Date: 27th February 1991 Date Type: Notified Designation Details: Site Of Special Scientific Interest Designation Date: 27th February 1991 Date Type: Notified Designation Details: Water Framework Directive (WFD) Designation Date: 27th February 1991 Date Type: Notified	A12NE (W)	308	9	318975 472270
296	**Special Areas of Conservation** Name: Morecambe Bay Multiple Areas: N Total Area (m2): 615375122.7 Source: Natural England Reference: UK0013027 **Status: Designated**	A12NE (W)	308	9	318975 472270
297	**Special Protection Areas** Name: Morecambe Bay And Duddon Estuary Multiple Areas: Y Total Area (m2): 668993797.85 Source: Natural England Reference: UK9020326 Designation Date: Not Supplied	A12NE (W)	308	9	318975 472270

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Cumberland Council	December 2019	Annual Rolling Update
Westmorland and Furness Council	December 2019	Annual Rolling Update
Barrow In Furness Borough Council (now part of Westmorland and Furness Council) - Environmental Health Department	January 2020	Annual Rolling Update
Environment Agency - Head Office	November 2023	Annually
South Lakeland District Council (now part of Westmorland and Furness Council) - Environmental Health Department	October 2017	Annual Rolling Update
Copeland Borough Council (now part of Cumberland Council) - Environmental Health Department	September 2017	Annual Rolling Update
Discharge Consents		
Environment Agency - North West Region	April 2025	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - North West Region	March 2013	
Integrated Pollution Controls		
Environment Agency - North West Region	January 2009	
Integrated Pollution Prevention And Control		
Environment Agency - North West Region	April 2025	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Copeland Borough Council (now part of Cumberland Council) - Environmental Health Department	February 2015	Variable
Cumberland Council	February 2015	Variable
Westmorland and Furness Council	February 2015	Variable
South Lakeland District Council (now part of Westmorland and Furness Council) - Environmental Health Department	June 2014	Variable
Barrow In Furness Borough Council (now part of Westmorland and Furness Council) - Environmental Health Department	October 2014	Variable
Local Authority Pollution Prevention and Controls		
South Lakeland District Council (now part of Westmorland and Furness Council) - Environmental Health Department	December 2020	Annual Rolling Update
Cumberland Council	February 2015	Annual Rolling Update
Westmorland and Furness Council	February 2015	Annual Rolling Update
Copeland Borough Council (now part of Cumberland Council) - Environmental Health Department	February 2015	Not Applicable
Barrow In Furness Borough Council (now part of Westmorland and Furness Council) - Environmental Health Department	October 2014	Not Applicable
Local Authority Pollution Prevention and Control Enforcements		
Copeland Borough Council (now part of Cumberland Council) - Environmental Health Department	February 2015	Variable
Cumberland Council	February 2015	Variable
Westmorland and Furness Council	February 2015	Variable
South Lakeland District Council (now part of Westmorland and Furness Council) - Environmental Health Department	June 2014	Variable
Barrow In Furness Borough Council (now part of Westmorland and Furness Council) - Environmental Health Department	October 2014	Variable
Nearest Surface Water Feature		
Ordnance Survey	April 2025	
Pollution Incidents to Controlled Waters		
Environment Agency - North West Region	January 2000	
Historical Prosecutions		
Environment Agency, North West Region	March 2013	Not Applicable
Prosecutions		
Environment Agency - Head Office	February 2024	Annually
Registered Radioactive Substances		
Environment Agency - Head Office	May 2023	
Environment Agency - North West Region	May 2023	

Agency & Hydrological	Version	Update Cycle
Substantiated Pollution Incident Register Environment Agency - North West Region - North Area	April 2025	Quarterly
Water Abstractions Environment Agency - North West Region	April 2025	Quarterly
Water Industry Act Referrals Environment Agency - North West Region	October 2017	
Groundwater Vulnerability Map Environment Agency - Head Office	June 2018	As notified
Groundwater Vulnerability - Soluble Rock Risk Environment Agency - Head Office	June 2018	As notified
Bedrock Aquifer Designations Environment Agency - Head Office	January 2018	As notified
Superficial Aquifer Designations Environment Agency - Head Office	January 2018	As notified
Source Protection Zones Environment Agency - Head Office	September 2022	Bi-Annually
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	December 2023	As notified
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	December 2023	As notified
Areas Benefiting from Flood Defences Environment Agency - Head Office	February 2023	
Flood Water Storage Areas Environment Agency - Head Office	January 2024	Quarterly
Flood Defences Environment Agency - Head Office	August 2022	
OS Water Network Lines Ordnance Survey	April 2025	Quarterly
Surface Water 1 in 30 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water 1 in 100 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water 1 in 1000 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water Suitability Environment Agency - Head Office	February 2016	Annually
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	As notified
Water Framework Directive - Catchment Environment Agency - Head Office	July 2024	Annually
Water Framework Directive - Groundwater Environment Agency - Head Office	July 2024	Annually
Water Framework Directive - Surface Waters Environment Agency - Head Office	July 2024	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	November 2002	As notified
Historical Landfill Sites		
Environment Agency - Head Office	April 2025	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - North West Region	January 2009	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - North West Region - North Area	May 2025	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - North West Region - North Area	April 2025	Quarterly
Local Authority Landfill Coverage		
Barrow In Furness Borough Council (now part of Westmorland and Furness Council) - Environmental Health Department	February 2003	Not Applicable
Copeland Borough Council (now part of Cumberland Council) - Environmental Health Department	February 2003	Not Applicable
Cumbria County Council - Economy And Environment Department	February 2003	Not Applicable
South Lakeland District Council (now part of Westmorland and Furness Council) - Environmental Health Department	February 2003	Not Applicable
Cumberland Council	May 2000	Not Applicable
Westmorland and Furness Council	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
Cumberland Council	August 2006	
Westmorland and Furness Council	August 2006	
Barrow In Furness Borough Council (now part of Westmorland and Furness Council) - Environmental Health Department	October 2018	
Copeland Borough Council (now part of Cumberland Council) - Environmental Health Department	October 2018	
Cumbria County Council - Economy And Environment Department	October 2018	
South Lakeland District Council (now part of Westmorland and Furness Council) - Environmental Health Department	October 2018	
Potentially Infilled Land (Non-Water)		
Landmark Information Group Limited	December 1999	
Potentially Infilled Land (Water)		
Landmark Information Group Limited	December 1999	
Registered Landfill Sites		
Environment Agency - North West Region - North Area	March 2006	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - North West Region - North Area	April 2018	
Registered Waste Treatment or Disposal Sites		
Environment Agency - North West Region - North Area	June 2015	

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	June 2025	Bi-Annually
Explosive Sites		
Health and Safety Executive	March 2017	
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	August 2001	
Planning Hazardous Substance Enforcements		
Copeland Borough Council (now part of Cumberland Council) - Planning	August 2023	Variable
Cumberland Council	February 2016	Variable
Westmorland and Furness Council	February 2016	Variable
Barrow In Furness Borough Council (now part of Westmorland and Furness Council)	January 2023	Variable
South Lakeland District Council (now part of Westmorland and Furness Council)	January 2023	Variable
Cumbria County Council - Development Control	May 2023	Variable
Planning Hazardous Substance Consents		
Barrow In Furness Borough Council (now part of Westmorland and Furness Council)	February 2016	Variable
Copeland Borough Council (now part of Cumberland Council) - Planning	February 2016	Variable
Cumberland Council	February 2016	Variable
South Lakeland District Council (now part of Westmorland and Furness Council)	February 2016	Variable
Westmorland and Furness Council	February 2016	Variable
Cumbria County Council - Development Control	May 2023	Variable

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	As notified
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	December 2015	As notified
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	April 2025	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	As notified
Coal Mining Affected Areas The Coal Authority - Property Searches	February 2023	
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	November 2024	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	November 2024	Annually
Industrial Land Use	**Version**	**Update Cycle**
Contemporary Trade Directory Entries Thomson Directories	March 2025	Quarterly
Fuel Station Entries Green Street Advisor (UK) Ltd	May 2025	Quarterly
Points of Interest - Commercial Services PointX	March 2025	Quarterly
Points of Interest - Education and Health PointX	March 2025	Quarterly
Points of Interest - Manufacturing and Production PointX	March 2025	Quarterly
Points of Interest - Public Infrastructure PointX	March 2025	Quarterly
Points of Interest - Recreational and Environmental PointX	March 2025	Quarterly
Underground Electrical Cables National Grid	January 2024	

Sensitive Land Use	Version	Update Cycle
Ancient Woodland		
Natural England	March 2025	Bi-Annually
Areas of Adopted Green Belt		
Barrow In Furness Borough Council (now part of Westmorland and Furness Council)	July 2024	Quarterly
Copeland Borough Council (now part of Cumberland Council) - Planning	July 2024	Quarterly
Cumberland Council	July 2024	Quarterly
South Lakeland District Council (now part of Westmorland and Furness Council)	July 2024	Quarterly
Westmorland and Furness Council	July 2024	Quarterly
Areas of Unadopted Green Belt		
Barrow In Furness Borough Council (now part of Westmorland and Furness Council)	July 2024	Quarterly
Copeland Borough Council (now part of Cumberland Council) - Planning	July 2024	Quarterly
Cumberland Council	July 2024	Quarterly
South Lakeland District Council (now part of Westmorland and Furness Council)	July 2024	Quarterly
Westmorland and Furness Council	July 2024	Quarterly
Areas of Outstanding Natural Beauty		
Natural England	May 2025	Bi-Annually
Environmentally Sensitive Areas		
Natural England	August 2023	
Forest Parks		
Forestry Commission	May 2023	Not Applicable
Local Nature Reserves		
Natural England	March 2025	Bi-Annually
Marine Nature Reserves		
Natural England	February 2025	Bi-Annually
National Nature Reserves		
Natural England	January 2025	Bi-Annually
National Parks		
Natural England	September 2024	Bi-Annually
Nitrate Sensitive Areas		
Natural England	April 2023	Not Applicable
Nitrate Vulnerable Zones		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	April 2016	
Environment Agency - Head Office	November 2024	Annually
Ramsar Sites		
Natural England	February 2025	Bi-Annually
Sites of Special Scientific Interest		
Natural England	May 2025	Bi-Annually
Special Areas of Conservation		
Natural England	January 2025	Bi-Annually
Special Protection Areas		
Natural England	May 2025	Bi-Annually

Data Suppliers

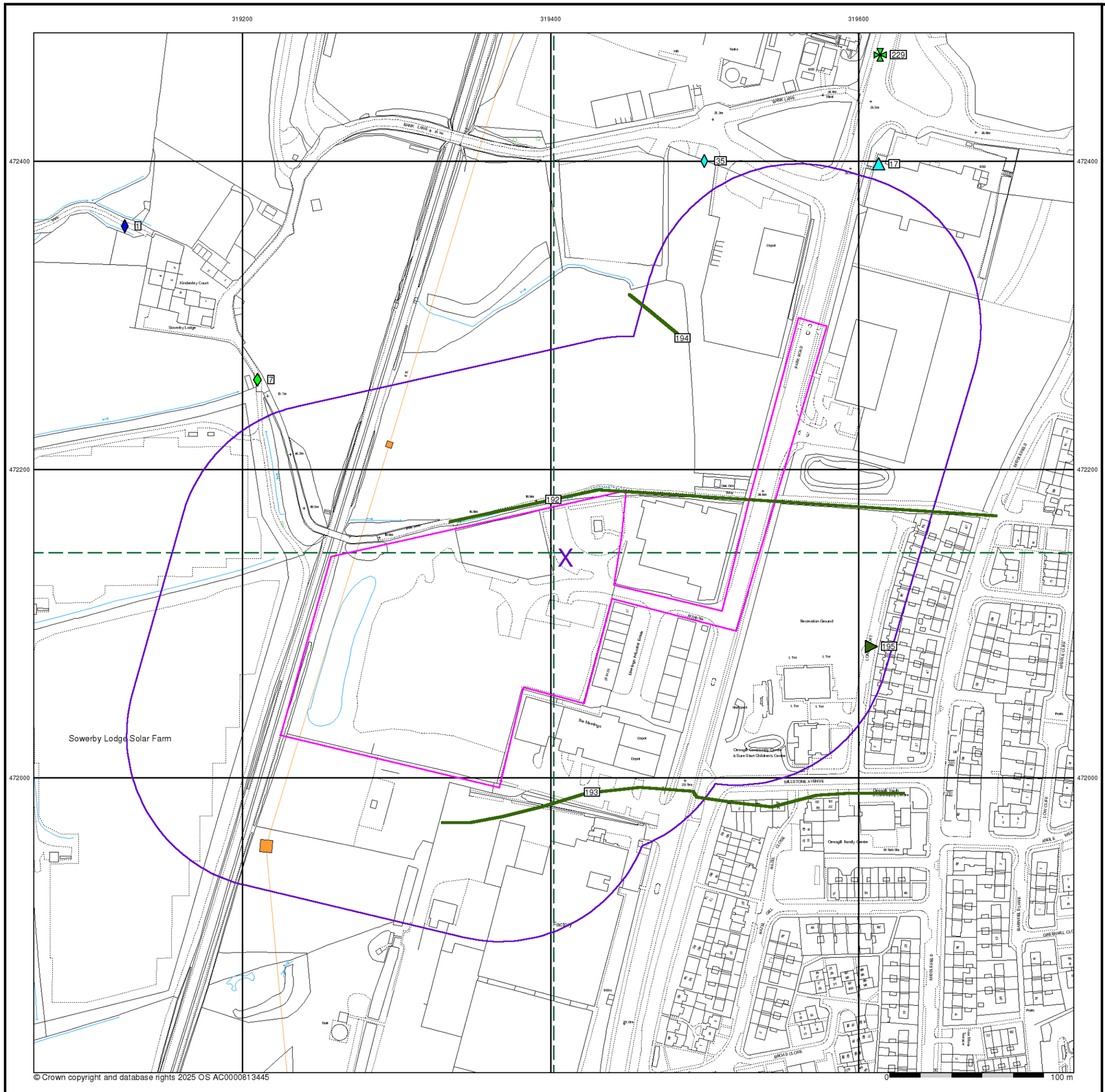
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Stantec UK Ltd	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	**Barrow In Furness Borough Council (now part of Westmorland and Furness Council) - Environmental Health Department** Town Hall, 28 Duke Street, Barrow-In-Furness, Cumbria, LA14 2LD	Telephone: 01229 894900 Fax: 01229 894217 Website: www.barrowbc.gov.uk
4	**Environment Agency - Head Office** Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
5	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.co.uk
6	**Cumbria County Council - Economy And Environment Department** Citadel Chambers, Citadel Row, Carlisle, Cumbria, CA3 8SG	Telephone: 01228 606718 Website: www.cumbria.gov.uk
7	**Health and Safety Executive** 5S.2 Redgrave Court, Merton Road, Bootle, L20 7HS	Website: www.hse.gov.uk
8	**PointX** 5-6 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
9	**Natural England** County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Landmark Information Group, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0330 036 6618 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Historical Prosecutions
- Prosecutions
- Registered Radioactive Substance
- River Network or Water Feature
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

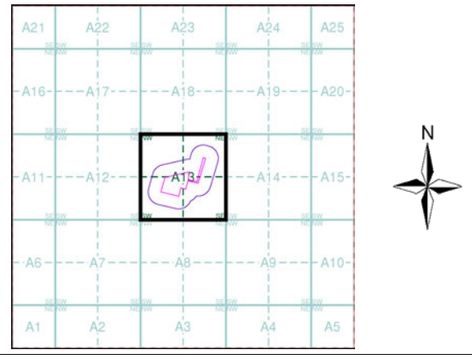
Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Geological

- BGS Recorded Mineral Site

Site Sensitivity Map - Segment A13



Order Details

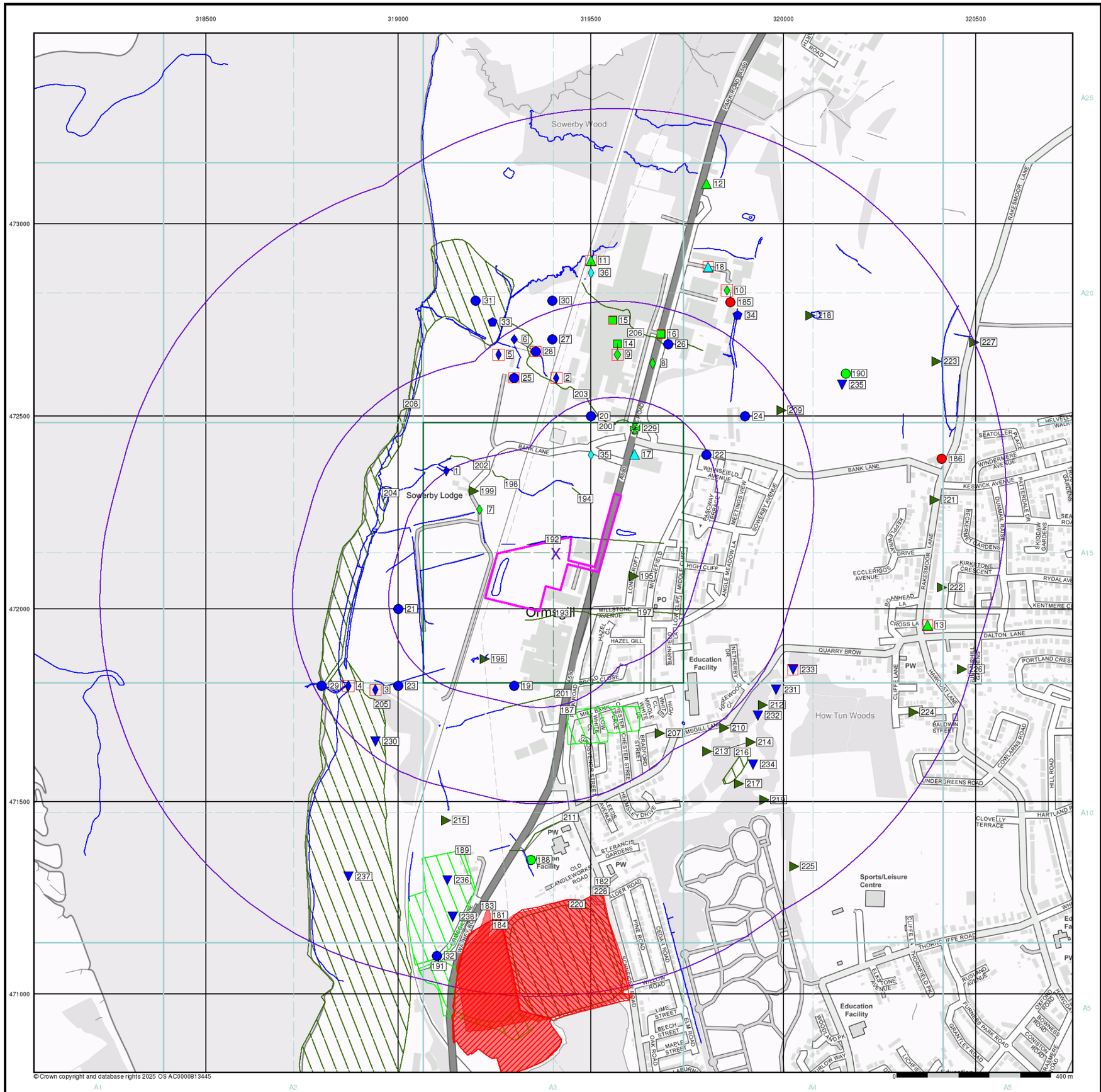
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Plot Buffer (m):	100

Site Details

Site at 319310, 472070

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Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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- Specified Buffer(s)
- Several of Type at Location
- Bearing Reference Point
- Map ID

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
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- Integrated Pollution Prevention Control
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- Local Authority Pollution Prevention and Control Enforcement
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- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

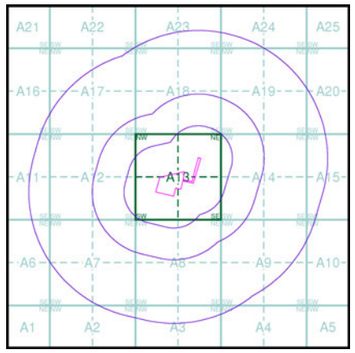
Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Geological

- BGS Recorded Mineral Site

Site Sensitivity Map - Slice A



Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

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Industrial Land Use Map

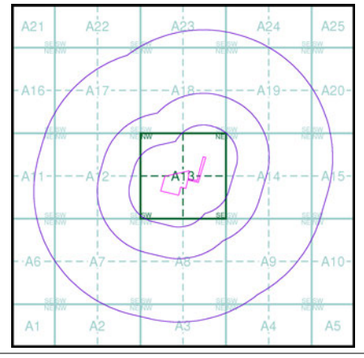
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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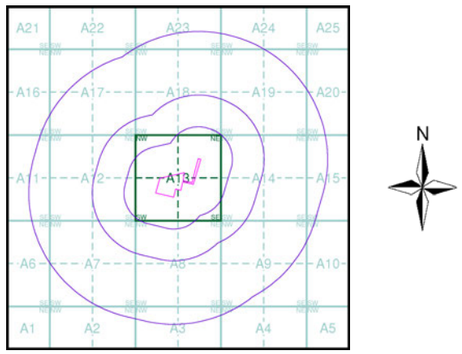
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

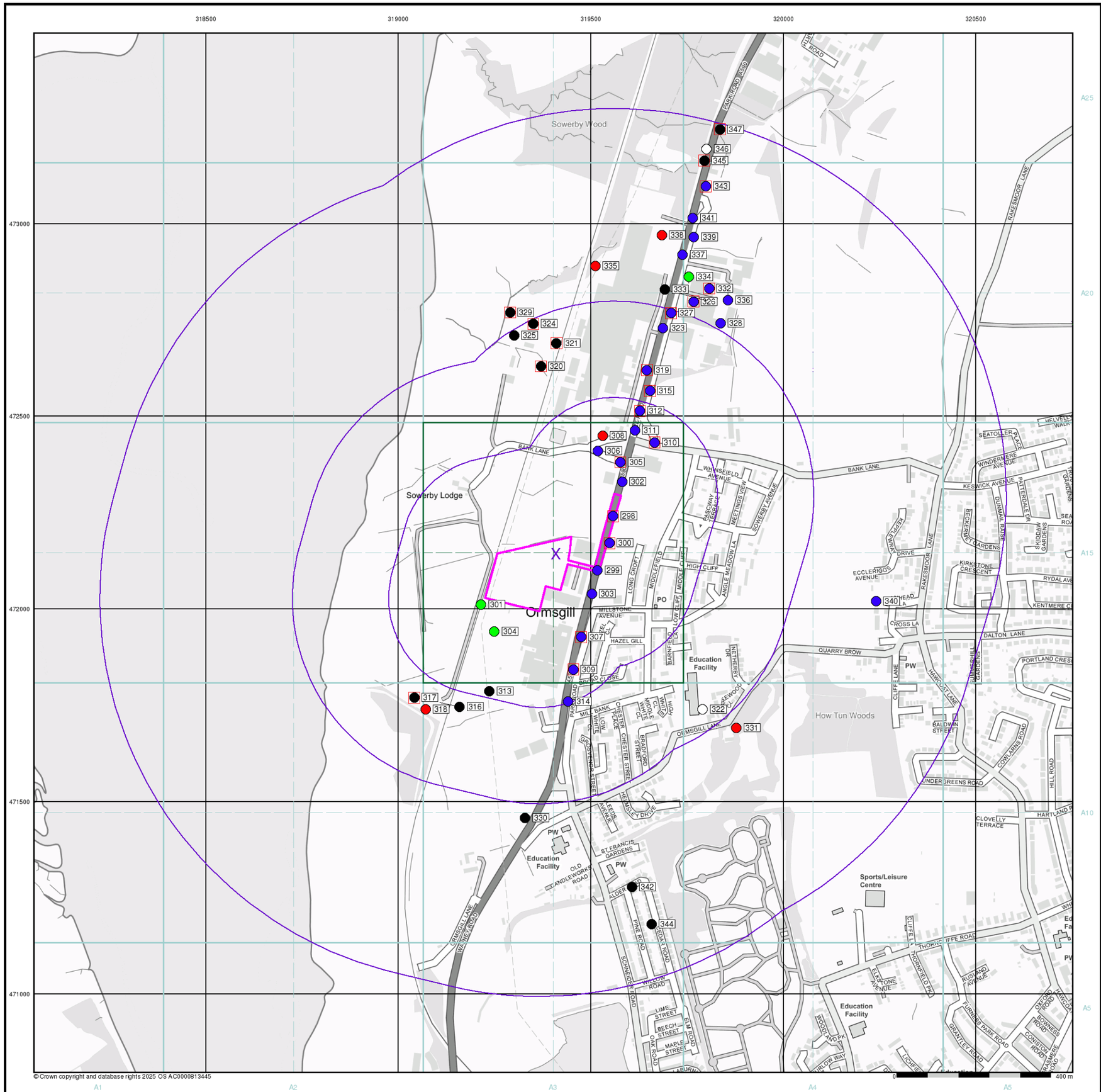
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
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Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

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- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

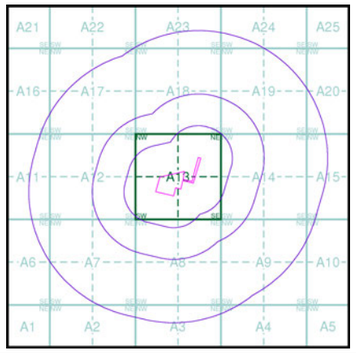
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

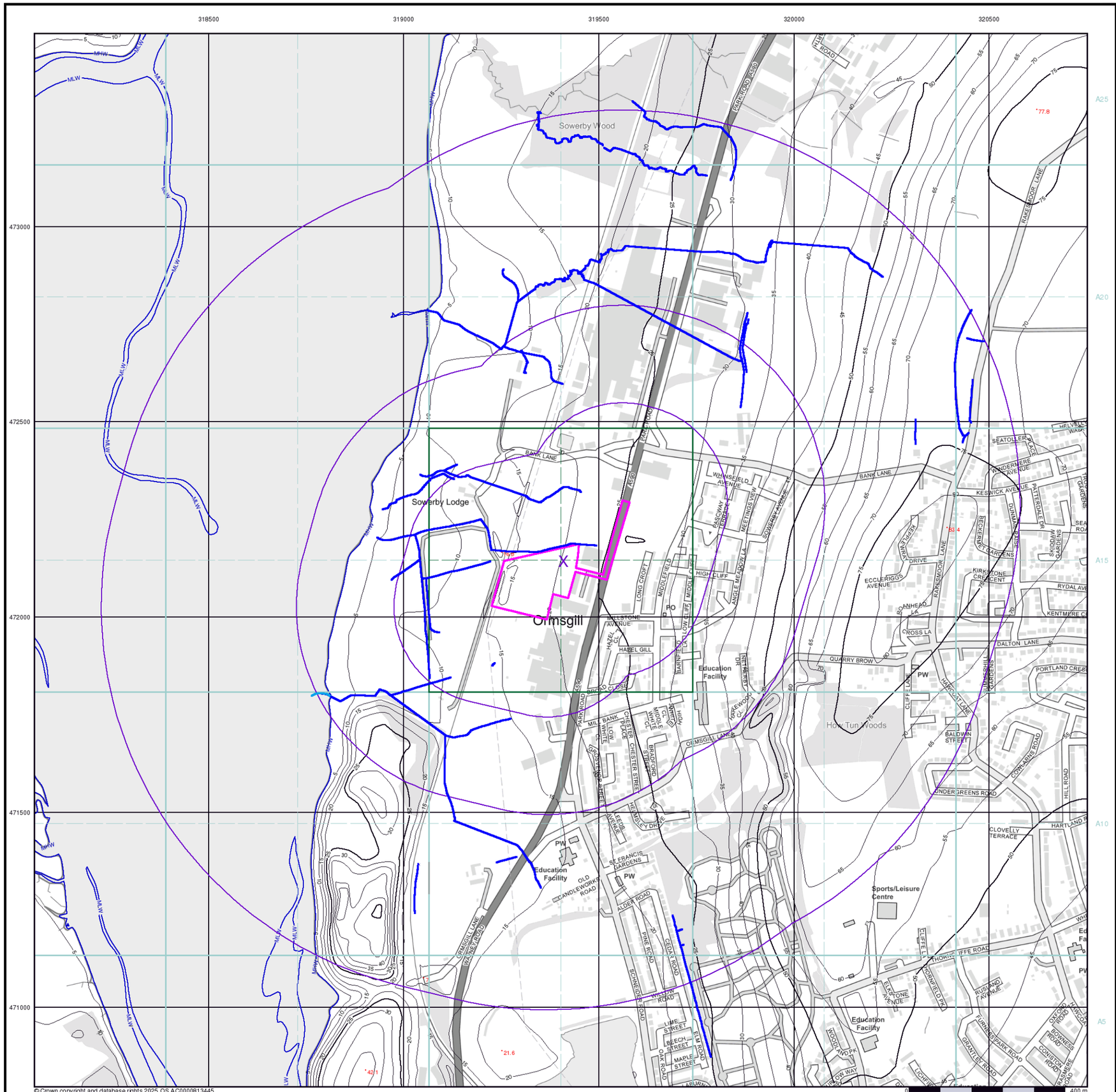
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

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A1 A2 A3 A4 A5

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

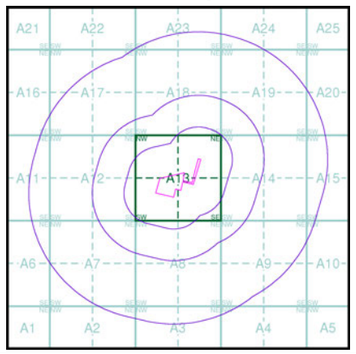
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



Order Details

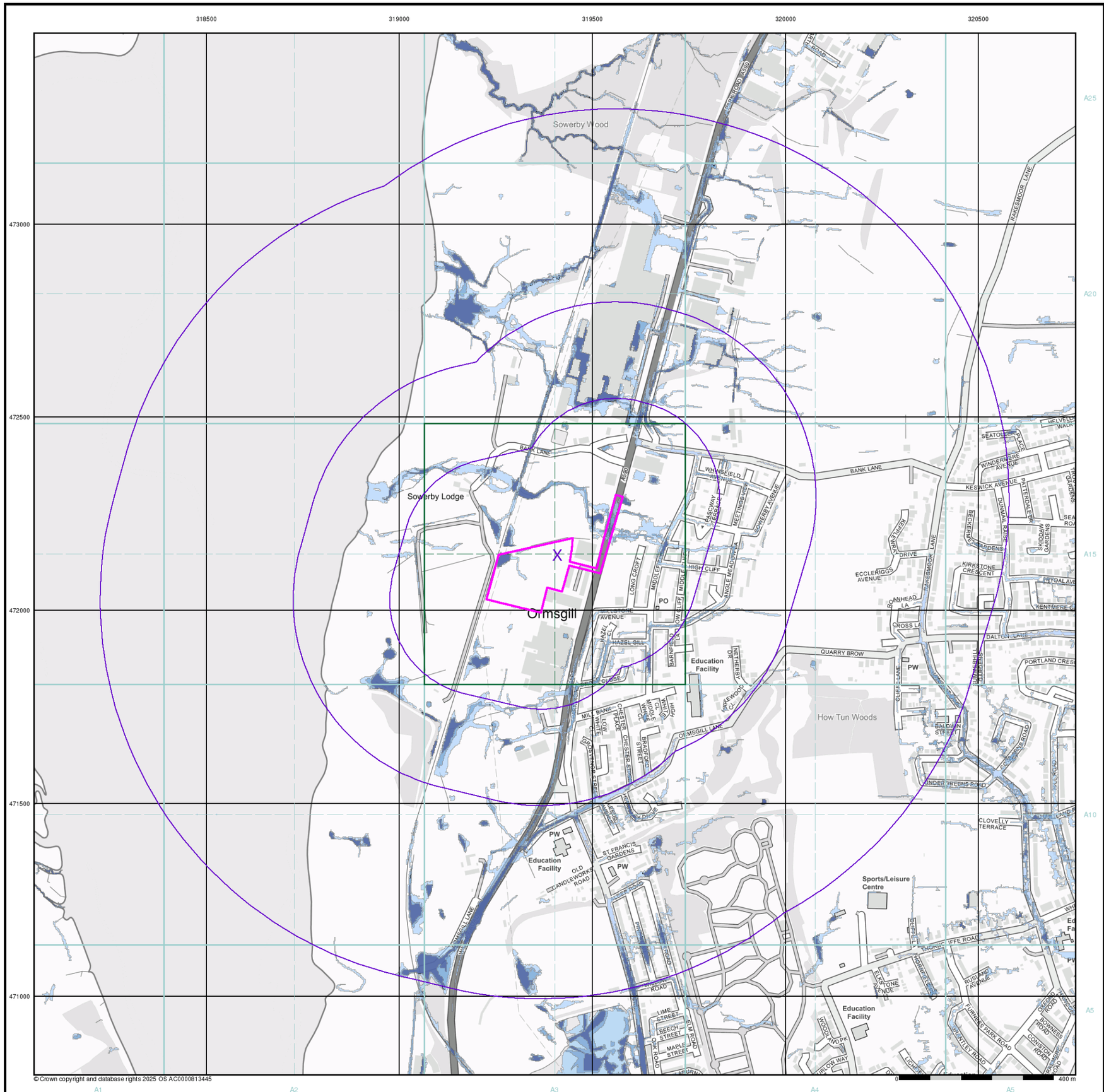
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Search Buffer (m):	1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Risk of Flooding from Surface Water

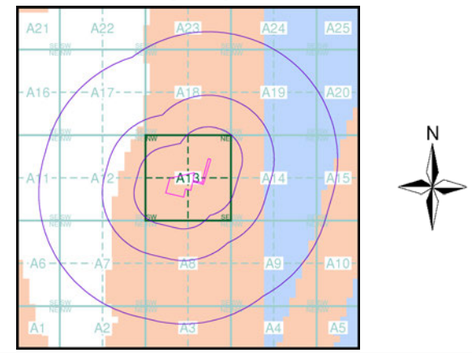
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



Order Details

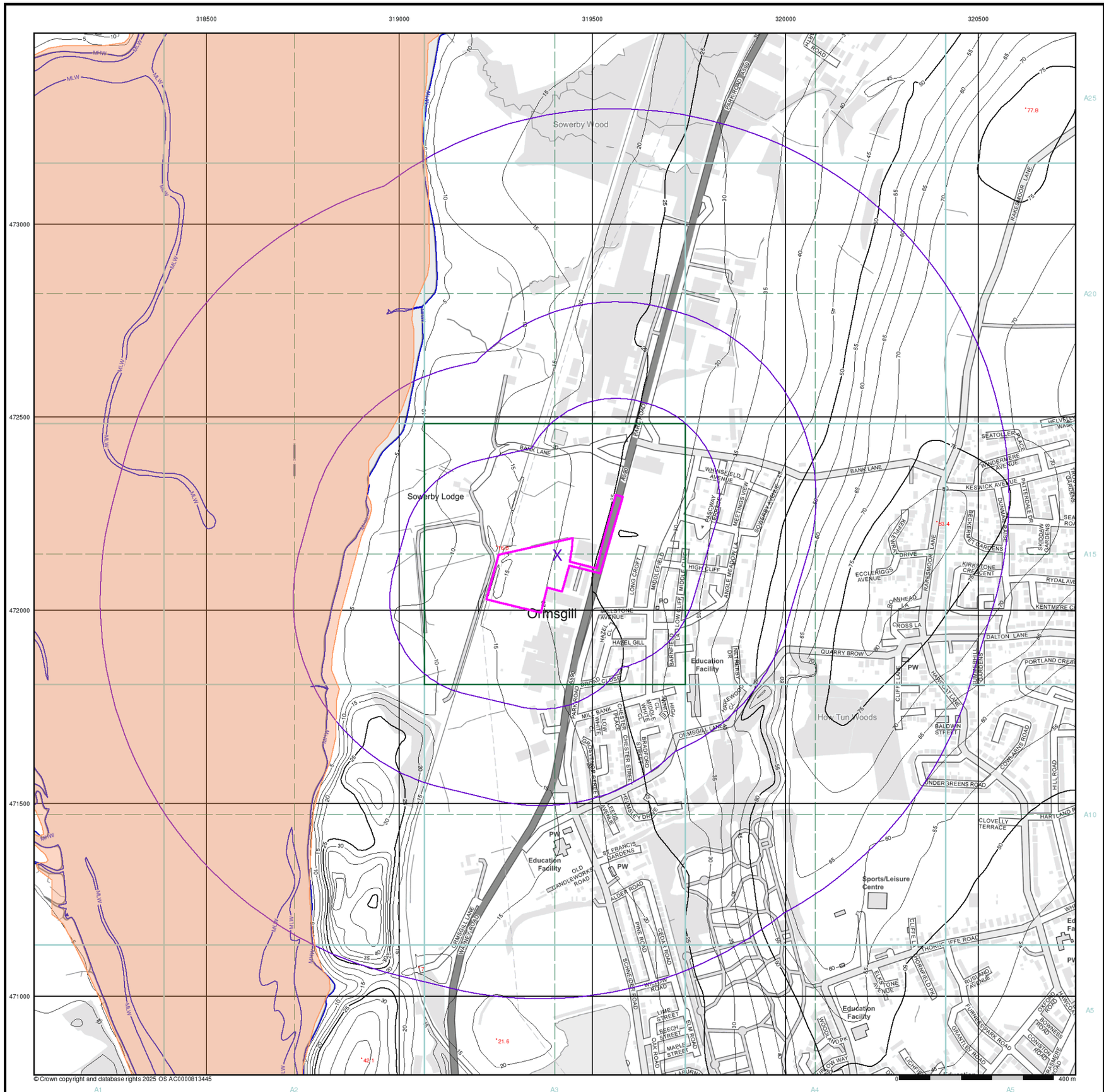
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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Fax: 0844 844 9951
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WFD Surface Waters Map

General

Specified Site | Specified Buffer(s) | Bearing Reference Point

Slice | Map ID

Water Framework Directive - Surface Water Quality

- High
- Good
- Moderate
- Poor
- Bad

Contours (height in meters)

Standard Contour 105 100 95

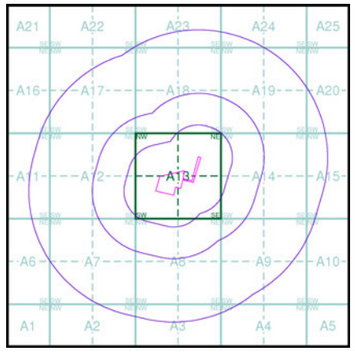
Master Contour

Spot Height * 167.3

MLW Mean Low Water

MHW Mean High Water

WFD Surface Waters Map - Slice A



Order Details

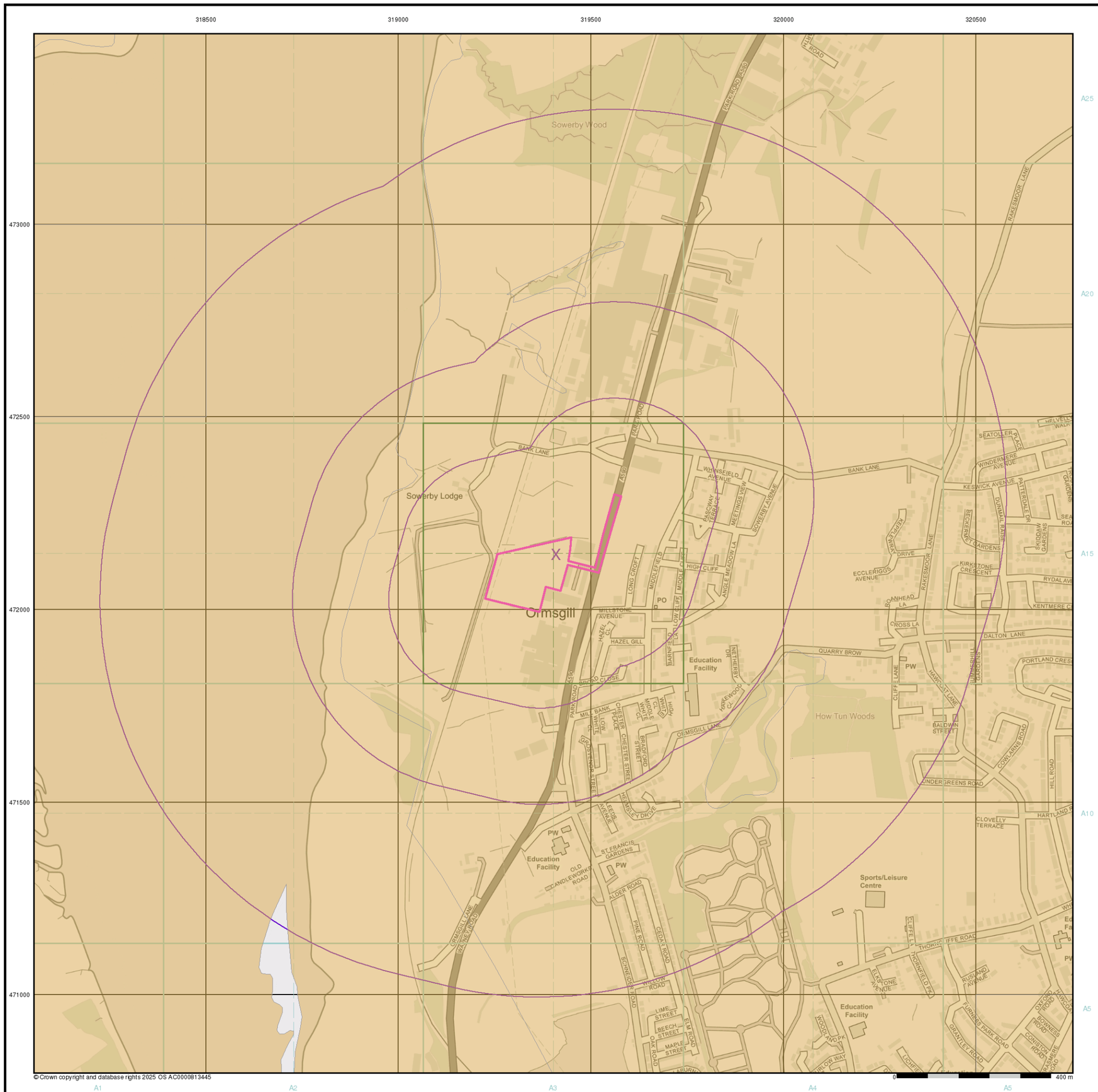
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

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General

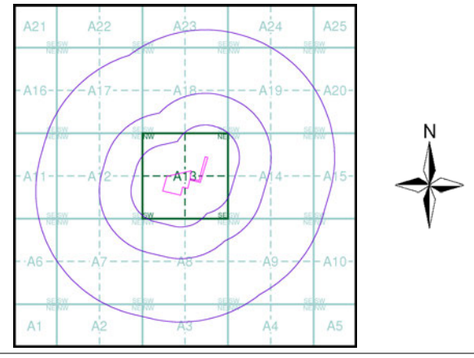
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

Estimated Soil Chemistry Arsenic - Slice A



Order Details

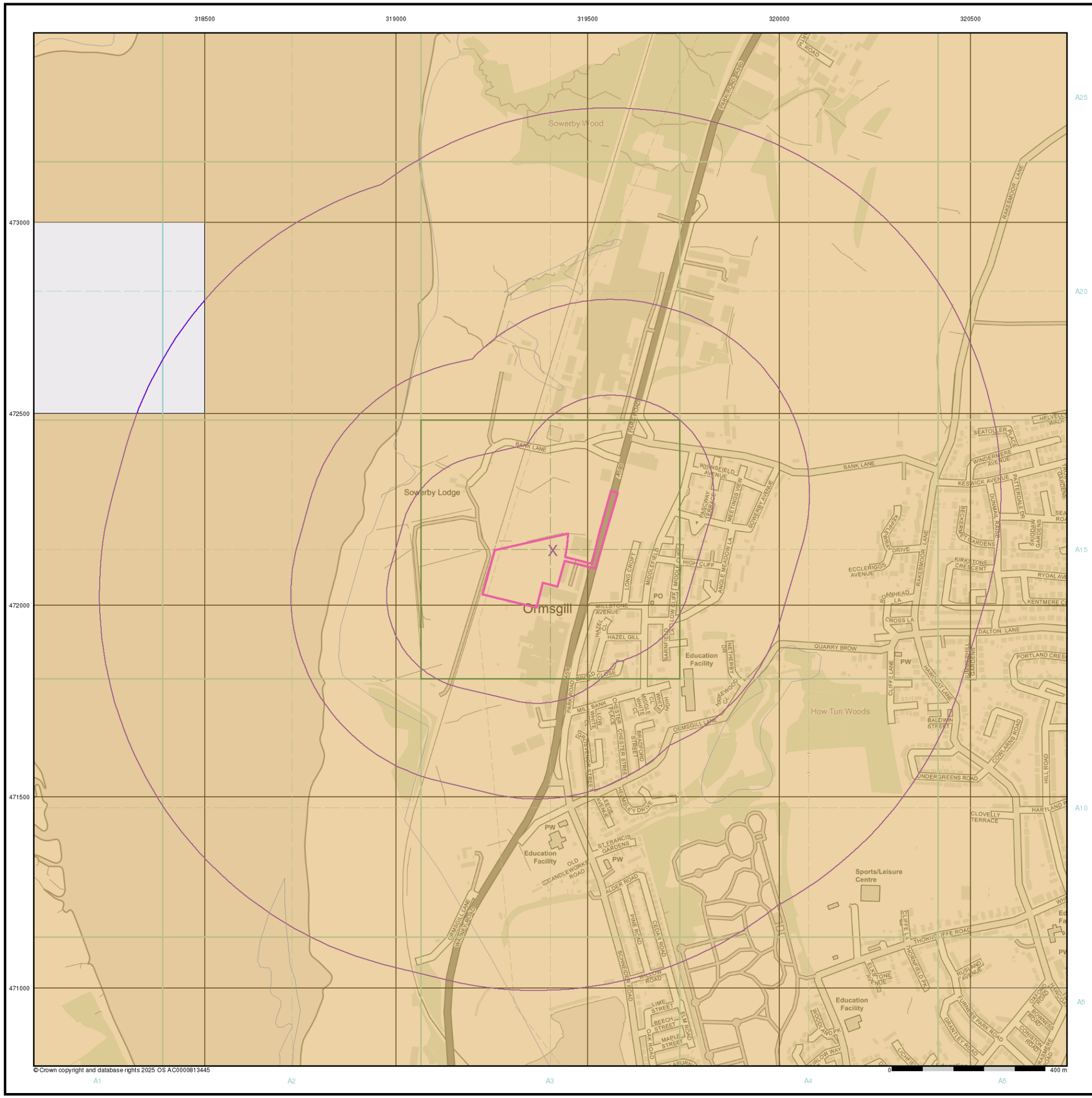
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
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Site Area (Ha):	3.16
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General

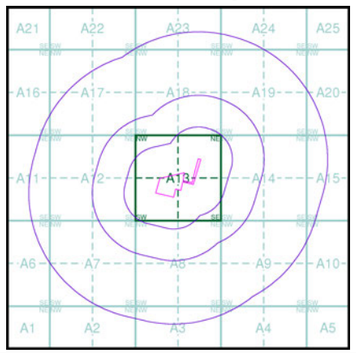
Specified Site Specified Buffer(s) X Bearing Reference Point

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg

- < 1.8
- 1.8 - 2.2
- 2.2 - 3.0
- > 3.0

Estimated Soil Chemistry Cadmium - Slice A



Order Details

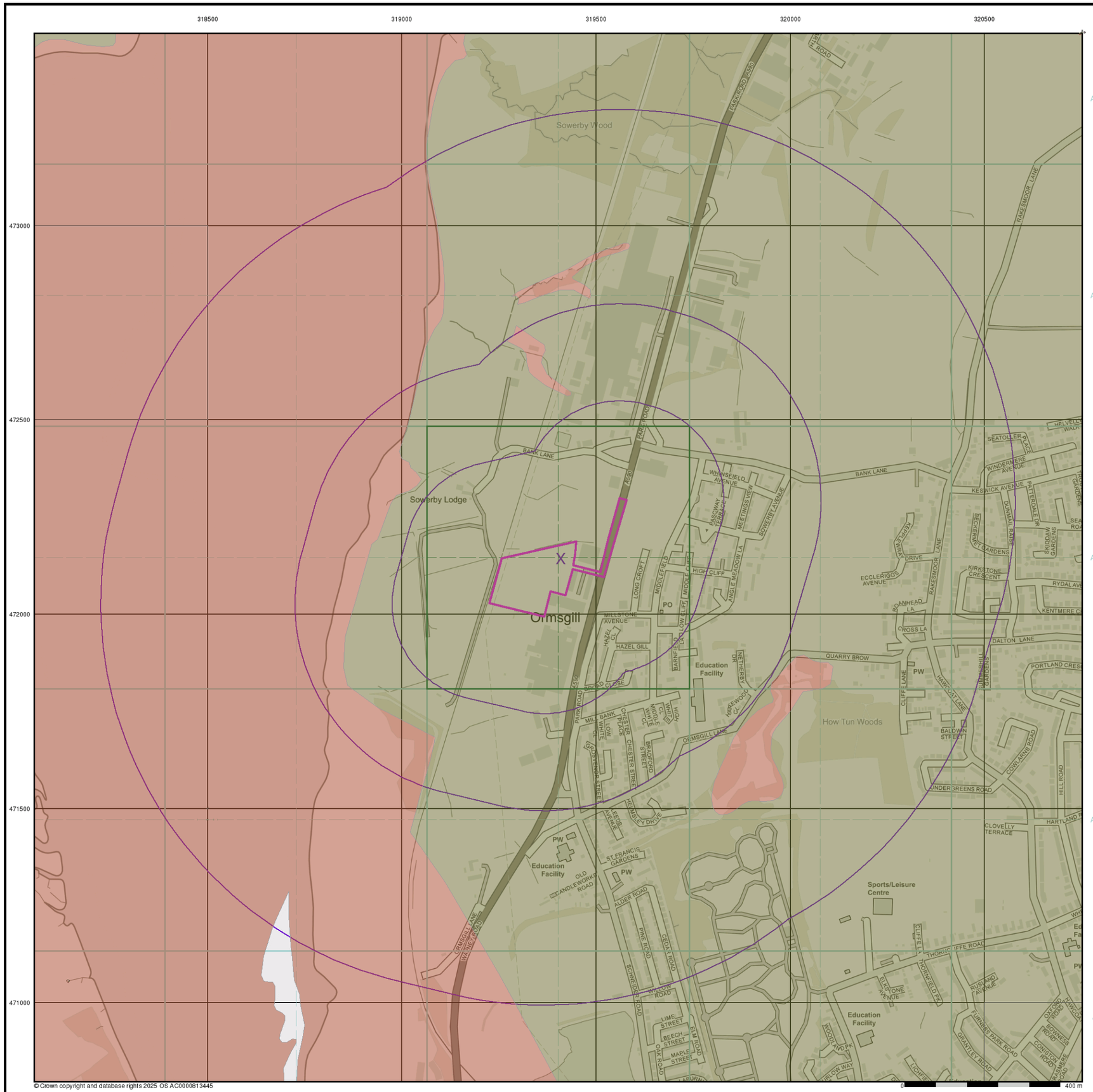
Order Details:	379674976_1_1
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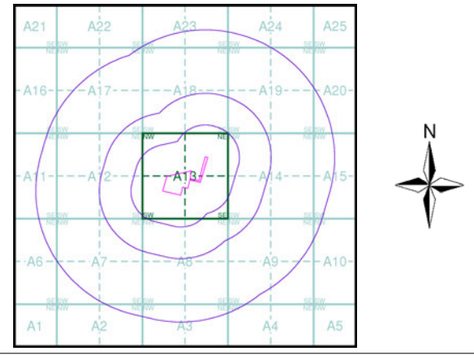
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

Estimated Soil Chemistry Chromium - Slice A



Order Details

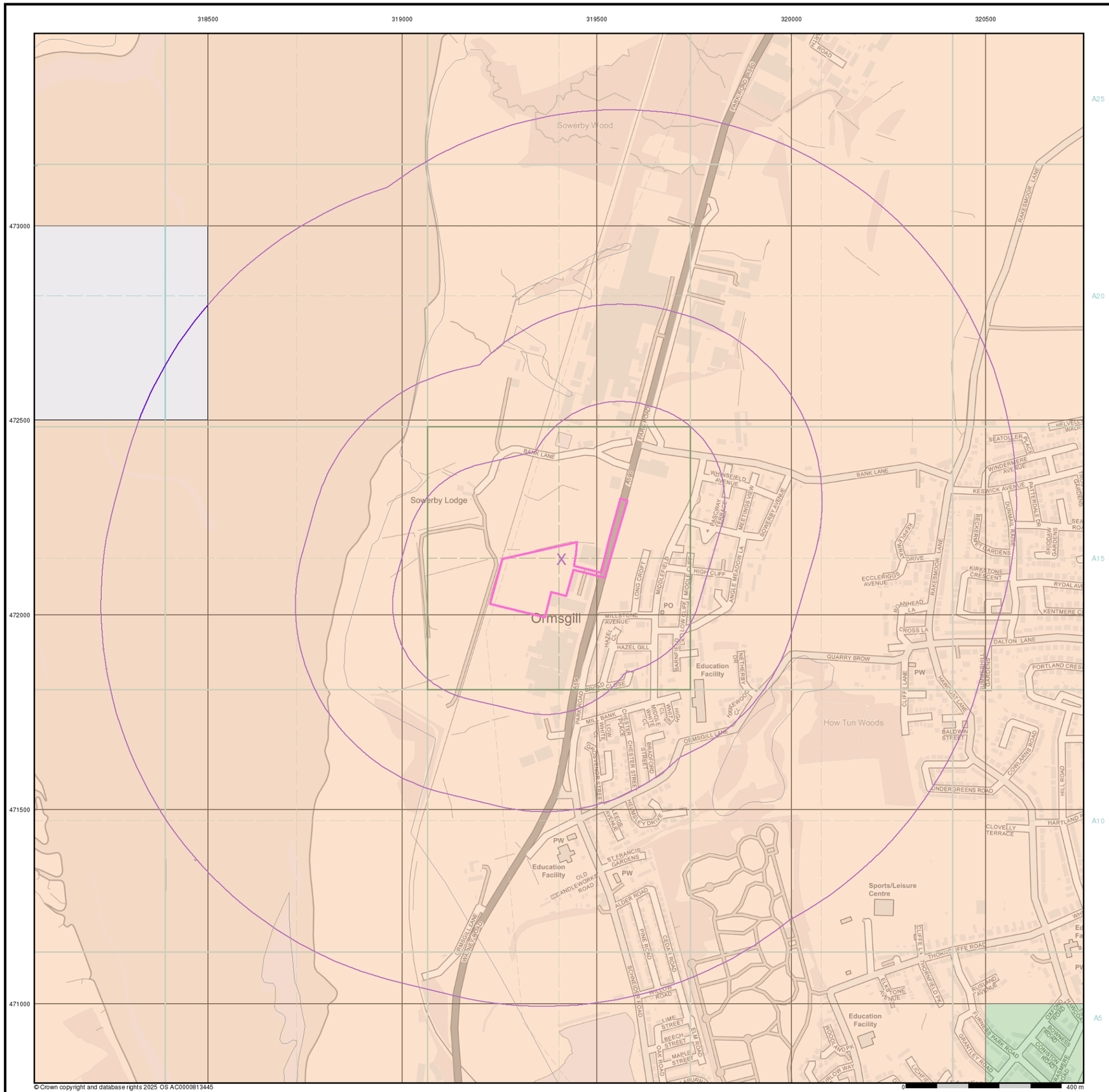
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National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

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Fax: 0844 844 9951
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General

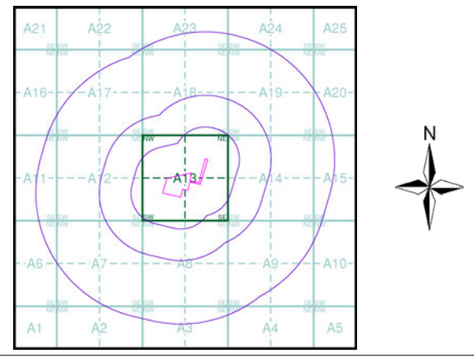
Specified Site Specified Buffer(s) X Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg

- <100 mg/kg
- 100 - 200
- 200 - 300
- 300 - 600
- 600 - 1200
- >1200

Estimated Soil Chemistry Lead - Slice A



Order Details

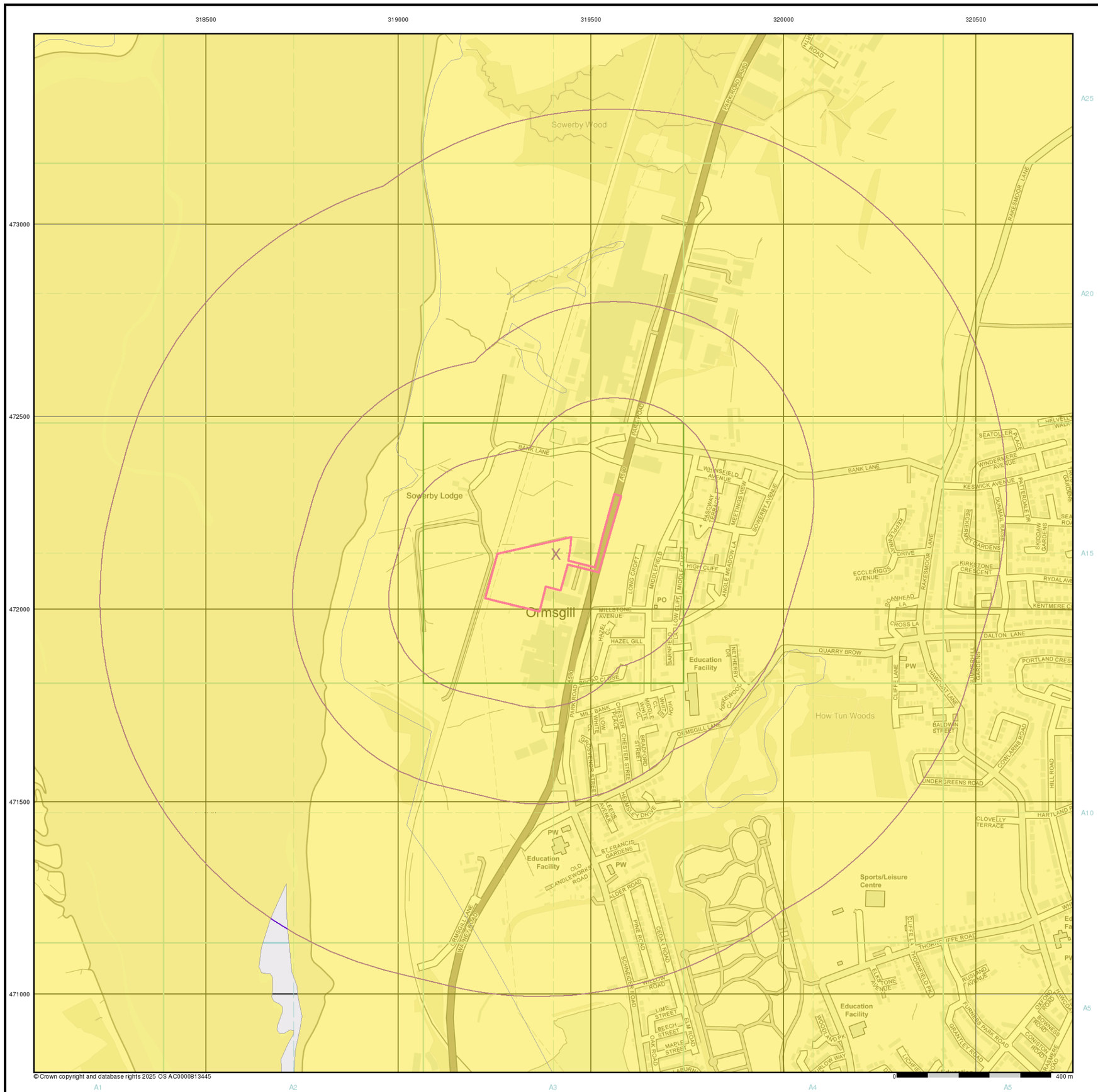
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Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
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Site Details

Site at 319310, 472070

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General

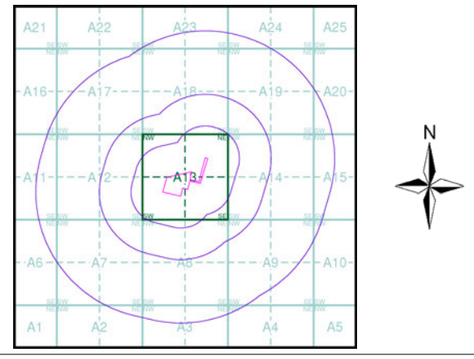
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg

- < 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 - 80
- 80 - 100
- > 100

Estimated Soil Chemistry Nickel - Slice A



Order Details

Order Details:	379674976_1_1
Customer Ref:	416.066073.00001
National Grid Reference:	319410, 472140
Slice:	A
Site Area (Ha):	3.16
Search Buffer (m):	1000

Site Details

Site at 319310, 472070

Landmark INFORMATION GROUP

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Order Details:
Order Number: 379674976
Customer Ref: 416.066073.00001
National Gr 472140
Slice: A
Site Area (Ha): 3.16
Search Buffer: 1000
Site Details 472070
A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirc
BGS Boreholes

Map ID:	Easting:	Northing:	Distance:	Quadrant R	Quadrant R	Bearing Ref	BGS Refere	Drilled Leng
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336	319856	472819	595	A19	SW	NE	Sd17se67/(	7.7
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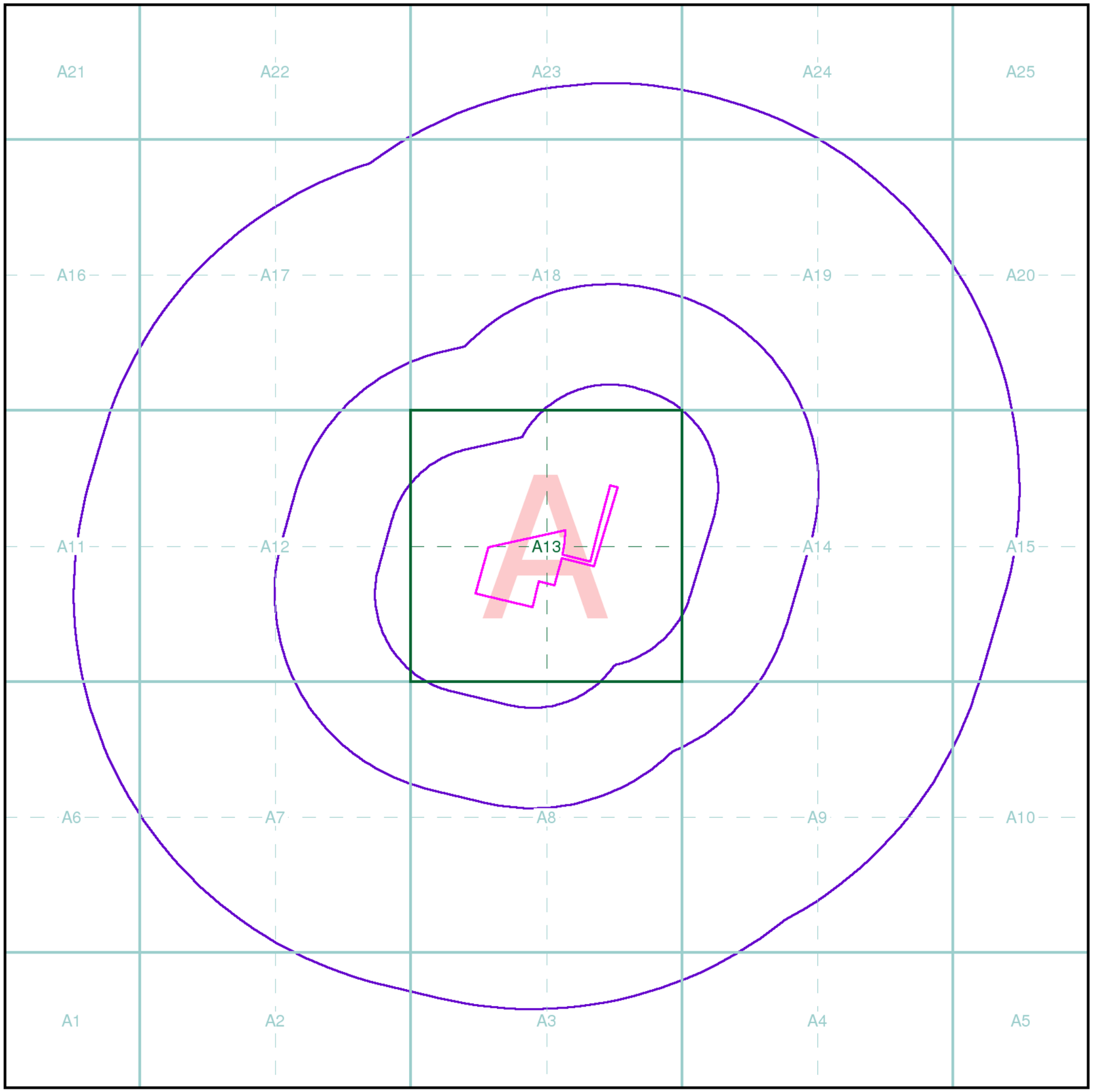
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Barrow Parl Not Available



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Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Map data

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

NATURAL ENGLAND

Envirocheck reports are compiled from 136 different sources of data.

Client Details

Ms E Lovatt, SLR Consulting Ltd, 3rd Floor, Brew House, Jacob Street, Tower Hill, Bristol, BS2 0EQ

Order Details

Order Number:	379674976_1_1
Customer Ref:	416.066073.00001
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Site Details

Site at 319310, 472070

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Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Appendix B Ground Investigation Report

Site Condition and Baseline Report

Barrow Green Hydrogen Plant

Barrow Green Hydrogen Limited

SLR Project No.: 416.066073.00001

19th January 2026

GROUND INVESTIGATION
AT
GYRODATA LIMITED,
BARROW-IN-FURNESS,
CUMBRIA
FOR
GYRODATA LIMITED

REPORT NO. 5651
NOVEMBER 2012

ENGINEER:
CURTINS CONSULTING
28 LOWTHER STREET
KENDAL
LA9 4DH

SUB SURFACE NORTH WEST LIMITED
3 PEEL STREET
PRESTON
LANCASHIRE
PR2 2QS
Tel: (01772) 561135

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1. INTRODUCTION	1.1 Site Location and Description 1.2 Proposed Development and Purpose of the Ground Investigation
2. INVESTIGATION	2.1 Investigation Details 2.2 Sub Surface Detail
3. SAMPLING AND TESTING	3.1 Sampling 3.2 Field Testing 3.3 Laboratory Testing
4. APPRAISAL AND RECOMMENDATIONS	4.1 Comments on the Profile 4.2 Foundations 4.3 Floor Slab Construction 4.4 Excavations and Groundwater 4.5 Buried Concrete 4.6 Roads, Hardstandings and Car Parks 4.7 Chemical Contamination Considerations 4.8 Permeability 4.9 General
APPENDICES	In-situ Test results Laboratory Test results Chemical Contamination results Borehole Record sheets Hand Dug Trial Pit Record sheets Figures

GROUND INVESTIGATION AT GYRODATA LIMITED, BARROW IN FURNESS, CUMBRIA

CLIENT: GYRODATA LIMITED

ENGINEER: CURTINS CONSULTING

---

1. INTRODUCTION

This report has been prepared in accordance with an email, dated 7th September 2012, from the Engineer on behalf of the Client.

The brief was set out in our estimate, ref. E9082 and dated 31st August 2012, with amendments as the investigation proceeded and includes:

- 11 No. cable percussive boreholes
- 8 No. borehole permeability tests
- 1 No. hand dug trial pits
- Geotechnical laboratory testing
- Chemical contamination analysis
- Provision of an interpretative report on the above.

1.1 Site Location and Description

The site is located at the existing Gyrodata Limited premises off Park Road in Barrow in Furness , as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is SD191722.

The site comprises an irregular shaped parcel of land bound to the east by the existing Gyrodata Limited premises then Park Road, to the west by a railway then fields, to the north by a field and to the south by a field and industrial properties.

The eastern half of the site slopes down to the west, while the western half of the site slopes down more gradually towards the north.

1.2 Proposed Development and Purpose of the Ground Investigation

We understand that it is proposed to construct two single storey steel framed buildings and a drainage attenuation pond on the site.

The purpose of the investigation was to obtain an indication of the ground conditions, at the positions of the boreholes, to assess the likelihood of a general pattern of strata being present below the site and to establish the load bearing characteristics of the strata deriving if possible an assessment of the suitability of appropriate founding techniques.

In addition a preliminary contamination assessment was required in order to determine necessary precautions and/or remedial measures required for the proposed development and to ascertain the need for any further sampling and analysis.

Sub Surface North West Limited
3 Peel Street, Preston, Lancashire, PR2 2QS
Tel: 01772 561135 Fax: 01772 204907 Email: preston@subsurface.co.uk

2. INVESTIGATION

2.1 Investigation Details

Eleven 150mm diameter boreholes were put down by cable percussive boring techniques at the positions determined by the Client's Engineer and set out by Sub Surface North West Limited as shown on Figure 2. The boreholes were put down to depths of 6.45m or 6.50m. The samples taken were logged in accordance with BS. EN. 14688 and 14689: 2002-2004 and the resulting Borehole Records are appended.

Four hand dug trial pits were taken out at the positions determined by the Client's Engineer and set out by Sub Surface North West Limited, as shown on Figure 2. The hand dug trial pits were excavated to a depth of between 0.80m and 1.00m. Samples were taken for logging, in accordance with BS. EN. 14688 and 14689: 2002-2004, and testing and in HD4, dimensions of the foundations were recorded. The resulting hand dug trial pit records are appended.

2.2 Sub Surface Detail

Details of the strata encountered in the ground investigation are given on the appended borehole records. The exploratory holes found made ground or topsoil overlying natural clay deposits. A general summary of the strata found is as follows:

Made Ground

Made ground was encountered in BH1, BH2 and BH3 to depths of 0.30m, 0.10m and 1.10m, respectively and comprised mainly brown, greyish brown and dark brown slightly gravelly sandy silty clay . In BH2 and BH3 the gravel sized fragments comprised fine to coarse stone and brick. In BH1 the made ground comprised brown clayey fine to coarse gravel and cobble sized fragments of stone, brick, concrete and pottery.

Topsoil

Topsoil was encountered in boreholes BH5 to BH11 to depths of between 0.20m to 0.50m.

Drift Deposits

Natural clay deposits were encountered in all of the boreholes at depths of between 0.10m and 1.10m and comprised mainly soft and firm becoming stiff medium strength locally high strength dark brown, brown and grey mottled slightly gravelly locally slightly sandy silty clay with localised sand lenses. The gravel comprised mainly fine to coarse quartz and siltstone.

Groundwater

No groundwater inflows were encountered in any of the exploratory holes other than a perched water table in the made ground in BH1 at 0.30m, although it should be noted that they were only left open for a short period of time. Also groundwater levels and rates of inflow may be subject to seasonal and climatic variations.

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3. SAMPLING AND TESTING

3.1 Sampling

Thirty two 100mm diameter undisturbed samples were taken at appropriate intervals in cohesive strata, for testing in the laboratory.

Small disturbed and bulk disturbed samples were obtained for the strata encountered and were subjected to careful examination and hand penetrometer tests, where appropriate.

The samples will be retained for a period of one month after the issue of this report, for reference purposes, and then disposed of unless otherwise instructed.

3.2 Field Testing

Thirty four Standard Penetration Tests (SPTs) were performed in natural cohesive strata, the results of which are recorded on the appended Standard Penetration Test Results Sheet with 'N' values and indicative states of compaction and consistency, where appropriate, given on the appended borehole records.

Borehole permeability tests were undertaken at various depths in BH9, BH10 and BH11. Water was added to the pits from a bowser and water levels were subsequently monitored. The results of the permeability tests are appended.

3.3 Laboratory Testing

The following laboratory tests were carried out in accordance with BS.1377: 1990, where applicable, and the results are appended.

- Moisture content, plastic limit and liquid limit tests
- Quick undrained triaxial tests
- California bearing ratio tests on samples remoulded at natural moisture content
- Soluble sulphate content and pH value tests

Contamination analyses have been performed on four soil samples to determine: pH and concentrations of sulphate, sulphide, cyanide, arsenic, boron (soluble), cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, speciated total petroleum hydrocarbons (TPHs), the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols.

The results of the above analyses are appended.

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4. APPRAISAL AND RECOMMENDATIONS

4.1 Comments on the Profile

At the outset it should be appreciated that only a small proportion of the area to be developed has been sampled and consequently the recommendations made and opinions expressed in this report can only be applied to such conditions as were encountered in the exploratory holes.

In our opinion the exploratory holes indicate a nature and degree of similarity to the extent that we consider them likely to be representative of the natural ground conditions, although clearly no guarantee can be given.

Due to the nature of made ground localised variations in thickness and composition should be anticipated and hence interpolation or extrapolation from the exploratory holes to adjoining areas should only be undertaken with caution.

Details of the findings of the investigation are given on the appended borehole and hand dug trial pit records and a summary of the ground conditions is given in Section 2.2.

4.2 Foundations

We understand that it is proposed to develop the site by constructing two single storey steel framed buildings with an associated drainage attenuation pond. However, at the time of writing this report no specific details regarding the design loads were available and consequently the recommendations given are in general terms only.

Boreholes 1 and 2 were taken out in the area of the first building, boreholes BH3, 4, 5, 6, 7 and 8 were taken out in the area of the second building and boreholes 9, 10 and 11 were taken out in the area of the proposed attenuation tank.

The ground investigation found made ground or topsoil overlying natural clay deposits. We would not recommend founding in the made ground in its present condition because of its inherent variability in consistency and compaction, and in parts the nature of its constituents.

Providing there is sufficient load bearing capability we recommend that the proposed buildings are founded on strip footings for wall loads and pad foundations for column loads in the natural firm or stiff medium strength cohesive strata.

Atterberg limit tests on the shallow cohesive strata indicate clays of low to intermediate plasticity which are considered to have a low to medium susceptibility to shrinkage and swelling with varying moisture content. Consequently we recommend that any foundations are placed at a minimum depth of 0.90m below finished ground level to avoid the zone which is subject to seasonal moisture content variation and frost action. If buildings are to be constructed adjacent to existing trees, trees are to be removed and/or trees are to be planted then the guidelines given in the National House Building Council (NHBC) Standards Chapter 4.2, 'Building Near Trees', should be followed for clays of medium shrinkage and swelling potential.

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It should be noted that in parts of the site the natural strata is at a depth of in excess of 0.90m and in these areas foundations should be taken down to a minimum 0.10m below the base of the made ground unless the NHBC guidelines indicate a greater depth.

Taking the results of the field and laboratory tests we have determined the safe bearing capacity of the natural strata, as follows:

TABLE 1 BUILDING ONE SAFE BEARING CAPACITY

Expl Hole No.	Depth (m)	SPT 'N' Value	Shear Strength (kN/m^2)	Safe Bearing Pressure (kN/m^2)		Minimum Foundation Depth (m)
				Strip Footing	Square Pad	
BH1	1.35	12	48	90	110	0.90
	2.00	-	125	235*	285*	
	3.15	16	64	120	145	
BH2	1.20	-	208	395*	470*	0.90
	2.15	12	48	90	110	
	3.00	-	110	205	250	

* Consideration must be given to weaker underlying strata which might be overstressed if loading is not reduced.

Appreciable variations in safe bearing capacity are indicated in Table 1 and as a consequence of this and the need to utilise a generally applicable safe bearing pressure to enable designs to be reasonably formulated we recommend that in the area of the Building 1 values of $90kN/m^2$ for strip footings and $110kN/m^2$ for square pads should not be exceeded for the minimum foundation depth given.

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TABLE 2 BUILDING ONE SAFE BEARING CAPACITY

Expl Hole No.	Depth (m)	SPT 'N' Value	Shear Strength (kN/m^2)	Safe Bearing Pressure (kN/m^2)		Minimum Foundation Depth (m)
				Strip Footing	Square Pad	
BH3	3.00	-	62	115	140	2.70
	4.15	14	56	105	125	
	5.00	-	90	170	205	
BH4	1.20	-	180	340	410	0.90
	2.15	10	40	75	90	
	3.00	-	124	235	280	
BH5	1.35	13	52	95	115	1.20
	2.00	-	206	390	465	
	3.15	15	60	110	135	
BH6	1.35	17	68	125	155	0.90
	2.00	-	204	385	465	
	3.15	19	76	140	170	
BH7	1.35	13	52	95	115	0.90
	2.00	-	255	480	580	
	3.15	15	60	110	135	
BH8	1.35	11	44	80	100	1.20
	2.00	-	167	315	380	
	3.15	17	65	120	145	
BH9	1.35	14	56	105	125	0.90
	2.00	-	273	515	620	
	3.15	15	60	110	135	

* Consideration must be given to weaker underlying strata which might be overstressed if loading is not reduced.

Appreciable variations in safe bearing capacity are indicated in Table 1 and as a consequence of this and the need to utilise a generally applicable safe bearing pressure to enable designs to be reasonably formulated we recommend that in the area of Building 2 values of $80kN/m^2$ for strip footings and $100kN/m^2$ for square pads should not be exceeded for the minimum foundation depth given.

In view of the depth of foundations required in some areas, notably BH3, it is anticipated that trench fill (lean mix concrete or layers of compacted graded stone) may be required in places to bring levels back up to the surface. We would anticipate that trench fill would normally be economically viable providing foundation depths do not exceed about 2.50 to 3.00m.

All formation levels should be carefully inspected by an experienced and qualified engineer to confirm the appropriateness of the design figures used with any softer zones removed and replaced with lean mix concrete. The formation should then be blinded with lean mix concrete as soon as possible after exposure, if there is to be a delay before construction, to prevent water softening or disturbance.

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It should be noted that the safe bearing pressures given for the cohesive strata do not take into consideration settlement. Settlement is dependent upon loading intensity, the width of footings/pads and the coefficient of volume compressibility (Mv) of the compressible strata. When details of the foundations are formulated we recommend that total and differential settlements are assessed to ensure that they are within acceptable limits.

4.3 Floor Slab Construction

With regard to the design and construction of floor slabs we would recommend the removal of any topsoil and/or Made Ground and the level brought up as required using a graded granular hardcore placed and compacted in layers of not greater than 150mm followed by the construction of a concrete ground bearing floor slab.

We would draw your attention to the localised area of soft clays in the near surface strata, most notably BH3 and in these areas we would recommend that the floor slab is reinforced.

4.4 Excavations and Groundwater

In our opinion, there should be no particular difficulties in excavating the strata indicated in the exploratory holes utilising an appropriate and suitably sized mechanical excavator.

It is recommended that all excavations to greater than 1.20m depth, or for shallower excavations where groundwater is encountered above this level, are closely supported, especially where man entry is required. Alternatively, where space permits, the excavations might be battered back to an appropriate angle.

The boreholes did not encounter groundwater other than a perched water table in the made ground in BH1 at 0.30m, although it should be noted that they were only left open for a relatively short period of time. Given the limited information on groundwater levels provided by the boreholes, groundwater inflows are not anticipated in shallow excavations, although some accumulation of perched water in the made ground might be encountered which should be able to be dealt with by pumping from a sump.

It should be noted that groundwater inflows and levels are likely to be subject to seasonal and climatic variations.

4.5 Buried Concrete

For the design of buried concrete the recommendations given in Building Research Establishment (BRE) Special Digest 1 (September 2005 revision), “Concrete in Aggressive Ground”, should be followed.

Determination of pH on the soil samples gave values in the range of 7.4 to 10.5.

Soluble sulphate concentrations were also determined for soil samples and the results ranged from <0.01 to 1.1g/l.

The results indicate that the Design Sulphate Class for the site should be DS-2.

Our knowledge of the site and ground conditions indicates that the site is “brownfield” with potentially mobile groundwater.

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Consequently, in accordance with the Design Sulphate Class for the site together with the site and groundwater conditions an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-2 should be used as detailed on the appended extract.

4.6 Roads, Hardstandings and Car Parks

Laboratory California Bearing Ratio (CBR) tests have been undertaken on samples of the near surface clay recompacted at their natural moisture content and the results of the tests are appended. A summary of the laboratory CBR test results is as follows:

TABLE 3 CBR RESULTS

Expl. Hole No.	Depth (m)	Dry Density (Mg/m^3)	Moisture Content (%)	CBR Value (%)	Sample
BH1	0.50	1.69	21	0.8	Brown slightly gravelly silty CLAY
BH2	0.50	1.73	20	1.0	Orangish brown and brown silty CLAY
BH3	0.50	1.32	57	0.3	Brownish grey gravelly sandy very silty CLAY with rootlets (Topsoil)
BH4	0.50	1.76	18	3.5	Fissured dark brown silty CLAY
BH5	0.50	1.60	22	0.7	Brown slightly gravelly silty CLAY
BH6	0.50	1.83	15	9.5	Brown slightly sandy silty CLAY
BH7	0.50	1.78	17	7.0	Brown slightly gravelly silty CLAY
BH8	0.50	1.71	20	0.9	Brown and grey slightly gravelly
HD1	0.20	1.93	13	1.4	Reddish brown gravelly very sandy silty CLAY
HD2	0.30	1.77	19	3.7	Light brown and brown mottled slightly gravelly sandy silty CLAY
HD3	0.30	1.68	22	1.6	Dark brown, brown and yellowish brown silty CLAY

It should be noted that the above values appear to significantly vary with moisture content and that the CBR values reduce with increased moisture content.

Given the above it would be advisable to remove any topsoil and design on a CBR value of 0.7%. If there is to be a delay before construction, to prevent water softening, loosening and disturbance, the formation strata should not be exposed. It is likely that the CBR value will be much improved in drier conditions.

4.7 Chemical Contamination Considerations

At the outset it should be noted that this contamination investigation is an initial baseline survey only, in order to provide a preliminary risk assessment on the level of contamination present, and not a full contamination survey. Based upon the findings of this investigation additional sampling, analysis and assessment may be required.

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It should be appreciated that the suite of determinants consist of a range of common contaminants and the analysis is restricted to these in the absence of historical evidence of the source of the made ground. However, the absence of other specific contaminants cannot be guaranteed.

Assessment (Soil)

In order to provide an assessment of the presence of contamination four soil samples have been analysed for a suite of determinants and the results are appended.

The Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) withdrew the soil guideline values (SGVs) and replaced the old CLR 10 document covering derivation of soil guideline values in 2008. This had the effect that any values derived using the old CLR 10 assumptions and parameters was also no longer valid. In response Atkins updated their soil screening values (SSVs). DEFRA and EA published new soil guideline values (SGVs) for mercury, selenium, benzene, toluene, ethylbenzene and xylene on 31 March 2009, arsenic and nickel on 12 May 2009 and cadmium and phenols in June 2009.

In July 2009 a substantial number of Generic Assessment Criteria (GACs) were published by Land Quality Management (LQM), in conjunction with the Chartered Institute of Environmental Health, which supplement the SGVs and effectively supersede many, but not all, SSVs. Contaminated Land: Applications in Real Environments (CL:AIRE) guideline values were also published in December 2009 to supplement the above. The guideline values (SGVs, GACs, CL:AIRE and SSVs) vary dependant upon the land use; allotment and residential use being the most sensitive and commercial/ industrial use being the least sensitive.

For the purposes of assessment the contamination analyses have been compared with the guideline values for a standard land use of commercial and industrial.

The contamination analysis determined no elevated levels of contaminants when compared with the guideline values for a standard land use of commercial and industrial. Guideline values for the assessment can be supplied directly to the Regulator, if requested.

In addition to the above, an assessment of risk to personnel who will come into contact with on-site materials throughout the site has been undertaken.

Conclusions and Recommendations

Section 78a(2) of the Environmental Protection Act: 1990, defines CONTAMINATED LAND for the purposes of Part IIA as:

“any land which appears to the LOCAL AUTHORITY in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

(a) SIGNIFICANT HARM is being caused or there is a SIGNIFICANT POSSIBILITY of such harm being caused; or

(b) POLLUTION OF CONTROLLED WATERS is being, or is likely to be, caused”

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Before a LOCAL AUTHORITY can make the judgement that land appears to be CONTAMINATED LAND on the basis that SIGNIFICANT HARM is being caused, or that there is a SIGNIFICANT POSSIBILITY of such harm being caused, the LOCAL AUTHORITY must identify a SIGNIFICANT POLLUTANT LINKAGE. This means that each of the following has to be identified:

(a) a CONTAMINANT;

(b) a relevant RECEPTOR (defined as living organisms, ecological systems, controlled waters or property); and

(c) a PATHWAY by means of which either:

  (i) the CONTAMINANT is causing SIGNIFICANT HARM to that RECEPTOR, or

  (ii) there is a SIGNIFICANT POSSIBILITY of such harm being caused by that CONTAMINANT to that RECEPTOR

It should be noted that the above words in capitals have a legal definition within the legislation.

Without a clear identification of all three elements of the pollutant linkage, land cannot be identified as contaminated under the regime.

Planning Policy Statement 23 Annex 2 – Development on Land Affected by Contamination, adopts the principles of the pollutant linkage to determine if land is affected by contaminants. The general principles detailed above apply to this assessment.

Our preliminary assessment, based on a limited number of soil samples only, indicates that there are no contaminants requiring remediation and/or precautions to be taken for the proposed development.

Should it be necessary to remove on-site materials from the site, classification of the waste should be undertaken before submitting analysis to appropriate waste carriers and/ or waste disposal site operators to determine the most appropriate tip to use and the associated costs.

SGVs, GACs, CL:AIRE and SSVs assume long term contact with contamination and assess chronic health risk. The risk of short term acute exposure to site personnel is dealt with in the remit of the Health and Safety Executive under the Health and Safety at Work Act: 1974 and Regulations made under the Act, including the Control of Substances Hazardous to Health (COSHH) Regulations. The levels of contamination and risk to site personnel should be considered under the Construction Design and Management (CDM) Regulations at the planning stage and in the development of the designers and contractors Health and Safety Plans and Method Statements. The risk of contact with on-site soils should be minimised.

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4.8 Permeability

Borehole permeability tests were undertaken at various depths in BH9, BH10 and BH11 and the results of the permeability tests are appended.

There was no drop in water level for the duration of any of the tests (90 minutes) and consequently for the purposes of designing the drainage we recommend the clay strata in the vicinity of the proposed attenuation pond are considered to be relatively impermeable.

4.9 General

In the preparation of this report no consideration has been given to the possible presence of ground gas or the long term stability of the existing slope as this was outside our brief.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned at our Preston office.

SUB SURFACE NORTH WEST LIMITED
REPORT No. 5651
NOVEMBER 2012

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Geoenvironmental Engineer
For and on behalf of
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O. J. Stevens B.Sc.(Hons.), M.Sc., C.Eng, C.Phys, C.Sci, C.Geol., MInstP, F.G.S., Eur.Geol., MRICS.
Director
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INSITU TEST RESULTS

SUB SURFACE
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Standard Penetration Test Results

Site : GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Client : GYRODATA LIMITED

Engineer : CURTINS CONSULTING

Job Number 5651

Sheet 1 / 1

Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments
					1	2	1	2	3	4		
BH1	1.20	1.35	1.65	SPT	2	3	3	3	3	3	N=12	
BH1	3.00	3.15	3.45	SPT	2	2	3	4	4	5	N=16	
BH1	5.00	5.15	5.45	SPT	2	3	3	4	5	5	N=17	
BH2	2.00	2.15	2.45	SPT	2	2	3	3	3	3	N=12	
BH2	4.00	4.15	4.45	SPT	1	2	2	3	3	5	N=13	
BH2	6.00	6.15	6.45	SPT	2	2	3	4	5	5	N=17	
BH3	1.20	1.35	1.65	SPT	1	1	1	1	1	1	N=4	
BH3	2.00	2.15	2.45	SPT	1	2	1	1	1	2	N=5	
BH3	4.00	4.15	4.45	SPT	2	2	3	3	4	4	N=14	
BH3	6.00	6.15	6.45	SPT	2	3	4	5	4	5	N=18	
BH4	2.00	2.15	2.45	SPT	2	2	2	2	3	3	N=10	
BH4	4.00	4.15	4.45	SPT	2	2	3	4	4	5	N=16	
BH4	6.00	6.15	6.45	SPT	2	3	3	4	5	6	N=18	
BH5	1.20	1.35	1.65	SPT	2	2	3	3	4	3	N=13	
BH5	3.00	3.15	3.45	SPT	2	3	3	4	4	4	N=15	
BH5	5.00	5.15	5.45	SPT	2	3	4	4	5	5	N=18	
BH6	1.20	1.35	1.65	SPT	2	3	4	4	4	5	N=17	
BH6	3.00	3.15	3.45	SPT	2	3	4	5	5	5	N=19	
BH6	5.00	5.15	5.45	SPT	2	3	4	4	5	5	N=18	
BH7	1.20	1.35	1.65	SPT	2	2	3	3	3	4	N=13	
BH7	3.00	3.15	3.45	SPT	2	3	4	4	3	4	N=15	
BH7	5.00	5.15	5.45	SPT	2	3	4	5	4	5	N=18	
BH8	1.20	1.35	1.65	SPT	2	2	2	3	3	3	N=11	
BH8	3.00	3.15	3.45	SPT	2	3	4	4	4	5	N=17	
BH8	5.00	5.15	5.45	SPT	2	3	4	4	5	5	N=18	
BH9	1.20	1.35	1.65	SPT	2	3	3	4	3	4	N=14	
BH9	3.00	3.15	3.45	SPT	2	3	3	4	4	4	N=15	
BH9	5.00	5.15	5.45	SPT	2	3	4	4	5	5	N=18	
BH10	2.00	2.15	2.45	SPT	2	3	4	4	4	4	N=16	
BH10	4.00	4.15	4.45	SPT	2	3	3	4	4	5	N=16	
BH10	6.00	6.15	6.45	SPT	2	3	4	4	5	5	N=18	
BH11	1.20	1.35	1.65	SPT	2	3	4	3	4	4	N=15	
BH11	3.00	3.15	3.45	SPT	2	3	3	4	4	4	N=15	
BH11	5.00	5.15	5.45	SPT	2	3	4	4	4	5	N=17	

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Insitu Test Results

Site: GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Job Number: 5651

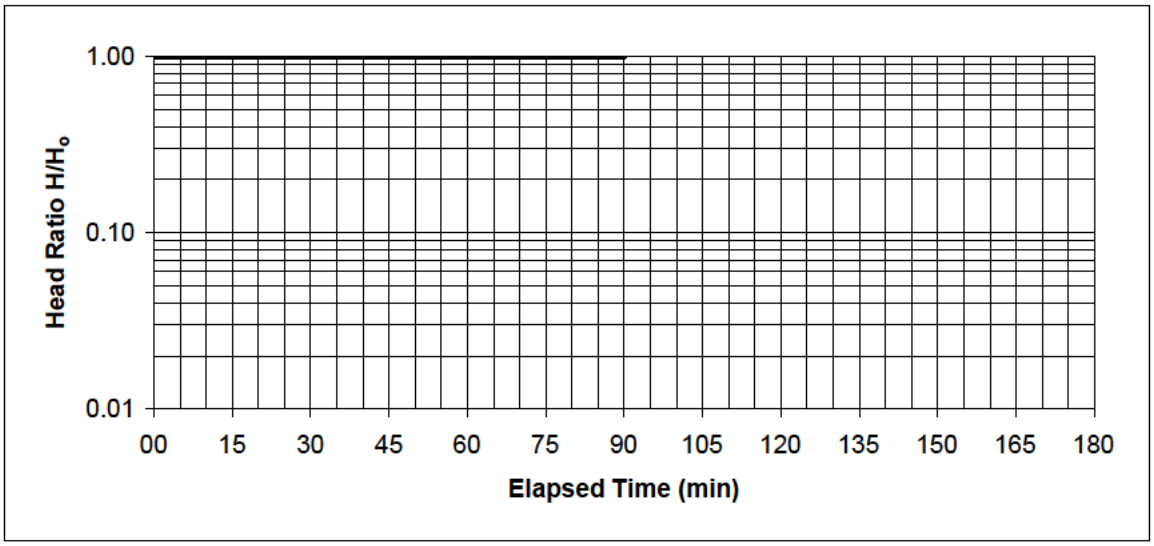
Client: GYRODATA LIMITED

Sheet: 1/8

Engineer: CURTINS CONSULTING

Falling Head Permeability Test

BH 9 TEST NO: 1 DATE: 01/10/2012



Time Elapsed		Depth of Water [d_t]	Water Column Ht. [$h_t = d_s - d_t$]	Head Ratio [h_t / h_o]
(min)	(sec)	(m)	(m)	
00	00	0.00	2.70	1.00
00	30	0.00	2.70	1.00
01	00	0.00	2.70	1.00
02	00	0.00	2.70	1.00
03	00	0.00	2.70	1.00
04	00	0.00	2.70	1.00
05	00	0.00	2.70	1.00
07	30	0.00	2.70	1.00
10	00	0.00	2.70	1.00
15	00	0.00	2.70	1.00
30	00	0.00	2.70	1.00
45	00	0.00	2.70	1.00
60	00	0.00	2.70	1.00
90	00	0.00	2.70	1.00

Top of test section:	1.00	m
Bottom of test section:	2.00	m
Response Zone [L]:	1.00	m
Diameter [D]:	0.15	m
Cross Sectional Area [A]:	0.02	m^2
Standing Water Depth [d_s]:	2.00	m
Initial Water Column H_t [h_o]:	2.70	m
Basic Time Lag [T]:	N/A	s
Intake Factor [F]:	2.4205	m

where $F = \frac{2\pi L}{\log_e [(L/D) + /\{1 + (L/D)^2\}]}$

COEFFICIENT OF PERMEABILITY $k = \frac{A}{F \times T}$ $k =$ **N/A*** **m/s**

Test Strata:

1.00m - 2.00m: Dark brown and occasional grey mottled slightly gravelly silty CLAY

Remarks:

*Coefficient of Permeability (k) unable to be determined due to relative impermeability of test strata

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Insitu Test Results

Site: GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Job Number: 5651

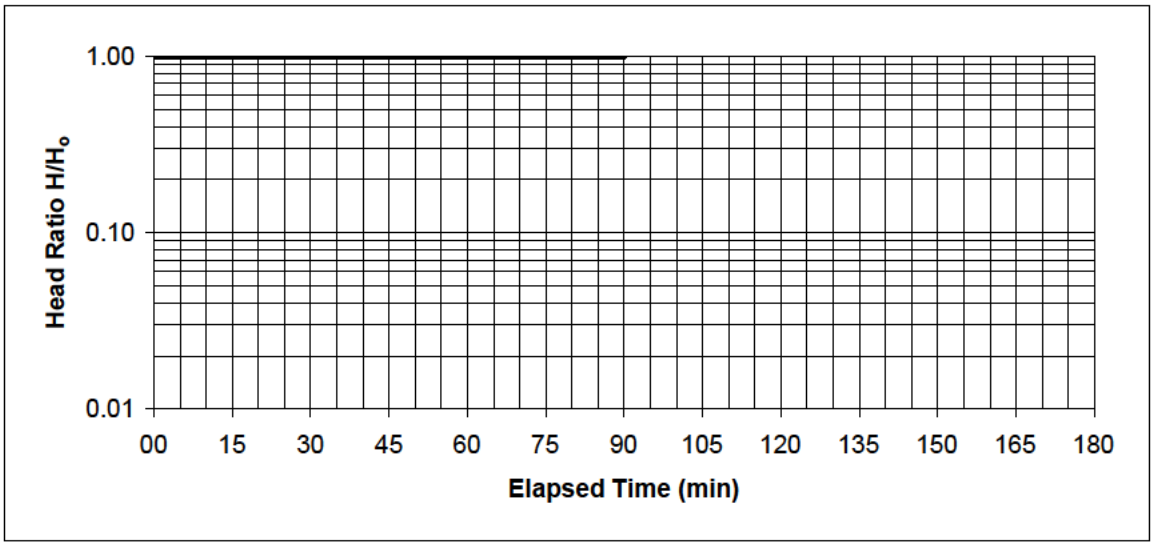
Client: GYRODATA LIMITED

Sheet: 2/8

Engineer: CURTINS CONSULTING

Falling Head Permeability Test

BH 9 TEST NO: 2 DATE: 01/10/2012



Time Elapsed		Depth of Water [d_t]	Water Column Ht. [$h_t = d_s - d_t$]	Head Ratio [h_t / h_o]
(min)	(sec)	(m)	(m)	
00	00	0.00	4.70	1.00
00	30	0.00	4.70	1.00
01	00	0.00	4.70	1.00
02	00	0.00	4.70	1.00
03	00	0.00	4.70	1.00
04	00	0.00	4.70	1.00
05	00	0.00	4.70	1.00
07	30	0.00	4.70	1.00
10	00	0.00	4.70	1.00
15	00	0.00	4.70	1.00
30	00	0.00	4.70	1.00
45	00	0.00	4.70	1.00
60	00	0.00	4.70	1.00
90	00	0.00	4.70	1.00

Top of test section:	2.60	m
Bottom of test section:	3.60	m
Response Zone [L]:	1.00	m
Diameter [D]:	0.15	m
Cross Sectional Area [A]:	0.02	m^2
Standing Water Depth [d_s]:	3.60	m
Initial Water Column H_t [h_o]:	4.70	m
Basic Time Lag [T]:	N/A	s
Intake Factor [F]:	2.4205	m

where $F = \frac{2\pi L}{\log_e [(L/D) + /\{1 + (L/D)^2\}]}$

COEFFICIENT OF PERMEABILITY $k = \frac{A}{F \times T}$ $k =$ **N/A*** **m/s**

Test Strata:

2.60m - 3.00m: Dark brown and occasional grey mottled slightly gravelly silty CLAY
3.00m - 3.60m: Dark brown silty CLAY

Remarks:

*Coefficient of Permeability (k) unable to be determined due to relative impermeability of test strata

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3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Insitu Test Results

Site: GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Job Number: 5651

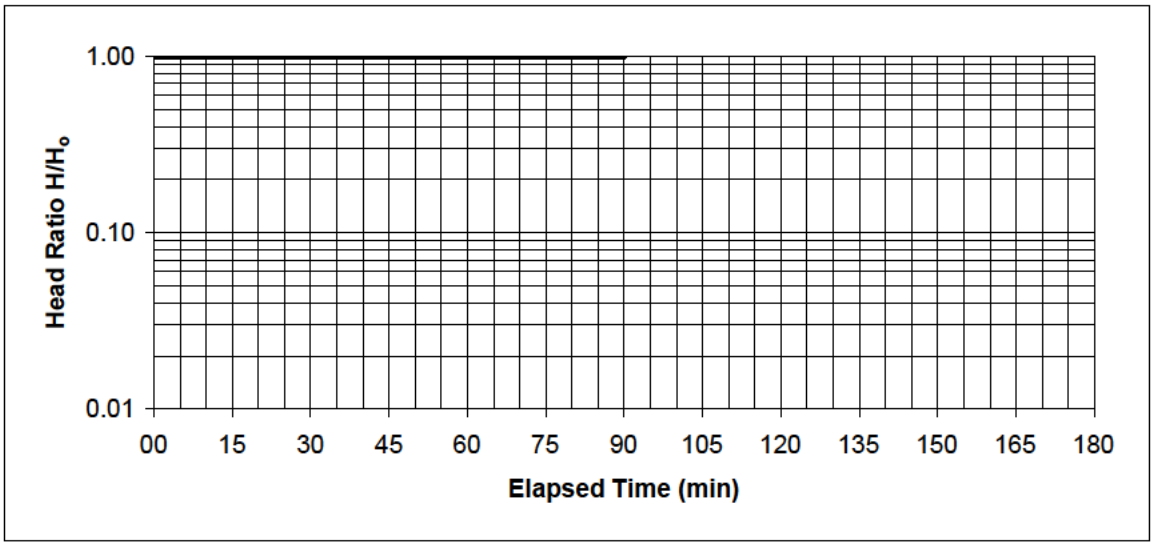
Client: GYRODATA LIMITED

Sheet: 3/8

Engineer: CURTINS CONSULTING

Falling Head Permeability Test

BH 9 TEST NO: 3 DATE: 02/10/2012



Time Elapsed		Depth of Water [d_t]	Water Column Ht. [$h_t = d_s - d_t$]	Head Ratio [h_t / h_o]
(min)	(sec)	(m)	(m)	
00	00	0.00	6.70	1.00
00	30	0.00	6.70	1.00
01	00	0.00	6.70	1.00
02	00	0.00	6.70	1.00
03	00	0.00	6.70	1.00
04	00	0.00	6.70	1.00
05	00	0.00	6.70	1.00
07	30	0.00	6.70	1.00
10	00	0.00	6.70	1.00
15	00	0.00	6.70	1.00
30	00	0.00	6.70	1.00
45	00	0.00	6.70	1.00
60	00	0.00	6.70	1.00
90	00	0.00	6.70	1.00

Top of test section:	4.50	m
Bottom of test section:	5.50	m
Response Zone [L]:	1.00	m
Diameter [D]:	0.15	m
Cross Sectional Area [A]:	0.02	m^2
Standing Water Depth [d_s]:	5.50	m
Initial Water Column H_t [h_o]:	6.70	m
Basic Time Lag [T]:	N/A	s
Intake Factor [F]:	2.4205	m

where $F = \frac{2\pi L}{\log_e [(L/D) + /\{1 + (L/D)^2\}]}$

COEFFICIENT OF PERMEABILITY $k = \frac{A}{F \times T}$ $k =$ **N/A*** **m/s**

Test Strata:

4.50m - 5.50m: Dark brown silty CLAY

Remarks:

*Coefficient of Permeability (k) unable to be determined due to relative impermeability of test strata

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Insitu Test Results

Site: GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Job Number: 5651

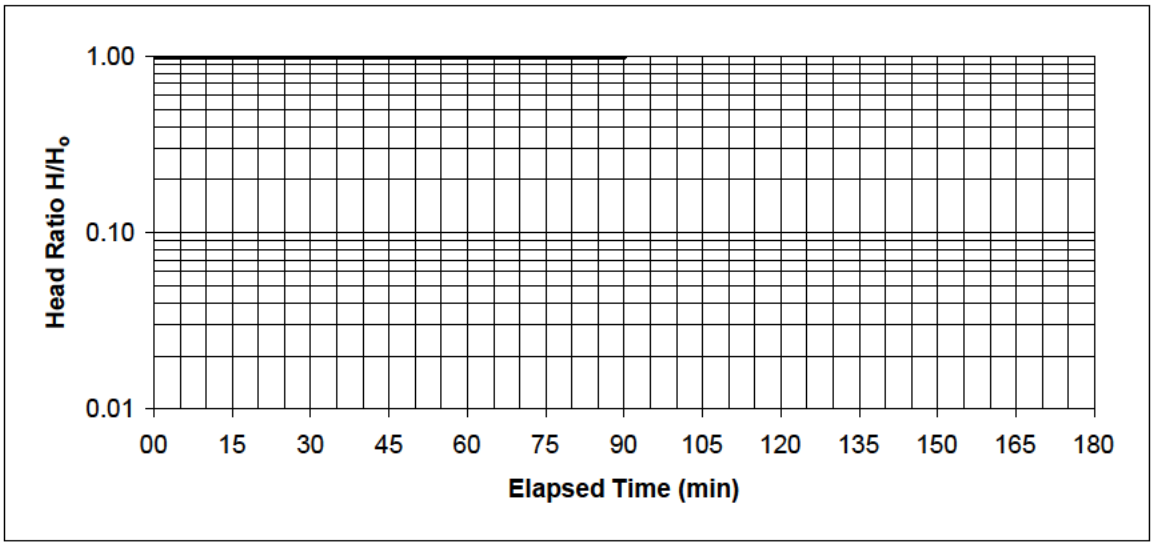
Client: GYRODATA LIMITED

Sheet: 4/8

Engineer: CURTINS CONSULTING

Falling Head Permeability Test

BH 10 TEST NO: 1 DATE: 01/10/2012



Time Elapsed		Depth of Water [d_t]	Water Column Ht. [$h_t = d_s - d_t$]	Head Ratio [h_t / h_o]
(min)	(sec)	(m)	(m)	
00	00	0.00	1.00	1.00
00	30	0.00	1.00	1.00
01	00	0.00	1.00	1.00
02	00	0.00	1.00	1.00
03	00	0.00	1.00	1.00
04	00	0.00	1.00	1.00
05	00	0.00	1.00	1.00
07	30	0.00	1.00	1.00
10	00	0.00	1.00	1.00
15	00	0.00	1.00	1.00
30	00	0.00	1.00	1.00
45	00	0.00	1.00	1.00
60	00	0.00	1.00	1.00
90	00	0.00	1.00	1.00

Top of test section:	0.20	m
Bottom of test section:	1.20	m
Response Zone [L]:	1.00	m
Diameter [D]:	0.15	m
Cross Sectional Area [A]:	0.02	m^2
Standing Water Depth [d_s]:	1.20	m
Initial Water Column H_t [h_o]:	1.00	m
Basic Time Lag [T]:	N/A	s
Intake Factor [F]:	0.3000	m

where F = 2D

COEFFICIENT OF PERMEABILITY $k = \frac{A}{F \times T}$ **k = N/A* m/s**

Test Strata:

0.20m - 1.20m: Dark brown and occasionally grey mottled slightly gravelly silty CLAY

Remarks:

*Coefficient of Permeability (k) unable to be determined due to relative impermeability of test strata

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Insitu Test Results

Site: GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Job Number: 5651

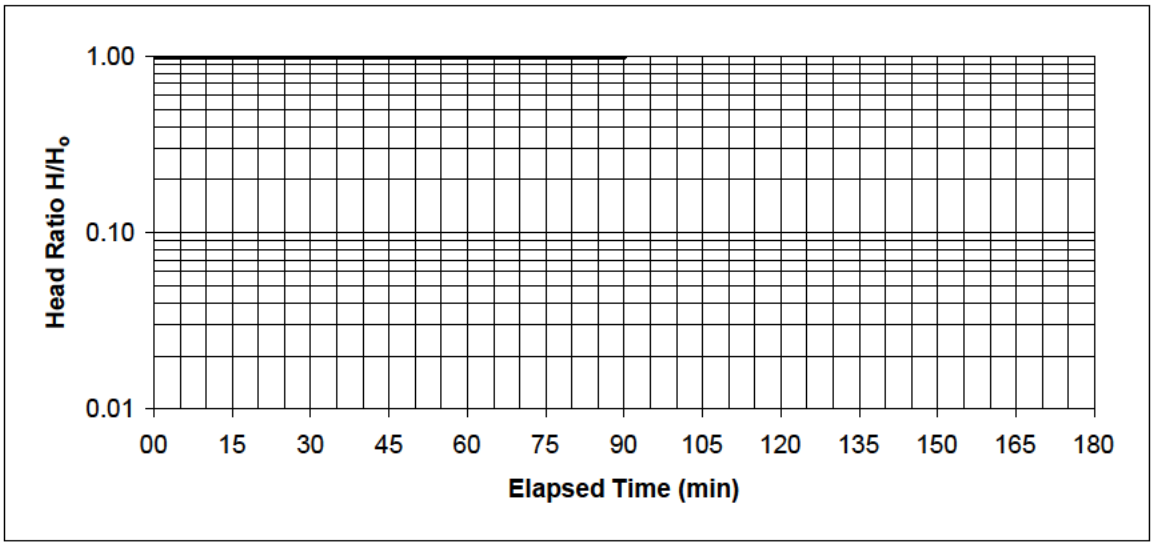
Client: GYRODATA LIMITED

Sheet: 5/8

Engineer: CURTINS CONSULTING

Falling Head Permeability Test

BH 10 TEST NO: 2 DATE: 01/10/2012



Time Elapsed		Depth of Water [d_t]	Water Column Ht. [$h_t = d_s - d_t$]	Head Ratio [h_t / h_o]
(min)	(sec)	(m)	(m)	
00	00	0.00	2.80	1.00
00	30	0.00	2.80	1.00
01	00	0.00	2.80	1.00
02	00	0.00	2.80	1.00
03	00	0.00	2.80	1.00
04	00	0.00	2.80	1.00
05	00	0.00	2.80	1.00
07	30	0.00	2.80	1.00
10	00	0.00	2.80	1.00
15	00	0.00	2.80	1.00
30	00	0.00	2.80	1.00
45	00	0.00	2.80	1.00
60	00	0.00	2.80	1.00
90	00	0.00	2.80	1.00

Top of test section:	1.80	m
Bottom of test section:	2.80	m
Response Zone [L]:	1.00	m
Diameter [D]:	0.15	m
Cross Sectional Area [A]:	0.02	m^2
Standing Water Depth [d_s]:	2.80	m
Initial Water Column H_t [h_o]:	2.80	m
Basic Time Lag [T]:	N/A	s
Intake Factor [F]:	2.4205	m

where $F = \frac{2\pi L}{\log_e [(L/D) + /\{1 + (L/D)^2\}]}$

COEFFICIENT OF PERMEABILITY $k = \frac{A}{F \times T}$ **k = N/A*** **m/s**

Test Strata:

1.80m - 2.80: Dark brown and occasionally grey mottled slightly gravelly silty CLAY

Remarks:

*Coefficient of Permeability (k) unable to be determined due to relative impermeability of test strata

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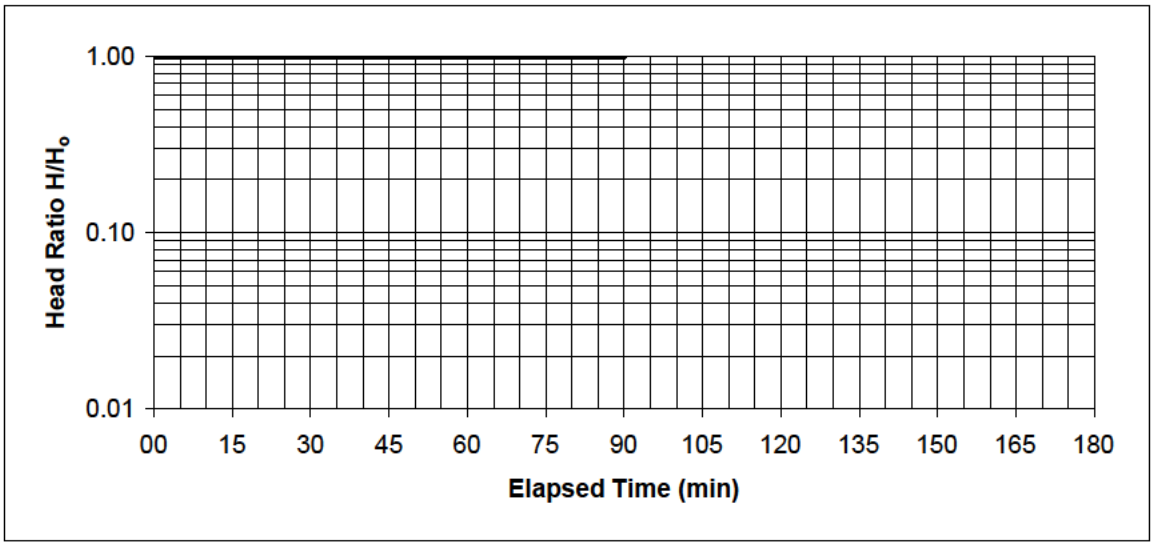
Client: GYRODATA LIMITED

Sheet: 6/8

Engineer: CURTINS CONSULTING

Falling Head Permeability Test

BH 10 TEST NO: 3 DATE: 01/10/2012



Time Elapsed		Depth of Water [d_t]	Water Column Ht. [$h_t = d_s - d_t$]	Head Ratio [h_t / h_o]
(min)	(sec)	(m)	(m)	
00	00	0.00	5.70	1.00
00	30	0.00	5.70	1.00
01	00	0.00	5.70	1.00
02	00	0.00	5.70	1.00
03	00	0.00	5.70	1.00
04	00	0.00	5.70	1.00
05	00	0.00	5.70	1.00
07	30	0.00	5.70	1.00
10	00	0.00	5.70	1.00
15	00	0.00	5.70	1.00
30	00	0.00	5.70	1.00
45	00	0.00	5.70	1.00
60	00	0.00	5.70	1.00
90	00	0.00	5.70	1.00

Top of test section:	3.70	m
Bottom of test section:	4.70	m
Response Zone [L]:	1.00	m
Diameter [D]:	0.15	m
Cross Sectional Area [A]:	0.02	m^2
Standing Water Depth [d_s]:	4.70	m
Initial Water Column H_t [h_o]:	5.70	m
Basic Time Lag [T]:	N/A	s
Intake Factor [F]:	2.4205	m

where $F = \frac{2\pi L}{\log_e [(L/D) + /\{1 + (L/D)^2\}]}$

COEFFICIENT OF PERMEABILITY $k = \frac{A}{F \times T}$ $k =$ **N/A*** **m/s**

Test Strata:

3.70m - 4.00m: Dark brown and occasionally grey mottled slightly gravelly silty CLAY
4.00m - 4.70m: Dark brown slightly gravelly silty CLAY

Remarks:

*Coefficient of Permeability (k) unable to be determined due to relative impermeability of test strata

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Job Number: 5651

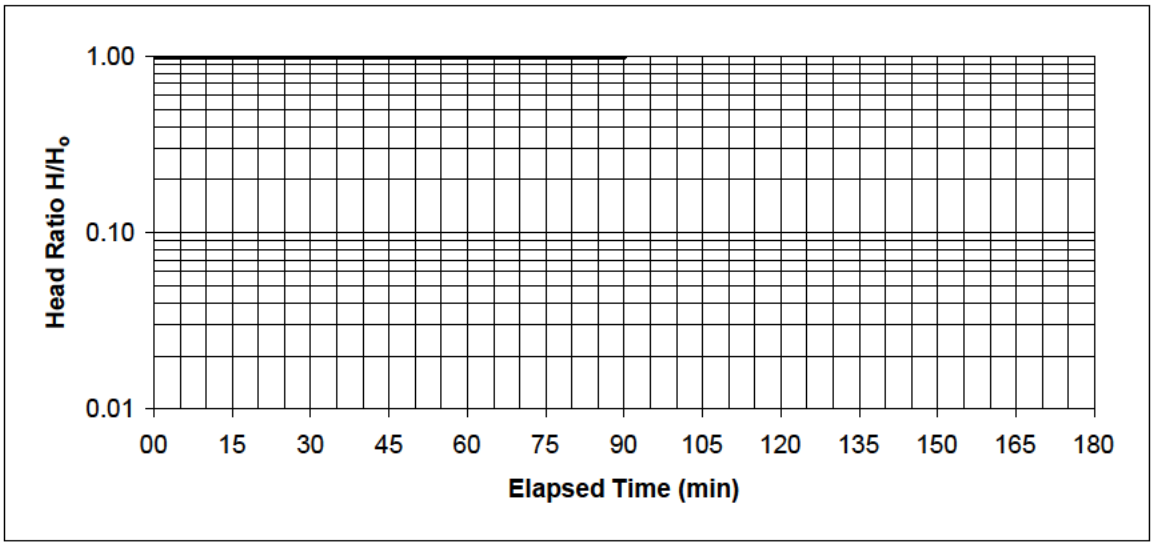
Client: GYRODATA LIMITED

Sheet: 7/8

Engineer: CURTINS CONSULTING

Falling Head Permeability Test

BH 11 TEST NO: 1 DATE: 28/09/2012



Time Elapsed		Depth of Water [d_t]	Water Column Ht. [$h_t = d_s - d_t$]	Head Ratio [h_t / h_o]
(min)	(sec)	(m)	(m)	
00	00	0.00	2.70	1.00
00	30	0.00	2.70	1.00
01	00	0.00	2.70	1.00
02	00	0.00	2.70	1.00
03	00	0.00	2.70	1.00
04	00	0.00	2.70	1.00
05	00	0.00	2.70	1.00
07	30	0.00	2.70	1.00
10	00	0.00	2.70	1.00
15	00	0.00	2.70	1.00
30	00	0.00	2.70	1.00
45	00	0.00	2.70	1.00
60	00	0.00	2.70	1.00
90	00	0.00	2.70	1.00

Top of test section:	1.00	m
Bottom of test section:	2.00	m
Response Zone [L]:	1.00	m
Diameter [D]:	0.15	m
Cross Sectional Area [A]:	0.02	m^2
Standing Water Depth [d_s]:	2.00	m
Initial Water Column H_t [h_o]:	2.70	m
Basic Time Lag [T]:	N/A	s
Intake Factor [F]:	2.4205	m

where $F = \frac{2\pi L}{\log_e [(L/D) + /\{1 + (L/D)^2\}]}$

COEFFICIENT OF PERMEABILITY $k = \frac{A}{F \times T}$ **k = N/A*** **m/s**

Test Strata:

1.00m - 1.20m: Brown and dark brown silty CLAY
1.20m - 2.00m: Dark brown slightly gravelly CLAY

Remarks:

*Coefficient of Permeability (k) unable to be determined due to relative impermeability of test strata

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Insitu Test Results

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Job Number: 5651

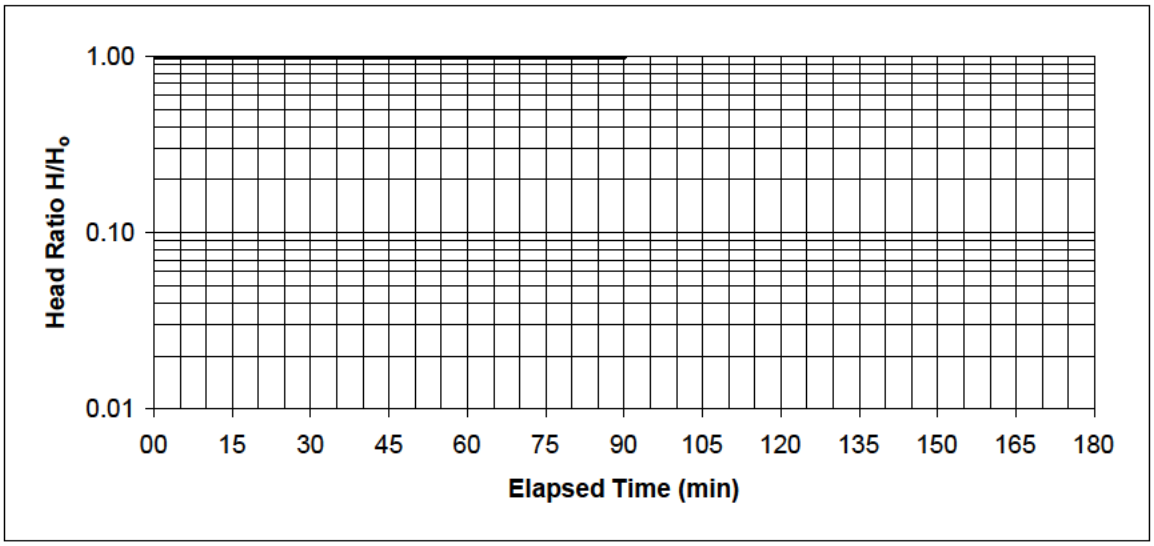
Client: GYRODATA LIMITED

Sheet: 8/8

Engineer: CURTINS CONSULTING

Falling Head Permeability Test

BH 11 TEST NO: 2 DATE: 28/09/2012



Time Elapsed		Depth of Water [d_t]	Water Column Ht. [$h_t = d_s - d_t$]	Head Ratio [h_t / h_o]
(min)	(sec)	(m)	(m)	
00	00	0.00	4.70	1.00
00	30	0.00	4.70	1.00
01	00	0.00	4.70	1.00
02	00	0.00	4.70	1.00
03	00	0.00	4.70	1.00
04	00	0.00	4.70	1.00
05	00	0.00	4.70	1.00
07	30	0.00	4.70	1.00
10	00	0.00	4.70	1.00
15	00	0.00	4.70	1.00
30	00	0.00	4.70	1.00
45	00	0.00	4.70	1.00
60	00	0.00	4.70	1.00
90	00	0.00	4.70	1.00

Top of test section:	2.70	m
Bottom of test section:	3.70	m
Response Zone [L]:	1.00	m
Diameter [D]:	0.15	m
Cross Sectional Area [A]:	0.02	m^2
Standing Water Depth [d_s]:	3.70	m
Initial Water Column H_t [h_o]:	4.70	m
Basic Time Lag [T]:	N/A	s
Intake Factor [F]:	2.4205	m

where $F = \frac{2\pi L}{\log_e [(L/D) + /\{1 + (L/D)^2\}]}$

COEFFICIENT OF PERMEABILITY $k = \frac{A}{F \times T}$ $k =$ **N/A*** **m/s**

Test Strata:

2.70m - 3.70m: Dark brown slightly gravelly CLAY

Remarks:

*Coefficient of Permeability (k) unable to be determined due to relative impermeability of test strata

LABORATORY TEST RESULTS

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Laboratory Test Results

Site : GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Client : GYRODATA LIMITED

Engineer : CURTINS CONSULTING

Job Number 5651

Sheet 1 / 1

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX

Borehole/ Trial Pit	Depth (m)	Sample	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Group Symbol	Description
				Percentage %	Moisture Content %						
BH1	1.20	D	16	96	17	36	17	19	0.00	CI	Dark brown silty CLAY.
BH2	1.20	U	15	95	16	32	17	15	-0.07	CL	Brown and grey mottled slightly gravelly sandy silty CLAY. Gravel is fine to medium.
BH4	1.20	U	15	95	16	34	17	17	-0.06	CL	Brown slightly gravelly sandy silty CLAY. Gravel is fine to coarse.
BH5	2.00	U	16	97	16	35	17	18	-0.06	CL/CI	Brown and grey slightly gravelly silty CLAY. Gravel is fine to coarse.
BH6	2.00	U	16	96	17	35	17	18	0.00	CL/CI	Brown and grey mottled slightly gravelly CLAY. Gravel is fine to medium.
BH7	2.00	U	15	96	16	33	15	18	0.06	CL	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH8	1.20	D	18	98	18	36	16	20	0.10	CI	Brown and occasional grey mottled slightly gravelly silty CLAY. Gravel comprises subangular to subrounded fine to medium quartz and siltstone.
BH9	2.00	U	15	67	22	35	18	17	0.24	CL/CI	Brown and grey mottled sandy slightly gravelly CLAY. Gravel is fine to medium.
BH10	1.20	U	17	100	17	38	16	22	0.05	CI	Brown slightly gravelly sandy silty CLAY. Gravel is fine to medium.
BH11	2.00	U	19	91	21	38	19	19	0.11	CI	Brown slightly gravelly silty CLAY. Gravel is fne to medium.

Method of Preparation : BS 1377:PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index

Remarks :

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Laboratory Test Results

Site : GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Client : GYRODATA LIMITED

Engineer : CURTINS CONSULTING

Job Number 5651

Sheet 1 / 2

DETERMINATION OF DENSITY, MOISTURE CONTENT AND UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Trial Pit	Depth (m)	Sample	Moisture Content %	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Cell Pressure (kN/m^2)	Deviator Stress (kN/m^2)	Apparent Cohesion (kN/m^2)	Angle of Shearing Resistance (degrees)	Description
BH1	2.00	U	17	2.19	1.87	50 100 150	246 251 255	125	0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse.
BH1	4.00	U	16	2.25	1.94	100 200 200	207 222 222	107	0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse.
BH1	6.00	U	17	2.14	1.82	125 175 225	140 148 151	73	0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse.
BH2	1.20	U	15	2.18	1.90	25 75 125	403 416 427	208	0	Brown and grey mottled slightly gravelly sandy silty CLAY. Gravel is fine to medium.
BH2	3.00	U	17	2.19	1.87	75 125 175	213 220 228	110	0	Brown slightly gravelly sandy silty CLAY. Gravel is fine to medium.
BH2	5.00	U	14	2.23	1.95	100 150 200	148 155 165	78	0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse.
BH3	3.00	U	15	2.21	1.92	75 125 175	121 124 127	62	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH3	5.00	U	19	2.18	1.83	100 150 200	174 180 188	90	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH4	1.20	U	15	2.19	1.90	25 75 125	336 362 381	180	0	Brown slightly gravelly sandy silty CLAY. Gravel is fine to coarse.
BH4	3.00	U	17	2.17	1.85	75 125 175	242 248 254	124	0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse.
BH4	5.00	U	18	2.16	1.84	100 150 200	210 212 216	106	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH5	2.00	U	16	2.19	1.89	50 100 150	397 412 425	206	0	Brown and grey slightly gravelly silty CLAY. Gravel is fine to coarse.
BH5	4.00	U	21	2.13	1.77	100 150 200	144 148 153	74	0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse.
BH5	6.00	U	19	2.13	1.79	125 175 225	136 141 146	71	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH6	2.00	U	16	2.22	1.93	50 100 150	386 412 428	204	0	Brown and grey mottled slightly gravelly CLAY. Gravel is fine to medium.
BH6	4.00	U	20	2.13	1.77	100 150 200	155 165 169	82	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH6	6.00	U	18	2.11	1.79	125 175 225	128 136 138	67	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH7	2.00	U	15	2.19	1.91	50 100 150	495 516 521	255	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.

Method of Preparation : BS 1377:PART 1:1990:7.4.2 Moisture content 1990: Preparation of undisturbed samples for testing BS 1377:PART 2:1990:7.2

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:7 Determination of density BS 1377:PART 7:1990:8 Undrained shear strength 1990:9 Multistage loading

Remarks :

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Laboratory Test Results

Site : GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Client : GYRODATA LIMITED

Engineer : CURTINS CONSULTING

Job Number 5651

Sheet 2 / 2

DETERMINATION OF DENSITY, MOISTURE CONTENT AND UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Trial Pit	Depth (m)	Sample	Moisture Content %	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Cell Pressure (kN/m^2)	Deviator Stress (kN/m^2)	Apparent Cohesion (kN/m^2)	Angle of Shearing Resistance (degrees)	Description
BH7	4.00	U	16	2.21	1.90	100 150 200	291 294 304	148	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH7	6.00	U	18	2.18	1.86	125 175 225	194 201 206	100	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH8	2.00	U	18	2.25	1.91	50 100 150	330 333 336	167	0	Brown slightly gravelly silty CLAY.
BH8	4.00	U	21	2.12	1.76	100 150 200	112 117 122	59	0	Brown silty CLAY.
BH8	6.00	U	17	2.19	1.87	125 175 225	296 302 308	151	0	Brown silty CLAY.
BH9	2.00	U	15	2.24	1.95	50 100 150	543 547 548	273	0	Brown and grey mottled sandy slightly gravelly CLAY. Gravel is fine to medium.
BH9	4.00	U	17	2.19	1.86	100 150 200	120 120 125	61	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH9	6.00	U	19	2.14	1.81	125 175 225	126 129 132	65	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH10	1.20	U	17	2.15	1.84	25 75 125	252 253 257	127	0	Brown slightly gravelly sandy silty CLAY. Gravel is fine to medium.
BH10	3.00	U	17	2.22	1.90	75 125 175	396 400 407	201	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH10	5.00	U	18	2.12	1.79	100 150 200	188 191 193	95	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH11	2.00	U	19	2.15	1.80	50 100 150	200 207 211	103	0	Brown slightly gravelly silty CLAY. Gravel is fne to medium.
BH11	4.00	U	19	2.14	1.79	100 150 200	195 203 208	101	0	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH11	6.00	U	18	2.24	1.90	125 175 225	112 114 117	57	0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse.

Method of Preparation : BS 1377:PART 1:1990:7.4.2 Moisture content 1990: Preparation of undisturbed samples for testing BS 1377:PART 2:1990:7.2

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:7 Determination of density BS 1377:PART 7:1990:8 Undrained shear strength 1990:9 Multistage loading

Remarks :

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SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Laboratory Test Results

Site: GYRODATA LIMITED, BARROW-IN-FURNESS, CUMBRIA

Client: GYRODATA LIMITED

Engineer: CURTINS CONSULTING

Job Number 5651

Sheet: 1/11

CALIFORNIA BEARING RATIO

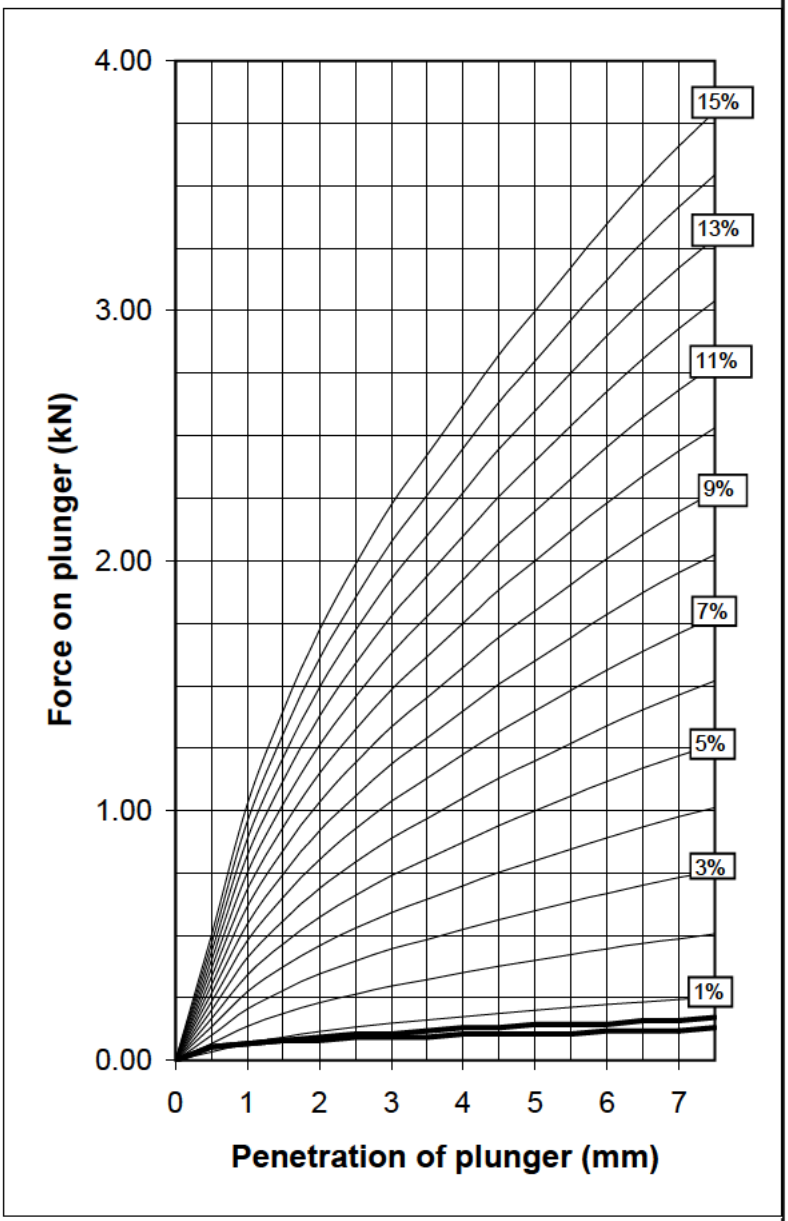
Position: BH1 Sample No: 304 Depth: 0.50 m

Description:

Brown slightly gravelly silty CLAY. Gravel is fine to coarse.

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	2.0	0.05	2.0	0.05
1.0	2.5	0.07	2.5	0.07
1.5	3.0	0.08	3.0	0.08
2.0	3.5	0.09	3.0	0.08
2.5	4.0	0.11	3.5	0.09
3.0	4.0	0.11	3.5	0.09
3.5	4.5	0.12	3.5	0.09
4.0	5.0	0.13	4.0	0.11
4.5	5.0	0.13	4.0	0.11
5.0	5.5	0.14	4.0	0.11
5.5	5.5	0.14	4.0	0.11
6.0	5.5	0.14	4.5	0.12
6.5	6.0	0.16	4.5	0.12
7.0	6.0	0.16	4.5	0.12
7.5	6.5	0.17	5.0	0.13



	CBR % Value at:	
	2.5mm	5.0mm
Top	**0.8%**	**0.7%**
Bottom	**0.7%**	**0.5%**

Passing 20mm Sieve = **100 %**

Moisture Content = **21 %**

Bulk Density = **2.05 Mg/m^3**

Dry Density = **1.69 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

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Client: GYRODATA LIMITED
Engineer: CURTINS CONSULTING

Job Number 5651
Sheet: 2/11

CALIFORNIA BEARING RATIO

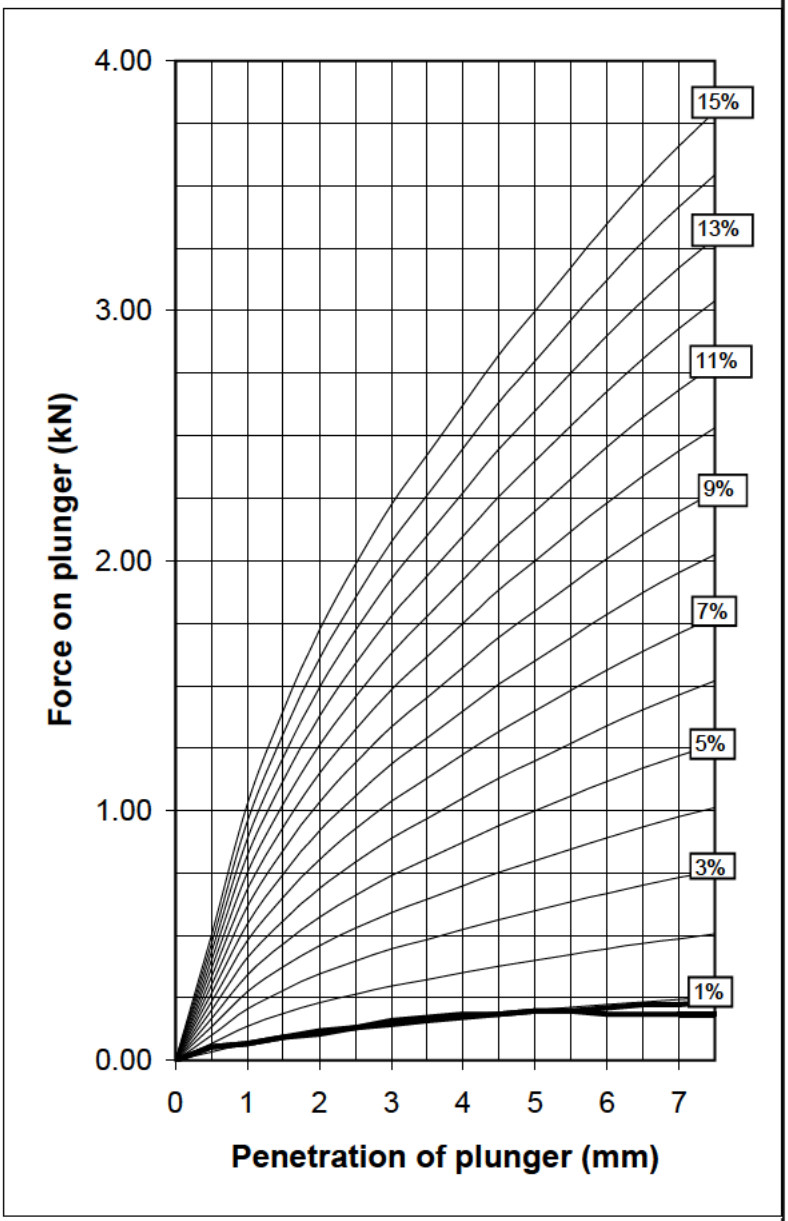
Position: BH2 Sample No: 334 Depth: 0.50 m

Description:

Orangish brown and brown silty CLAY

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	2.0	0.05	2.0	0.05
1.0	2.5	0.07	2.5	0.07
1.5	3.5	0.09	3.5	0.09
2.0	4.0	0.11	4.5	0.12
2.5	5.0	0.13	5.0	0.13
3.0	5.5	0.14	6.0	0.16
3.5	6.0	0.16	6.5	0.17
4.0	6.5	0.17	7.0	0.18
4.5	7.0	0.18	7.0	0.18
5.0	7.5	0.20	7.5	0.20
5.5	7.5	0.20	7.5	0.20
6.0	7.0	0.18	8.0	0.21
6.5	7.0	0.18	8.5	0.22
7.0	7.0	0.18	8.5	0.22
7.5	7.0	0.18	9.0	0.24



	CBR % Value at:	
	2.5mm	5.0mm
Top	**1.0%**	**1.0%**
Bottom	**1.0%**	**1.0%**

Passing 20mm Sieve = **100 %**
Moisture Content = **20 %**
Bulk Density = **2.07 Mg/m^3**
Dry Density = **1.73 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

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Client: GYRODATA LIMITED

Engineer: CURTINS CONSULTING

Job Number 5651

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CALIFORNIA BEARING RATIO

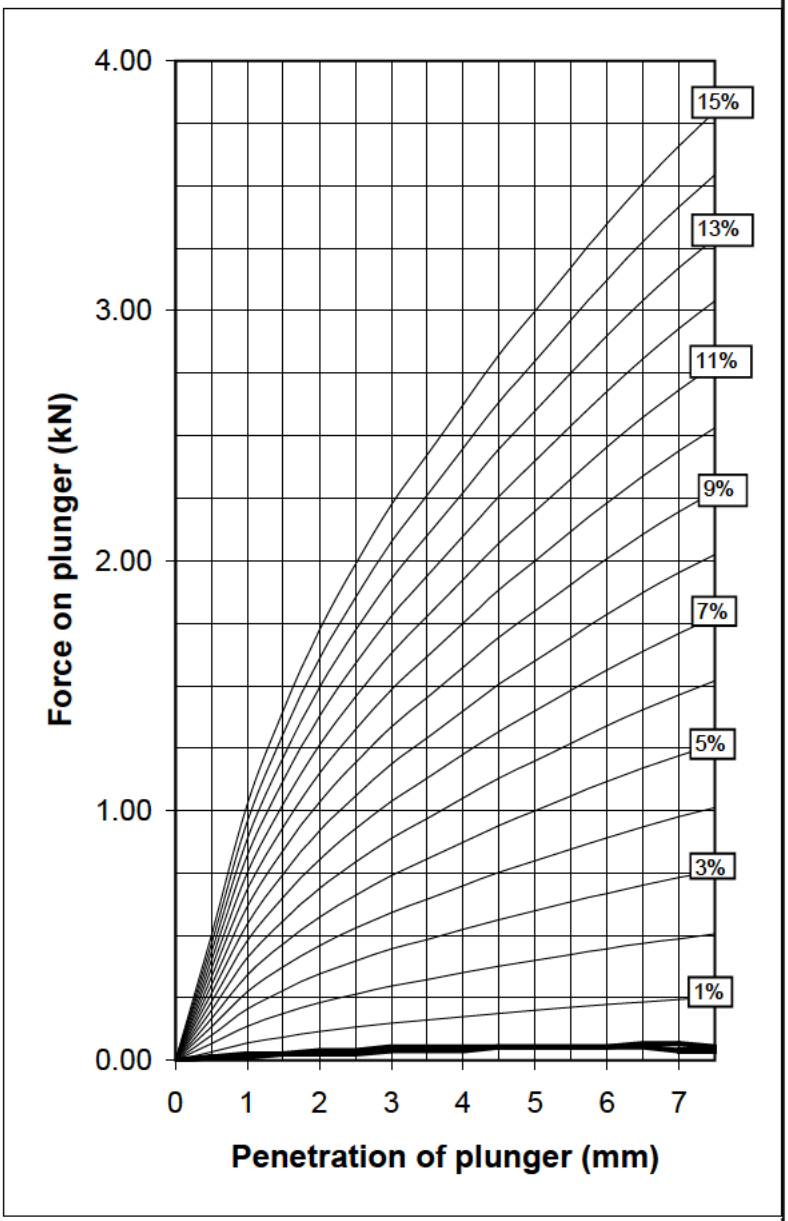
Position: BH3 Sample No: 356 Depth: 0.50 m

Description:

Brownish grey gravelly sandy very silty CLAY with rootlets (Topsoil).

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	0.5	0.01	0.5	0.01
1.0	0.5	0.01	1.0	0.03
1.5	1.0	0.03	1.0	0.03
2.0	1.0	0.03	1.5	0.04
2.5	1.0	0.03	1.5	0.04
3.0	1.5	0.04	2.0	0.05
3.5	1.5	0.04	2.0	0.05
4.0	1.5	0.04	2.0	0.05
4.5	2.0	0.05	2.0	0.05
5.0	2.0	0.05	2.0	0.05
5.5	2.0	0.05	2.0	0.05
6.0	2.0	0.05	2.0	0.05
6.5	2.0	0.05	2.5	0.07
7.0	1.5	0.04	2.5	0.07
7.5	1.5	0.04	2.0	0.05



	CBR % Value at:	
	2.5mm	5.0mm
Top	**0.2%**	**0.3%**
Bottom	**0.3%**	**0.3%**

Passing 20mm Sieve = **100 %**

Moisture Content = **57 %**

Bulk Density = **2.07 Mg/m^3**

Dry Density = **1.32 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

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Client: GYRODATA LIMITED

Engineer: CURTINS CONSULTING

Job Number 5651

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CALIFORNIA BEARING RATIO

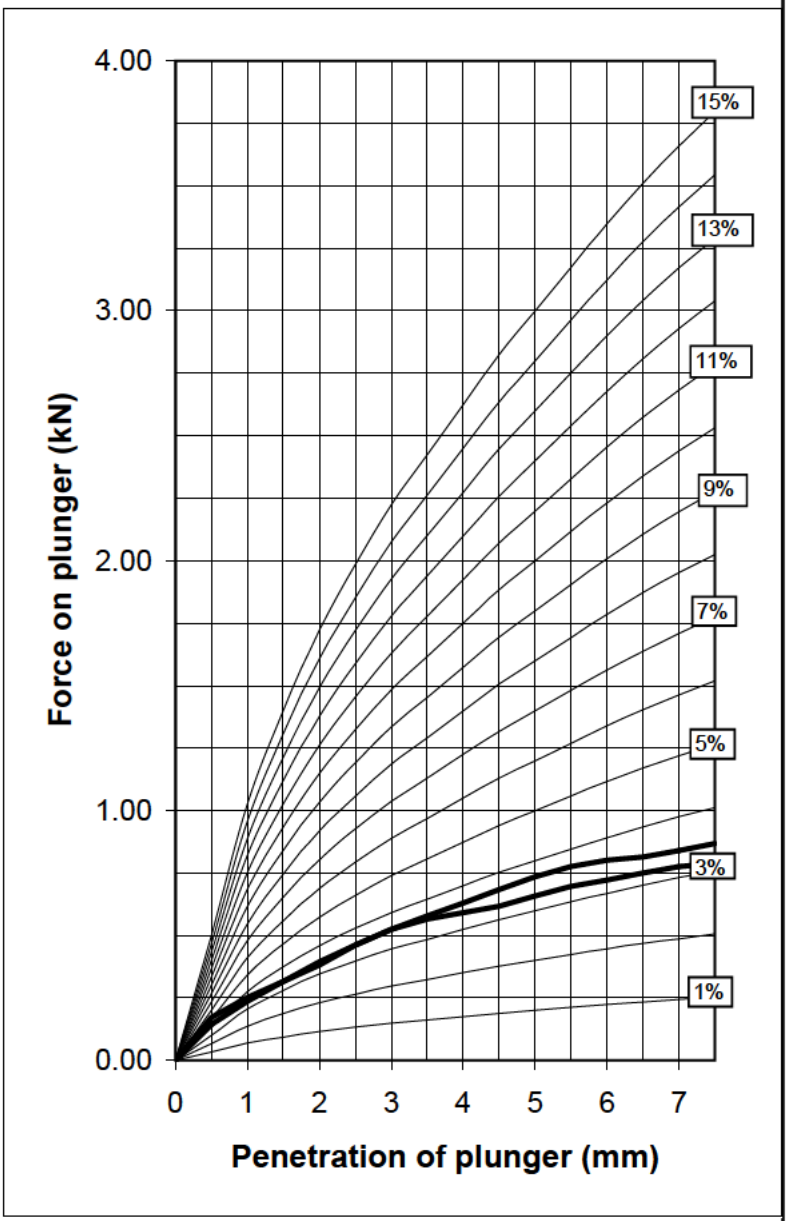
Position: BH4 Sample No: 397 Depth: 0.50 m

Description:

Fissured dark brown silty CLAY

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	6.5	0.17	5.5	0.14
1.0	9.5	0.25	9.0	0.24
1.5	12.0	0.32	12.0	0.32
2.0	15.0	0.39	14.5	0.38
2.5	17.5	0.46	17.5	0.46
3.0	20.0	0.53	20.0	0.53
3.5	22.0	0.58	21.5	0.57
4.0	24.0	0.63	22.5	0.59
4.5	26.0	0.68	23.5	0.62
5.0	28.0	0.74	25.0	0.66
5.5	29.5	0.78	26.5	0.70
6.0	30.5	0.80	27.5	0.72
6.5	31.0	0.82	28.5	0.75
7.0	32.0	0.84	29.5	0.78
7.5	33.0	0.87	30.0	0.79



	CBR % Value at:	
	2.5mm	5.0mm
Top	**3.5%**	**3.7%**
Bottom	**3.5%**	**3.3%**

Passing 20mm Sieve = **100 %**

Moisture Content = **18 %**

Bulk Density = **2.09 Mg/m^3**

Dry Density = **1.76 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

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Engineer: CURTINS CONSULTING

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CALIFORNIA BEARING RATIO

Position: BH5 Sample No: 410 Depth: 0.50 m

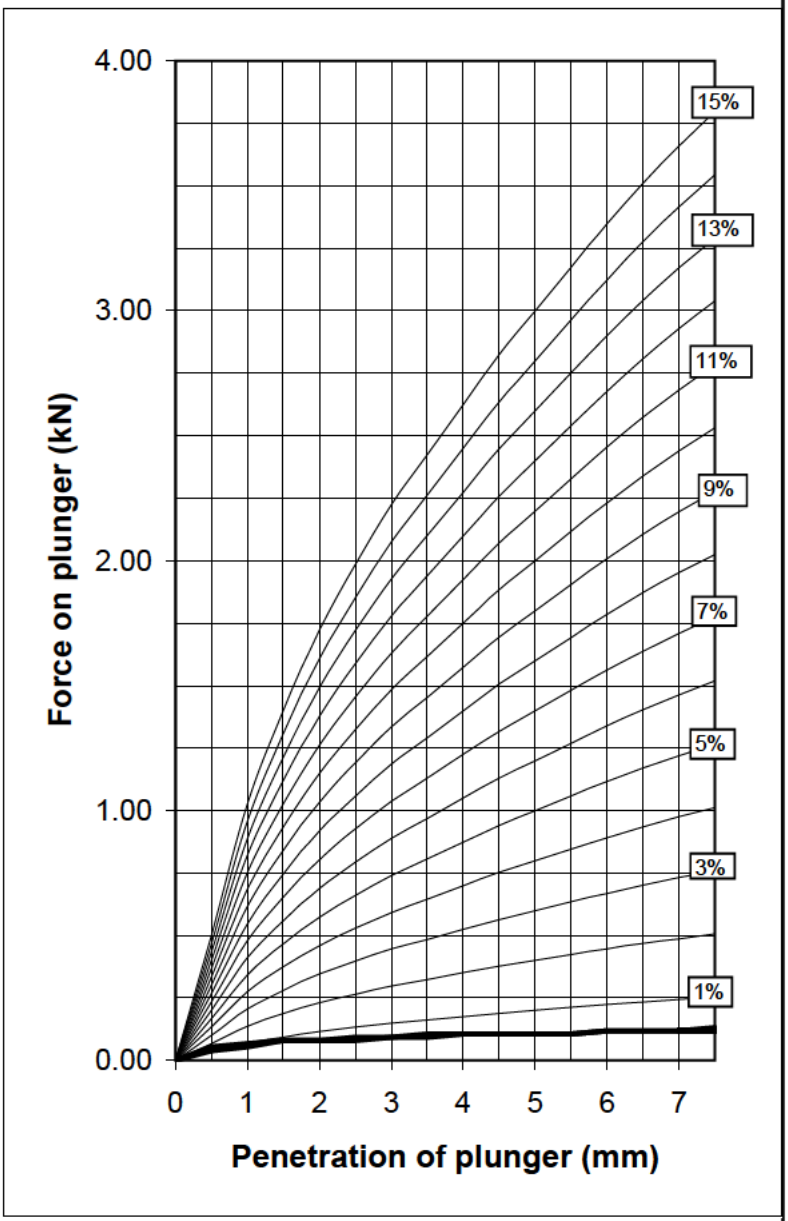
Description:

Brown slightly gravelly silty CLAY. Gravel is fine.

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	2.0	0.05	1.5	0.04
1.0	2.5	0.07	2.0	0.05
1.5	3.0	0.08	3.0	0.08
2.0	3.0	0.08	3.0	0.08
2.5	3.5	0.09	3.0	0.08
3.0	3.5	0.09	3.5	0.09
3.5	4.0	0.11	3.5	0.09
4.0	4.0	0.11	4.0	0.11
4.5	4.0	0.11	4.0	0.11
5.0	4.0	0.11	4.0	0.11
5.5	4.0	0.11	4.0	0.11
6.0	4.5	0.12	4.5	0.12
6.5	4.5	0.12	4.5	0.12
7.0	4.5	0.12	4.5	0.12
7.5	4.5	0.12	5.0	0.13

	CBR % Value at:	
	2.5mm	5.0mm
Top	**0.7%**	**0.5%**
Bottom	**0.6%**	**0.5%**



Passing 20mm Sieve = **100 %**

Moisture Content = **22 %**

Bulk Density = **1.96 Mg/m^3**

Dry Density = **1.60 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

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Client: GYRODATA LIMITED

Engineer: CURTINS CONSULTING

Job Number 5651

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CALIFORNIA BEARING RATIO

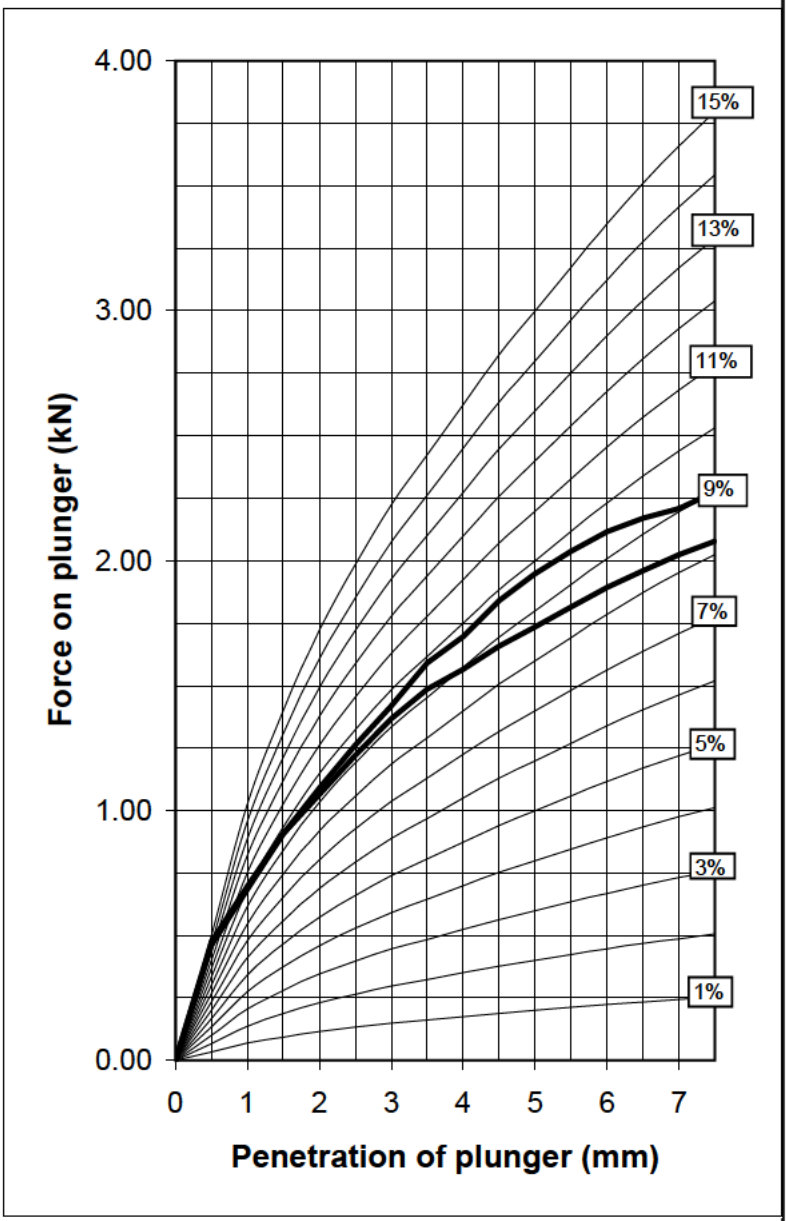
Position: BH6 Sample No: 424 Depth: 0.50 m

Description:

Brown slightly sandy silty CLAY

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	17.5	0.46	18.0	0.47
1.0	26.0	0.68	26.5	0.70
1.5	34.5	0.91	34.5	0.91
2.0	41.5	1.09	40.5	1.07
2.5	48.0	1.26	46.5	1.22
3.0	54.0	1.42	52.0	1.37
3.5	60.5	1.59	56.5	1.49
4.0	64.5	1.70	59.5	1.56
4.5	70.0	1.84	63.0	1.66
5.0	74.0	1.95	66.0	1.74
5.5	77.5	2.04	69.0	1.81
6.0	80.5	2.12	72.0	1.89
6.5	82.5	2.17	74.5	1.96
7.0	84.0	2.21	77.0	2.03
7.5	86.5	2.27	79.0	2.08



	CBR % Value at:	
	2.5mm	5.0mm
Top	**9.6%**	**9.7%**
Bottom	**9.3%**	**8.7%**

Passing 20mm Sieve = **100 %**

Moisture Content = **15 %**

Bulk Density = **2.11 Mg/m^3**

Dry Density = **1.83 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

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Client: GYRODATA LIMITED
Engineer: CURTINS CONSULTING

Job Number 5651
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CALIFORNIA BEARING RATIO

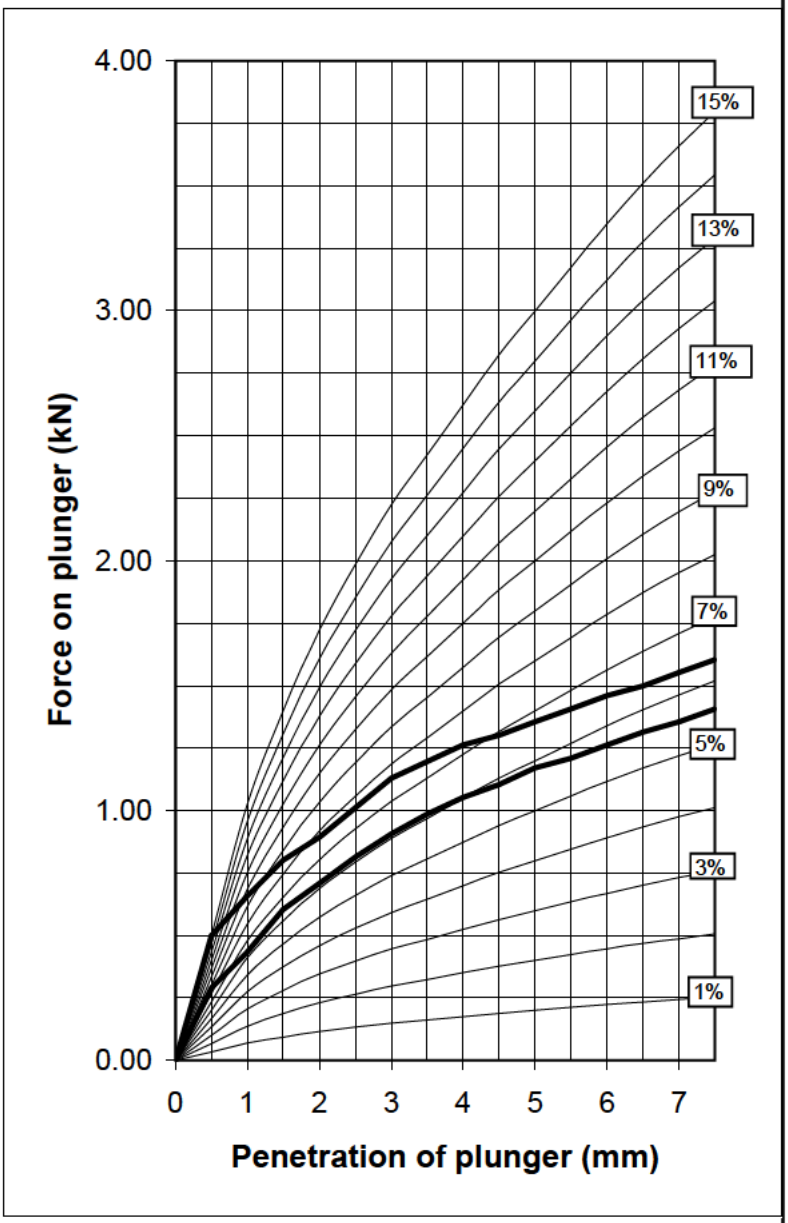
Position: BH7 Sample No: 383 Depth: 0.50 m

Description:

Brown slightly gravelly silty CLAY. Gravel is fine to medium.

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	19.0	0.50	11.0	0.29
1.0	25.0	0.66	16.5	0.43
1.5	30.5	0.80	23.0	0.60
2.0	34.0	0.89	27.0	0.71
2.5	38.5	1.01	31.0	0.82
3.0	43.0	1.13	34.5	0.91
3.5	45.5	1.20	37.5	0.99
4.0	48.0	1.26	40.0	1.05
4.5	49.5	1.30	42.0	1.10
5.0	51.5	1.35	44.5	1.17
5.5	53.5	1.41	46.0	1.21
6.0	55.5	1.46	48.0	1.26
6.5	57.0	1.50	50.0	1.32
7.0	59.0	1.55	51.5	1.35
7.5	61.0	1.60	53.5	1.41



	CBR % Value at:	
	2.5mm	5.0mm
Top	**7.7%**	**6.8%**
Bottom	**6.2%**	**5.9%**

Passing 20mm Sieve = **99 %**
Moisture Content = **17 %**
Bulk Density = **2.08 Mg/m^3**
Dry Density = **1.78 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

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Engineer: CURTINS CONSULTING

Job Number 5651

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CALIFORNIA BEARING RATIO

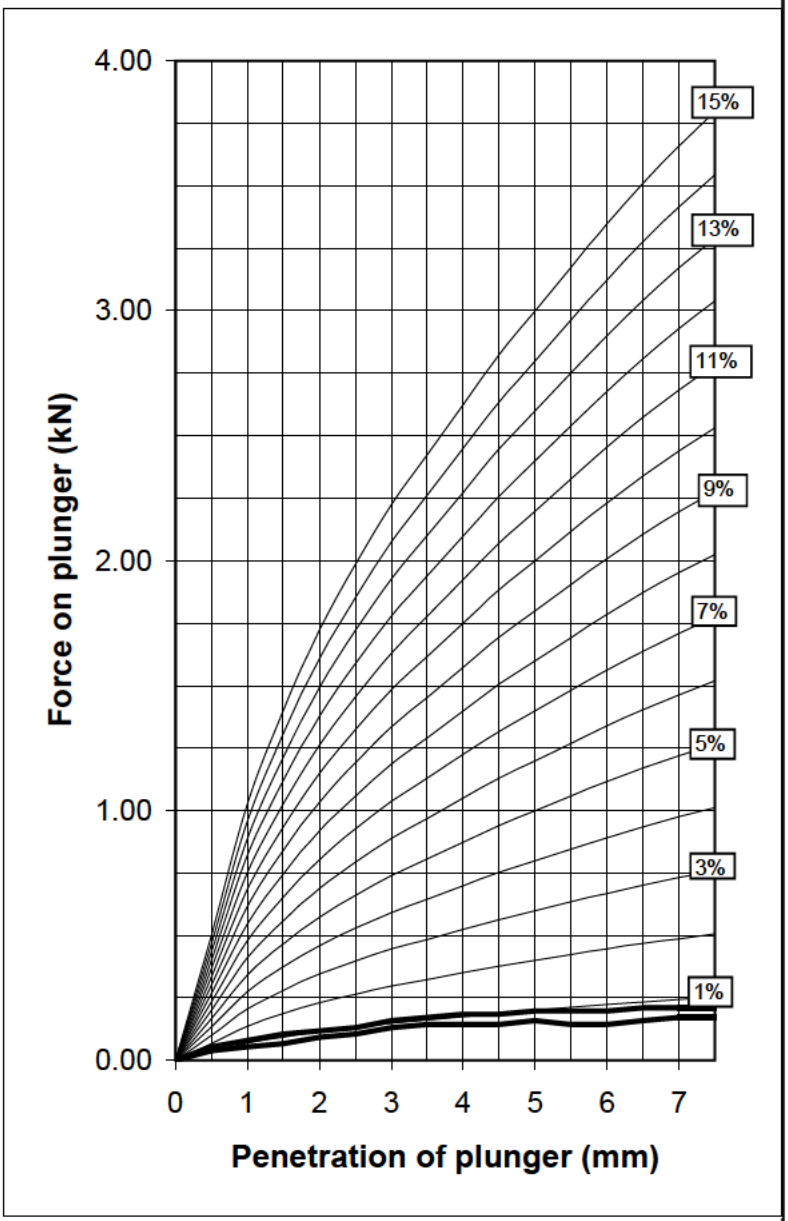
Position: BH8 Sample No: 369 Depth: 0.50 m

Description:

Brown and grey slightly gravelly silty CLAY. Gravel is fine.

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	1.5	0.04	2.0	0.05
1.0	2.0	0.05	3.0	0.08
1.5	2.5	0.07	4.0	0.11
2.0	3.5	0.09	4.5	0.12
2.5	4.0	0.11	5.0	0.13
3.0	5.0	0.13	6.0	0.16
3.5	5.5	0.14	6.5	0.17
4.0	5.5	0.14	7.0	0.18
4.5	5.5	0.14	7.0	0.18
5.0	6.0	0.16	7.5	0.20
5.5	5.5	0.14	7.5	0.20
6.0	5.5	0.14	7.5	0.20
6.5	6.0	0.16	8.0	0.21
7.0	6.5	0.17	8.0	0.21
7.5	6.5	0.17	8.0	0.21



	CBR % Value at:	
	2.5mm	5.0mm
Top	**0.8%**	**0.8%**
Bottom	**1.0%**	**1.0%**

Passing 20mm Sieve = **100 %**

Moisture Content = **20 %**

Bulk Density = **2.06 Mg/m^3**

Dry Density = **1.71 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

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Engineer: CURTINS CONSULTING

Job Number 5651

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CALIFORNIA BEARING RATIO

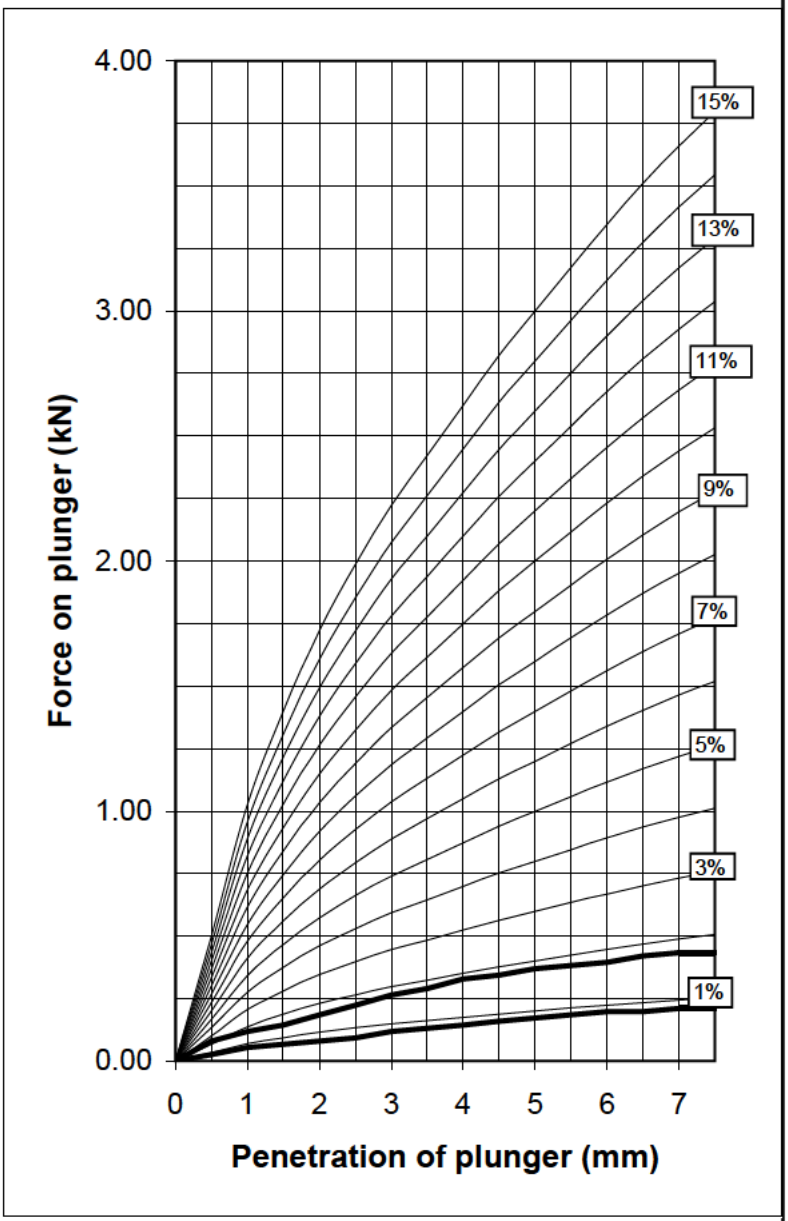
Position: HD 1 Sample No: 300 Depth: 0.20 m

Description:

Reddish brown gravelly very sandy silty CLAY. Gravel is fine to medium.

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	1.0	0.03	3.0	0.08
1.0	2.0	0.05	4.5	0.12
1.5	2.5	0.07	5.5	0.14
2.0	3.0	0.08	7.0	0.18
2.5	3.5	0.09	8.5	0.22
3.0	4.5	0.12	10.0	0.26
3.5	5.0	0.13	11.0	0.29
4.0	5.5	0.14	12.5	0.33
4.5	6.0	0.16	13.0	0.34
5.0	6.5	0.17	14.0	0.37
5.5	7.0	0.18	14.5	0.38
6.0	7.5	0.20	15.0	0.39
6.5	7.5	0.20	16.0	0.42
7.0	8.0	0.21	16.5	0.43
7.5	8.0	0.21	16.5	0.43



	CBR % Value at:	
	2.5mm	5.0mm
Top	**0.7%**	**0.9%**
Bottom	**1.7%**	**1.8%**

Passing 20mm Sieve = **96 %**

Moisture Content = **13 %**

Bulk Density = **2.18 Mg/m^3**

Dry Density = **1.93 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Laboratory Test Results

Site: GYRODATA LIMITED, BARROW-IN-FURNESS, CUMBRIA

Client: GYRODATA LIMITED

Engineer: CURTINS CONSULTING

Job Number 5651

Sheet: 10/11

CALIFORNIA BEARING RATIO

Position: HD 2 Sample No: 301 Depth: 0.30 m

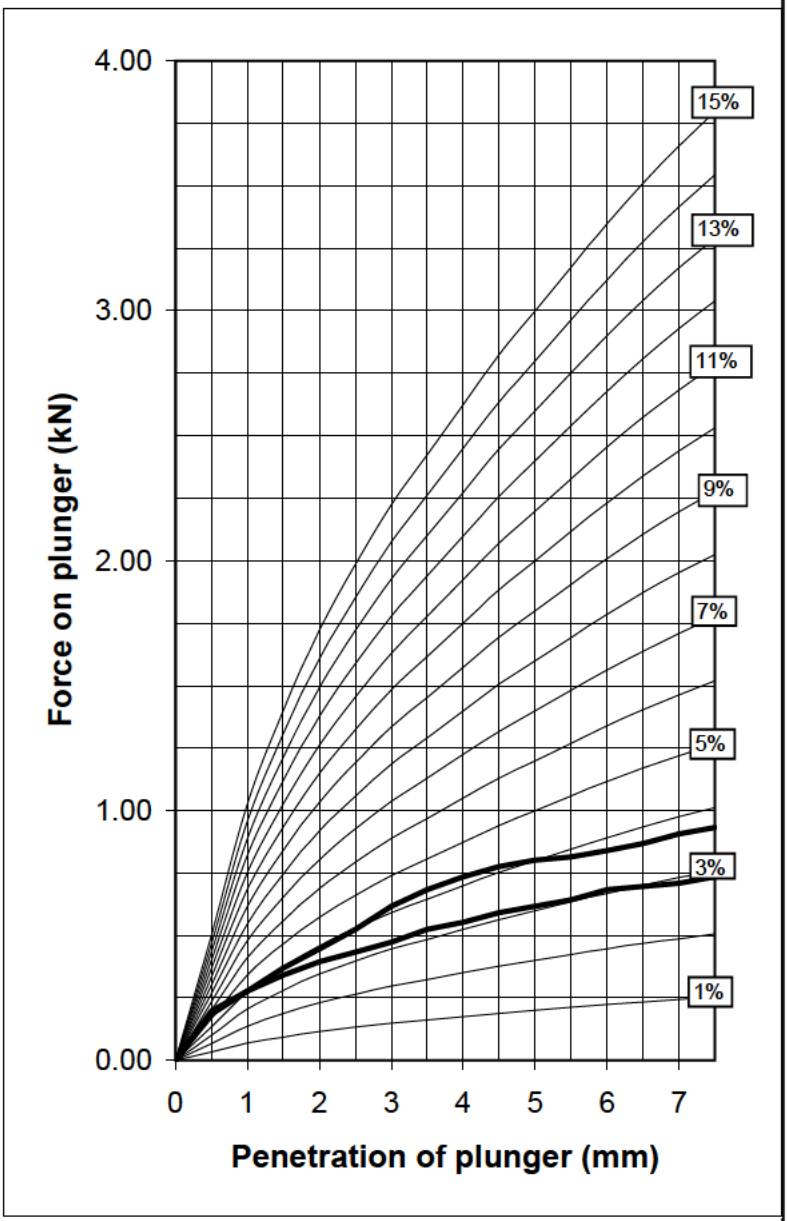
Description:

Light brown and brown mottled slightly gravelly sandy silty CLAY. Gravel is fine.

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	7.5	0.20	7.0	0.18
1.0	10.5	0.28	10.5	0.28
1.5	14.0	0.37	13.0	0.34
2.0	17.0	0.45	15.0	0.39
2.5	20.0	0.53	16.5	0.43
3.0	23.5	0.62	18.0	0.47
3.5	26.0	0.68	20.0	0.53
4.0	28.0	0.74	21.0	0.55
4.5	29.5	0.78	22.5	0.59
5.0	30.5	0.80	23.5	0.62
5.5	31.0	0.82	24.5	0.64
6.0	32.0	0.84	26.0	0.68
6.5	33.0	0.87	26.5	0.70
7.0	34.5	0.91	27.0	0.71
7.5	35.5	0.93	28.0	0.74

	CBR % Value at:	
	2.5mm	5.0mm
Top	**4.0%**	**4.0%**
Bottom	**3.3%**	**3.1%**



Passing 20mm Sieve = **100 %**

Moisture Content = **19 %**

Bulk Density = **2.10 Mg/m^3**

Dry Density = **1.77 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Laboratory Test Results

Site: GYRODATA LIMITED, BARROW-IN-FURNESS, CUMBRIA

Client: GYRODATA LIMITED

Engineer: CURTINS CONSULTING

Job Number 5651

Sheet: 11/11

CALIFORNIA BEARING RATIO

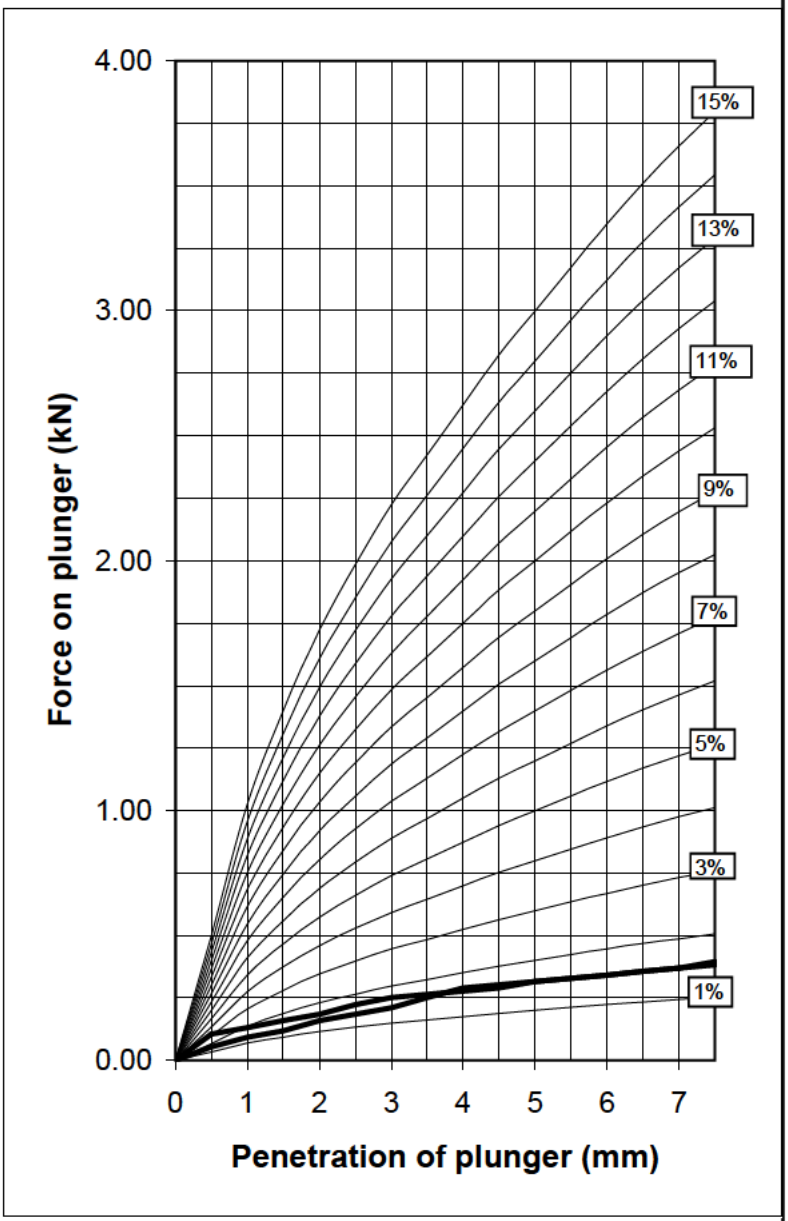
Position: HD 3 Sample No: 302 Depth: 0.30 m

Description:

Dark brown, brown and yellowish brown silty CLAY

Preparation of sample: 4.5 Kg Rammer Method

Penetration of Plunger mm	Force on Plunger			
	Top	kN Top	Bottom	kN Bottom
0.0	0.0	0.00	0.0	0.00
0.5	2.0	0.05	4.0	0.11
1.0	3.5	0.09	5.0	0.13
1.5	4.5	0.12	6.0	0.16
2.0	6.0	0.16	7.0	0.18
2.5	7.0	0.18	8.5	0.22
3.0	8.0	0.21	9.5	0.25
3.5	9.5	0.25	10.0	0.26
4.0	11.0	0.29	10.5	0.28
4.5	11.5	0.30	11.0	0.29
5.0	12.0	0.32	12.0	0.32
5.5	12.5	0.33	12.5	0.33
6.0	13.0	0.34	13.0	0.34
6.5	13.5	0.36	13.5	0.36
7.0	14.0	0.37	14.0	0.37
7.5	15.0	0.39	14.5	0.38



	CBR % Value at:	
	2.5mm	5.0mm
Top	**1.4%**	**1.6%**
Bottom	**1.7%**	**1.6%**

Passing 20mm Sieve = **100 %**

Moisture Content = **22 %**

Bulk Density = **2.04 Mg/m^3**

Dry Density = **1.68 Mg/m^3**

Comments:	Operator	Checked	Approved
	SJG	DJ	

SUB SURFACE
SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Laboratory Test Results

Site : GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA

Client : GYRODATA LIMITED

Engineer : CURTINS CONSULTING

Job Number 5651

Sheet 1 / 1

DETERMINATION OF THE pH VALUE AND THE SULPHATE CONTENT OF SOIL AND GROUNDWATER

Borehole/ Trial Pit	Depth (m)	Sample	Concentration of Soluble Sulphate			Percentage of sample passing 2mm Sieve %	pH	Classification	Description
			Soil		Groundwater g /l				
			Total S04 %	S04 in 2:1 water:soil g /l					
BH1	0.00	B		1.10			10.5	DS-2	MADE GROUND: brown clayey sandy fine to coarse gravel sized fragments of stone, brick, concrete and pottery.
BH1	1.20	D		0.11			8.8	DS-1	Dark brown silty CLAY.
BH2	0.50	B		0.03			8.6	DS-1	Brown and occasional grey mottling silty CLAY with occasional relic rootlets.
BH2	1.65	D		0.01			8.7	DS-1	Brown and occasional grey mottling silty CLAY with occasional relic rootlets.
BH3	0.30	B		0.03			8.6	DS-1	MADE GROUND: dark greyish brown slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium stone.
BH3	1.20	D		0.01			8.7	DS-1	Dark greyish brown silty CLAY with occasional rootlets.
BH4	0.50	B		0.01			8.0	DS-1	Brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium siltstone and quartz.
BH5	0.50	B		0.02			8.0	DS-1	Brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium siltstone and quartz.
BH5	2.45	D		0.01			8.1	DS-1	Reddish brown slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to medium quartz and siltstone.
BH6	0.50	B		0.02			7.9	DS-1	Dark brown silty CLAY.
BH7	0.50	B		0.01			7.8	DS-1	Brown silty CLAY.
BH7	2.00	U		0.01			8.4	DS-1	Brown slightly gravelly silty CLAY. Gravel is fine to medium.
BH8	0.50	B		0.01			8.2	DS-1	Brown silty CLAY with occasional rootlets.
BH9	0.50	B		0.01			7.8	DS-1	Brown slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to coarse quartz.
BH10	1.20	U		0.01			8.4	DS-1	Brown slightly gravelly sandy silty CLAY. Gravel is fine to medium.
BH11	0.50	B		0.01			8.4	DS-1	Brown and dark brown mottled silty CLAY.

Method of Preparation : BS 1377:PART 1:1990:7.5 Preparation of soil for chemical tests BS 1377:PART 3:1990:5.2, 5.3, 5.4 & 9.4

Method of Test : BS 1377:PART 3:1990:5 Determination of the sulphate content of soil and ground water BS 1377:PART 3:1990:9 Determination of the pH value.

Remarks : Classification relates to Design Sulphate Class of BRE Special Digest 1 (2005)

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AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) SITE CLASSIFICATION

Table C1 Aggressive Chemical Environment for Concrete (ACEC) classification for natural ground locations[a]

Sulfate				Groundwater		
Design Sulfate Class for Location	2:1 water/soil extract[b]	Groundwater	Total potential sulfate[c]	Static water	Mobile water	ACEC Class for location
1	2 (SO_4 mg/l)	3 (SO_4 mg/l)	4 (SO_4 %)	5 (pH)	6 (pH)	7
DS-1	<500	<400	<0.24	≥2.5		AC-1s
					>5.5d	AC-1d
					2.5 - 5.5	AC-2z
DS-2	500 - 1500	400 - 1400	0.24 - 0.6	>3.5		AC-1s
					>5.5	AC-2z
				2.5-3.5		AC-2s
					2.5 - 5.5	AC-3z
DS-3	1600-3000	1500-3000	0.7 - 1.2	>3.5		AC-2s
					>5.5	AC-3
				2.5 - 3.5		AC-3s
					2.5 - 5.5	AC-4
DS-4	3100 - 6000	3100 - 6000	1.3 - 2.4	>3.5		AC-3s
					>5.5	AC-4
				2.5 - 3.5		AC-4s
					2.5 - 5.5	AC-5
DS-5	>6000	>6000	>2.4	>3.5		AC-4s
				2.5 - 3.5	≥2.5	AC-5

Notes

a Applies to locations on sites that comprise either undisturbed ground that is in its natural state (ie not brownfield - Table C2) or clean fill derived from such ground

b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered relative to previous Digests (Box C7).

c Applies only to locations where concrete will be exposed to sulfate ions (SO4) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).

d For flowing water that is potentially aggressive to concrete owing to high purity or an aggressive carbon dioxide level greater than 15mg/l (Section C2.2.3), increase the ACEC Class to AC-2z.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static
- Concrete placed in ACEC Classes that included the suffix 'z' primarily have to resist acid conditions and may be made with any of the cements or combinations listed in Table D2 on page 42.

Table C1 Aggressive Chemical Environment for Concrrete (ACEC) classification for brownfield locations[a]

Sulfate						Groundwater		
Design Sulfate Class for Location	2:1 water/soil extract[b]		Groundwater		Total potential sulfate[c]	Static water	Mobile water	ACEC Class for location
1	2 (SO_4 mg/l)	3 (Mg mg/l)	4 (SO_4 mg/l)	5 (Mg mg/l)	6 (SO_4 %)	7 (pH)[d]	8 (pH)[d]	9
DS-1	<500		<400		<0.24	≥2.5		AC-1s
							>6.5[d]	AC-1
							5.5 - 6.5	AC-2z
							4.5 - 5.5	AC-3z
							2.5 - 4.5	AC-4z
DS-2	500 - 1500		400 - 1400		0.24 - 0.6	>5.5		AC-1s
							>6.5	AC-2
						2.5 - 5.5		AC-2s
							5.5 - 6.5	AC-3z
							4.5 - 5.5	AC-4z
							2.5 - 5.5	AC-5z
DS-3	1600 - 3000		1500 - 3000		0.7 - 1.2	>5.5		AC-2s
							>6.5	AC-3
						2.5 - 5.5		AC-3s
							5.5 - 6.5	AC-4
							2.5 - 5.5	AC-5
DS-4	3100 - 6000	≤1200	3100 - 6000	≤1000	1.3 - 2.4	>5.5		AC-3s
							>6.5	AC-4
						2.5 - 5.5		AC-4s
							2.5 - 6.5	AC-5
DS-4m	3100 - 6000	>1200[e]	3100 - 6000	>1000[e]	1.3 - 2.4	>5.5		AC-3s
							>6.5	AC-4m
						2.5 - 5.5		AC-4ms
							2.5 - 6.5	AC-5m
DS-5	>6000	≤1200	>6000	≤1000	>2.4	>5.5		AC-4s
						2.5 - 5.5	≤1000	AC-5
DS-5m	>6000	>1200[e]	>6000	>1000[e]	>2.4	>5.5		AC-4ms
						2.5 - 5.5	≥2.5	AC-5m

Notes

a Brownfield sites are those sites, or parts of sites, that might contain chemical residues produced by or associated with industrial production (Section C5.1.3).

b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered relative to previous Digests (Box C7).

c Applies only to locations where concrete will be exposed to sulfate ions (SO4) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).

d An additional account is taken of hydrochloric and nitric acids by adjustment to sulfate content (Section C5.1.3).

e The limit on water-soluble magnesium does not apply to brackish groundwater (chloride content between 12 000mg/l and 17000 mg/l). This allows 'm' to be omitted from the relevant ACEC Classification. Seawater (chloride content about 18 000 mg/l) and stronger brines are not covered by this table.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that included the suffix 'z' primarily have to resist acid conditions and may be made with any of the cements or combinations listed in Table D2 on page 42.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.

CHEMICAL CONTAMINATION ANALYSIS RESULTS

Chemtest
The right chemistry to deliver results

Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt
02 November 2012

Dear Simon Gabbatt

Test Report Number **215261**

Your Project Reference **5651 - Gyrodata Limited, Barrow, Cumbria**

Please find enclosed the results of analysis for the samples received 25 October 2012.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely



Keith Jones, Technical Manager

UKAS TESTING
2183

ISO 14001 Registered Company
sira CERTIFICATION SERVICE
UKAS ENVIRONMENTAL MANAGEMENT
011

Notes to accompany report:

- *The sign < means 'less than'*
- *Tests marked 'U' hold UKAS accreditation*
- *Tests marked 'M' hold MCertS (and UKAS) accreditation*
- *Tests marked 'N' do not currently hold UKAS accreditation*
- *Tests marked 'S' were subcontracted to an approved laboratory*
- *n/e means 'not evaluated'*
- *i/s means 'insufficient sample'*
- *u/s means 'unsuitable sample'*
- *Comments or interpretations are beyond the scope of UKAS accreditation*
- *The results relate only to the items tested*
- *All results are expressed on a dry weight basis*
- *The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenols*
- *For all other tests the samples were dried at < 37°C prior to analysis*
- *Uncertainties of measurement for the determinands tested are available upon request*
- *None of the test results included in this report have been recovery corrected*

Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt

LABORATORY TEST REPORT

Results of analysis of 4 samples
received 25 October 2012

5651 - Gyrodata Limited, Barrow, Cumbria

Chemtest
The right chemistry to deliver results

Report Date
02 November 2012

Login Batch No					215261			
Chemtest LIMS ID					AH88813	AH88814	AH88815	AH88816
Sample ID					BH1	BH2	BH3	MOUND 1
Sample No					043	048	055	051
Sampling Date					23/10/2012	23/10/2012	23/10/2012	23/10/2012
Depth					0.10m	0.10m	0.50m	
Matrix					*SOIL*	*SOIL*	*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*				
2010	pH			M	10.5	8.9	7.5	11.4
2300	Cyanide (total)	57125	mg kg-1	M	<0.50	<0.50	<0.50	<0.50
2325	Sulfide (Easily Liberatable)	18496258	mg kg-1	M	6.6	5.9	4.5	4.4
2120	Boron (hot water soluble)	7440428	mg kg-1	M	1.5	0.7	0.9	<0.4
2490	Chromium (hexavalent)	18540299	mg kg-1	N	<0.5	<0.5	<0.5	<0.5
2430	Sulfate (total) as SO4	14808798	%	M	0.44	0.11	0.07	0.69
2450	Arsenic	7440382	mg kg-1	M	14	14	4.2	10
	Cadmium	7440439	mg kg-1	M	<0.10	<0.10	<0.10	<0.10
	Chromium	7440473	mg kg-1	M	32	32	22	18
	Copper	7440508	mg kg-1	M	23	25	12	39
	Mercury	7439976	mg kg-1	M	<0.10	<0.10	<0.10	<0.10
	Nickel	7440020	mg kg-1	M	5.2	11	<5.0	<5.0
	Lead	7439921	mg kg-1	M	44	49	23	56
	Selenium	7782492	mg kg-1	M	<0.20	<0.20	0.29	<0.20
	Zinc	7440666	mg kg-1	M	62	76	32	1100
2670	TPH >C6-C10		mg kg-1	N	2.0	1.4	< 1	< 1
	TPH >C10-C21		mg kg-1	N	44	12	< 1	1.8
	TPH >C21-C40		mg kg-1	N	97	25	< 1	1.4
	Total Petroleum Hydrocarbons		mg kg-1	M	140	38	< 10	< 10
2700	Naphthalene	91203	mg kg-1	M	< 0.1	< 0.1	< 0.1	< 0.1
	Acenaphthylene	208968	mg kg-1	M	0.11	0.16	< 0.1	< 0.1
	Acenaphthene	83329	mg kg-1	M	0.24	0.45	< 0.1	< 0.1
	Fluorene	86737	mg kg-1	M	0.16	0.3	< 0.1	< 0.1

All tests undertaken between 25/10/2012 and 01/11/2012

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt

LABORATORY TEST REPORT

Results of analysis of 4 samples
received 25 October 2012

5651 - Gyrodata Limited, Barrow, Cumbria

Chemtest
The right chemistry to deliver results

Report Date
02 November 2012

					215261			
					AH88813	AH88814	AH88815	AH88816
					BH1	BH2	BH3	MOUND 1
					043	048	055	051
					23/10/2012	23/10/2012	23/10/2012	23/10/2012
					0.10m	0.10m	0.50m	
					SOIL	*SOIL*	*SOIL*	*SOIL*
2700	Phenanthrene	85018	mg kg-¹	M	1.6	3.4	< 0.1	< 0.1
	Anthracene	120127	mg kg-¹	M	0.65	1.1	< 0.1	< 0.1
	Fluoranthene	206440	mg kg-¹	M	3.2	5.4	< 0.1	< 0.1
	Pyrene	129000	mg kg-¹	M	2.7	4.2	< 0.1	< 0.1
	Benzo[a]anthracene	56553	mg kg-¹	M	1.6	2.3	< 0.1	< 0.1
	Chrysene	218019	mg kg-¹	M	1.6	2.3	< 0.1	< 0.1
	Benzo[b]fluoranthene	205992	mg kg-¹	M	1.5	2.3	< 0.1	< 0.1
	Benzo[k]fluoranthene	207089	mg kg-¹	M	1.3	1.6	< 0.1	< 0.1
	Benzo[a]pyrene	50328	mg kg-¹	M	1.5	2.2	< 0.1	< 0.1
	Dibenzo[a,h]anthracene	53703	mg kg-¹	M	0.21	0.16	< 0.1	< 0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg-¹	M	0.74	1.2	< 0.1	< 0.1
	Benzo[g,h,i]perylene	191242	mg kg-¹	M	0.46	1.2	< 0.1	< 0.1
	Total (of 16) PAHs		mg kg-¹	M	18	28	< 2	< 2
2760	Methyl tert-butyl ether	1634044	µg kg-¹	N	< 1	< 1	< 1	< 1
	Benzene	71432	µg kg-¹	M	< 1.0	< 1.0	< 1.0	< 1.0
	Toluene	108883	µg kg-¹	M	< 1.0	< 1.0	< 1.0	< 1.0
	Ethylbenzene	100414	µg kg-¹	M	< 1.0	< 1.0	< 1.0	< 1.0
	m- & p-Xylene	1330207	µg kg-¹	U	< 1.0	< 1.0	< 1.0	< 1.0
	o-Xylene	95476	µg kg-¹	U	< 1.0	< 1.0	< 1.0	< 1.0
2920	Phenols (total)		mg kg-¹	N	<0.3	<0.3	<0.3	<0.3

All tests undertaken between 25/10/2012 and 01/11/2012

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

BOREHOLE RECORD SHEETS

SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	20/09/2012-21/09/2012	CURTINS CONSULTING	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	B					(0.30)	MADE GROUND: brown clayey sandy angular to subrounded fine to coarse gravel sized to cobble sized fragments of stone, brick, concrete and pottery.		
0.10-0.30	B					0.30			
0.50-1.00	B					(0.90)	Stiff brown and occasional grey mottled silty CLAY, slightly sandy in places.		
1.20-1.65	SPT N=12			2,3/3,3,3,3		1.20	Stiff medium becoming high strength dark brown slightly gravelly silty CLAY, slightly sandy in places. Gravel is subangular to rounded fine to medium quartz and siltstone.		
1.20-1.65	D								
1.20-1.65	B								
2.00-2.45	U c=125kPa			20/09/2012:DRY		(1.80)	.... below 2.00m : high strength		
				21/09/2012:DRY					
2.45-2.50	D								
3.00-3.45	SPT N=16			2,2/3,4,4,5		3.00	Stiff medium strength locally high strength dark brown slightly gravelly silty CLAY, Gravel is subangular to rounded fine to coarse quartz and siltstone.		
3.00-3.45	D								
3.00-3.45	B								
4.00-4.45	U c=107kPa						.... at 4.00m : high strength		
4.45-4.50	D					(3.50)			
5.00-5.45	SPT N=17			2,3/3,4,5,5			.... at 5.00m : occasional lenses of fine to medium sand		
5.00-5.45	D								
5.00-5.45	B								
6.00-6.45	U c=73kPa								
6.45-6.50	D			21/09/2012:DRY		6.50	Complete at 6.50m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Standing water in inspection pit at 0.30m
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH1

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SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	24/09/2012-25/09/2012	CURTINS CONSULTING	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B					0.16	MADE GROUND: grass over brown and dark brown gravelly slightly sandy silty clay with occasional roots. Gravel sized fragments are subangular to rounded fine to coarse stone and brick.		
0.50-1.00	B						Firm high locally medium strength dark brown and occasional grey mottled slightly sandy silty CLAY. Gravel is subangular to rounded fine to medium quartz and siltstone.		
1.20-1.65	U c=208kPa								
1.65-1.70	D								
2.00-2.45	D			24/09/2012:DRY		(3.29)	.... at 2.00m : medium strength		
2.00-2.45	B			25/09/2012:DRY					
2.00-2.45	SPT N=12			2,2/3,3,3,3					
3.00-3.45	U c=110kPa								
3.45-3.50	D					3.45	Stiff medium strength dark brown slightly gravelly silty CLAY, very silty in places. Gravel is subangular to rounded fine to coarse quartz and siltstone.		
4.00-4.45	SPT N=13			1,2/2,3,3,5					
4.00-4.45	D								
4.00-4.45	B								
5.00-5.45	U c=78kPa					(3.00)			
5.00-5.45	D								
6.00-6.45	SPT N=17			2,2/3,4,5,5					
6.00-6.45	D								
				25/09/2012:DRY		6.45	Complete at 6.45m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH2

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	25/09/2012	CURTINS CONSULTING	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	MADE GROUND: grass over topsoil.		
0.30-0.50	B					0.30	MADE GROUND: soft greyish brown and dark brown slightly gravelly sandy silty clay. Gravel sized fragments are subangular to subrounded fine to coarse stone and brick.		
0.50-1.00	B								
0.50-1.00	B					(0.80)			
						1.10	Very soft low strength dark greyish brown silty CLAY with occasional rootlets.		
1.20-1.65	SPT N=4			1,1/1,1,1,1					
1.20-1.65	D								
1.20-1.65	B								
						(1.60)			
2.00-2.45	SPT N=5			1,2/1,1,1,2					
2.00-2.45	D								
2.00-2.45	B								
						2.70	Stiff medium locally high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to medium quartz and siltstone.		
3.00-3.45	U c=62kPa								
3.45-3.50	D								
4.00-4.45	SPT N=14			2,2/3,3,4,4					
4.00-4.45	D								
4.00-4.45	B								
						(3.75)			
5.00-5.45	U c=90kPa						.... at 5.00m : high strength		
5.45-5.50	D								
6.00-6.45	SPT N=18			2,3/4,5,4,5					
6.00-6.45	D								
				25/09/2012:DRY		6.45	Complete at 6.45m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH3

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Site GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA			**Borehole Number** BH4
Boring Method LIGHT CABLE PERCUSSIVE	**Casing Diameter** 150mm to 5.90m	**Ground Level (mOD)**	**Client** GYRODATA LIMITED	**Job Number** 5651
	Location AS PLAN	**Dates** 26/09/2012	**Engineer** CURTINS CONSULTING	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	Grass over TOPSOIL (driller's description).		
0.30-0.50	B					0.30	Firm dark brown slightly sandy silty CLAY with some roots and rootlets.		
0.50-1.00	B					(0.70)			
						1.00	Stiff medium strength locally high strength dark brown slightly gravelly silty CLAY, slightly sandy in places. Gravel is subangular to rounded fine to coarse quartz, siltstone and shell fragments.		
1.20-1.65	U c=180kPa								
1.65-1.70	D								
2.00-2.45	SPT N=10			2,2/2,2,3,3					
2.00-2.45	D								
2.00-2.45	B								
3.00-3.45	U c=124kPa								
3.45-3.50	D								
						(5.45)			
4.00-4.45	SPT N=16			2,2/3,4,4,5					
4.00-4.45	D								
4.00-4.45	B								
5.00-5.45	U c=106kPa								
5.45-5.50	D								
6.00-6.45	SPT N=18			2,3/3,4,5,6					
6.00-6.45	D								
				26/09/2012:DRY		6.45	Complete at 6.45m		

Remarks
Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH4

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Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH5

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location AS PLAN	**Dates** 27/09/2012	**Engineer** CURTINS CONSULTING	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							Grass over TOPSOIL (driller's description).		
						(0.30)			
0.30-0.50	B					0.30	Soft brown slightly gravelly slightly sandy silty CLAY. Gravel is subrounded to rounded fine to coarse siltstone and quartz.		
0.50-1.00	B								
						(0.90)			
						1.20			
1.20-1.65	SPT N=13			2,2/3,3,4,3			Stiff medium strength locally high strength dark brown and occasional grey mottled slightly gravelly silty CLAY. Gravel is subangular to rounded fine to medium quartz and siltstone.		
1.20-1.65	D								
1.20-1.65	B								
2.00-2.45	U c=206kPa			20/09/2012:DRY					
				27/09/2012:DRY		(1.80)			
2.45-2.50	D								
3.00-3.45	SPT N=15			2,3/3,4,4,4		3.00	Stiff medium strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz, mudstone and siltstone.		
3.00-3.45	D								
3.00-3.45	B								
4.00-4.45	U c=74kPa								
4.45-4.50	D								
						(3.50)			
5.00-5.45	SPT N=18			2,3/4,4,5,5					
5.00-5.45	D								
5.00-5.45	B								
6.00-6.45	U c=71kPa								
6.45-6.50	D			27/09/2012:DRY		6.50	Complete at 6.50m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH5

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH6

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location AS PLAN	**Dates** 27/09/2012	**Engineer** CURTINS CONSULTING	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	Grass over TOPSOIL (driller's description).		
0.30-0.50	B					0.30 (0.20)	Firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse quartz and siltstone.		
0.50-1.00	B					0.50	Stiff medium locally high strength dark brown and occasional grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is subrounded to rounded fine to medium quartz and siltstone.		
1.20-1.65	SPT N=17			2,3/4,4,4,5					
1.20-1.65	D								
1.20-1.65	B								
						(2.50)			
2.00-2.45	U c=204kPa								
2.45-2.50	D								
3.00-3.45	SPT N=19			2,3/4,5,5,5		3.00	Stiff medium strength locally high strength dark brown slightly gravelly silty CLAY, slightly sandy in places. Gravel is subrounded to rounded fine to medium quartz and siltstone.		
3.00-3.45	D								
3.00-3.45	B								
4.00-4.45	U c=82kPa								
4.45-4.50	D								
						(3.50)			
5.00-5.45	SPT N=18			2,3/4,4,5,5					
5.00-5.45	D								
5.00-5.45	B								
6.00-6.45	U c=67kPa								
6.45-6.50	D			27/09/2012:DRY		6.50	Complete at 6.50m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH6

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH7

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	27/09/2012	CURTINS CONSULTING	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	Grass over TOPSOIL (driller's description).		
0.30-0.50	B					0.30			
						(0.20)	Dark brown very silty CLAY with some roots and rootlets.		
0.50-1.00	B					0.50	Firm brown silty CLAY.		
						(0.70)			
1.20-1.65	SPT N=13			2,2/3,3,3,4		1.20	Stiff medium strength locally high strengt brown and occasional grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium siltstone, quartz and shell fragments.		
1.20-1.65	D								
1.20-1.65	B								
						(1.25)			
2.00-2.45	U c=255kPa								
						2.45			
2.45-2.50	D						Stiff medium strength, locally high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz and siltstone.		
3.00-3.45	SPT N=15			2,3/4,4,3,4					
3.00-3.45	D								
3.00-3.45	B								
4.00-4.45	U c=148kPa								
						(4.05)			
4.45-4.50	D								
5.00-5.45	SPT N=18			2,3/4,5,4,5					
5.00-5.45	D								
5.00-5.45	B								
				26/09/2012:DRY					
6.00-6.45	U c=100kPa								
6.45-6.50	D					6.50	Complete at 6.50m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH7

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH8

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location AS PLAN	**Dates** 25/09/2012	**Engineer** CURTINS CONSULTING	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	Grass over TOPSOIL (driller's description).		
0.30-0.50	B					0.30	Soft brown silty CLAY with occasional rootlets.		
0.50-1.00	B					(0.90)			
1.20-1.65	SPT N=11			2,2/2,3,3,3		1.20	Firm medium strength locally high strength brown and occasional grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to rounded fine to medium quartz and siltstone.		
1.20-1.65	D								
1.20-1.65	B								
2.00-2.45	U c=167kPa					(1.80)			
2.45-2.50	D								
3.00-3.45	SPT N=17			2,3/4,4,4,5		3.00	Stiff medium strength, locally high strength dark brown slightly gravelly silty CLAY, slightly sandy in places. Gravel is subangular to rounded fine to coarse quartz, siltstone and shell fragments.		
3.00-3.45	D								
3.00-3.45	B								
4.00-4.45	U c=59kPa					(3.50)			
4.45-4.50	D								
5.00-5.45	SPT N=18			2,3/4,4,5,5					
5.00-5.45	D								
5.00-5.45	B								
6.00-6.45	U c=151kPa			25/09/2012:DRY					
6.45-6.50	D					6.50	Complete at 6.50m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH8

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH9

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	01/10/2012-02/10/2012	CURTINS CONSULTING	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	Grass over TOPSOIL (driller's decription).		
0.30-0.50	B					0.30	Firm brown and dark brown slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to coarse quartz.		
0.50-1.00	B					(0.90)			
1.20-1.65	SPT N=14			2,3/3,4,3,4		1.20	Firm medium strength locally high strength dark brown and occasional grey mottled slightly gravelly silty CLAY, sandy in places, with occasional rootlet remains. Gravel is subangular to rounded fine to coarse sandstone and quartz.		
1.20-1.65	D								
1.20-1.65	D								
2.00-2.45	U c=273kPa					(1.80)			
2.45-2.50	D								
3.00-3.45	SPT N=15			2,3/3,4,4,4		3.00	Stiff medium strength dark brown silty CLAY, slightly gravelly in places. Gravel is subrounded fine to medium quartz and siltstone.		
3.00-3.45	D								
3.00-3.45	B								
				01/10/2012:DRY					
				02/10/2012					
4.00-4.45	U c=61kPa								
4.45-4.50	D								
						(3.50)			
5.00-5.45	SPT N=18			2,3/4,4,5,5					
5.00-5.45	D								
5.00-5.45	B								
6.00-6.45	U c=65kPa								
6.45-6.50	D			02/10/2012:DRY		6.50	Complete at 6.50m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Permeability tests undertaken at 1.00m to 2.00m, 2.60m to 3.60m, and 4.50m to 5.50m
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH9

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Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH10

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	01/10/2012	CURTINS CONSULTING	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							Grass over TOPSOIL (driller's description).		
						0.20			
0.20-0.50	B						Soft brown and dark brown slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to medium quartz.		
0.50-1.00	B								
						(1.00)			
						1.20			
1.20-1.65	U c=127kPa						Stiff medium strength locally high strength dark brown and occasional grey mottled slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz and sandstone.		
1.65-1.70	D								
2.00-2.45	SPT N=16			2,3/4,4,4,4					
2.00-2.45	D								
2.00-2.45	B								
						(2.80)			
3.00-3.45	U c=201kPa								
3.45-3.50	D								
4.00-4.45	SPT N=16			2,3/3,4,4,5		4.00	Stiff medium locally high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz, siltstone and sandstone.		
4.00-4.45	D								
4.00-4.45	B								
5.00-5.45	U c=95kPa								
						(2.45)			
5.45-5.50	D								
6.00-6.45	SPT N=18			2,3/4,4,5,5					
6.00-6.45	D								
				01/10/2012:DRY		6.45	Complete at 6.45m		

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Permeability test undertaken at 0.20m to 1.20m, 1.80m to 2.80m and 3.70m to 4.70m
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH10

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Site	Borehole Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	BH11

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 5.90m		GYRODATA LIMITED	5651
	Location AS PLAN	**Dates** 28/09/2012	**Engineer** CURTINS CONSULTING	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.50)	Grass over TOPSOIL (driller's description).		
0.50-1.00	B					0.50	Firm brown and dark brown silty CLAY.		
						(0.70)			
1.20-1.65	SPT N=15			2,3/4,3,4,4		1.20	Stiff medium strength locally high strength dark brown slightly gravelly CLAY, slightly sandy in places. Gravel is subrounded to rounded fine to medium quartz and siltstone.		
1.20-1.65	D								
1.20-1.65	B								
2.00-2.45	U c=103kPa								
2.45-2.50	D								
3.00-3.45	SPT N=15			2,3/3,4,4,4					
3.00-3.45	D								
3.00-3.45	B								
						(5.30)			
4.00-4.45	U c=101kPa								
4.45-4.50	D								
5.00-5.45	SPT N=17			2,3/4,4,4,5					
5.00-5.45	D								
5.00-5.45	D								
6.00-6.45	U c=57kPa								
6.45-6.50	D			28/09/2012:DRY		6.50	Complete at 6.50m		

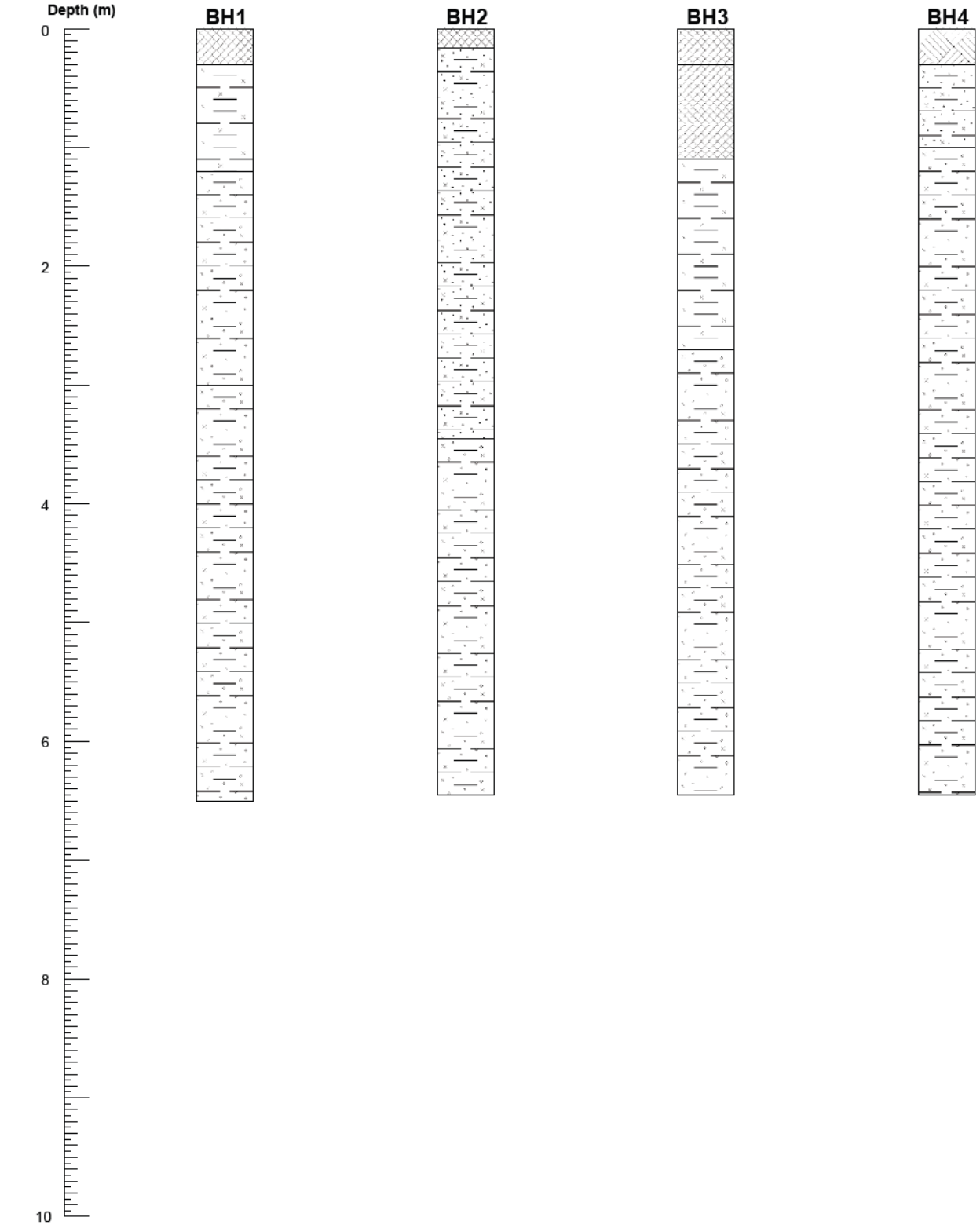
Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
Permeability test undertaken at 1.00m to 2.00m and 2.70m to 3.70m
Backfilled on completion.

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. 5651.BH11

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Key

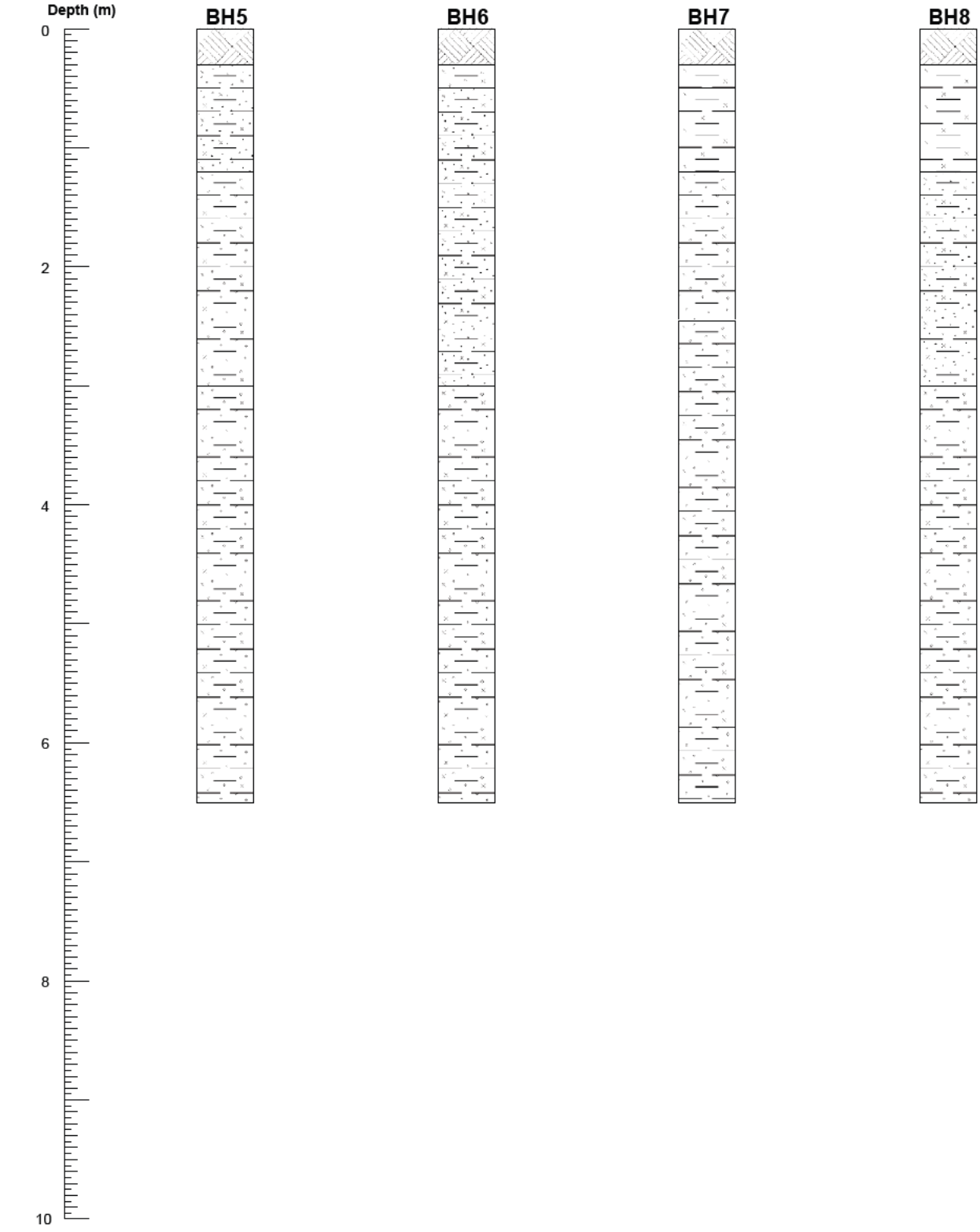
- Groundwater Strike
- Strike Rise Level
- MADE GROUND
- Silty CLAY
- TOPSOIL
- Silty sandy CLAY
- Silty gravelly CLAY

SUB SURFACE
SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	21/11/2012		1/3	5651
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
GYRODATA LIMITED			1:50[V]	5651.1

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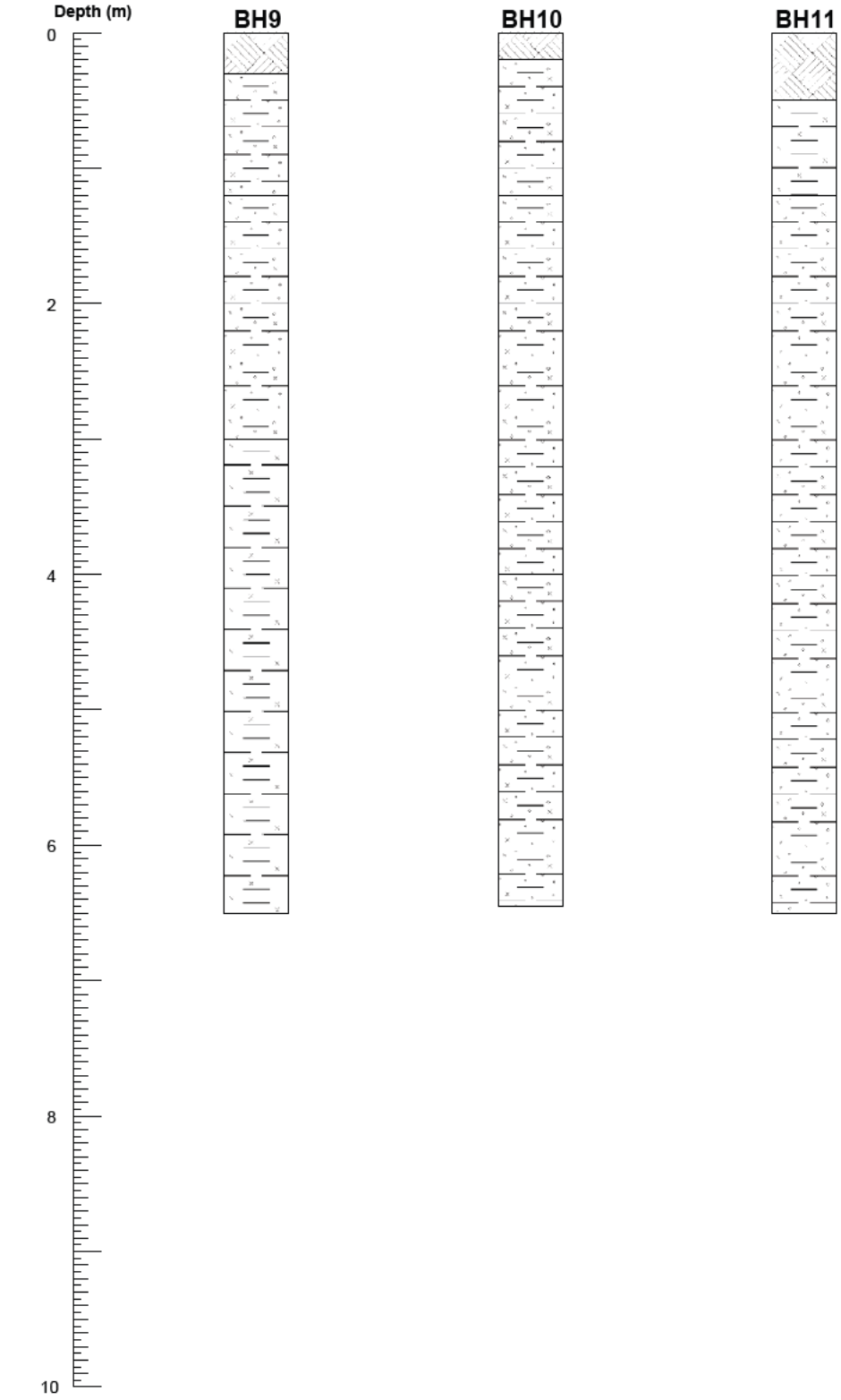
- Groundwater Strike
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Site	Date Drawn	Date Checked	Sheet	Job Number
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Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
GYRODATA LIMITED			1:50[V]	5651.1

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Key

- Groundwater Strike
- Strike Rise Level
- MADE GROUND
- Silty CLAY
- TOPSOIL
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Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	21/11/2012		3/3	5651
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
GYRODATA LIMITED			1:50[V]	5651.1

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HAND DUG TRIAL PIT RECORD SHEETS

SUB SURFACE

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Site GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA			**Trial Pit Number** HD1
Excavation Method HAND DUG PIT	**Dimensions**	**Ground Level (mOD)**	**Client** GYRODATA LIMITED	**Job Number** 5651
	Location AS PLAN	**Dates** 20/09/2012	**Engineer** CURTINS CONSULTING	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Brown gravelly CLAY. Disturbed strata.		
					0.10			
0.20-0.70	B					Firm to stiff brown very gravelly sandy CLAY.		
					(0.90)			
			20/09/2012		1.00			
						Complete at 1.00m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	TM/SJ	5651.HD1

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SUB SURFACE

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Site GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA			**Trial Pit Number** HD2
Excavation Method HAND DUG PIT	**Dimensions**	**Ground Level (mOD)**	**Client** GYRODATA LIMITED	**Job Number** 5651
	Location AS PLAN	**Dates** 20/09/2012	**Engineer** CURTINS CONSULTING	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL.		
0.30-0.80	B				0.30	Firm to stiff brown gravelly sandy silty CLAY.		
					(0.70)			
			20/09/2012		1.00	Complete at 1.00m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	TM/SJ	5651.HD2

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Site GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA			**Trial Pit Number** HD3
Excavation Method HAND DUG PIT	**Dimensions**	**Ground Level (mOD)**	**Client** GYRODATA LIMITED	**Job Number** 5651
	Location AS PLAN	**Dates** 20/09/2012	**Engineer** CURTINS CONSULTING	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL.		
0.30-0.80	B				0.30	Firm to stiff brown gravelly sandy silty CLAY.		
					(0.70)			
			20/09/2012		1.00	Complete at 1.00m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
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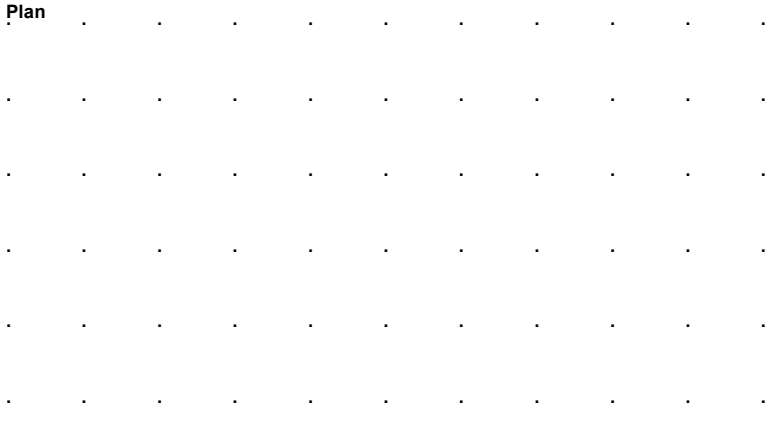
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Trial Pit Number
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	HD4

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
HAND DUG PIT			GYRODATA LIMITED	5651
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	20/09/2012	CURTINS CONSULTING	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.00)	MADE GROUND: loose aggregate.		
			20/09/2012		1.00	Complete at 1.00m		

Plan

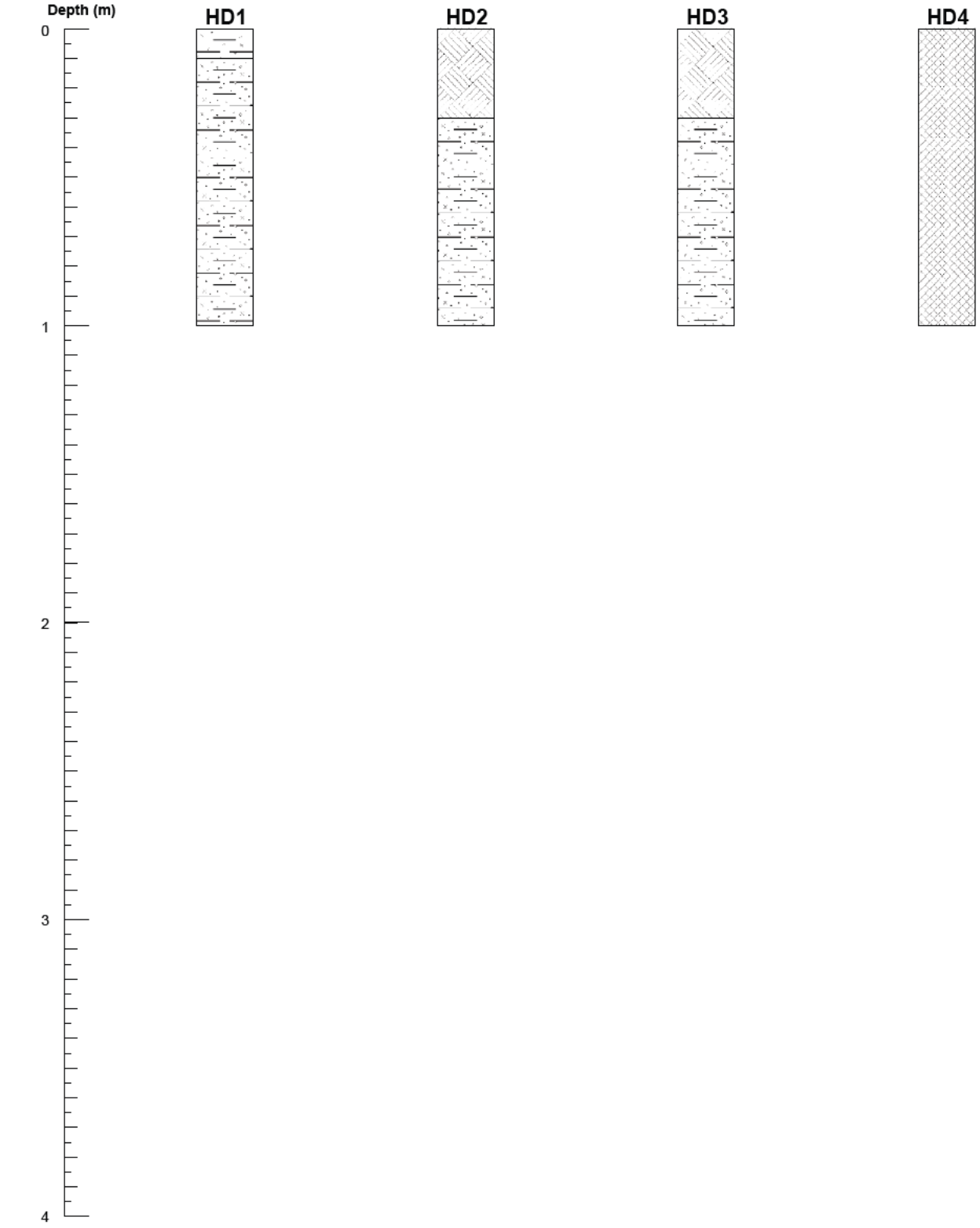


Remarks

See appended cross section.
No further progress possible, loose aggregate kept falling into the hole.

Scale (approx)	Logged By	Figure No.
1:25	TM/SJ	5651.HD4

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Key

- Groundwater Strike
- Strike Rise Level
- Silty gravelly CLAY
- Silty sandy gravelly CLAY
- TOPSOIL
- MADE GROUND

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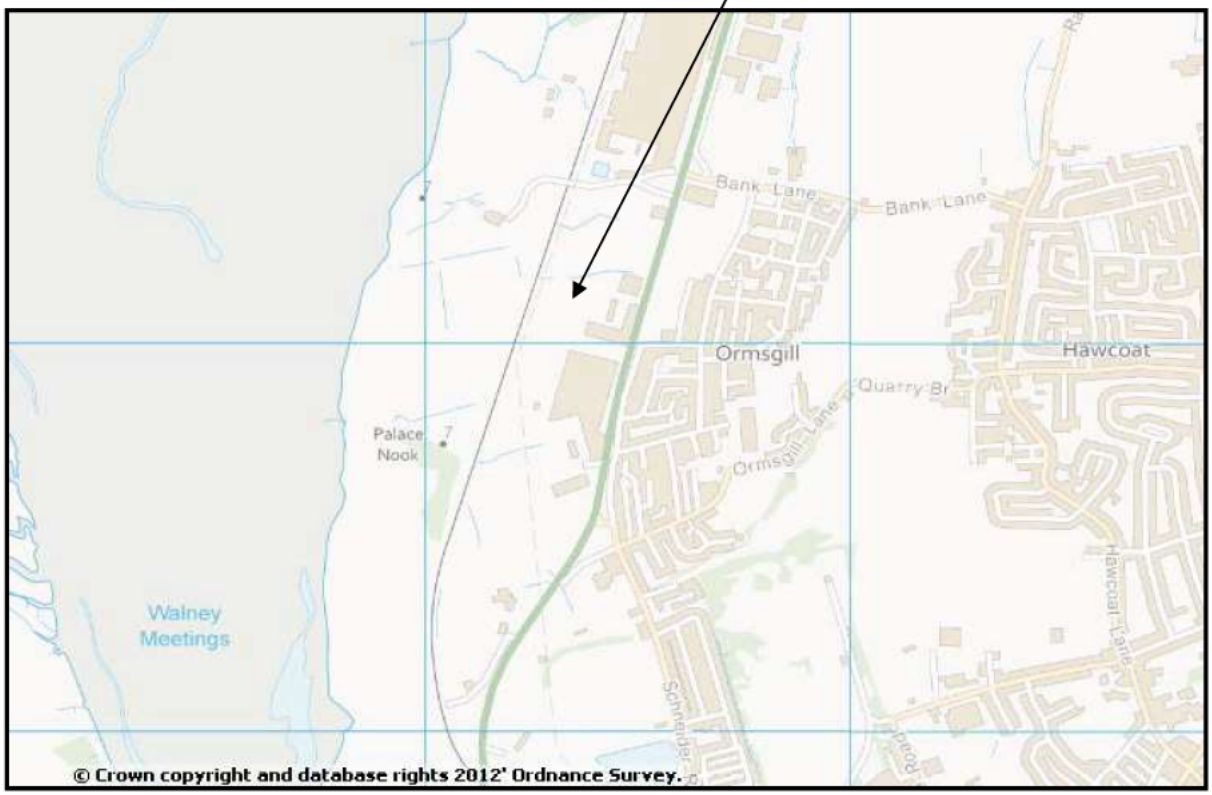
Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
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Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
GYRODATA LIMITED			1:20[V]	5651.1

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FIGURES





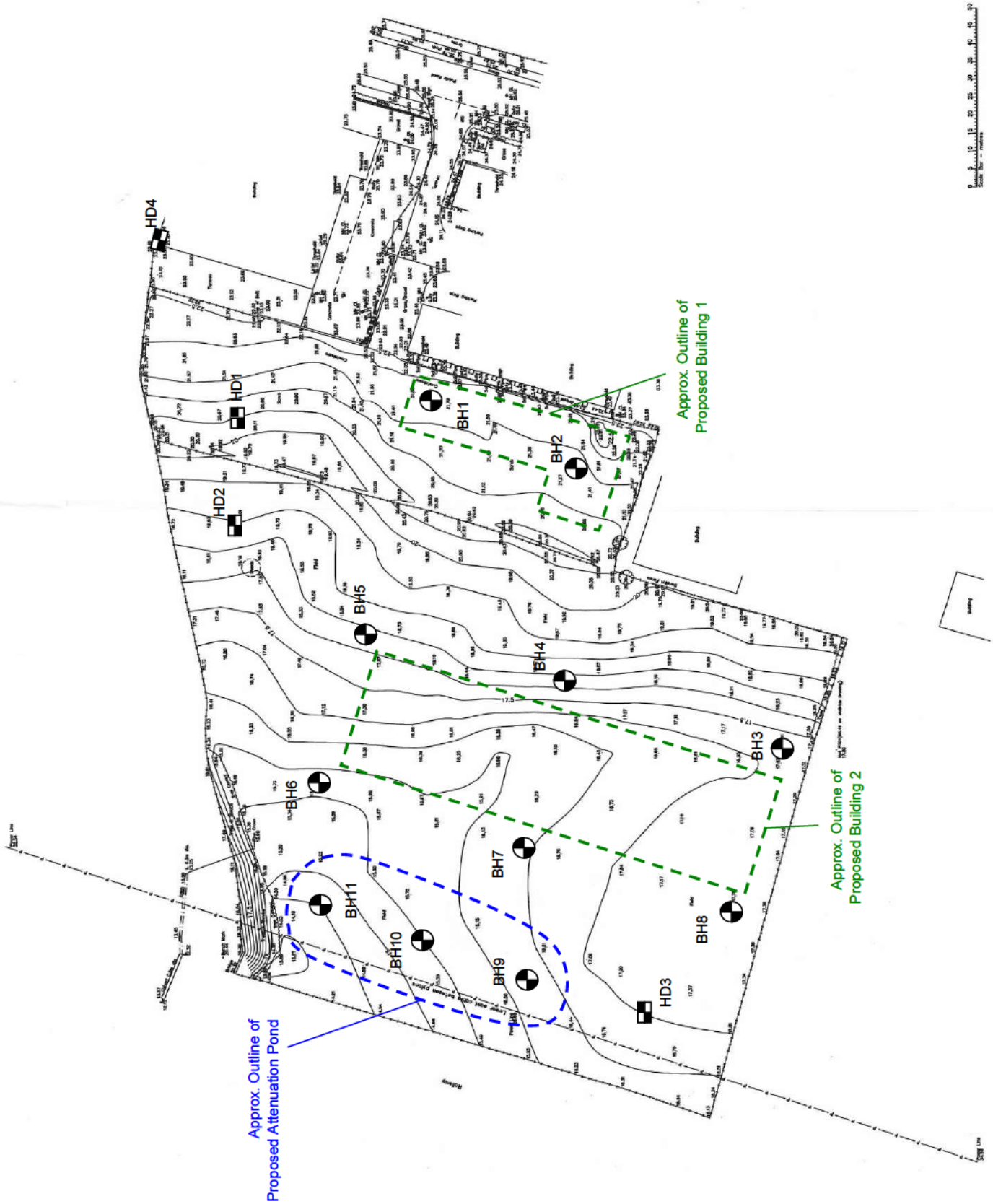
SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site Location

Site	Date Drawn	Date Checked	Orientation	Job No.
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	15-Nov-12		N	5651
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
GYRODATA LIMITED	DJ		_	1



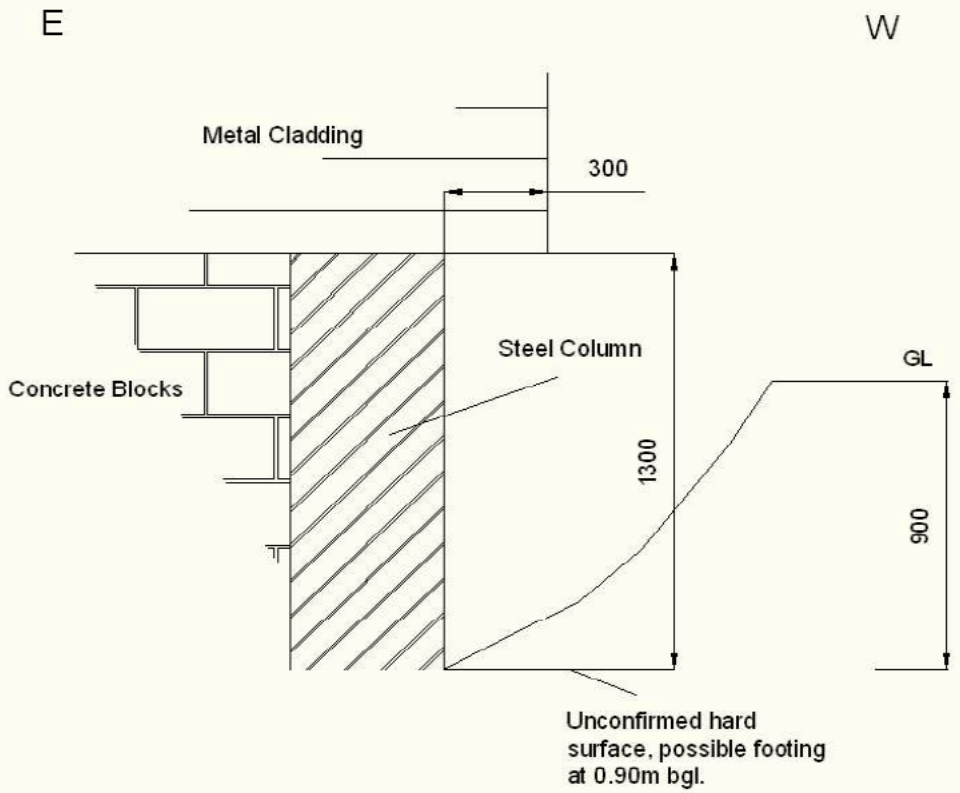
Base plan supplied by the Client's Engineer - Survey undertaken by Spatial Data Limited

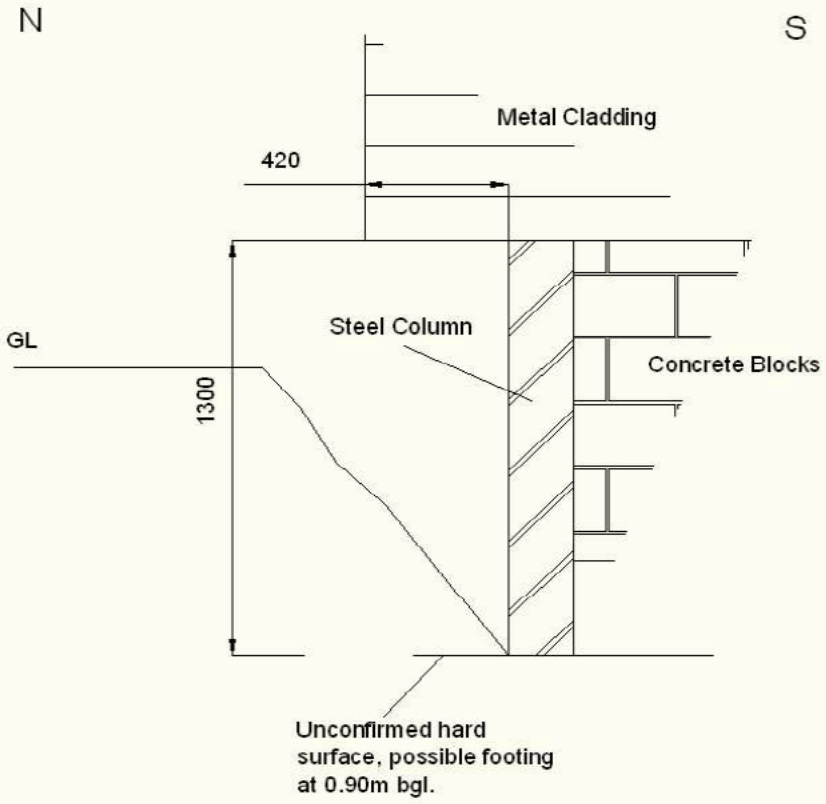
SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Locations of Exploratory Holes

Site	Date Drawn	Date Checked	Orientation	Job No.
GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	15-Nov-12		N	5651
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
GYRODATA LIMITED	DJ		–	2

HD4 Cross Sections





SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Site location			
Site GYRODATA LIMITED, PARK ROAD, BARROW-IN-FURNESS, CUMBRIA	Date Drawn 22-Nov-12	Date Checked	Orientation –	Job No. 5651
Client GYRODATA LIMITED	Drawn By DJ	Checked By	Scale –	Figure No. 3

Appendix C Relevant Hazardous Substances Assessment

Site Condition and Baseline Report

Barrow Green Hydrogen Plant

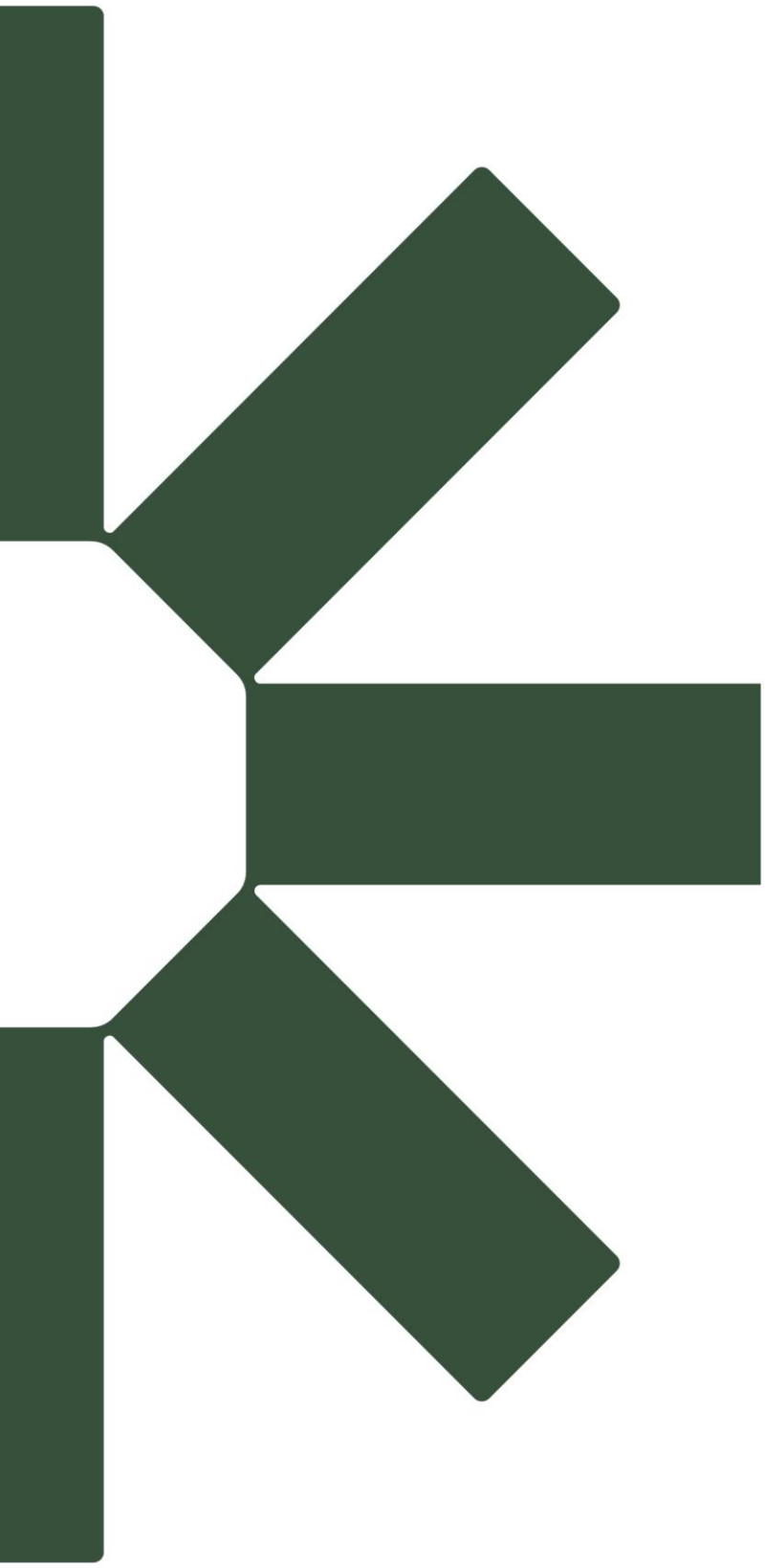
Barrow Green Hydrogen Limited

SLR Project No.: 416.066073.00001

19th January 2026

C.1 Relevant Hazardous Substances Assessment

The relevant hazardous substances assessment for the site found that there are no hazardous substances being introduced on site as a result of the proposed development.



Making Sustainability Happen

Appendix G Noise Impact Assessment

Environmental Permit Application Noise Impact Assessment

Barrow Green Hydrogen

Barrow Green Hydrogen Ltd

Prepared by:

SLR Consulting Limited

Broadwalk House, Southernhay West, Exeter, EX1 1GE

SLR Project No.: 416.066073.00001

19 January 2026

Version 2

Revision Record

Version	Date	Prepared By	Checked By	Authorised By
1	15 October 2025	M. Dawson MIOA	A. Tomlinson MIOA	M Dawson MIOA
2	19th January 2026	M. Dawson MIOA	A. Tomlinson MIOA	M Dawson MIOA

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Barrow Green Hydrogen Ltd (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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Appendices

Appendix A Glossary of Terminology

A.1 Acoustic Terminology

1.0 Introduction

Barrow Green Hydrogen Ltd is proposing to develop a Green Hydrogen Power Plant (GHPP) at Meeting Industrial Estate, Barrow-in-Furness, LA14 4TL (hereafter referred to as 'the site'). This noise impact assessment is to be submitted as part of an application for an Environmental Permit.

Due to the potential for the new plant to increase noise levels in the area the Environment Agency (EA) has requested that the permit application includes an assessment of the proposed operations in accordance with BS4142:2014+A1:2019.

The Noise Impact Assessment for the Environmental Permit application is presented in this Report.

1.1 Report Structure

This Report presents:

- A description of the Site.
- A description of applicable guidance.
- A summary of the results of the relevant previous baseline background sound survey at locations representative of the nearest noise-sensitive receptors to the proposed site.
- An assessment of undertaken in accordance with British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS4142) as required by the Environment Agency (EA) Guidance *Noise and vibration management: environmental permits.*

Whilst reasonable effort has been made to ensure that this report is easy to understand, it is technical in nature; to assist the reader, a glossary of terminology is included in **Appendix A**.

2.0 Site Description

2.1 Existing Site

The site is located on the land to the west of Park Road (A590), Barrow-in-Furness, LA14. The existing land proposed for development currently comprises of brownfield sites, in a predominantly industrial area. The proposed site is adjacent to the Meeting Industrial Estate which includes a variety of industrial/commercial units including HBP Ltd (Construction Company) and Gilmour Fabrications (Metal Supplier).

The north of the site is open land with existing industrial premises. To the east the site are adjacent industrial units with Park Road beyond. Further east are existing dwellings on Park Road, Millstone Avenue and Long Croft. To the south the site is bordered by open land and industrial premises. To the west the site is bordered by a solar farm with Walney Channel beyond.

Figure 2-1 Site and Surrounding Area



2.2 Proposed Development

The position of the site in the context of the surrounding area can be seen in Figures 2-1 & 2-2.

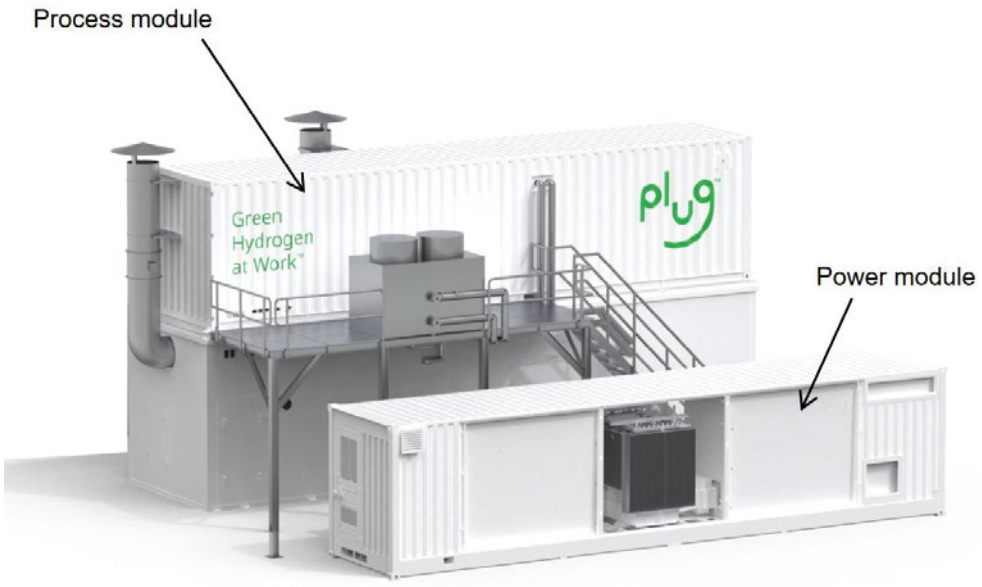
Figure 2-2: Site Location



The core of the facility will be six Plug Power EX-2125D units. Each unit comprises a Process Module and a Power Module as illustrated in Figure 2-3.

The Process Module will produce and purify the hydrogen from water supplied by United Utilities and low voltage direct current (DC) supplied by the Power Module. The Process Module comprises two container units. A Process Unit underneath where the electrolysis stacks are located and a Utility Unit on top, containing for example water demineralisation equipment. For further information on the process, please refer to the main Environmental Permit application document.

Figure 2-3: One Unit Layout



It is understood the site could operate for up to 24 hours a day. Therefore, the impact of daytime and night-time operations has been considered for this assessment.

2.3 Planning History

Planning permission for a 30MW hydrogen electrolyser at the Site was approved in 2023 (App: B09/2022/0869).

It is noted that the planning permission for the Site includes noise limits as summarised below in Condition 27. Condition 27 is copied below:

"Noise from the development must not cause the existing background noise level (measured as the LA90 (10 minutes) to be exceeded at any neighbouring noise sensitive locations. Tonal noise will result in a 5dB addition to that noise". The reason given for this condition is "to safeguard the amenity of local residents".

SLR believes that the wording of the condition is erroneous and, to comply with the relevant British Standard, BS4142, it should read as follows:

"Noise (specific sound) from the development must not exceed the background noise level (measured as the LA90 (10 minutes) at any neighbouring noise sensitive locations. Tonal noise will result in a 5dB addition to that noise". The reason given for this condition is "to safeguard the amenity of local residents"

3.0 Environment Agency Requirements

A summary of the requirements outlined in the EA Guidance document, and the assessment methodology outlined in BS4142:2014+A1:2019 are provided below.

3.1 Guidance

The Environment Agency (EA) released the guidance document *Noise and vibration management: environmental permits* (NVM) in July 2021, replacing the previous guidance presented in *Horizontal Guidance for Noise (H3) parts 1 and 2*. The NVM details when a noise assessment is required, the competency required to undertake an assessment and how to carry out a noise impact assessment.

The NVM references BS4142:2014+A1:2019 as the appropriate assessment methodology.

The NVM outlines how context should be taken into account in the assessment and notes that *"Whilst context allows you to interpret impact thresholds (to a degree), there are practical limits to the extent of the interpretation. It is unlikely you could adjust the assessment outcome beyond the next band (for example, modifying a BS 4142 outcome of more than 10dB to be less than an 'adverse impact')."*

Determining the outcome of the assessment the following should be considered:

- weekdays rather than weekends.
- what the sound 'means' – meaningful sound is one that conveys an unpleasant meaning beyond its mere acoustic content, for example noise from an abattoir.
- time of day.
- the absolute sound level.
- where the sound occurs.
- new industry or new residences.
- intrinsic links between the source and receptor, for example the source is the resident's place of work.
- local attitudes.
- the residual acoustic environment.
- the land use at the receptor (for example, gardens rather than yards).
- the exceedance (traditional BS 4142).
- whatever else might be particular to that individual situation.

Based on the results of the BS4142:2014+A1:2019 assessment the NVM has three distinct requirements as detailed in Table 3-1.

Table 3-1: NVM Assessment

NVM Result	BS4142 Descriptor	Next Stage
Unacceptable level of audible or detectable noise	The closest corresponding BS 4142 descriptor is 'significant adverse impact'	You must take further action or you may have to reduce or stop operations. The environment agencies will not issue a permit if you are likely to be operating at this level.

NVM Result	BS4142 Descriptor	Next Stage
Audible or detectable noise	The closest corresponding BS 4142 descriptor is 'adverse impact'	Your duty is to use appropriate measures to prevent or, where that is not practicable, minimise noise. You are not in breach if you are using appropriate measures. But you will need to rigorously demonstrate that you are using appropriate measures.
No noise, or barely audible or detectable noise	The closest corresponding BS 4142 descriptor is 'low impact or no impact'	Low impact does not mean there is no pollution. However, if you have correctly assessed it as low impact under BS 4142, the environment agencies may decide that taking action to minimise noise is a low priority.

3.2 British Standard 4142:2014+A1:2019

British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* is intended to be used to assess the potential adverse impact of sound, of an industrial and/or commercial nature, at nearby noise-sensitive receptor locations within the context of the existing sound environment.

Where the specific sound contains tonality, impulsivity and/or other sound characteristics, penalties should be applied depending on the perceptibility. For tonality, a correction of either 0, 2, 4 or 6dB should be added and for impulsivity, a correction of either 0, 3, 6 or 9dB should be added. If the sound contains specific sound features which are neither tonal nor impulsive, a penalty of 3dB should be added.

In addition, if the sound contains identifiable operational and non-operational periods, that are readily distinguishable against the existing sound environment, a further penalty of 3dB may be applied.

The assessment of impact contained in BS4142:2014+A1:2019 is undertaken by comparing the sound rating level, i.e. the specific sound level of the source plus any penalties, to the measured representative background sound level immediately outside the noise-sensitive receptor location. Consideration is then given to the context of the existing sound environment at the noise-sensitive receptor location to assess the potential impact.

Once an initial estimate of the impact is determined, by subtracting the measured background sound level from the rating sound level, BS4142:2014+A1:2019 states that the following should be considered:

- typically, the greater the difference, the greater the magnitude of the impact;
- a difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- a difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
- the lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. It is an indication that the specific sound source has a low impact, depending on the context.

BS4142:2014+A1:2019 notes that:

"Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

BS4142:2014+A1:2019 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

To account for the acoustic character of proposed sound sources, BS4142:2014+A1:2019 provides the following with respect to the application of penalties to account for *"the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention".*

- **Tonality** – "For sound ranging from not tonal to predominantly tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible;
- **Impulsivity** – A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible;
- **Intermittency** – When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied; and
- **Other Sound Characteristics** – Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied."

Finally, BS4142:2014+A1:2019 outlines guidance for the consideration of the context of the potential impact, including consideration of the existing residual sound levels, location and/or absolute sound levels.

4.0 Baseline Sound Survey

A baseline sound survey has previously been completed by RSK Acoustics[1]. A summary of the noise sensitive receptors, survey locations, baseline survey results, and noise levels taken forward for assessment, are presented below.

4.1 Noise Sensitive Receptors

The proposed nearest receptors considered in the assessment are as follows:

[1] RSK Acoustics. Report ref 206/1355/R2, dated November 2022.

Table 4-1 Noise Sensitive Receptors

Ref.	Receptor Name	Coordinates	Approximate Distance to Nearest Site Application Boundary
R1	House on Bank Lane	54.140204, -3.238643	210m to the northwest
R2	Dwellings on Long Croft	54.138516, -3.231927	310m to the east
R3	Dwellings on Park Road	54.136710, -3.233704	145m to the southeast

4.2 Survey Locations

Figure 4-1 shows an aerial view of the proposed site in red, the nearby single-carriageway 40mph A590 road, the Noise Sensitive Receptors (R1-3) listed in Table 4-1 in Black and Yellow and the Noise Monitoring Positions (MP1-3) listed in Table 4-2 in Blue and White.

Figure 4-1 Noise Survey Receptors & Measurement Locations



Table 4-2 shows Noise Monitoring Positions and the rationale for their locations in relation to the NSRs in Table 4-1.

Table 4-2 Survey Locations

No.	Location	Rationale
MP1	Northwest of site	To obtain baseline noise levels in the vicinity of R1
MP2	East of site	To obtain baseline noise levels in the vicinity of R2 & R3
MP3	Southeast of site	To obtain baseline noise levels in the vicinity of R3 during the daytime

4.3 Survey Results

Tables Table 4-3Table 4-4 show the results of the unattended Noise Survey undertaken by RSK Acoustics in 2022. The calculated in equivalent, maximum, 90th and 10th percentile results are shown in the rightmost four columns

Table 4-5 shows the attended Noise Survey by RSK in 2022. More datapoints were collected over a short daytime window. A general noise climate is also shown.

Table 4-3 MP1 Survey Results

Date	Time Period	LAeq,T (dB)	LAFmax (dB)	LA90,T (dB)	LA10,T (dB)
15/09/2022	13:30 – 23:00	52	44	52	44
	23:00 – 07:00	48	45	48	45
16/09/2022	07:00 – 23:00	52	46	52	46
	23:00 – 07:00	48	44	48	44
17/09/2022	07:00 – 23:00	51	44	51	44
	23:00 – 07:00	48	46	48	46
18/09/2022	07:00 – 23:00	49	44	49	44
	23:00 – 07:00	48	45	48	45
19/09/2022	07:00 – 15:30	52	43	-	-

Table 4-4 MP2 Survey Results

Date	Time Period	LAeq,T (dB)	LAFmax (dB)	LA90,T (dB)	LA10,T (dB)
15/09/2022	15:30 – 23:00	70	62	70	62
	23:00 – 07:00	64	51	64	51
16/09/2022	07:00 – 23:00	49	86	41	49
	23:00 – 07:00	71	60	71	60

Date	Time Period	LAeq,T (dB)	LAFmax (dB)	LA90,T (dB)	LA10,T (dB)
17/09/2022	07:00 – 23:00	62	48	62	48
	23:00 – 07:00	53	89	43	50
18/09/2022	07:00 – 15:30	70	58	-	-

Table 4-5 MP3 Attended Survey Results

Date	Start Time (hh:mm)	LAeq,15min (dB)	LA90,15min (dB)	Noise Sources
18/09/2022	13:09	66	61	Traffic noise from A590, light traffic from Park Road, pedestrians, birds, alarms
	13:24	66	60	
	13:39	67	61	
	13:54	67	61	
	14:09	67	61	
	14:24	67	61	
	14:39	67	62	
	14:54	67	61	
	15:09	67	61	
	15:24	67	62	
	15:39	67	63	
	15:54	68	63	

Table 4-3 and Table 4-4 show the data presented in the report by RSK. Discrepancies are present, such as the $L_{Aeq,T}$ values being higher than the L_{AFmax} values as well as the $L_{A90,T}$ values being higher than the $L_{A10,T}$ values. It can also be seen than the data appears to be duplicated from the $L_{Aeq,T}$ and L_{AFmax} columns to the $L_{A90,T}$ and $L_{A10,T}$ columns. However, SLR has reviewed the appendices from this report, namely the Statistical Analysis and Time History graphs, and can conclude the data in Table 4-6 onwards is accurate.

4.4 Baseline Background Sound Levels Taken Forward

Table 4-6 shows the data reviewed by RSK to select a representative daytime and nighttime decibel value for each NSR.

Table 4-6 Representative Baseline Background Sound Levels

Ref.	Receptor Name	Baseline Measurement Location	Representative Daytime Background Level $L_{A90,T}$ (dB)	Representative Night-time Background Level $L_{A90,T}$ Level (dB)
R1	House on Bank Lane	ML1	42	43
R2	Dwellings on Long Croft	ML2	51	46
R3	Dwellings on Park Road	ML2	51	46

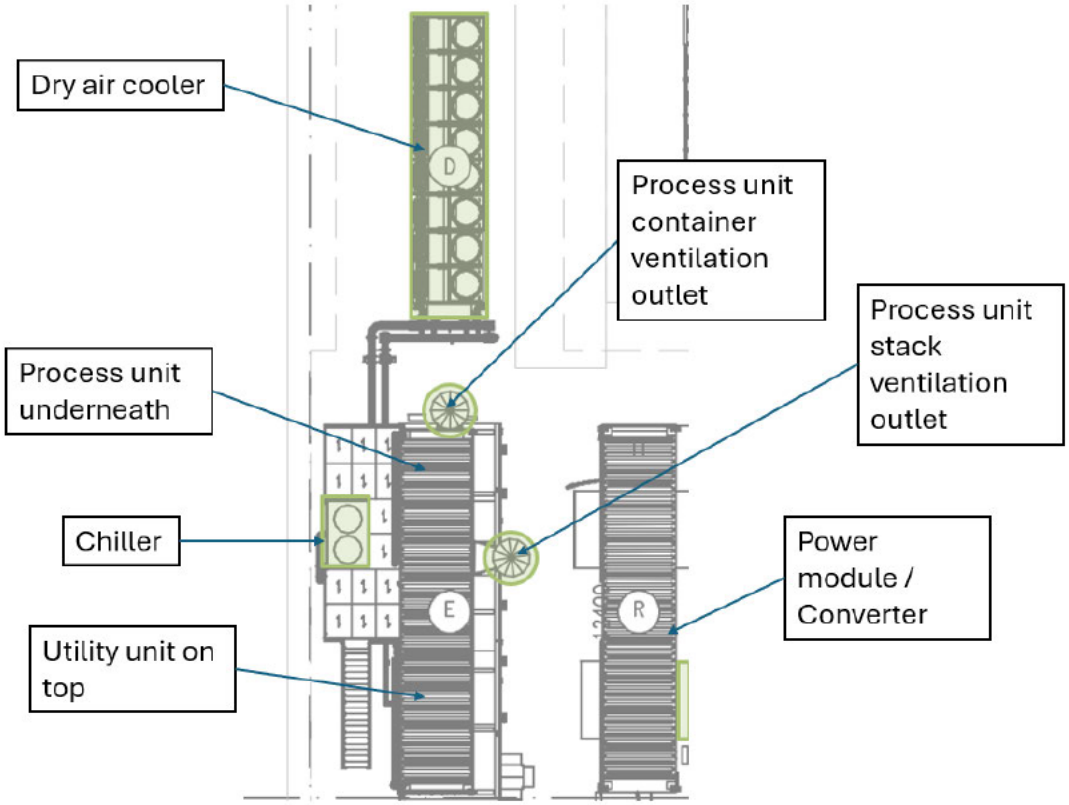
5.0 BS4142 Assessment

5.1 Noise Sources

The core of the facility will be six Plug Power EX-2125D Units. Each unit comprises a Process Module and a Power Module.

The Process Module will produce and purify the hydrogen from water supplied by United Utilities and low voltage direct current (DC) supplied by the Power Module. The noise sources associated with each Unit are indicated in green in Figure 5-1.

Figure 5-1: Noise Source Plan View Schematic per Unit



.

Table 5-1: Noise Sources

Location	Source	X/Y	Height [m]	Sound Power Level [dB]	Mitigation	CadnaA Attribute
Unit 1	Chiller	319325.17, 472062.49	6.1	83		Point Source
	Process Unit Air Vent	319328.40, 472058.23	7.4	90	-4dB Acoustic Hood	
	Process Unit Air Vent	319322.96, 472057.41	7.7	90	-4dB Acoustic Hood	
	Converter	319316.90, 472053.09	1.5	83		
	Utility Unit Air Vent	319315.15, 472061.68	4.0	90	-4dB Acoustic Hood	
	Air Coolers	319341.34, 472056.72	2.4	77		Area Source
Unit 2	Chiller	319329.63, 472080.15	6.1	83		Point Source
	Process Unit Air Vent	319333.02, 472075.79	7.4	90	-4dB Acoustic Hood	
	Process Unit Air Vent	319327.63, 472075.02	7.7	90	-4dB Acoustic Hood	
	Converter	319321.44, 472070.65	1.5	83		
	Utility Unit Air Vent	319320.31, 472079.31	4.0	90	-4dB Acoustic Hood	
	Air Coolers	319346.34, 472074.14	2.4	77		Area Source
Unit 3	Chiller	319334.30, 472097.92	6.1	83		Point Source
	Process Unit Air Vent	319337.59, 472093.55	7.4	90	-4dB Acoustic Hood	
	Process Unit Air Vent	319332.35, 472092.89	7.7	90	-4dB Acoustic Hood	
	Converter	319325.99, 472088.57	1.5	83		
	Utility Unit Air Vent	319324.60, 472096.77	4.0	90	-4dB Acoustic Hood	
	Air Coolers	319350.73, 472092.11	2.4	77		Area Source
Unit 4	Chiller	319356.13, 472075.89	6.1	83		Point Source
	Process Unit Air Vent	319353.05, 472080.31	7.4	90	-4dB Acoustic Hood	
	Process Unit Air Vent	319358.33, 472080.87	7.7	90	-4dB Acoustic Hood	
	Converter	319364.14, 472085.08	1.5	83		
	Utility Unit Air Vent	319366.03, 472076.53	4.0	90	-4dB Acoustic Hood	
	Air Coolers	319339.88, 472081.40	2.4	77		Area Source
Unit 5	Chiller	319351.56, 472058.18	6.1	83		Point Source
	Process Unit Air Vent	319348.37, 472062.49	7.4	90	-4dB Acoustic Hood	
	Process Unit Air Vent	319353.76, 472063.16	7.7	90	-4dB Acoustic Hood	
	Converter	319359.93, 472067.51	1.5	83		
	Utility Unit Air Vent	319361.03, 472059.30	4.0	90	-4dB Acoustic Hood	
	Air Coolers	319334.92, 472064.07	2.4	77		Area Source
Unit 6	Chiller	319346.99, 472040.46	6.1	83		Point Source
	Process Unit Air Vent	319343.80, 472044.83	7.4	90	-4dB Acoustic Hood	
	Process Unit Air Vent	319349.19, 472045.65	7.7	90	-4dB Acoustic Hood	
	Converter	319355.18, 472049.99	1.5	83		
	Utility Unit Air Vent	319357.22, 472041.52	4.0	90	-4dB Acoustic Hood	
	Air Coolers	319330.95, 472046.21	2.4	77		Area Source

Other plant included in the model is summarised in Table 5-2.

Table 5-2:Other Plant

Equipment	X/Y	Height (m)	Sound Power Data dB(A)	CadnaA Attribute
HV Transformer	319345.64, 472020.17	3.5	74	Point Source
LV Transformer	319327.46, 472029.64	3.5	63	Point Source

5.2 Noise Model Assumptions

The sound predictions in this assessment have been undertaken using a proprietary software-based noise model, CadnaA 2024 (Including the ISO 9613 update), which implements the full range of the latest UK noise-based calculation methods.

The calculation algorithms set out in ISO 9613-2:2024 *"Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation"* have been used and the model assumes:

- A ground absorption factor of 0.5 (to represent mixed ground conditions).
- Contour Data to include OS terrain data.
- A reflection factor of 3.

5.3 Sound Character Corrections

The character of each noise source, and the correction that will be applied in the BS 4142 assessment are as follows:

- Tonality: It has been considered unlikely for tonality to be perceptible in the residual sound climate. Therefore, no penalty has been applied.
- Impulsivity: The noise sources are not known to exhibit significant impulsive characteristics based on well-maintained equipment.
- Intermittency: Although noise sources at the site may operate intermittently, it has been considered unlikely on/off events to be perceptible in the residual sound climate. Therefore, no penalty has been applied.
- Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a character correction of 3 dB can be applied. A precautionary character correction of +3 dB has been applied for robust assessment tending towards a worst-case.

In total a +3 dB character correction has been added to the calculated specific sound level at each receptor.

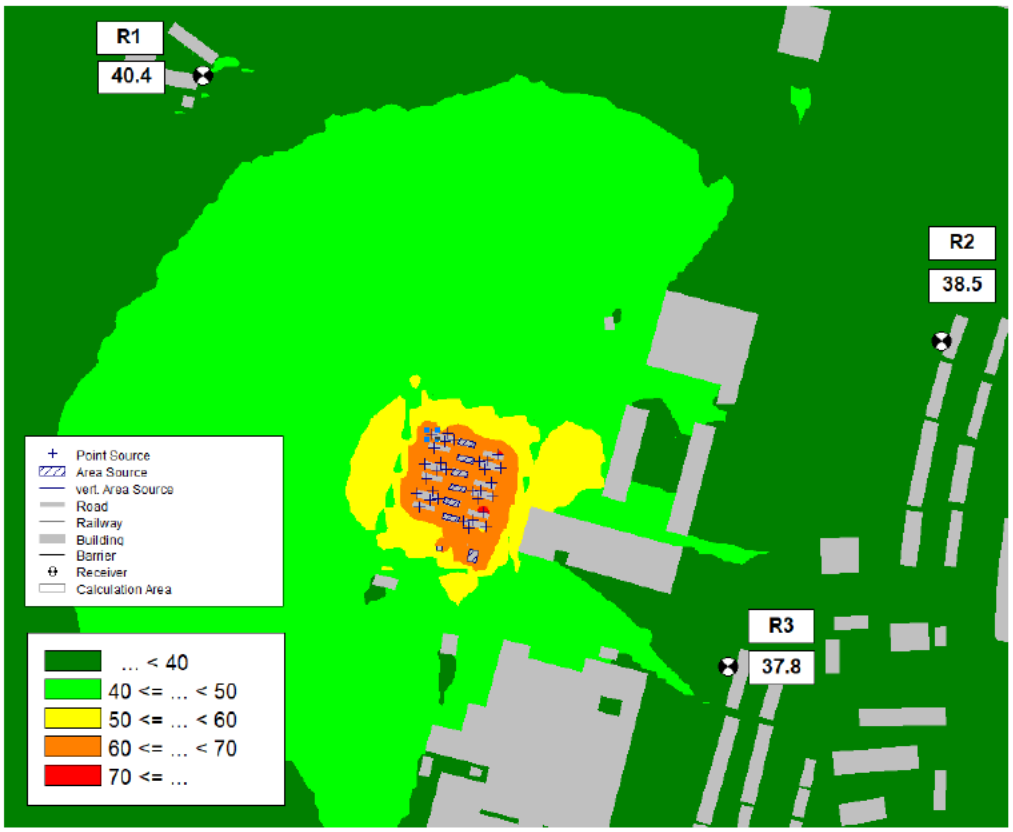
5.4 Results

The BS4142 assessment is presented in **Table 5-3**. The daytime and night-time CADNA output images can be seen in **Figure 5-2** and **Figure 5-3.**

Table 5-3: BS4142 Assessment

Receptor	Assessment Period	Predicted Specific Sound Level, dB $L_{Aeq,T}$[2]	Predicted Rating Level, dB $L_{Ar,Tr}$	Background Sound Level dB $L_{A90,T}$	Difference dB
R1	Daytime	40	43	42	+1
	Night-Time	42	45	43	+2
R2	Daytime	39	42	51	-9
	Night-Time	41	44	46	-2
R3	Daytime	38	41	51	-10
	Night-Time	40	43	46	-3

Figure 5-2: Daytime BS4142 Assessment



[2] See Table 7.1 of Report 410.HF03.00001 V3 Dated October 2022.

Figure 5-3: Night-Time BS4142 Assessment



5.5 Discussion

Planning permission for a 30MW hydrogen electrolyser at the Site was approved in 2023 (App: B09/2022/0869).

It is noted that the planning permission for the Site includes noise limits as summarised below in Condition 27. Condition 27 is copied below:

"Noise from the development must not cause the existing background noise level (measured as the LA90 (10 minutes) to be exceeded at any neighbouring noise sensitive locations. Tonal noise will result in a 5dB addition to that noise". The reason given for this condition is "to safeguard the amenity of local residents".

SLR believes that the wording of the condition is erroneous and, to comply with the relevent British Standard, BS4142, should read as follows:

"Noise (specific sound) from the development must not exceed the background noise level (measured as the LA90 (10 minutes) at any neighbouring noise sensitive locations. Tonal noise will result in a 5dB addition to that noise". The reason given for this condition is "to safeguard the amenity of local residents".

The NIA predicts that that the specific sound level will be equal to or less than the baseline background sound level. With appropriate measures implemented to prevent or where that it is not practicable to minimise noise impact, the rating level is below the background level at all but one nearby sensitive receptor. At the Properties on Bank Lane to the northwest of the site a +1dB difference during the day is predicted, and during the night a +2dB difference is predicted.

It should be noted that the results of the NIA are considered to be conservative. It is based on sound power levels provided by the equipment manufacturers which are at guaranteed levels or based on applicable standards, rather than measured sound power levels. They are

therefore conservative. SLR considers that the sound power levels provided are high compared to our experience.

In addition, a +3dB character correction was applied on a precautionary basis. Without this character correction, the rating level would be below the background sound level at all receptor locations.

It is therefore proposed that noise monitoring as outlined in the Noise Management Plan is undertaken following commencement of operations to review the impacts.

A level difference between the rating level and the baseline background sound level of up to 5dB is, in accordance with BS4142, likely to be an indication of an adverse impact, depending on the context. A level difference between the rating level and the baseline background sound level of less than 0dB is indicative of a low or no impact.

Notwithstanding this, a Noise Management Plan (NMP) has been prepared and will be implemented at the Site to prevent or where that it is not practicable to minimise noise impacts. Measures which will be employed include:

- Housing of electrolysers within acoustic containers;
- Minimising of start-up and shut down periods;
- Use of silencers on oxygen vents;
- Use of acoustic hoods on process unit and utility unit air vents;
- Selection of low noise generating equipment;
- Facility will be unmanned with low number of vehicle movements and deliveries;
- Maintaining and operation of equipment in accordance with manufacturer's specifications;
- Monitoring of noise levels;
- Following an action plan in the event of noise levels in excess of expected levels;
- Engagement with neighbours; and
- Use of a complaints procedure.

With these, it is considered that appropriate measures to mitigate noise are proposed. During commissioning, Barrow Green Hydrogen will reassess via undertaking of a noise monitoring exercise.

6.0 Conclusion

Barrow Green Hydrogen Ltd is proposing to develop a Green Hydrogen Power Plant (GHPP) at Meeting Industrial Estate, Barrow-in-Furness, LA14 4TL. This noise impact assessment is to be submitted as part of an application for an Environmental Permit.

Due to the potential for the new plant to increase noise levels in the area the EA has requested that the permit application includes an assessment of the proposed operations in accordance with BS4142:2014+A1:2019.

The Noise Impact Assessment for the Permit application is presented in this Report.

It is considered that appropriate measures to mitigate noise are proposed. During commissioning, Barrow Green Hydrogen will reassess via undertaking of a noise monitoring exercise.

7.0 Closure

The assessment has required a suitable level of technical ability and has been undertaken by a Suitably Qualified Person (SQP). An individual with all the following credentials has been considered a SQP for this assessment:

- Has a minimum of three years' verifiable experience (within the last five years) of providing noise impact assessments in planning. Such experience has clearly demonstrated a practical understanding of factors affecting acoustics in relation to the proposed development use and in the built environment in general, including acting in an advisory capacity to provide recommendations and design advice in planning, and;
- Holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics.

This assessment has been led and managed by a SQP as defined above.

Where some elements of the assessment (e.g. measurements) have been carried out by an acoustician who does not meet the requirements above, this has been undertaken with the direct guidance and supervision of a SQP who has reviewed, agreed and overseen the measurement methodology and any results obtained.

The SQP confirms that the relevant measurements and calculations:

- Represent good industry practice in accordance with available guidance.
- Are appropriate given the development being assessed and scope of works proposed.
- Avoid invalid, biased and exaggerated claims.

The checker and author of this document confirm that they both comply with the definition of a SQP defined in this Section.

Regards,

SLR Consulting Limited



Aaron Tomlinson, BEng. (Hons) MIOA
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Technical Director

Appendix A Glossary of Terminology

Environmental Permit Application Noise Impact Assessment

Barrow Green Hydrogen

Barrow Green Hydrogen Ltd

SLR Project No.: 416.066073.00001

19th January 2026

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A-1: Sound Levels Commonly Found in the Environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off

A.1 Acoustic Terminology

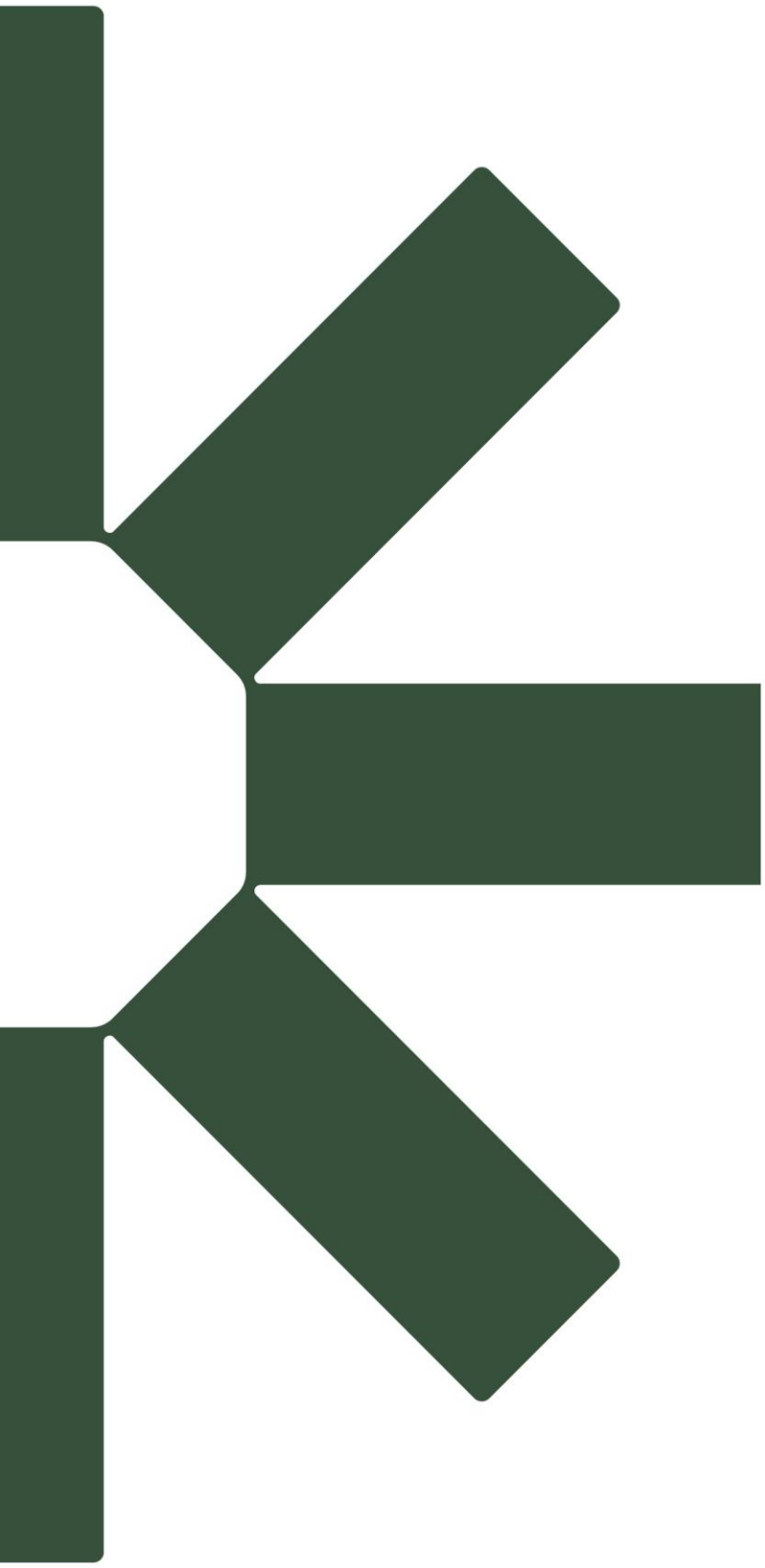
dB (decibel) The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (of 20 µPa).

dB(A) A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

$L_{Aeq,\,T}$ $L_{Aeq,\,T}$ is defined as the notional steady sound level which, over a stated period T, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

$L_{A10,\,T}$ & L_{A90} If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{A10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{A90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{A10} index to describe road traffic noise.

$L_{Amax(F)}$ $L_{Amax(F)}$ is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level



Making Sustainability Happen

Appendix H Noise Management Plan

Noise Management Plan

Barrow Green Hydrogen

Barrow Green Hydrogen Ltd

Prepared by:

SLR Consulting Limited

3rd Floor, Brew House, Jacob Street, Tower Hill,
Bristol, BS2 0EQ

SLR Project No.: 416.066073.00001

19 January 2026

Version 1

Revision Record

Version	Date	Prepared By	Checked By	Authorised By
1	19 January 2026	GA	PW	PW

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Barrow Green Hydrogen Ltd (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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Drawing 03A **Environmental Site Setting**

Drawing 03B **Cultural and Natural Heritage**

Appendices

Appendix A **Noise Complaint Form**

1.0 SITE DETAILS

Site name	Barrow Green Hydrogen Plant
Site address	Meetings Industrial Estate Park Road Barrow-in-Furness Cumbria LA14 4TL
Operator name	Barrow Green Hydrogen Ltd
Permit number	EPR/VP3128LT

2.0 WHO THIS PLAN IS FOR

BGH understands and accepts its responsibility for controlling noise impact, and will regularly review the effectiveness of this Noise Management Plan (NMP).

This NMP is for all employees, contractors and subcontractors involved in the design, management and operation of the Barrow Green Hydrogen Plant to ensure noise is managed appropriately.

A copy of the NMP shall be made available on site for staff, contractors, Environment Agency officers to refer to.

3.0 INTRODUCTION

3.1 Site Description

The Barrow Green Hydrogen Plant is an electrolytic hydrogen production plant operated by Barrow Green Hydrogen Ltd (BGH). The plant has the capacity to produce up to 12,816kg of hydrogen per day. The core of the facility is 6 no. containerised 5MW Proton Exchange Membrane (PEM) electrolysers.

The Site provides hydrogen to feed the Kimberly Clark paper mill (EA permit ref. EPR/BJ7611IY) to the north via a buried pipeline.

The process design is based around modular electrolyser units each of which include a dedicated stack, and most of the balance of plant equipment. The 6 units operate independently. The units have a potable water feed, power, and nitrogen supply to the units to operate. The units produce oxygen as a by-product from electrolysis.

The electrolyser core stack system will produce hydrogen at 40bar and 40°C. This is further processed by a Hydrogen Purification System which consists of a deoxo-dryer to purify the hydrogen by virtually removing all the oxygen and water. After purification and drying, hydrogen is chilled and stored within 9 low pressure buffer tanks. Prior to supply off-site to Kimberly Clark, the pressure is regulated to 2bar and the flow metered via a pressure regulation and metering skid.

3.2 Site Location

The Site is centred on National Grid Reference (NGR) SD 19436 72080. Barrow-in-Furness town centre lies 3km to the south-east. The Site sits in an industrial estate with residential areas located to the east, a solar farm and agricultural fields to the west with the Walney Channel beyond. The closest residential properties are approximately 110m to the east of the Site. The nearest designated habitat site is 330m west of the Site (Morecambe Bay Special Area of Conservation and Special Marine Protection Area and the Duddon Estuary Ramsar, Site of Special Scientific Interest and Special Marine Protection Area).

3.3 Operating Hours

The electrolysers operate for approximately 16 hours per day on average, at any time of day, Monday to Sunday. The Site's operating profile is temporally correlated with renewable electricity generation and therefore dictated by the weather.

3.4 Maintenance and Review of the NMP

The Site Manager is responsible for:

- ensuring that nuisances and hazards arising from the facility due to noise are minimised;
- ensuring that the NMP is maintained as up to date;
- ensuring people are trained in its requirements and application;
- maintaining records of noise complaints and overseeing associated investigations; and
- coordinating the undertaking of noise monitoring and acting on its results.

A copy of the plan is stored electronically, plus a paper copy is available on Site for staff, contractors, subcontractors and the Environment Agency to refer to.

The plan is reviewed once every three years or in response to changes, complaints or incidents.

Prior to engaging in work on the plant, employees, contractors and subcontractors are to be provided with training on noise minimisation and the requirements of this NMP as relevant to their duties. This training is delivered as part of BGH's site induction process by the staff member overseeing the induction.

3.5 Relevant Sector Guidance

Whilst at the time of writing specific BAT guidance for the production of Hydrogen via electrolysis has not been published by the EA, the following documents have been referenced as technical standards:

- EA – Hydrogen production by electrolysis of water: emerging techniques (March 2024);
- EA – Review of emerging techniques for hydrogen production from electrolysis of water (March 2024);
- EA - Noise and vibration management: environmental permits (January 2022);
- EA – Control and monitor your emissions for your environmental permit (December 2025);
- European Commission – Best available techniques reference document for common waste water and waste gas treatment / management systems in the chemical sector (2016);
- UK BAT Office – Best available techniques reference document for common waste gas management and treatment systems in the chemical sector (Formal Draft 2025);
- EA – How to comply with your environmental permit. additional guidance for: the inorganic chemicals sector – Sector Guidance Note S4.03 (March 2009);
- European Commission – Best available techniques reference document for Industrial Cooling Systems (2001); and

- European Commission – Best available techniques reference document for Energy Efficiency (2009).

4.0 RECEPTORS

Table 1 and Drawings 03A and 03B identify receptors which are considered to be Potentially sensitive and could reasonably be affected by noise from activities at the Site.

Table 1 Identified Receptors

Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary at closest point (in metres)
Human Receptors within 500m of the EP boundary as shown on Drawing 03A			
Houses on Bank Lane	Residential	Northwest	175m
Residential properties opposite Park Road	Residential area	Northeast, east & southeast	175m
Ormsgill Nursery and Primary School	Educational facilities	South-east	400m
Cultural and Ecological Receptors within 2km of the proposed EP boundary and International and European Designations within 10km of the proposed EP boundary as shown on Drawing 03B			
Morecambe Bay and Duddon Estuary	Special Protections Areas (Marine Components GB)	West	330m
Duddon Estuary SSSI	SSSI's (England)	West	330m
Duddon Estuary	Ramsar Sites (England)	West	330m
Morecambe Bay	Special Areas of Conservation	West, south, south-east	330m
North Walney	National Nature Reserve	West	390m
Barrow Municipal Cemetery	Registered Parks and Gardens	South-east	680m
Sandscale Haws	National Nature Reserve	North	1640m
Morecambe Bay	Ramsar Sites (England)	South	3300m

5.0 NOISE SOURCES AND PROCESSES

The core of the facility is six Plug Power EX-2125D units. Each unit comprises a Process Module and a Power Module as illustrated in Figure 1.

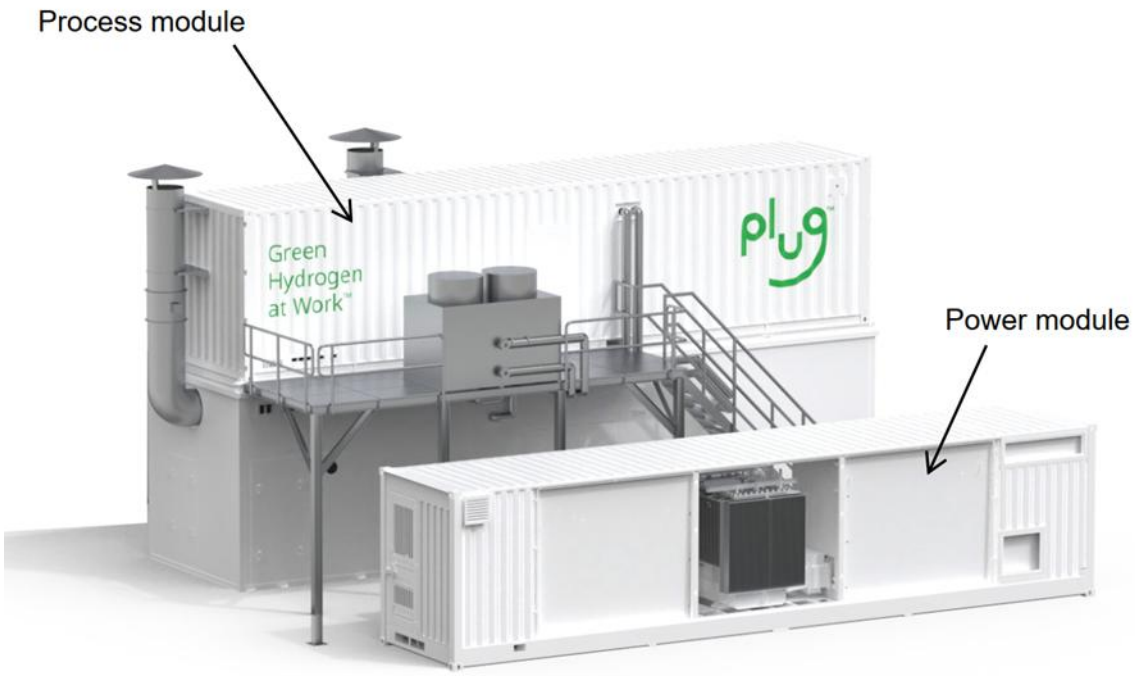


Figure 1 Plug Power EX-2125D Layout

The Process Module produces and purifies the hydrogen from water and low voltage direct current (DC) electricity supplied by the Power Module. The Process Module comprises two container units. A Process Unit underneath where the electrolysis stacks are located and a Utility Unit on top, containing for example water demineralisation equipment. For further information on the process, please refer to the main Environmental Permit application document[1].

The Site shall normally be unmanned with control and monitoring undertaken 24 hours a day from a Remote-Control Room (RCR). There will be a ground operations team to mobilise to the Site to provide support during emergency situations and for programmed maintenance, troubleshooting and surveillance activities.

The noise sources associated with each Unit are indicated in green in Figure 2.

The layout of the Site is illustrated on Drawing 02 Site Layout and Environmental Permit Boundary.

[1] SLR Consulting (2025). Barrow Green Hydrogen Plant - Environmental Permit Application. SLR ref. 416.066073.00001.

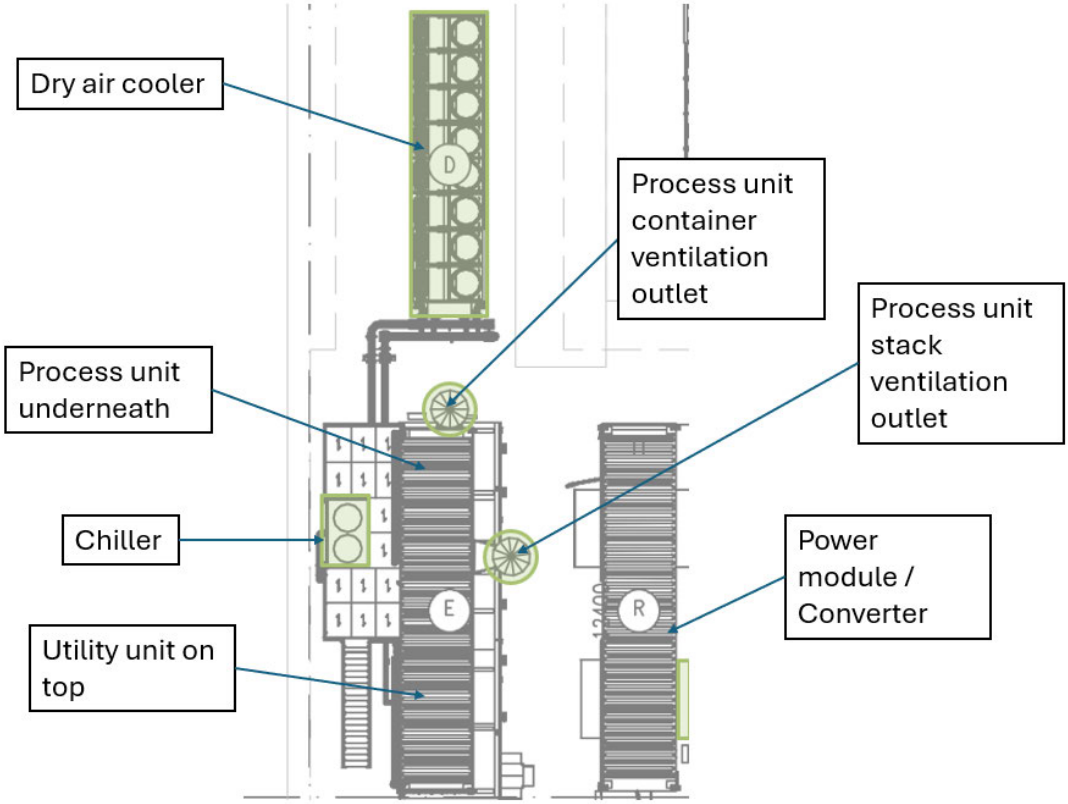


Figure 2 Noise Source Plan View Schematic per Unit

Table 2 lists process noise sources on Site.

Table 2 Noise Sources

Location	Source	X/Y	Height [m]	Sound Power Level [dB]	Mitigation
Unit 1	Chiller	319325.17, 472062.49	6.1	83	
	Process Unit Air Vent	319328.40, 472058.23	7.4	90	-4dB Acoustic Hood
	Process Unit Air Vent	319322.96, 472057.41	7.7	90	-4dB Acoustic Hood
	Converter	319316.90, 472053.09	1.5	83	
	Utility Unit Air Vent	319315.15, 472061.68	4.0	90	-4dB Acoustic Hood
	Air Coolers	319341.34, 472056.72	2.4	77	
Unit 2	Chiller	319329.63, 472080.15	6.1	83	
	Process Unit Air Vent	319333.02, 472075.79	7.4	90	-4dB Acoustic Hood
	Process Unit Air Vent	319327.63, 472075.02	7.7	90	-4dB Acoustic Hood
	Converter	319321.44, 472070.65	1.5	83	
	Utility Unit Air Vent	319320.31, 472079.31	4.0	90	-4dB Acoustic Hood
	Air Coolers	319346.34, 472074.14	2.4	77	
Unit 3	Chiller	319334.30, 472097.92	6.1	83	
	Process Unit Air Vent	319337.59, 472093.55	7.4	90	-4dB Acoustic Hood
	Process Unit Air Vent	319332.35, 472092.89	7.7	90	-4dB Acoustic Hood
	Converter	319325.99, 472088.57	1.5	83	
	Utility Unit Air Vent	319324.60, 472096.77	4.0	90	-4dB Acoustic Hood
	Air Coolers	319350.73, 472092.11	2.4	77	
Unit 4	Chiller	319356.13, 472075.89	6.1	83	
	Process Unit Air Vent	319353.05, 472080.31	7.4	90	-4dB Acoustic Hood
	Process Unit Air Vent	319358.33, 472080.87	7.7	90	-4dB Acoustic Hood
	Converter	319364.14, 472085.08	1.5	83	
	Utility Unit Air Vent	319366.03, 472076.53	4.0	90	-4dB Acoustic Hood
	Air Coolers	319339.88, 472081.40	2.4	77	
Unit 5	Chiller	319351.56, 472058.18	6.1	83	
	Process Unit Air Vent	319348.37, 472062.49	7.4	90	-4dB Acoustic Hood
	Process Unit Air Vent	319353.76, 472063.16	7.7	90	-4dB Acoustic Hood
	Converter	319359.93, 472067.51	1.5	83	
	Utility Unit Air Vent	319361.03, 472059.30	4.0	90	-4dB Acoustic Hood
	Air Coolers	319334.92, 472064.07	2.4	77	
Unit 6	Chiller	319346.99, 472040.46	6.1	83	
	Process Unit Air Vent	319343.80, 472044.83	7.4	90	-4dB Acoustic Hood
	Process Unit Air Vent	319349.19, 472045.65	7.7	90	-4dB Acoustic Hood
	Converter	319355.18, 472049.99	1.5	83	
	Utility Unit Air Vent	319357.22, 472041.52	4.0	90	-4dB Acoustic Hood
	Air Coolers	319330.95, 472046.21	2.4	77	
HV Transformer		319345.64, 472020.17	3.5	74	
LV Transformer		319327.46, 472029.64	3.5	63	

5.1 Noise Impact Assessment Conclusion

The results of the BS4142 assessment undertaken in support of the 2025 Environmental Permit Application[2] is presented in Table 3.

Table 3 BS4142 Assessment

Receptor	Receptor Name	Assessment Period	Predicted Specific Sound Level, dB $L_{Aeq,T}$[3]	Predicted Rating Level, dB $L_{Ar,Tr}$	Background Sound Level dB $L_{A90,T}$	Difference dB
R1	Houses on Bank Lane	Daytime	40	43	42	+1
		Night-Time	42	45	43	+2
R2	Dwellings on Long Croft	Daytime	39	42	51	-9
		Night-Time	41	44	46	-2
R3	Dwellings on Park Road	Daytime	38	41	51	-10
		Night-Time	40	43	46	-3

The NIA predicts that that the specific sound level will be equal to or less than the baseline background sound level. With appropriate measures implemented to prevent or where that it is not practicable to minimise noise impact, the rating level is below the background level at all but one nearby sensitive receptor. At the Properties on Bank Lane to the northwest of the site a +1dB difference during the day is predicted, and during the night a +2dB difference is predicted.

It should be noted that the results of the NIA are considered to be conservative. It is based on sound power levels provided by the equipment manufacturers which are at guaranteed levels or based on applicable standards, rather than measured sound power levels. They are therefore conservative. SLR considers that the sound power levels provided are high compared to our experience.

In addition, a +3dB character correction was applied on a precautionary basis. Without this character correction, the rating level would be below the background sound level at all receptor locations.

It is therefore proposed that noise monitoring as outlined in Section 6.3 is undertaken following commencement of operations to review the impacts.

A level difference between the rating level and the baseline background sound level of up to 5dB is, in accordance with BS4142, likely to be an indication of an adverse impact, depending on the context. A level difference between the rating level and the baseline background sound level of less than 0dB is indicative of a low or no impact.

5.2 Abnormal Situations

Abnormal conditions have the potential to lead to situations where noise impact is greater than predicted during normal operation conditions.

[2] SLR Consulting (2025). Barrow Green Hydrogen Plant – Noise Impact Assessment. . SLR ref. 416.066073.00001.

[3] See Table 7.1 of Report 410.HF03.00001 V3 Dated October 2022.

Table 4 considers abnormal situations and their potential to affect noise impact.

Table 4 Abnormal Situations Risk Assessment

Situation	Risk
Wind direction	Observed sound levels at Houses on Bank Lane could be greater if wind is blowing towards it from the direction of the Site.
Temperature	Plant could malfunction if operated outside of design temperatures
Breakdowns	Elevated levels of noise may escape from the site due to the breakdown of plant machinery, equipment or abatement systems. Machines not operating to the manufacturer's specification may create unacceptable levels of noise and the failure of control equipment such as damage to acoustic panels or acoustic barriers may allow unacceptable levels of noise to escape from the site.
Accidents	Elevated levels of noise may escape from the site due to accidents. Machines not operating to the manufacturer's specification may create unacceptable levels of noise and the failure of control equipment such as damage to acoustic panels or acoustic barriers may allow unacceptable levels of noise to escape from the site.

6.0 CONTROL MEASURES AND PROCESS MONITORING

The previous section described the noise sources and processes on site which could result in a risk of noise pollution. The purpose of this section is to demonstrate how BGH prevent or minimise the noise from activities on Site.

6.1 Appropriate Measures / Best Available Techniques

Table 5 below details action(s) BGH take to prevent and / or minimise this risk using appropriate measures and BAT. It takes into account the level of risk associated with each potentially noise emitting activity on the Site and the type of sensitive receptors in the surrounding area.

Table 5 Actions and Procedures to Achieve Appropriate Measures / Best Available Techniques (BAT)

Activity Which Produces Noise	Operational Hours / Days	Control Measures / Appropriate Measures	Contribution to Overall Impact	Action Taken if Outside Optimum Process Parameters
Noise emissions from equipment on site (e.g. motors, compressors, venting).	Average approximately 16 hours per day but up to 24 hours, 7 days a week.	The Site is located in a medium sensitivity setting with respect to noise. The surrounding landscape is comprised of commercial / industrial premises screened from the residential areas located approximately 110m to the east. The setting of the hydrogen plant within the plot has been located away from the most impacted noise sensitive receptor to the northeast (Houses on Bank Lane). While there will be noise generated by the facility by components such as air compressors, pumps, cooling fans, vents, and transformers during normal operation on a 24-hour basis and sources such as maintenance, pressure release valves in abnormal scenarios, it is not anticipated that emissions will be at a level likely to cause pollution or nuisance outside of the Site. BGH have sought to minimise emissions of noise as follows: • Housing of electrolysers within acoustic containers; • Minimising of start-up and shut down periods; • Use of silencers on oxygen vents; • Use of acoustic hoods on process unit and utility unit air vents; • Selection of low noise generating equipment; • Facility will be unmanned with low number of vehicle movements and deliveries; and • Maintaining and operation of equipment in accordance with manufacturer's specifications.	High	Investigate reasons for elevated sound levels. Implement remedial measure to reduce sound level.
Noise from traffic movements	Irregular and infrequent. Routine maintenance and	The Site is located in a medium sensitivity setting with respect to noise. The surrounding landscape is comprised of commercial / industrial premises screened from the residential areas located approximately 110m to the east.	Low	Investigate reasons for elevated sound levels.

Activity Which Produces Noise	Operational Hours / Days	Control Measures / Appropriate Measures	Contribution to Overall Impact	Action Taken if Outside Optimum Process Parameters
	deliveries undertaken in normal working hours 09:00 – 17:30 Monday to Friday. Responsive maintenance or emergency response may be required outside of these hours however.	The setting of the hydrogen plant within the plot has been located away from the most impacted noise sensitive receptor to the northeast (Houses on Bank Lane). Traffic movements associated with the proposed facility will be minimal. Hydrogen produced at the site will be transported from site in pipework, as such no traffic movements to site will be associated with offloading hydrogen. Traffic movements associated with the facility will be limited to maintenance, inspection, and deliveries. As such, noise emissions associated with traffic movements to the site are expected to be low. Despite this, the following management techniques will be in place to ensure noise emissions from vehicles movements are eliminated: • Vehicles will be required to adhere to a speed limit on site; and • Site surfaces will be kept in good repair to minimise noise associated with uneven roads.		Implement remedial measure to reduce sound level.
Maintenance activities	Routine maintenance and deliveries undertaken in normal working hours 09:00 – 17:30 Monday to Friday, excluding bank holidays. Responsive maintenance or emergency response may be required outside	Neighbours will be notified of planned maintenance that may include potentially noisy activities. Training will be provided to contractors prior to undertaking work on site on noise minimisation and the requirements of this NMP as relevant to their duties. Planned and routine maintenance activities will be scheduled to take place during normal working hours Monday to Friday, excluding bank holidays.	Low	Investigate reasons for unexpected sound levels. Implement remedial measures to reduce sound level.

Activity Which Produces Noise	Operational Hours / Days	Control Measures / Appropriate Measures	Contribution to Overall Impact	Action Taken if Outside Optimum Process Parameters
	of these hours however.			
Abnormal situations	Infrequent	Elevated levels of noise may be identified either by receipt of noise complaint from a third party suggesting that there is an excessive noise from the Site or by detection of noise as a result of the routine monitoring by site personnel. In the event of elevated levels of noise at receptor locations being detected, investigation and remedial action will be taken as per the complaint investigation procedure in Section 8 to prevent reoccurrence. In the event of a breakdown, the affected electrolyser unit(s) will be unable to operate and will therefore be shutdown preventing their contribution to sound levels.	Low	Investigate reasons for elevated sound levels. Implement remedial measure to reduce sound level.

6.2 On-Site Monitoring Procedures

Table 6 On Site Monitoring Procedures

Description of Procedure	Procedure	When will this be carried out?	Corrective action
Replacing old / faulty equipment	Procurement of new equipment	In accordance with manufacturer's recommendations or as soon as practicable in the event of a breakdown.	Replace equipment that have sound levels which are equivalent or lower sound levels compared to existing equipment.
Checking acoustic hoods	Visual inspection to ensure no damage or holes	Monthly	Replace or repair if damaged.

Description of Procedure	Procedure	When will this be carried out?	Corrective action
Weekly site walkover	Weekly site walkover to include assessment of unusual noises. Record inspection findings.	Weekly	Record observed noise. Investigate unusual noises and implement remedial measures to reduce sound level.

6.3 Monitoring Off-Site Sound Levels

Table 7 Monitoring Off-Site Sound Levels Procedure

Measurement location	Frequency of measurement	Minimum measurement duration	Measurement period	Operating conditions on site	Expected specific sound level
MP1 and MP2 as per Figure 3 to repeat locations in 2025 Noise Impact Assessment	Once within first 3 months of operation	96 hours unattended to cover weekday and weekend daytime and nighttime operation.	Approximately midday Friday to approximately midday on Monday	Normally operating with no planned downtime No unusual activities in the surrounding area such as construction.	As per Table 3 at receptors R1 to R3 Target less than 0dB difference or lower at R1 (House on Bank Lane)
Attended spot measurements of sound power levels on site as close to noise source locations in Table 2 as can be achieved safely	Once within first 3 months of operation	Attended spot measurements of sound power levels on site	Normally operating with no planned downtime	Normally operating with no planned downtime	As per Table 2



Figure 3 Noise Survey Receptors & Measurement Locations

6.3.1 Procedure to be Implemented if Measured Sound Levels are in Excess of Expected Levels

If the measured sound levels from monitoring to be undertaken as outlined in Tables 6 & 7 are greater than expected specific sound levels, an investigation is to be undertaken, led by the Site Manager, utilising competently qualified contractors to support.

The investigation procedure can be summarised as follows:

1. Check with monitoring contractor whether there were any issues with the monitoring such an anomalous results, quality assurance issues and equipment was properly calibrated.
2. Assess whether there was any unusual activities or equipment malfunctions undertaken on site that could have contributed to the observed sound levels.
3. Assess whether there were any unusual activities off site that could have contributed to the observed sound levels.

4. If there were any unusual activities or equipment malfunctions on site which were identified, remediate the issue and arrange a repeat monitoring exercise at earliest opportunity.
5. If there were any unusual activities off site that could have contributed to the observed sound levels, repeat monitoring exercise at earliest opportunity.
6. Repeat 1-5 until monitoring is undertaken in conditions representative of normal operating and background sound levels.
7. If results continue to exceed expected specific sound levels, action is to be taken as follows:
    - If any source sound power level is more than guaranteed levels or those associated with relevant standards, seek remedial action by equipment supplier / manufacturer including repair or replacement as necessary.
    - If source sound power levels are within guaranteed levels or those associated with relevant standards, rank contributions by source and consider and implement additional appropriate mitigation to reduce specific sound level, such as addition of acoustic screens or replacement with quieter equipment.
    - In the interim, the plant should be operated at a reduced capacity to bring down specific sound level to within expected levels or restrict operating hours until remedial action / additional mitigation can be implemented, if nearby sensitive receptors consider they are being impacted.
    - Following implementation of interim measures or permanent solutions, monitoring should be repeated to verify that expected specific sound levels are achieved. In the event they are not, follow investigation steps 1-7 until all appropriate measures are implemented to prevent or where that it is not practicable to minimise noise impacts.

7.0 ENGAGEMENT WITH NEIGHBOURS

Prior to commissioning of the facility and at regular intervals thereafter, the Site Manager is responsible for ensuring that:

- neighbours know how to contact the site if they think that noise is a problem;
- action is taken promptly to investigate and solve any problems;
- inform neighbours about planned and unavoidable noisy activities (for example maintenance activities); and
- work with neighbours to pinpoint a noise if its source is uncertain.

This could be achieved for example by means of communications / newsletters describing forthcoming activities on Site, website information, meeting with community leaders, open days or organised visits to the Site.

8.0 COMPLAINTS REPORTING

Members of the public can contact BGH via the following link:

Get in Touch | Barrow Green Hydrogen

If a complaint is received from a local resident, an investigation shall be instigated within one working day to identify the cause of the complaint, led by the Site Manager.

The Environment Agency (EA) should be notified immediately of receipt of the complaint via an email to the Site's designated Area Officer.

The Noise Complaint Form detailed in Appendix A should be filled in, either at the time of the complaint or by contacting the complainant to obtain additional information.

The Site Manager is responsible for investigating the complaint, keeping the complainant and EA up to date and implementing remedial action as necessary.

A complaint investigation may involve the identification and cessation of the activity or activities considered to be the cause of the complaint and/or the investigation of mitigation measures to reduce the noise emission levels from the activity or activities to expected sound levels. For example, this could include the replacement of noisy plant with quieter alternatives and/or implementing additional mitigation or abatement measures.

If it is not possible to identify the source of the complaint, it may be necessary to undertake a noise survey and investigation. If this is needed, a suitably qualified person should be employed to undertake the required survey work.

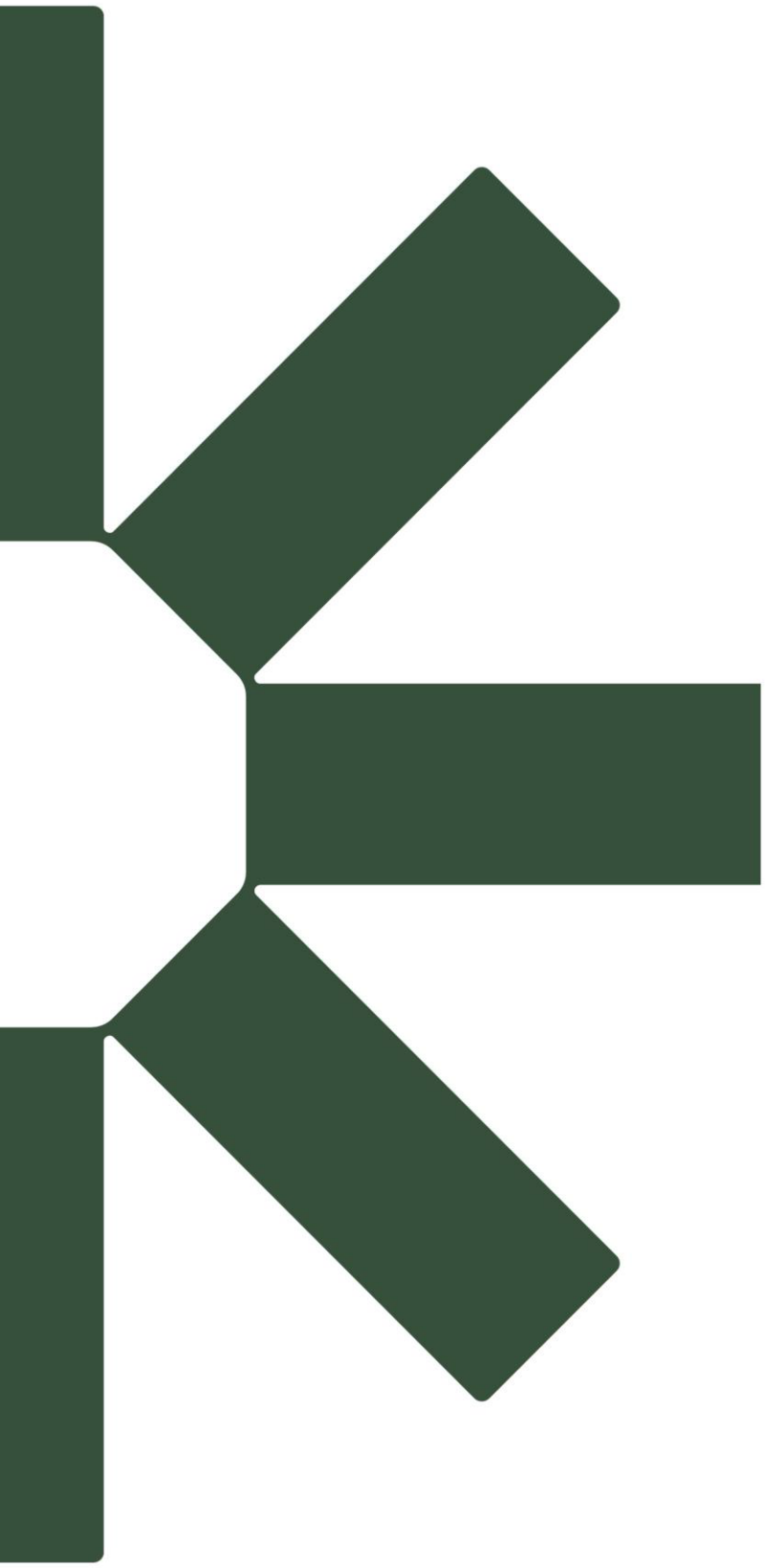
The complainant and EA should be updated within 1 week of instigating the investigation to report on the initial findings, using the notification form in Schedule 5 of the Site's Environmental Permit for this purpose. Where further investigation involving a noise survey is necessary, this should be scheduled to take place within 1 month of the initial investigation and the complainant and EA updated within 1 week of receipt of the monitoring results.

If remedial action is required this should be implemented as soon as practicable and noise reduction verified following implementation. The complainant and EA should be kept up to date at regular intervals during this process and following verification of the remedial works.

Feedback is to be sought from the complainant following implementation of remedial measures to consider their perception change.

Appendix A Noise Complaint Form

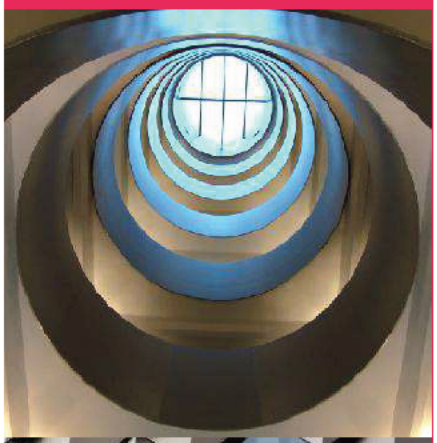
Item	Data input
Date recorded	
Complaint reference number	
Name and address of caller	
Telephone	
Location of caller in relation to site	
Time and date of complaint	
Date, time and duration of offending noise	
Callers description of noise	
Has the caller any other comments on noise?	
Weather conditions	
Wind strength and direction	
Any previous complaints relating to this noise?	
Any other relevant information?	
Potential sources that could give rise to the complaint	
Operating conditions at the time of the offending noise	
Follow up – date and time caller contacted	
Action taken	
Amendment requirement to NMP	
Form completed by (print)	Signed and date



Making Sustainability Happen

Appendix I Flood Risk Assessment

2022/0869









30MW Electrolyser

Flood Risk Assessment and Drainage Strategy

Curtins Ref: 082665-CUR-ZZ-XX-T-92001

Revision: P03

Issue Date: 01 December 2022

Client Name: Carlton Power Ltd

Client Address: Carlton House, 26 Ellerbeck Court, Stokesley, North Yorkshire, TS9 5PT

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2022/0869

Rev	Description	Issued by	Checked	Date
P01	Planning Submission	CJS	AJR	30/11/2022
P02	Client Comments Addressed	CJS	AJR	01/12/2022
P03	Client/LPA Comments Addressed – 50% climate change scenario included	GW	CS	18/01/2023

This report has been prepared for the sole benefit, use, and information for the client. The liability of Curtins Consulting Limited with respect to the information contained in the report will not extend to any third party.

Author	Signature	Date
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Reviewed	Signature	Date
Andy Roberts MEng (Hons) MICE Director	[redacted]	30/11/2022

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1.0 Introduction

1.1 Project Background

Curtins was instructed by Carlton Power to undertake a Flood Risk Assessment (FRA) for the development of a Hydrogen Plant on land at Meetings Industrial Estate, Barrow-in-Furness, Cumbria.

The report provides information on the nature of flood risk at the site and follows Government guidance with regards to development and flood risk and is based on currently available information.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Curtins shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins.

1.2 Scope of Assessment

The assessment has been undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Governments Planning Policy Guidance to the National Planning Policy Framework (NPPF).

The site area is approximately 2.18 hectares (ha) and confirms the full extent of the application site as indicated on drawing S3722-8310-0001 R3.0 by Fichtner Consulting Engineers Ltd. Site layout drawing is provided in Appendix A.

Following scrutiny of the Environment Agency (EA) flood zone maps it has been identified that the site lies within an area classified as Flood Zone 1 (FZ1) (Very Low Risk of flooding from Rivers and Sea) . Land having a less than 0.1% (1 in 1000) annual probability of river flooding; or Land having a less than 1 in 1000 or greater annual probability of sea flooding. (Shown as areas without shading on the Flood Map).

Though the site is in FZ1, the site area is greater than 1ha and therefore a FRA is required to accompany a planning application, in which all sources of potential flood risk, and taking into account the management of surface water run-off, should be considered. The FRA should also consider the impact of climate change both to and from development proposals.

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In July 2018, the Government made changes to the National Planning Policy Framework which made Sustainable Urban Drainage Systems (SuDS) a requirement for the determination of planning applications for 'major' developments.

SuDS will therefore be a requirement on this site as the site is considered to be 'major' development by the Town and Country Planning Order 2015 as total proposed development floor space is 1000m^2 or more or a site of 1ha or more.

A review of existing drainage infrastructure within the site and wider the area has confirmed that the site and wider area is well served by private drainage systems, with an existing attenuation pond and controlled surface water discharge to an adjacent unnamed culverted watercourse, which then flows into the Walney Channel. Foul water drainage assets within and adjacent to the site are also identified as private, with the nearest United Utilities (UU) public combined sewer located in the junction of Buccleuch Dock Road and Michaelson Road, approximately 200m northwest of the site.

The FRA will:

- Investigate all potential risks of flooding to the site,
- consider the impact the development may have elsewhere with regards to flooding,
- consider proposals to mitigate any potential risk of flooding determined to be present; and
- consider residual risks to the site.

The Drainage Strategy will:

- Review current and proposed means of surface water disposal;
- Determine peak runoff rates for the pre- and post-development case.

This assessment has referenced the following information:

- Developers' Site Layout Proposals
- Site Topographic Survey
- Barrow Council Level 1 Strategic Flood Risk Assessment (May 2015)
- Barrow Borough Local Plan 2016-2031 (Adopted June 2019)
- Environment Agency Flood Map for Planning
- Environment Agency Long Term Flood Map – Flood Risk from Surface Water
- National Planning Policy Guidance (NPPG) on Climate Change
- British Geological Survey (BGS) Geological Maps

1.3 Proposed Development

The proposals are to comprise:

- Construction of a Hydrogen Production facility;
- associated hard and soft landscaping to include HGV access and

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- the laying of a new H2 Pipeline within the A590 Park Road corridor.

The proposed site plan, drawing S3722-8310-0001 R6.0 by Fichtner Consulting Engineers Ltd, is provided in Appendix A.

2.0 Existing Site Appraisal

2.1 History and Current Use

The site is located within the Meeting Industrial Estate, and lies between the A590 to the east and the Furness Railway Line to the west. The nearest post code is LA14 4TL and the site is centred on National Grid Reference (NGR) 319350mE 472100mN.



Figure 2-1: Site Location Plan

Existing development within the site boundary comprises a concrete access road and parking areas; tarmac parking areas; gravel parking areas and rough ground comprising gravel, bare earth, scrub and dense vegetation. Located In the west of the site is a constructed pond, designed as an attenuation structure for surface water runoff management. The current condition reflects as-built prior enabling package of works for development of this land.

A review of historic mapping indicates no previous development has occurred on the site prior to the approved enabling works as indicated on plans provided in Appendix C.

2.2 Topography

A topographic survey of the main development site has been undertaken and is provided in Appendix B.

Figure 2-2 below shows the site and wider topographical relief and contours.

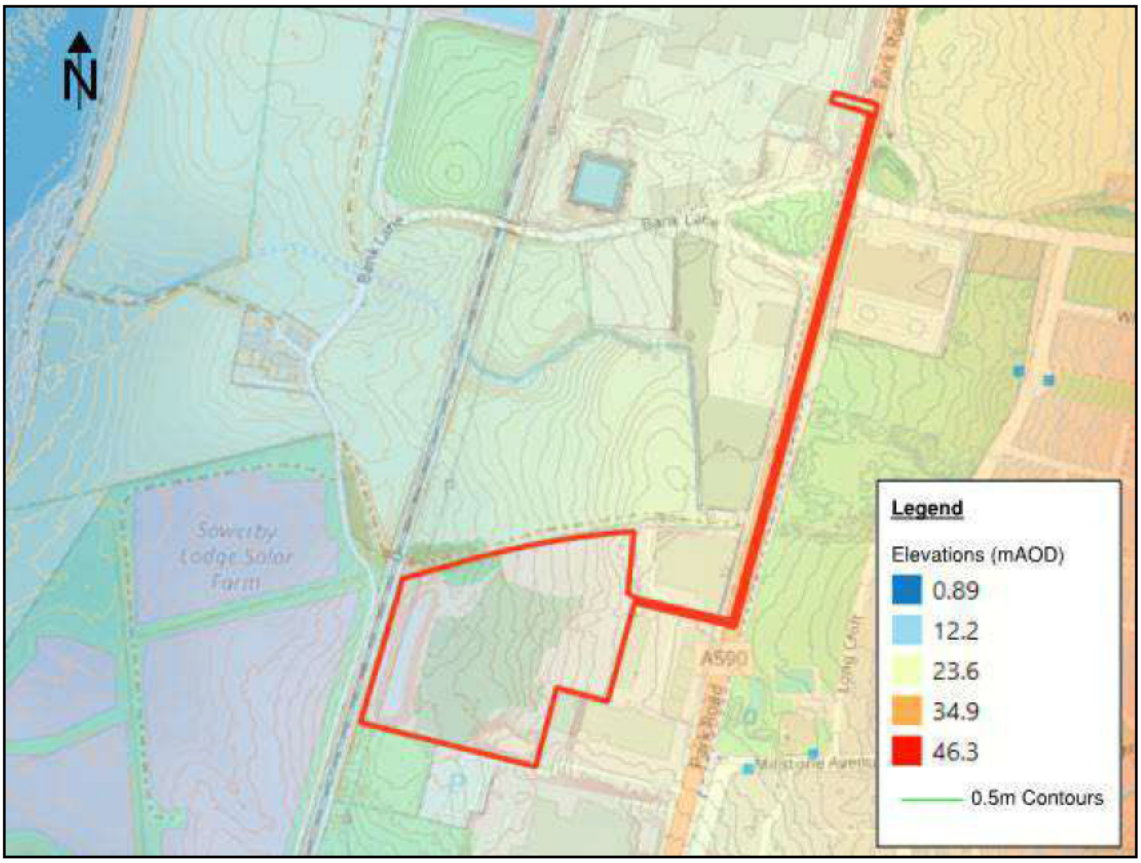


Figure 2-2: Site Topography

The application area lying within the A590, Park Road is generally level with elevation of the site is generally level, with the road undulating between 24.70mAOD and 25.70mAOD. The level at the site entrance off Park road lies at 25.65mAOD. From the site entrance to the main development area the access road falls from 25.65mAOD to 22.50mAOD over 77m, at an average gradient of 0.041m/m (1 in 24).

The main site area generally falls from east to west from 22.50mAOD to 16.0mAOD (eastern crest level of the attenuation pond) over a distance of 148m. This calculates to a gradient of 0.044m/m (1 in 23). West of the pond, the land continues to fall to the west, with the lowest level on site recorded as 13.76mAOD. at the northwest corner of the main site boundary.

2.3 Geology and Hydrogeology

The British Geological Survey (BGS) 1:50,000 mapping records (Bedrock and Superficial Editions) for Barrow-in-Furness (Sheet 058) (Ref. 2) indicates the following geological and hydrogeological succession underlying the site:

Table 2-1 – Geological/Hydrogeological Succession

	Geology	Associated Hydrogeological Classification
Made Ground	BGS records indicate no presence of Made Ground (Undivided) on site.	N/A
Superficial Deposits	Till, Devension - Diamicton[1]	Secondary Undifferentiated Aquifer[2]
Bedrock	St Bees Sandstone Member[3]	Principal Aquifer[4]

Notes:
1. *Unsorted and unstratified drift comprising a heterogenous mixture of clay, sand, gravel and boulders.*
2. *Assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.*
3. *The formation consists of red-brown, very fine- to medium-grained, commonly micaceous sandstones, generally cross bedded, some parallel lamination; mudstone clasts locally common, subordinate thin beds of greenish grey sandstone.*
4. *These are layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.*

2.4 Existing Waterbodies

No above ground watercourses have been identified within the proposal site.

The following waterbodies have been identified within the vicinity of the proposal site:

- An open drainage ditch lies outwith the northern bound or the main development area, flowing west. The ditch is then culverted prior to crossing beneath the railway line
- An open ditch lies 80m to the north of the main development area and 45m to the west of Park Road. The ditch flows north for approximately 125m before heading west to cross the railway line and outfall to the Walney Channel 340m northwest of the main site boundary
- The Walney Channel lies 340m to the west of the site.
- Morecambe Bay lies 2.5km to the west.

2.5 Existing Drainage

The A 590 Park Road is served by highway drainage owned and operated by the highways authority.

The site access is also served by positive surface water drainage systems which accepts surface water from existing development, discharging both to the north into the east-west flowing ditch located outwith the main site boundary and to the south.

In 2013, Curtins designed an enabling works scheme for the previous site owner to allow for the development of the current application site.

Drawings produced for construction, provided in Appendix C, indicate a positive surface water drainage system, serving the hardstanding areas within the site and also elements of paved and roof areas

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outwith the site boundary to the east. These are shown to discharge to the attenuation pond in the west of the site.

Discharge from the pond is to the off-site culvert which flows west beneath the railway line. Flow from the pond is controlled by a vortex/hydro brake or depth/flow relationship flow control. The Greenfield runoff rate for the site has been determined using the IH124 method. Results of this assessment confirm a QBAR rate of 7.7l/s (litres/second based on a site of 2.75ha positively drained area).

Pond/basin design/details and recent topographical survey show a volume in excess of 2100m^3. The pond/basin is complete with an overflow.

There is no foul drainage provision within the main site area. However, the previous enabling works indicate that two pumped mains were to be constructed which connect to an existing combined drain located within the existing adjacent development.

3.0 Development and Flood Risk

3.1 National Planning Policy

Paragraph 159 of the NPPF[1] states that: Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

Paragraph 167 of the NPPF states that: When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;
- it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- any residual risk can be safely managed; and
- safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

3.2 Local Planning Policy and Guidance

The Barrow Borough Local Plan 2016-2031[2], adopted in June 2019, sets out the overall strategic direction for planning by providing policies to guide decisions on planning applications over the period to 2031, be they allocated sites or not.

The Local Plan contains a set of development management policies for the local planning authority area of Barrow-in-Furness. When a planning application is submitted, the Council uses development management policies (planning policies) alongside other policies in the Development Plan to help it assess whether or not the application should be granted planning permission.

The relevant policies in respect to development and flood risk are identified as ***Policy C1: Flood Risk and Erosion*** and ***Policy C3a: Water Management***.

[1] National Planning Policy Framework, Ministry of Housing, Communities and Local Government, July 2021
[2] https://www.barrowbc.gov.uk/residents/planning/planning-policy/local-plan/

The Policies are set out below:

Policy C1: Flood Risk and Erosion

The Council will support natural defence measures to protect against all sources of flooding, including coastal, fluvial and surface water flooding and erosion in the Borough. However, where the implementation of natural defences is not feasible or viable, the Council will support new hard defence structures. All new defence measures will be expected to meet the following criteria:

a) Measures are designed and incorporated to enhance biodiversity and be compliant with the Water Framework Directive;

b) There will be no unacceptable harm to natural coastal processes, geodiversity and the historic environment;

c) Opportunities are maximised to enhance the England Coast Path or other public rights of way, where the defences are situated on or adjacent to such a public right of way;

d) The open character of the undeveloped coast is maintained, with the existing landscape character of the site respected and reinforced; and

e) The proposal complies with the relevant policies in the Development Plan.

Developments proposed next to watercourses should be compliant with the Water Framework Directive and cause no deterioration in water body status but where possible look to improve the status to 'good'. Development will not unacceptably encroach on or restrict access to a watercourse.

Culverted watercourses should be restored to open channels to restore a more natural river environment unless there is an overriding reason not to do so, and no water course should be culverted unless there is an overriding need to do so.

Vegetated buffer strips between watercourses and development will be required to protect and enhance habitat value and water quality, while ensuring access for flood defence purposes is retained. The width of the buffer will be dependent upon a number of factors, including the type of development proposed and the findings of any ecological surveys accompanying the application.

Measures should be implemented that deter future development, including domestic gardens, extending into the buffer.

Policy C3a: Water management

All new development will minimise its impacts on the environment through the following measures:

a) New development will achieve the minimum standards for water efficiency, as defined by Building Regulations (Approved Document G). By the installation of fittings and fixed appliances, water recycling or other appropriate measures for the prevention of undue consumption of water and which recycle and conserve water resources.

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b) New development will be required to prioritise the use of sustainable drainage systems (SUDS) and ensure there is no increase in flood risk from surface water. Drainage systems should be of a high design standard and will benefit biodiversity and contribute to improved water quality. Developers will be expected to submit a Drainage Strategy that shows how foul and surface water will be effectively managed. Surface water should be discharged in the following order of priority:

i. An adequate soakaway or some other form of infiltration system.

ii. An attenuated discharge to a surface water body such as a watercourse.

iii. An attenuated discharge to public surface water sewer, highway drain or

another drainage system.

iv. An attenuated discharge to public combined sewer.

Applicants wishing to discharge to public sewer will need to submit clear evidence demonstrating why alternative options are not available.

c) Approved development proposals will be expected to be supplemented by appropriate maintenance and management regimes for surface water drainage schemes.

d) On large sites, applicants should ensure that the drainage proposals are part of a wider, holistic strategy, which coordinates the approach to drainage between phases, between developers/landowners and over a number of years of construction.

e) On greenfield sites, applicants will be expected to demonstrate that the current natural discharge from a site is at least mimicked.

f) On previously developed land, applicants should target a reduction of surface water discharge in accordance with the non-statutory technical standards for sustainable drainage produced by DEFRA. In demonstrating a reduction, applicants should include clear evidence of existing positive connections from the site with associated calculations on rates of discharge.

g) Landscaping proposals should consider what contribution the landscaping of a site can make to reducing surface water discharge. This can include hard and soft landscaping such as permeable surfaces.

h) The treatment and processing of surface water is not a sustainable solution. Surface water should be managed at source and not transferred. Every option should be investigated before discharging surface water into a public sewerage network. A discharge to groundwater or watercourse may require the consent of the Environment Agency or Cumbria County Council as Lead Local Flood Authority.

The retrofitting of SuDS in locations that generate surface water run-off will be supported, subject to the criteria above.

3.3 Site Specific NPPF Flood Risk Categorisation

To assess the NPPF flood risk classification for the site, the first step is to inspect both the EA web-based flood mapping data for flooding from rivers and sea and the Local Planning Authority SFRA (where available) and surface water and reservoirs. The rivers and sea flood map is used to inform planning of a sites Flood Zone(s) however, the surface water and reservoir flood maps should also be used to identify other flood risks.

From the Environment Agency flooding from rivers and seas map, presented later, it can be seen that the site is classified as Flood Zone 1 (FZ1) (Very Low Risk of flooding from Rivers and Sea); Land having a less than 0.1% (1 in 1000) annual probability of river or sea flooding.

For the purpose of this assessment, the site is classified as being in FZ1.

3.4 Site Specific Flood Zone Compatibility

The proposals for the development site fall within the following categories:

- 'Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood.'

This type of development is classed as 'Essential Infrastructure' in the Flood Risk Vulnerability Classification with reference to NPPF Planning Practice Guidance (PPG) Table 2[3].

The site is located within Flood Zone 1, for which 'Essential Infrastructure' development is deemed to be appropriate. Refer to Table 3[4] for the Flood Zone compatibility table taken from the NPPF PPG, presented below.

[3] https://www.gov.uk/guidance/flood-risk-and-coastal-change#Table-2-Flood-Risk-Vulnerability-Classification
[4]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/575184/Table_3_-_Flood_risk_vulnerability_and_flood_zone__compatibility_.pdf

Table 3-1: NPPF Flood Risk Vulnerability Classification (reproduced from Table 3[8])

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	×	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	×	×	×	✓*

Key:

✓ Development is appropriate

× Development should not be permitted

Notes

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

It is anticipated that the lifespan of the development will be 60 years (as general industry). If planning approved in 2022, the "lifetime" will be to 2082.

4.0 Assessment of Flood Risk

4.1 Sources of Flood Risk

This section assesses the risk from different types of flooding to the development and the risk of flooding from the development, taking into consideration climate change, as well as how flood risks should be managed. The approach to assessing flood risk at the development site was informed by the requirements of NPPF in conjunction with the client and Environment Agency requirements.

4.2 Fluvial and Tidal Flood Risk

From the Environment Agency flooding from rivers and seas map:

- Zone 1 Very Low Probability: Land having a less than 0.1% (1 in 1,000) annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
- Zone 2 Low Probability: Land having between a 1% (1 in 100) and 0.1% (1 in 1,000) annual probability of river flooding; or land having between a 0.5% (1 in 200) and 0.1% (1 in 1,000) annual probability of sea flooding. (Land shown in light blue on the Flood Map).
- Zone 3a Medium Probability: Land having between a 3.3% (1 in 30) and 1% (1 in 100) or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding (Land shown in dark blue on the Flood Map).
- Zone 3b High Probability (Functional Floodplain): This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map). Notionally, Flood Zone 3b indicates there is a chance of flooding of greater than 1 in 30 (3.3%).

The flood map also contains the following information:

- Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some natural or constructed entities which retain, store or channel water and which may protect against smaller floods.
- Areas benefiting from flood defences – areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

The current flood risk from both fluvial and tidal sources is shown in Figure 4-1 below. The site is in Flood Zone 1 and is therefore considered to be at **Very Low Risk** of flooding.



Figure 4-1: Environment Agency Flood Map for Planning (Rivers and Sea)

4.3 Surface Water Flooding to the site

Surface water flooding can be caused when rainwater during extreme rainfall events does not drain away through the normal drainage system or soak into the ground with flooding occurring, principally from manholes and gullies. Surcharging sewers can result in overland flows which if originating at a higher elevation than a development site can potentially pose a flood risk.

From the UK Government's Risk of Flooding from Surface Water (RoFSW, (extent of flooding) map, level of surface water flood risk is expressed as;

- Very low risk – meaning that that each year this area has a chance of flooding of less than 0.1%.
- Low risk – meaning that each year this area has a chance of flooding of between 0.1% and 1%.
- Medium risk means that each year this area has a chance of flooding of between 1% and 3.3%
- High risk means that each year this area has a chance of flooding of greater than 3.3%.

The predicted extent and depth of flooding to the site from surface water is indicated in Figure 4-2



Figure 4-2: Risk of Flooding from Surface Water – Extent and Depth of Flooding

The RoFSW mapping generally indicates overland surface water flows from east to west, with a small element of ponding occurring as discreet unconnected areas.

At the northern extent of the application boundary, flood risk is only apparent during the low risk rainfall event, and to a depth of below 300mm. The mapped extents suggest that flow is around buildings and finds it way into the stream network and into the Walney Channel.

Further south, shallow depth flooding, less than 300mm is indicated across the A590 Park Road for both the medium and low risk rainfall events. As with the northern extent, overland flows are indicated to flow east to west and towards the Walney Channel.

No surface water flooding from the A590 Park Road is shown to flow into the access road to the main site development area.

Within the main development area, the risk of flooding from surface water is indicated to be present for high, medium and low risk events. However, this is limited to a small area of low lying ground to the

northwest of the attenuation pond, potentially to a depth of 900mm. The flooding extent encroaches into the pond and therefore will discharge through the outflow control which includes an overflow structure.

There is also a shallow overland flow path established during the low risk event, to the attenuation pond. Similarly, this will drain through the flow controls.

4.4 Surface Water Flooding from the site

Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. The proposed surface water drainage directly relating to the development proposals shall, wherever possible, utilize existing site drainage infrastructure.

New development has the potential to increase flood risk where any increase in impermeable areas results in additional run-off from proposed roads, car parks and building roofs being discharged freely into the downstream drainage network.

Mitigation measures to ensure the risk remains low are proposed in Section 5 and an assessment of the proposed surface water flows is carried out within the accompanying drainage strategy for the site.

4.5 Reservoir Flooding

Reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly, and essential safety work is carried out.

The Flood Warning Information Service Long Term Flood Risk from Reservoirs map indicates the site is not at risk from reservoirs in either the local or wider vicinity of the site.

4.6 Groundwater Flooding

The British Geological Survey (BGS) shows the geology bedrock underlying the site to comprise Sandstone. The superficial deposits are Till.

There are both Principal and Secondary Aquifers within the bedrock (Sandstone) These are rock layers with capacity for water storage.

SFRA[5] indicates there a no known significant groundwater flooding issues within the proximity of the site.

It therefore unlikely groundwater poses a risk at surface, and hence **Low**. However, to ensure that the risk remains very low, mitigation measures are proposed in section 5.

[5] CAPITA, Barrow Borough Council Strategic Flood Risk Assessment – Rev4, May 2015

4.7 Public Sewers, Highway Drainage Flooding and Infrastructure Failure

The site and immediate surrounding area is served by private drainage.

There is no anecdotal evidence of historic flooding or information contained within the SFRA to indicate flooding within the vicinity of the site. Hence the risk of flooding is **Low.**

On-site surface water drainage is expected to continue to discharge in the same manner as at present. In that sense, the redeveloped site will not increase surface water runoff from the site.

It is probable that foul water drainage will require a pumped solution to enable foul water to be connected to the existing off-site drainage.

4.8 Historical Flooding

There are no historical incidents of flooding to the site.

4.9 Summary of Flood Risk

From the evidence collated, the main types of flooding that may apply to the proposed development site are as follows:

- Fluvial flooding to the site – **NONE**
- Tidal flooding to the site – **NONE**
- Surface water flooding to the site – **LOW**
- Surface water flooding from the site – **LOW**
- Reservoir flooding to the site – **NONE**
- Groundwater flooding to the site – **LOW**
- Public Sewers and Drainage flooding to the site –**LOW**
- Historic Flooding – **NONE**

5.0 Flood Risk Mitigation

5.1 Fluvial/Tidal Flood Mitigation

The development site lies entirely within Flood Zone 1 and therefore is at no risk of fluvial and tidal flooding. No specific measures are required at this location to mitigate against fluvial and tidal flooding.

5.2 Surface Water Flooding to the site Mitigation

The UK Government RoFSW maps indicate that there are localised areas of high - low risk of surface water flooding, predominantly within the section of A590 Park Road. However, the road is well served by highway gulleys and a positive highway drainage system exists. No further mitigation is considered necessary.

The other area shown to be at risk is a low lying area to the north of the existing attenuation pond. The topographic survey of the site confirms that an element of ground levels fall towards the attenuation pond and therefore surface water flooding shown in the EA maps will flow into the basin. In this respect, no further mitigation is considered necessary.

Where the shallow overland flow route is identified, on-site landscaping and drainage should be designed to ensure formal direction of flows are to the pond structure.

Providing the above measures are implemented the flooding risk to the development site from surface water is therefore considered low post development.

5.3 Surface Water Flooding from the site Mitigation

Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated from up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments & services.

Guidance on the impacts of climate change on flood risk is provided on the GOV.UK website page 'Flood risk assessment: climate change allowances. This was initially published on the 19th February 2016 and was last updated on 27th May 2022.

The guidance covers the impacts on peak river flow, peak rainfall intensity, sea level rise, offshore wind speed and extreme wave height.

The development lifetime of 60 years and assumed planning approval date of 2022/2023 would mean that climate change has to be considered up to the 2080's epoch.

In respect to rainfall, the site lies in the South West Lakes Management Catchment. The Environment Agency published climate change allowances[6] for peak rainfall intensities which should be applied to new developments. Figure 5-1 below demonstrates the climate change allowances with central and upper end allowances being considered for this catchment.

South West Lakes Management Catchment peak rainfall allowances

3.3% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	25%	40%
2070s	35%	45%

1% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	30%	45%
2070s	35%	50%

*Use '2050s' for development with a lifetime up 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.

Figure 5-1: Environment Agency Climate Change Allowance (Peak Rainfall)

The design life of the development is 60 years, which puts it in the 2080s epoch.

The EA's current guidance is for developments other than residential development with a lifetime between 2061 and 2100 use the central allowance for the 2070s epoch (2061 to 2125).

Climate change uplifts in peak rainfall must be considered for both the 1% (1 in 100-yr) and 3.3% (1 in 30-yr) annual exceedance probability events.

[6] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

To minimise localised flooding within the site, the drainage design should ensure that gullies, drainage channels and drains are all suitably sized to accommodate peak storm flows from the critical duration 100-yr plus climate change event and the volume from the 100-yr plus climate change 6hr storm duration rainfall event. Also, all inlet features should have suitably sized sumps to catch silts and should be subject to a documented routine maintenance and cleansing regime.

The surface water should be constrained within the site and this could be attained by enhanced landscaping features where suitable and attenuation where appropriate.

Flood water exceedance routes should be identified, both on and off site as detailed design progresses.

For any sustainable drainage systems employed in the development, an appropriate management and maintenance plan for the sustainable drainage system for the lifetime of the development should be submitted prior to occupation which should include:

- Any arrangements for adoption by an appropriate public body or statutory undertaker, management and maintenance by the site owner, occupiers or appointed management company
- Arrangements concerning appropriate funding mechanisms for its on-going maintenance of all elements of the sustainable drainage system (i.e. inspections, regular maintenance)
- Means of access for maintenance and easements where applicable

Assuming that the proposed drainage system is designed to provide adequate capacity, and that the system will be correctly maintained, it can be assumed risk of flood from blockage or overloading is minimal.

The final design of the surface water drainage system shall be in accordance with the legislation set by Barrow Council and Cumbria County Council.

5.4 Reservoir Flooding Mitigation

There are reservoirs within the wider vicinity of the site. The EA Flood Risk from Reservoir map indicates the site is not at risk from this source. No specific measures are required at this location to mitigate against reservoir flooding

5.5 Groundwater Flood Mitigation

Groundwater flooding tends to be more persistent than other sources of flooding, typically lasting for weeks or months rather than hours or days. Groundwater flooding does not generally pose a significant risk to life due to the slow rate at which the water level rises; however, it can cause significant risk to property.

The site is considered at low risk of groundwater flooding from both the SFRA evidence base and Phase 2 Geoenvironmental Survey site records which recorded no groundwater strikes across the site.

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External ground levels across the site should fall away from the proposed buildings and ensure that the creation of low points are avoided (other than those used intentionally for drainage features) in order that in the unlikely event of groundwater flooding, the flood water is safely routed away from the buildings on site.

Providing the above mitigation measures are imposed, the risk from groundwater flooding would be considered low post development.

6.0 Surface Water Drainage Strategy

6.1 Assessment of Pre and Post Development Site Runoff

Pre-development Site Runoff (original site condition)

Prior to any development, i.e. prior to the Gyrodata enabling works, the site was considered to discharge surface water at greenfield rate. The development land was formerly glassed as agricultural. As such could be historically considered 'greenfield' and likely to discharge surface water at greenfield rate.

The Greenfield runoff rate for the site has been determined using the IH124 method. Results of this assessment confirm a QBAR rate of 7.7l/s (litres/second based on a site of 2.75ha positively drained area).

Previous Enabling Package Site Runoff (Gyrodata)

The Gyrodata enabling works package was subsequently developed on this basis. Following a review of the enabling package construction issue information, provided in Appendix C, and the recent topographical site survey undertaken (confirming built elements) the following seems notable:

- 7.7l/s discharge restriction to an offsite unnamed watercourse (ordinary watercourse) north west of the site.
- Discharge restriction provided by means of a vortex flow control or depth/flow relationship flow control.
- Pond/basin design/details show a volume in excess of 2100m^3. The pond as drawn has a top water line plan area of 2110m^2 (as can be scaled off the drawing), the permanent waterline plan area of 757m2 with a level difference of 1.5m. Thus a 0.75m plan area of c.1405 x 1.5m gives 2107.5m3 conservatively. (Check calc 2110+757 / 2 = 1433.5m^2 * 1.5 = 2150.25m^3)
- On the basis of a site impermeable area of 2.2ha, as indicated on the Gyrodata construction information, the 1 in 100 year plus critical event an attenuation requirement in excess of 2100m^3 was required/constructed. Note topographical survey shows very similar pond/basin plan area, depth and therefore volume.
- Road/parking areas utilise a separate drainage network from clean roof water – petrol interceptor required/constructed (as evidenced on the topographical surveys which shows a number of close proximity lids east of the pond/basin; assumed interceptor layout).
- Overflow set such as the basin provides 2100m^3 of storage. Extreme rainfall events would trigger the use of the overflow mechanism beyond the enabling package allowance.
- In the absence of formal volumetric simulation calculations for the enabling package design a UkSuDs output was produced which verified a requirement for c.2100m^3 (as per the enabling package design criteria), see Appendix D.
- All existing information subject to full drainage/CCTV survey to verify built elements.

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Post Development Site Runoff

The proposed development offers much less impermeable areas, c.1.55ha or c.70% of the enabling works package estimates and likely constructed allowances.

Following a review of the UK SuDS 'Surface Water Storage Requirements for Site' tool, a much reduced attenuation volume, c.1456m^3 is required, including a conservative allowance of 50% for climate change and 10% urban creep/ impermeable area expansion allowance. As discussed in section 5.3, current guidance on climate change uplift for rainfall is 35% for commercial / industrial development.

The as-built enabling package as constructed pond offers volumes in excess of this requirement and as such is considered to be suitable based on current site proposal.

Water quality treatment is provided by petrol interception via the constructed enabling package elements. Should this prove insufficient further downstream silt/petrol additional interception can be provided via proprietary products, suitably located upstream of any additional outfalls to the existing pond/basin.

Copies of the Predevelopment greenfield rates assessment, enabling package site runoff and post development site runoff information is supplied in Appendix D.

7.0 Conclusions and Recommendations

In consideration of the proposed Flood Risk Assessment and Drainage Strategy for the site the following conclusions and recommendations are made:

- Fluvial flooding to the site – **NONE**
- Tidal flooding to the site – **NONE**
- Surface water flooding to the site – **LOW**
- Surface water flooding from the site – **LOW**
- Reservoir flooding to the site – **NONE**
- Groundwater flooding to the site – **LOW**
- Public Sewers and Drainage flooding to the site –**LOW**
- Historic Flooding – **NONE**

In respect to flood risk, the following recommendations are made:

- Proposed external ground levels across the site should fall away from proposed buildings and key infrastructure in a manner which does not create low points where water might collect unintentionally.

In respect to surface water management, the following conclusions are made:

- The site is currently served by surface water drainage systems that:
  - in the case of the A590 Park Road discharge to the existing highway and the development proposals within the public highway will have a neutral impact on the existing arrangements.
  - In the case of the main development area, this drains to the existing on-site attenuation pond to be discharged at a controlled rate the adjacent ditch.
- The Greenfield Runoff Rate, QBAR, has been determined as 7.7l/s. This has been shown to match with the rate stated on the Enabling Works Construction Drawings. It is therefore concluded that 7.7l/s is an appropriate discharge rate for the site.
- Pond/basin design/details show a volume in excess of 2100m^3. The pond as drawn has a top water line plan area of 2110m^2 (as can be scaled off the drawing), the permanent waterline plan area of 757m2 with a level difference of 1.5m. Thus a 0.75m plan area of c.1405 x 1.5m gives 2107.5m3 conservatively. (Check calc 2110+757 / 2 = 1433.5m^2 * 1.5 = 2150.25m^3)
- The proposed impermeable areas resulting from the current development proposals have been determined to be 30% less than those resulting from previous proposals and from which the current attenuation pond and outflow controls were designed and constructed.

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- In respect to dealing with current climate change uplifts, a conservative value of 40% has been used in the attenuation volume assessment and it is concluded that the attenuation pond has sufficient storage capacity to attenuate runoff from current proposals.
- Following a review of the UK SuDS 'Surface Water Storage Requirements for Site' tool, a much reduced attenuation volume, c.1456m^3 is required, including a conservative allowance of 50% for climate change and 10% urban creep/ impermeable area expansion allowance.
- It is therefore recommended that the existing Greenfield QBAR is retained for the current development and the attenuation pond is retained in its current form.

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8.0 Appendices

Appendix A **Site Location Plan**

Appendix B **Topographic Survey**

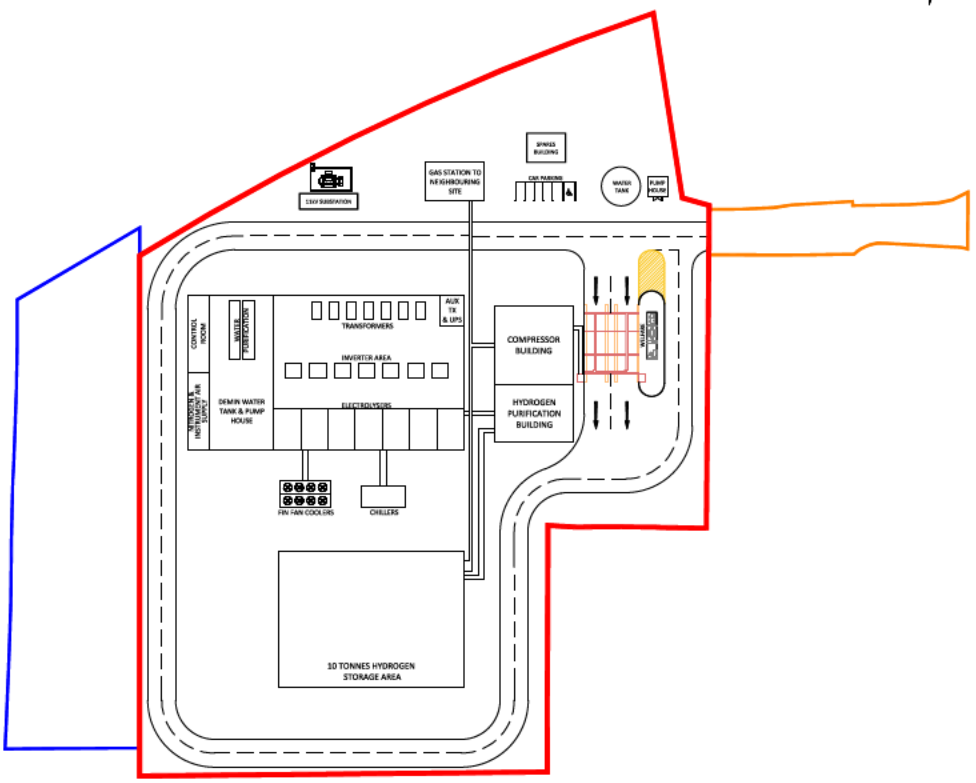
Appendix C **Existing Drainage Record**

Appendix D **Surface Water Runoff Estimation**

2022/0869

Appendix A Site Location Plan

2022/0869





ALL INFORMATION ON THIS DRAWING IS INDICATIVE ONLY, AND MAY BE SUBJECT TO FURTHER DESIGN DEVELOPMENT.

DO NOT SCALE

NOTES:

REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE
R3.0	PRELIMINARY	EMC	DTW	NT	25.08.22
R2.0	PRELIMINARY	EMC	DTW	NT	24.08.22
R1.0	PRELIMINARY	DTW	EMC	NT	18.08.22

FICHTNER
CONSULTING ENGINEERS LIMITED

Kingsgate, Wellington Road North,
Stockport, Cheshire, SK4 1LW, UK
Tel: 0161 476 0032
Website: www.fichtner.co.uk

CLIENT: CARLTON POWER

SITE: BARROW

PROJECT: 35MW ELECTROLYSER

TITLE: 35MW ELECTROLYSER LAYOUT

DRAWING STATUS:	PRELIMINARY	
DRAWN BY:	AO1	DATE: 26.07.22
CHECKED BY:	DTW	DATE: 26.07.22
APPROVED BY:	NT	DATE: 26.07.22
FILENAME:	S3722-8310-0001AO1 ELECTROLYSER LAYOUT R3.0	
OFFICE OF ISSUE:	STOCKPORT	
SHEET SIZE:	A3	SCALE: 1:1000

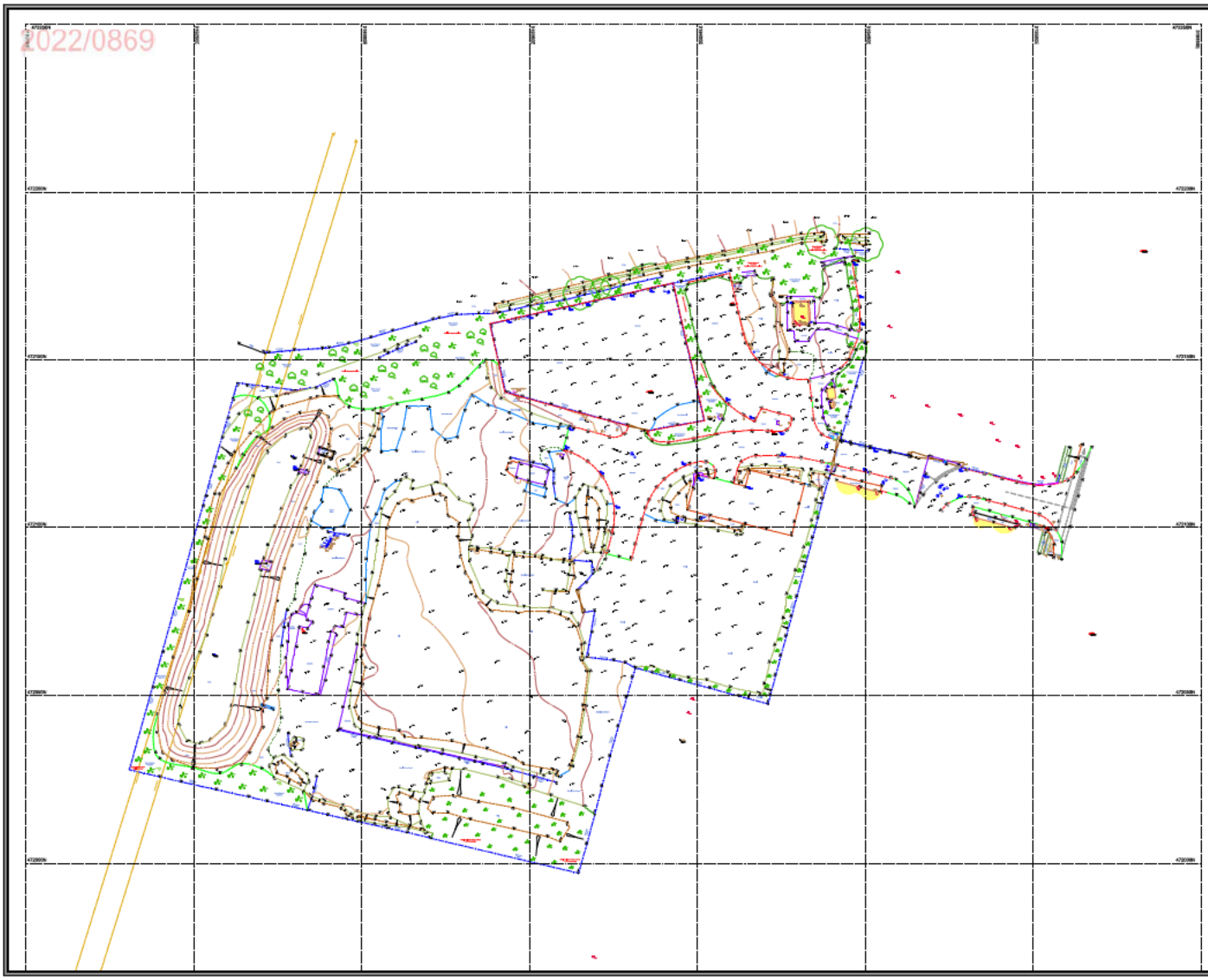
DRAWING No.: S3722-8310-0001 Sheet 1 Of 2

REVISION: R3.0

2022/0869

Appendix B Topographic Survey

2022/0869



N

Station Information:

Station	Easting (m)	Northing (m)	Level (m)
GH1	319353.080	472696.674	35.779
GH2	319423.137	472709.872	37.969
GH4	319382.355	472656.891	17.204
GH10	319351.069	472760.371	39.797
GH11	319316.769	472696.275	35.047
GH28	319411.764	472709.641	39.909
GH30	319385.060	472745.417	18.265

OS Note:

Some services may have been omitted due to negligence.
The Ordnance Survey tile is to be used as a guide only.

OS Buildings | Surveyed Buildings

This survey has been orientated to the Ordnance Survey National Grid (OSGB36) via Global Navigational Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15/OSGM15 geoid model within LEICA Geo Office.
The survey has been controlled to the point and a further one or more OSGB36 (TS) points established to create a true O.S. bearing for angle distribution.

No scale factor has been applied to the survey therefore the ground distances shown are ground & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the exact O.S and datum.

Legend:



Rev	Date	Description	Drawn	Checked

greenhatch group

Topographical Surveys
Measured Building Surveys
Utility / CCTV Surveys
Laser Scanning
Sand & Silt Analysis

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Belfast (Head Office) | Dublin | London

CLIENT
Carbon Power Limited

PROJECT
Meeting Industrial Estate
Barrow-in-Furness
Cumbria, LA14 4TL

TITLE
Topographical Survey

SCALE	DATE
A1@ 1: 500	30.09.22
DRAWN	QUALITY VER
JC	GH14848
Level datum	See notes
Grid orientation	See notes
Job number	45364
Drawing No.	Rev.
45364_T	0

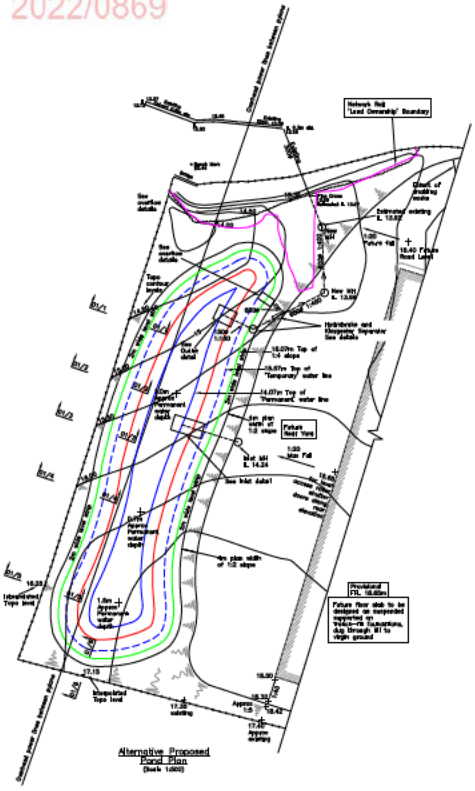
This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility when it is supplied to any party other than the original client.
All dimensions should be checked on site prior to design and construction.
Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Issued

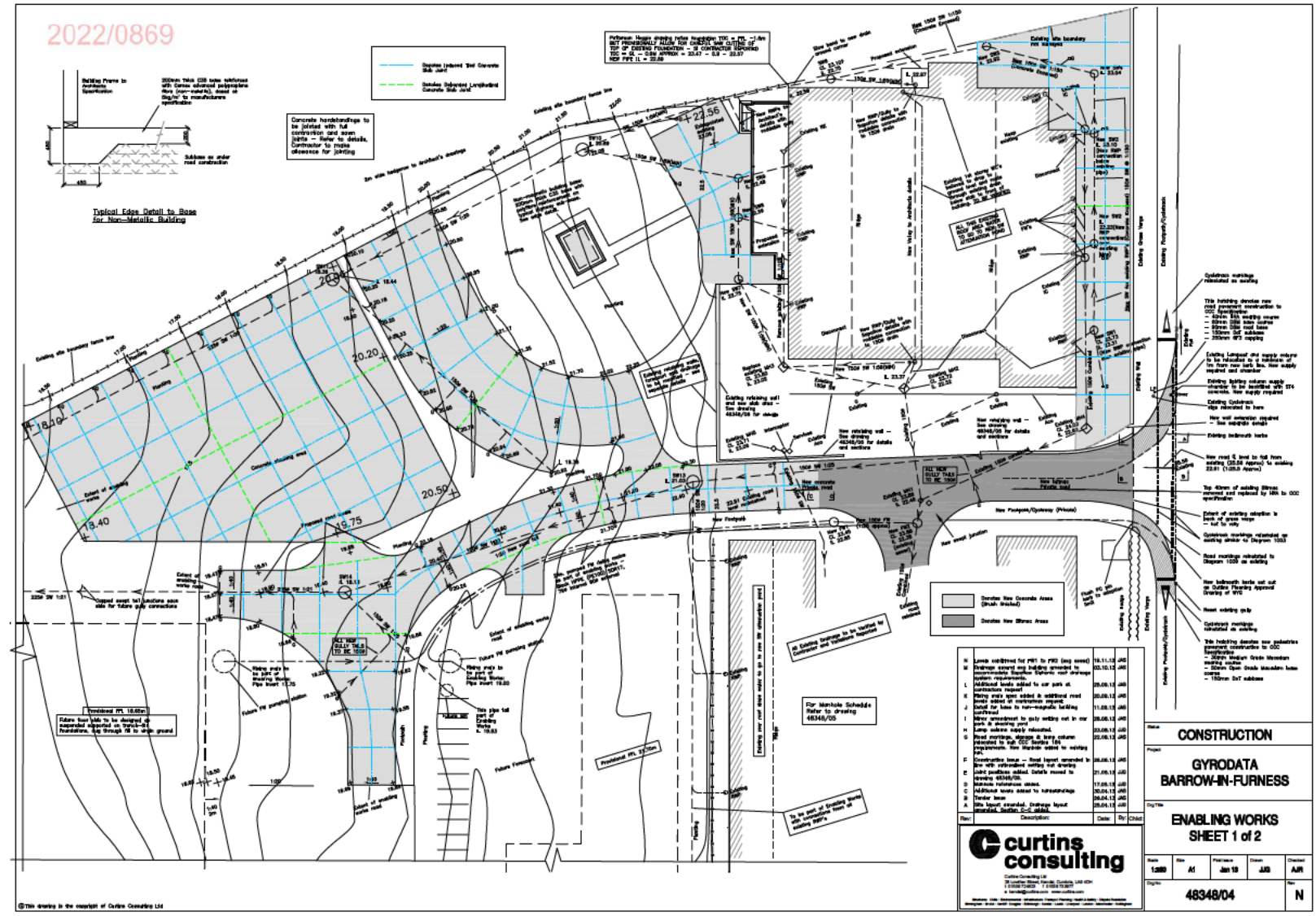
2022/0869

Appendix C Existing Drainage Record

2022/0869


Network Rail 'Land Ownership' Boundary
Extension existing
Future Road Level
Hydrobrake and Klargester Separator See details
Top of 1:3 slope
Permanent water line
Future Road Verge
Hot dip galvanised MS grill
Provisional (TBC 16.60m)
Future floor slab to be designed as suspended supported by 1No.0.4m Foundations, dug through 81 to virgin ground
Overflow Pipe
Inlet Pipe
Pond liner membrane on 50mm sand bed
Proprietary collar sealed to pipes and membrane
Probables 1st/Board over liner, below slab
Future Road Verge
Construction as down slope
Stone pitching over pipe
Hot dip galvanised MS trash screen

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Rev	Description	Date	By	Chkd
N	Levels amendment for PRT to FW2 (exp saver)	19.11.13	JAS	
M	Drainage amend and building amended to accommodate Sapphire Extronic roof drainage system requirements.	03.10.13	JAS	
L	Additional levels added to car park at contractors request	29.09.13	JAS	
K	Piling mats spec added & additional road levels added at contractors request.	20.09.13	JAS	
J	Detail for base to non-magnetic building confirmed	11.09.13	JAS	
I	Minor amendment to gully setting out in car park & drawing zero	28.08.13	JAS	
H	Lamp column supply relocated.	23.08.13	JAS	
G	Road markings, signage & lamp column relocated to suit CCC Section 184 requirements. New Manhole added to existing run.	22.08.13	JAS	
F	Construction issue – Road layout amended & 6m with reinforcement setting out drawing	26.06.13	JAS	
E	Joint positions added. Details moved to drawing 48348/09.	21.06.13	JAS	
D	Manhole references areas.	17.06.13	JAS	
C	Additional levels added to hotmakings	30.04.13	JAS	
B	Tender issue	26.04.13	JAS	
A	Site layout amended. Drainage layout amended. Section C–C added.	25.04.13	JAS	

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Birmingham Bristol Cardiff Glasgow Edinburgh Kendal Leeds Liverpool London Manchester Nottingham

Status: CONSTRUCTION

Project: GYRODATA BARROW-IN-FURNESS

Dwg Title: ENABLING WORKS SHEET 1 of 2

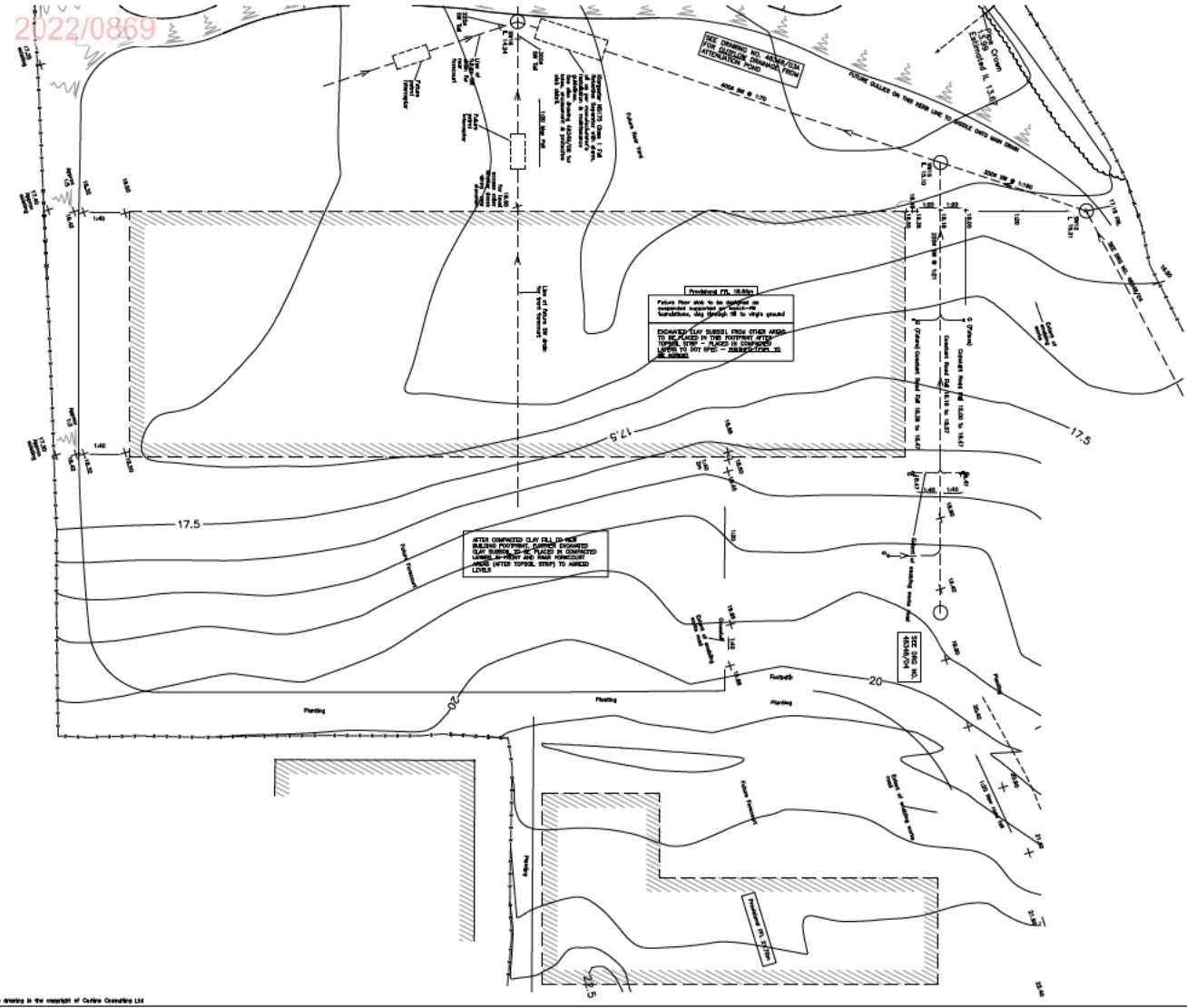
Scale	Size	First Issue	Drawn	Checked
1:250	A1	Jan 13	JAS	AJR

Dwg No: 48348/04

Rev: N

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2022/0869


SEE DRAWING NO. 48348/02/A FOR OVERFLOW DRAINAGE FROM ATTENUATION POND
Existing Culvert to be diverted as shown
Existing Culvert to be diverted as shown
Existing Culvert to be diverted as shown

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Appendix D Surface Water Runoff Estimation

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Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

2022/0869

Calculated by:	Glen Watson
Site name:	082665
Site location:	Meetings Lane, Barrow-in-Furness

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	54.13860° N
Longitude:	3.23447° W
Reference:	2586957438
Date:	Nov 30 2022 14:12

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 2.75

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics	Default	Edited
SAAR (mm):	1014	1014
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	7.73	7.73
1 in 1 year (l/s):	6.73	6.73
1 in 30 years (l/s):	13.14	13.14
1 in 100 year (l/s):	16.08	16.08
1 in 200 years (l/s):	18.32	18.32

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

HR Wallingford
Working with water

Surface water storage requirements for sites

2022/0869

www.uksuds.com | Storage estimation tool

Calculated by: Glen Watson

Site name: 082665

Site location: Meeting Lane, Barrow-in-Furness

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	54.13854° N
Longitude:	3.23425° W
Reference:	2359221068
Date:	Nov 30 2022 15:20

Site characteristics

Total site area (ha):	2.75
Significant public open space (ha):	0
Area positively drained (ha):	2.75
Impermeable area (ha):	1.5540
Percentage of drained area that is impermeable (%):	57
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	2.75
Net impermable area for storage volume design (ha):	1.55
Pervious area contribution to runoff (%):	0

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	1.4
Urban creep allowance factor:	1.1
Volume control approach	Use long term storage
Interception rainfall depth (mm):	0
Minimum flow rate (l/s):	7.7

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
SPR:	0.3	0.3

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	61
Rainfall 100 yrs 12 hrs:	--	76.65
FEH / FSR conversion factor:	1.05	1.05
SAAR (mm):	1014	1014
M5-60 Rainfall Depth (mm):	17	17
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 10 year:	1.38	1.38
Growth curve factor 30 year:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Q_{BAR} for total site area (l/s):	7.73	7.73
Q_{BAR} for net site area (l/s):	7.73	7.73

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	7.7	7.7	Attenuation storage 1/100 years (m^3):	1163	1163
1 in 30 years (l/s):	13.1	13.1	Long term storage 1/100 years (m^3):	225	225
1 in 100 year (l/s):	16.1	16.1	Total storage 1/100 years (m^3):	1389	1389

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This report was produced using the storage estimation tool developed by HRWallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at http://uksuds.com/terms-and-conditions.htm. The outputs from this tool have been used to estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

HR Wallingford
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Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

2022/0869

Calculated by: Glen Watson

Site name: 082665

Site location: Meeting Lane, Barrow-in-Furness

This is an estimation of the storage volume requirements that are needed to meet normal
best practice criteria in line with Environment Agency guidance "Rainfall runoff management
for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and
the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design
of drainage systems. It is recommended that hydraulic modelling software is used to calculate
volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	54.13854° N
Longitude:	3.23424° W
Reference:	2104100030
Date:	Jan 18 2023 15:39

2022/0869

Site characteristics

Total site area (ha):	2.75
Significant public open space (ha):	0
Area positively drained (ha):	2.75
Impermeable area (ha):	1.554
Percentage of drained area that is impermeable (%):	57
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	2.75
Net impermable area for storage volume design (ha):	1.55
Pervious area contribution to runoff (%):	0

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	1.5
Urban creep allowance factor:	1.1
Volume control approach	Use long term storage
Interception rainfall depth (mm):	5
Minimum flow rate (l/s):	7.7

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
SPR:	0.3	0.3

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	61
Rainfall 100 yrs 12 hrs:	--	76.65
FEH / FSR conversion factor:	1.05	1.05
SAAR (mm):	1014	1014
M5-60 Rainfall Depth (mm):	17	17
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 10 year:	1.38	1.38
Growth curve factor 30 year:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Q_{BAR} for total site area (l/s):	7.73	7.73
Q_{BAR} for net site area (l/s):	7.73	7.73

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	7.7	7.7
1 in 30 years (l/s):	13.1	13.1
1 in 100 year (l/s):	16.1	16.1

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m^3):	1230	1230
Long term storage 1/100 years (m^3):	225	225
Total storage 1/100 years (m^3):	1456	1456

This report was produced using the storage estimation tool developed by HRWallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at http://uksuds.com/terms-and-conditions.htm. The outputs from this tool have been used to estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

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Working with water

Surface water storage requirements for sites

2022/0869

www.uksuds.com | Storage estimation tool

Calculated by:	Glen Watson
Site name:	082665
Site location:	Meeting Lane, Barrow-in-Furness

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	54.13854° N
Longitude:	3.23425° W
Reference:	445513532
Date:	Nov 30 2022 15:08

Site characteristics

Total site area (ha):	2.75
Significant public open space (ha):	0
Area positively drained (ha):	2.75
Impermeable area (ha):	2.2090
Percentage of drained area that is impermeable (%):	80
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	2.75
Net impermable area for storage volume design (ha):	2.21
Pervious area contribution to runoff (%):	0

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	1.3
Urban creep allowance factor:	1.1
Volume control approach	Use long term storage
Interception rainfall depth (mm):	0
Minimum flow rate (l/s):	7.7

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
SPR:	0.3	0.3

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	61
Rainfall 100 yrs 12 hrs:	--	76.65
FEH / FSR conversion factor:	1.05	1.05
SAAR (mm):	1014	1014
M5-60 Rainfall Depth (mm):	17	17
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 10 year:	1.38	1.38
Growth curve factor 30 year:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Q_{BAR} for total site area (l/s):	7.73	7.73
Q_{BAR} for net site area (l/s):	7.73	7.73

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	7.7	7.7	Attenuation storage 1/100 years (m^3):	1609	1609
1 in 30 years (l/s):	13.1	13.1	Long term storage 1/100 years (m^3):	457	457
1 in 100 year (l/s):	16.1	16.1	Total storage 1/100 years (m^3):	2066	2066

2022/0869

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2022/0869

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Registered office: 51-55 Tithebarn Street, Liverpool, L2 2SB

Appendix J Safety Datasheets

ELECTROLUBE
THE SOLUTIONS PEOPLE

SAFETY DATA SHEET
Multi-Purpose Grease

According to Regulation (EC) No 1907/2006, Annex II, as amended.Commission Regulation (EU) No 2015/830 of 28 May 2015.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name Multi-Purpose Grease

Product number MPG, EMPG50T, ZE

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Lubricant.

Uses advised against No specific uses advised against are identified.

1.3. Details of the supplier of the safety data sheet

Supplier

ELECTROLUBE. A division of HK WENTWORTH LTD
ASHBY PARK, COALFIELD WAY,
ASHBY DE LA ZOUCH, LEICESTERSHIRE LE65 1JR
UNITED KINGDOM
+44 (0)1530 419600
+44 (0)1530 416640
info@hkw.co.uk

1.4. Emergency telephone number

Emergency telephone +44 1865 407333

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Not Classified

Health hazards Not Classified

Environmental hazards Not Classified

2.2. Label elements

Hazard statements NC Not Classified

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Composition comments None of the ingredients are required to be listed.

SECTION 4: First aid measures

4.1. Description of first aid measures

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General information Get medical attention if any discomfort continues. Show this Safety Data Sheet to the medical personnel.

Inhalation Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as collar, tie or belt.

Ingestion Rinse mouth thoroughly with water. Remove any dentures. Give a few small glasses of water or milk to drink. Stop if the affected person feels sick as vomiting may be dangerous. Do not induce vomiting unless under the direction of medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. Maintain an open airway. Loosen tight clothing such as collar, tie or belt.

Skin contact Remove affected person from source of contamination. Rinse immediately with plenty of water.

Eye contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 10 minutes.

Protection of first aiders First aid personnel should wear appropriate protective equipment during any rescue.

4.2. Most important symptoms and effects, both acute and delayed

General information See Section 11 for additional information on health hazards. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation Prolonged inhalation of high concentrations may damage respiratory system.

Ingestion Gastrointestinal symptoms, including upset stomach. Fumes from the stomach contents may be inhaled, resulting in the same symptoms as inhalation.

Skin contact Prolonged contact may cause dryness of the skin.

Eye contact May cause temporary eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor Treat symptomatically.

Specific treatments No special treatment required.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media The product is not flammable. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards Containers can burst violently or explode when heated, due to excessive pressure build-up.

Hazardous combustion products Thermal decomposition or combustion products may include the following substances: Harmful gases or vapours.

5.3. Advice for firefighters

Protective actions during firefighting Avoid breathing fire gases or vapours. Evacuate area. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. If a leak or spill has not ignited, use water spray to disperse vapours and protect men stopping the leak.

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Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Firefighter's clothing conforming to European standard EN469 (including helmets, protective boots and gloves) will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions No action shall be taken without appropriate training or involving any personal risk. Keep unnecessary and unprotected personnel away from the spillage. Wear protective clothing as described in Section 8 of this safety data sheet. Follow precautions for safe handling described in this safety data sheet. Wash thoroughly after dealing with a spillage.

6.2. Environmental precautions

Environmental precautions Avoid discharge to the aquatic environment. Large Spillages: Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air).

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Wear protective clothing as described in Section 8 of this safety data sheet. Clear up spills immediately and dispose of waste safely. Reuse or recycle products wherever possible. Approach the spillage from upwind. Small Spillages: If the product is soluble in water, dilute the spillage with water and mop it up. Alternatively, or if it is not water-soluble, absorb the spillage with an inert, dry material and place it in a suitable waste disposal container. Large Spillages: If leakage cannot be stopped, evacuate area. Flush spilled material into an effluent treatment plant, or proceed as follows. Contain and absorb spillage with sand, earth or other non-combustible material. Place waste in labelled, sealed containers. Clean contaminated objects and areas thoroughly, observing environmental regulations. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Read and follow manufacturer's recommendations. Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink and animal feeding stuffs. Handle all packages and containers carefully to minimise spills. Keep container tightly sealed when not in use. Avoid the formation of mists.

Advice on general occupational hygiene Wash promptly if skin becomes contaminated. Take off contaminated clothing. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Wash at the end of each work shift and before eating, smoking and using the toilet. Change work clothing daily before leaving workplace.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store away from incompatible materials (see Section 10). Store in accordance with local regulations.

Storage class Unspecified storage.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure Controls/personal protection

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8.1. Control parameters

8.2. Exposure controls

Protective equipment



Appropriate engineering controls	Provide adequate ventilation. Good general ventilation should be adequate to control worker exposure to airborne contaminants.
Eye/face protection	Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Personal protective equipment for eye and face protection should comply with European Standard EN166. The following protection should be worn: Chemical splash goggles.
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. To protect hands from chemicals, gloves should comply with European Standard EN374. Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. Frequent changes are recommended.
Other skin and body protection	Appropriate footwear and additional protective clothing complying with an approved standard should be worn if a risk assessment indicates skin contamination is possible.
Hygiene measures	Provide eyewash station and safety shower. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Clean equipment and the work area every day. Good personal hygiene procedures should be implemented. Wash at the end of each work shift and before eating, smoking and using the toilet. When using do not eat, drink or smoke.
Respiratory protection	Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Provide adequate ventilation. Large Spillages: If ventilation is inadequate, suitable respiratory protection must be worn.
Environmental exposure controls	Not regarded as dangerous for the environment.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Grease.
Colour	Light brown.
Odour	Oil-like.
pH	Not available.
Melting point	Not available.
Initial boiling point and range	Not available.
Flash point	230°C/446°F COC (Cleveland open cup).
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.

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Upper/lower flammability or explosive limits	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Bulk density	Not available.
Solubility(ies)	Not available.
Partition coefficient	Not available.
Auto-ignition temperature	Not available.
Decomposition Temperature	Not available.
Viscosity	Not available.
Explosive properties	Not considered to be explosive.
Oxidising properties	Does not meet the criteria for classification as oxidising.

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity See the other subsections of this section for further details.

10.2. Chemical stability

Stability Stable at normal ambient temperatures and when used as recommended. Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions No potentially hazardous reactions known.

10.4. Conditions to avoid

Conditions to avoid There are no known conditions that are likely to result in a hazardous situation.

10.5. Incompatible materials

Materials to avoid No specific material or group of materials is likely to react with the product to produce a hazardous situation.

10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include the following substances: Harmful gases or vapours.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects Not regarded as a health hazard under current legislation.

Acute toxicity - oral

Notes (oral LD_{50}) Based on available data the classification criteria are not met.

Acute toxicity - dermal

Notes (dermal LD_{50}) Based on available data the classification criteria are not met.

Acute toxicity - inhalation

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Notes (inhalation LC_{50})	Based on available data the classification criteria are not met.

Skin corrosion/irritation

Animal data	Based on available data the classification criteria are not met.

Serious eye damage/irritation

Serious eye damage/irritation	Based on available data the classification criteria are not met.

Respiratory sensitisation

Respiratory sensitisation	Based on available data the classification criteria are not met.

Skin sensitisation

Skin sensitisation	Based on available data the classification criteria are not met.

Germ cell mutagenicity

Genotoxicity - in vitro	Based on available data the classification criteria are not met.

Carcinogenicity

Carcinogenicity	Based on available data the classification criteria are not met.
IARC carcinogenicity	None of the ingredients are listed or exempt.

Reproductive toxicity

Reproductive toxicity - fertility	Based on available data the classification criteria are not met.
Reproductive toxicity - development	Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure

STOT - single exposure	Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure	Not classified as a specific target organ toxicant after repeated exposure.

Aspiration hazard

Aspiration hazard	Based on available data the classification criteria are not met.

General information	No specific health hazards known. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.
Inhalation	Prolonged inhalation of high concentrations may damage respiratory system.
Ingestion	Gastrointestinal symptoms, including upset stomach. Fumes from the stomach contents may be inhaled, resulting in the same symptoms as inhalation.
Skin contact	Prolonged contact may cause dryness of the skin.
Eye contact	May cause temporary eye irritation.
Route of entry	Ingestion Inhalation Skin and/or eye contact
Target organs	No specific target organs known.

SECTION 12: Ecological Information

Ecotoxicity	Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.

12.1. Toxicity

Toxicity	Based on available data the classification criteria are not met.

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12.2. Persistence and degradability

Persistence and degradability The degradability of the product is not known.

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Partition coefficient Not available.

12.4. Mobility in soil

Mobility No data available.

12.5. Results of PBT and vPvB assessment

12.6. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information The generation of waste should be minimised or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way. Disposal of this product, process solutions, residues and by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any local authority requirements.

Disposal methods Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste packaging should be collected for reuse or recycling. Incineration or landfill should only be considered when recycling is not feasible. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of the local water authority.

SECTION 14: Transport information

General The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

Transport labels
No transport warning sign required.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
No.

14.6. Special precautions for user

Not applicable.

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14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations Health and Safety at Work etc. Act 1974 (as amended).
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348) (as amended) ["CDG 2009"].
EH40/2005 Workplace exposure limits.

EU legislation Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Commission Regulation (EU) No 2015/830 of 28 May 2015.
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

Inventories

EU - EINECS/ELINCS

None of the ingredients are listed or exempt.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
IATA: International Air Transport Association.
ICAO-TI: Technical Instructions for the Safe Transport of Dangerous Goods by Air.
IMDG: International Maritime Dangerous Goods.
CAS: Chemical Abstracts Service.
ATE: Acute Toxicity Estimate.
LC_{50}: Lethal Concentration to 50 % of a test population.
LD_{50}: Lethal Dose to 50% of a test population (Median Lethal Dose).
EC_{50}: 50% of maximal Effective Concentration.
PBT: Persistent, Bioaccumulative and Toxic substance.
vPvB: Very Persistent and Very Bioaccumulative.

Training advice Read and follow manufacturer's recommendations. Only trained personnel should use this material.

Issued by Bethan Massey

Revision date 18/01/2017

Revision 0

SDS number 845

Multi-Purpose Grease

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

Ion Exchange Resin
SAFETY DATA SHEET

Crystal Quest® Manufacturing
55 Chastain Road Suite 100
Kennesaw, GA 30144 USA
Phone: 800-934-0051

Section 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier:

Trade name or designation of mixture: Purolite® C107E

EC Number: Not applicable.

Registration Number: This mixture is exempted from Registration according to the provisions of Title IIand VI and Article 2(9) of REACH.

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Ion Exchange, Adsorbent, and/or Catalyst

Uses advised against: None Known

1.3. Details of the supplier of the safety data sheet

Supplier:
Purolite Ltd.
Llantrisant Business Park,
Llantrisant, Wales, UK CF72 8LF
Tel:+44 1443 229334
Fax:+44 1443 227073

Manufacturer:

Purolite S.R.L.
Str.Aleea Uzinei nr.11,
505700 Victoria,
Judetul Brasov,
Romania
Tel:+40 2682 43004
Fax:+40 2682 43002

Purolite
150 Monument Road
Bala Cynwyd, PA 19004 USA
Tel:+1 610 668 9090
Fax:+1 610 668 8139

Purolite (China) Co. Limited
Qianlong Economic Development Zone,
Qianyuan Town, Deqing County,
Huzhou City, Zhejiang, China 313216
Tel:+86 572 8422908
Fax:+86 572 8425345

Contact Person: Ken Shaner
Email: msds@purolite.com

1.4. Emergency Telephone Number: +1 866 387 7344
+1760 602 8703

Section 2. Hazards identification

2.1 Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC as amended: This preparation is not classified as dangerous according to Directive 1999/45/EC and its amendments.

2.1.1 Classification according to Regulation (EC) No 1272/2008 as amended

Hazard summary

Physical hazards	Not classified for physical hazards.
Health hazards	Not classified for health hazards.
Environmental hazards	Not classified for hazards of the environment.
Specific hazards	Direct contact with eyes may cause temporary irritation.
Main symptoms	Under normal conditions of intended use, this material does not pose a risk to health.

2.2 Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Hazard statements	The mixture does not meet the criteria for classification.
Precautionary Statements	
Prevention	Use personal protective equipment as required.
Response	Get medical advice/attention if you feel unwell.
Storage	Store away from incompatible materials.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Supplemental label information	None.

2.3 Other hazards Not assigned.

Section 3. Composition/information on ingredients

3.1 Substance Not applicable.

3.2 Mixture

General Information

3.2.1 Not applicable.

3.2.2

Chemical name%	**CAS No. / EC No.REACH Registration No.**	**Index No.Notes**
Polyacrylic acid	42 - 569052-45-3	
Classification:	**DSD:** **CLP:**	
Water	44 - 587732-18-5 231-791-2	
Classification:	**DSD:** **CLP:**	

DSD: Directive 67/548/EEC.
CLP: Regulation No. 1272/2008.

Composition comments

The full text for all R- and H-phrases is displayed in section 16. All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume

Section 4. First aid measures

General Information
If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

4.1 Description of first aid measures

4.1.1 Inhalation
Move into fresh air and keep at rest. Get medical attention if any discomfort continues.

4.1.2 Skin contact
Wash off immediately with soap and plenty of water. If irritation persists get medical attention.

4.1.3 Eye contact
Flush thoroughly with water for at least 15 minutes. Get medical attention if irritation develops and persists.

4.1.4 Ingestion
Rinse mouth thoroughly. Never give liquid to an unconscious person. Do not induce vomiting. If vomiting occurs,the head should be kept low so that stomach vomit doesn't enter the lungs. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed
Under normal conditions of intended use, this material does not pose a risk to health.

4.3 Indication of any immediate medical attention and special treatment
Treat symptomatically

Section 5. Fire-fighting measures

General fire hazards
The product is not flammable.

5.1 Extinguishing media
- **Suitable extinguishing media**

Extinguishing with foam, carbon dioxide, dry powder or water fog.
- **Unsuitable extinguishing media**

None known.

5.2 Special hazards arising from the substance or mixture
By heating and fire, harmful vapors/gases may be formed.

5.3 Advice for fire fighters
- **Special protective equipment for fire fighters**

Wear self-contained breathing apparatus and protective clothing.
- **Special fire fighting procedures**

In the event of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

Section 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel
Avoid contact with skin and eyes. For personal protection, see section 8 of the SDS.

6.1.2 For emergency responders
Keep unnecessary personnel away. Wear protective clothing as described in Section 8 of this safety data sheet.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Cover with plastic sheet to prevent spreading. Do not allow to enter drains, sewers or watercourses.

6.3 Methods and material for containment and cleaning up
Avoid the generation of dusts during clean-up. Sweep up or vacuum up spillage and collect in suitable container for disposal. Collect and dispose of spillage as indicated in section 13 of the SDS.

6.4 Reference to other sections
For personal protection, see section 8 of the SDS. For waste disposal, see Section 13 of the SDS.

Section 7. Handling and storage

7.1 Precautions for safe handling
Use with adequate ventilation. Wear protective clothing as described in Section 8 of this safety data sheet. Observe good industrial hygiene practices.

7.2 Precautions for safe storage
Keep containers tightly closed in a dry, cool and well-ventilated place.

7.3 Specific end use(s)
Ion exchange, adsorbent or catalyst

Section 8. Exposure controls/personal protection

8.1 Control parameters

8.1.1 Occupational exposure limits
No exposure limits noted for ingredient(s).

8.1.2 Recommended monitoring procedures
Follow standard monitoring procedures.

8.1.4 DNEL
Not available.
PNEC
Not available.

8.2 Exposure controls

8.2.1 Appropriate engineering controls
Provide adequate ventilation.

8.2.2 Individual protection measures, such as personal protective equipment

General information

Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Eye/face protection

If contact is likely, safety glasses with side shields is recommended.

Skin protection (Hand protection)

Protective gloves should be worn to prevent skin contact. Suitable gloves can be recommended by the glove supplier.

Other

Wear appropriate clothing to prevent repeated or prolonged skin contact.

Respiratory protection

No personal respiratory protective equipment is normally required.

Thermal hazards

None known.

Hygiene measures

Avoid contact with eyes. Handle in accordance with good industrial hygiene and safety practice. Always observe good personal hygiene measures, such as washing after handling the material and before eating,drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

8.2.3 Environmental exposure controls

Environmental manager must be informed of all major spillages.

Section 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Beads
Physical state:	Solid
Form:	Bead
Color:	White, yellow, cream, tan or light brown
Odor:	Odorless
Odor threshold:	N/A
pH:	Slightly acidic
Melting point/freezing point:	N/A
Boiling point, initial boiling point, and boiling range:	N/A
Flash point:	N/A
Auto-ignition temperature:	N/A
Flammability (solid,gas):	N/A
Flammability limit-lower (%):	N/A
Flammability limit-upper (%):	N/A
Oxidizing properties:	N/A
Explosive properties:	N/A
Explosive limit:	N/A
Vapour pressure:	Like water
Vapour density:	N/A
Evaporation rate:	N/A
Relative density: 1.15 - 1.25Solubility (water):	Insoluble in water and organic solvents
Partition coefficient n-octanol/water:	No data available.
Decomposition temperature:	N/A
Viscosity:	N/A
Percent volatile:	N/A

9.2 Other Information
No relevant additional information available.

Section 10. Stability and reactivity

10.1 Reactivity
The product is stable and non reactive under normal conditions of use, storage and transport.

10.2 Chemical Stability
Material is stable under normal conditions.

10.3 Possibility of hazardous reactions
No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid
Heat, sparks, flames elevated temperatures.

10.5 Incompatible materials
Strong oxidizing agents. Nitric acid.

10.6 Hazardous decomposition products
Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors.

Section 11. Toxicological information

General Information
Occupational exposure to the substance or mixture may cause adverse effects.
Information on likely routes of exposure:
- **Ingestion**

May cause discomfort if swallowed.
- **Inhalation**

Inhalation of dusts may cause respiratory irritation.
- **Skin contact**

May cause mild skin irritation.
- **Eye contact**

May cause eye irritation on direct contact.
- **Symptoms**

Irritation of eyes and mucous membranes. Irritation of nose and throat.

11.1 Information on toxicological effects

11.1.1 Not applicable.

11.1.2 Mixture
- **Acute toxicity**

May cause discomfort if swallowed.
- **Skin corrsion/irritation**

Prolonged skin contact may cause temporary irritation.
- **Serious eye dmage/eye irritation**

Direct contact with eyes and mucous membranes. Irritation of nose and throat.
- **Respiratory sensitization**

Not classified.
- **Skin sensitization**

Not classified.

- **Germ cell mutagenicity**
Not classified.
- **Carcinogenicity**
Not classified.
- **Reproductivity toxicity**
Not classified.
- **Specific target organ toxicity - single exposure**
Inhalation of dust may cause respiratory irritation.
- **Specific target organ toxicity - repeated exposure**
Not classified.
- **Aspiration hazard**
Not classified.
- **Mixture versus substance information**
Not available.
- **Other information**
Not available.

Section 12. Ecological information

12.1 Toxicity
No toxicity data noted for the ingredient(s)

12.2 Persistence and degradability
No data available.

12.3 Bioaccumulative potential
No data available.
Mobility
No data available.
Environmental fate - Partition coefficient
No data available.

12.4 Mobility in soil
No data available.

12.5 Results of PBT and vPvB assessment
Not a PBT or vPvB substance or mixture.

12.6 Other adverse effects
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Section 13. Disposal considerations

13.1 Waste treatment methods
Residual waste
Dispose of in accordance with local regulations.
Contaminated packaging
Empty containers should be taken to an approved waste handling site for recycling or disposal.
EU waste code
Waste codes should be assigned by the user based on the application for which the product was used.
Disposal methods/information
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/containers in accordance with local/regional/national/international regulations.

Section 14. Transport information

14.1 ADR
The product is not covered by international regulation on the transport of dangerous goods.

14.2 RID
The product is not covered by international regulation on the transport of dangerous goods.

14.3 ADN
The product is not covered by international regulation on the transport of dangerous goods.

14.4 IATA
The product is not covered by international regulation on the transport of dangerous goods.

14.5 IMDG
The product is not covered by international regulation on the transport of dangerous goods.

14.6 Tranpsort in Bulk according to AnnexII of MARPOL 73/78 and the IBC Code
No information available.

Section 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:
EU Regulations:
Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer, Annex I:
Not listed.
Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer, Annex II:
Not listed.
Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I:
Not listed.
Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1:
Not listed.
Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2:
Not listed.
Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3:
Not listed.
Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V:
Not listed.
Directive 96/61/EC concerning integrated pollution prevention and control (IPPC): Article 15, European Pollution Emission Registery (EPER):
Not listed.
Regulation (EC) No. 1907/2006, REACH Article 59(1). Candidate List:
Not listed.
Other regulations
This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. The product does not need to be labeled in accordance with EC directives or respective national laws.
National regulations
Follow national regulation for work with chemical agents.

15.2 Chemical safety assessment
No Chemical Safety Assessment has been carried out

Section 16. Other information:

List of abbreviations:
DNEL: Derived No-Effect Level.
PNEC: Predicted No-Effect Concentration.
PBT: Persistent, bioaccumulative and toxic.
vPvB: Very Persistent and very bioaccumulative.

References:
Not available.

Information on evaluation method leading to the classification of mixture:-
The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available.

Full text of any statements or R-phrases and H-phrases under Sections 2 to 15:
None.

Training information:
Follow training instructions when handling this material.

Further information:
This mixture is exempted from Registration according to the provisions of Title II and VI and Article 2(9) of REACH.

Disclaimer:
The information provided in this safety data sheet is based on current knowledge about the product and current legal requirements and standards. It relates specifically to health, safety and environmental requirements and standards, may not identify all hazards associated with the product or its uses or misuses, does not signify any warranty with regard to the properties of the product, and only applies when the product is used for the purposes indicated in section 1. This product is not sold as suitable for other purposes and such other usage may cause risks not mentioned in this safety data sheet.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 6.2
Revision Date 17.02.2025
Print Date 18.02.2025

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	:	Propylene Glycol
Product Number	:	P4347
Brand	:	Sigma-Aldrich
REACH No.	:	A registration number is not available for this substance as the substance or its uses are exempted from registration or the annual tonnage does not require a registration.
CAS-No.	:	57-55-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Merck Life Science UK Limited New Road The Old Brickyard GILLINGHAM Dorset SP8 4XT UNITED KINGDOM
Telephone	:	+44 (0)1747 833-000
Fax	:	+44 (0)1747 833-313
E-mail address	:	TechnicalService@merckgroup.com

1.4 Emergency telephone

Emergency Phone #	:	+44 (0)870 8200418 (CHEMTREC)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

2.2 Label elements

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

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2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
Toxicological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	Propylene glycol 1,2-Propanediol
Formula	:	$C_3H_8O_2$
Molecular weight	:	76.09 g/mol
CAS-No.	:	57-55-6
EC-No.	:	200-338-0

No components need to be disclosed according to the applicable regulations.

SECTION 4: First aid measures

4.1 Description of first-aid measures

If inhaled
After inhalation: fresh air.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

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5.2 Special hazards arising from the substance or mixture

Carbon oxides
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters

In the event of fire, wear self-contained breathing apparatus.

5.4 Further information

Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed.

hygroscopic

Storage class
Storage class (TRGS 510): 10: Combustible liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

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Component	CAS-No.	Control parameters	Value	Basis
1,2-propanediol	57-55-6	TWA	150 ppm 474 mg/m3 Total vapour and particles	UK. EH40 WEL - Workplace Exposure Limits
		TWA	10 mg/m3 particles	UK. EH40 WEL - Workplace Exposure Limits

8.2 Exposure controls

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Respiratory protection
Recommended Filter type: Filter A-(P2)

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains.

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SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Physical state	liquid
b)	Color	colorless
c)	Odor	No data available
d)	Melting point/freezing point	Melting point/ range: -60 °C - lit.
e)	Initial boiling point and boiling range	187 °C - lit.
f)	Flammability (solid, gas)	No data available
g)	Upper/lower flammability or explosive limits	Upper explosion limit: 12.5 %(V) Lower explosion limit: 2.6 %(V)
h)	Flash point	104 °C - closed cup - Regulation (EC) No. 440/2008, Annex, A.9
i)	Autoignition temperature	> 400 °C at > 1,000.1 - < 1,014.4 hPa
j)	Decomposition temperature	No data available
k)	pH	No data available
l)	Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: 12.78 mPa.s at 45 °C
m)	Water solubility	at 20 °C - Regulation (EC) No. 440/2008, Annex, A.6completely miscible
n)	Partition coefficient: n-octanol/water	Pow: 0.085; log Pow: -1.07 at 20.5 °C - Regulation (EC) No. 440/2008, Annex, A.8 - Bioaccumulation is not expected.
o)	Vapor pressure	0.2 hPa at 25 °C - Regulation (EC) No. 440/2008, Annex, A.4
p)	Density	1.036 g/cm3 at 25 °C - lit.
	Relative density	1.03 at 20 °C - Regulation (EC) No. 440/2008, Annex, A.3
q)	Relative vapor density	
r)	Particle characteristics	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information

Surface tension	71.6 mN/m at 1.01g/l at 21.5 °C - Surface tension

SECTION 10: Stability and reactivity

10.1 Reactivity

Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

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10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
increased reactivity with:
Oxidizing agents
Acid anhydrides
Acid chlorides

10.4 Conditions to avoid
Strong heating.

10.5 Incompatible materials
various plastics

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - 22,000 mg/kg
Remarks: (ECHA)
Inhalation: No data available
LD50 Dermal - Rabbit - > 2,000 mg/kg
Remarks: (ECHA)

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Test Type: Chromosome aberration test in vitro
Test system: Human lymphocytes
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
Test Type: Ames test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Result: negative
Remarks: (ECHA)

Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow

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Application Route: Intraperitoneal

Result: negative
Remarks: (ECHA)

Test Type: Chromosome aberration test in vitro
Species: Rat
Cell type: Bone marrow
Application Route: Oral

Result: negative
Remarks: (ECHA)

Test Type: dominant lethal test
Species: Rat

Application Route: Oral

Result: negative
Remarks: (ECHA)

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Repeated dose toxicity - Rat - male - Oral - 2 yr - NOAEL (No observed adverse effect level) - 1,700 mg/kg
Remarks: (ECHA)

RTECS: TY2000000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Hazardous properties cannot be excluded but are unlikely when the product is handled appropriately.

Handle in accordance with good industrial hygiene and safety practice.

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SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	static test LC50 - Oncorhynchus mykiss (rainbow trout) - 40,613 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	static test LC50 - Ceriodaphnia dubia (water flea) - 18,340 mg/l - 48 h (US-EPA)
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 19,000 mg/l - 96 h (OECD Test Guideline 201)
Toxicity to bacteria	NOEC - Pseudomonas putida - > 20,000 mg/l - 18 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test NOEC - Ceriodaphnia (water flea) - 29,000 mg/l - 7 d (US-EPA)

12.2 Persistence and degradability

Biodegradability	aerobic Dissolved organic carbon (DOC) - Exposure time 28 d Result: 98.3 % - Readily biodegradable. (OECD Test Guideline 301F)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Biological effects:
When discharged properly, no impairments in the function of adapted biological wastewater treatment plants are to be expected.

Stability in water	- 2.3 yr Remarks: reaction with hydroxyl radicals(IUCLID)

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. Notice Directive on waste 2008/98/EC.

SECTION 14: Transport information

14.1 UN number
ADR/RID: - IMDG: - IATA: -

14.2 UN proper shipping name
ADR/RID: Not dangerous goods
IMDG: Not dangerous goods
IATA: Not dangerous goods

14.3 Transport hazard class(es)
ADR/RID: - IMDG: - IATA: -

14.4 Packaging group
ADR/RID: - IMDG: - IATA: -

14.5 Environmental hazards
ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user
No data available
Further information
Not classified as dangerous in the meaning of transport regulations.

14.7 Maritime transport in bulk according to IMO instruments
Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.2 Chemical Safety Assessment
For this product a chemical safety assessment was not carried out

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SECTION 16: Other information

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

Printing date 19.04.2024 Version number 7.0 (replaces version 6.0) Revision: 19.04.2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: **Maintenance Oil**

Article number: 3079 Clear matt, 3081 Clear satin, 3098 Clear semi-matt Anti-Slip (R9), 3440 White transparent

1.2 Relevant identified uses of the substance or mixture and uses advised against No further relevant information available.

Application of the substance / the mixture Maintenance product
Coating compound/ Surface coating/ paint

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier: Osmo Holz und Color GmbH & Co. KG
Affhüppen Esch 12
D-48231 Warendorf
Germany

Further information obtainable from: Product safety department
Tel.: +49 (0) 251 / 692 - 188
Fax: +49 (0) 251 / 692 - 462
e-mail: helmut.starp@osmo.de

1.4 Emergency telephone number: emergency phone no. Berlin (24h): +49 (0) 30 / 30686 790 advisory service in German and English

*

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 The product is not classified, according to the CLP regulation.

Additional information: For the wording of the listed hazard phrases refer to section 16.

2.2 Label elements

Hazard pictograms Void

Signal word Void

Hazard statements Void

Precautionary statements P101 If medical advice is needed, have product container or label at hand.
P102 Keep out of reach of children.
P262 Do not get in eyes, on skin, or on clothing.
P271 Use only outdoors or in a well-ventilated area.

Additional information: EUH210 Safety data sheet available on request.

2.3 Other hazards Warning:
Wash out any used cloth impregnated with this product immediately after use or store in an airtight container (danger of self-ignition)
Always wear a dust mask when sanding.

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Trade name: Maintenance Oil

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Observe the general safety regulations when handling chemicals.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

*

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Description: Mixture of substances listed below with nonhazardous additions.

Dangerous components:		
CAS: 64742-48-9 EC number: 918-481-9	aliphatic hydrocarbons, C10-C13 n-alkanes, i-alkanes, cyclics, aromatics < 2 % Asp. Tox. 1, H304, EUH066	25–50%
EC number: 927-676-8	Hydrocarbons, C13-C18, n-alkanes, isoalkanes,cyclics, <2% aromatics Asp. Tox. 1, H304	10–50%
CAS: 34590-94-8 EINECS: 252-104-2	Dipropylene glycol monomethyl ether substance with a Community workplace exposure limit	0–≤2.5%
CAS: 13463-67-7 EINECS: 236-675-5	titanium dioxide - aerodynamic diameter >10 µm	0-<2.5%

SVHC Not applicable.

Additional information: The content of Titanium dioxide varies according to the colour shade.
Note 10: The classification as a carcinogen by inhalation applies only to mixtures in powder form containing 1 % or more of titanium dioxide which is in the form of or incorporated in particles with aerodynamic diameter ≤ 10 µm.
For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information: Take affected persons out into the fresh air.

After inhalation: Supply fresh air; consult doctor in case of complaints.
In case of unconsciousness place patient stably in side position for transportation.

After skin contact: Immediately wash with water and soap and rinse thoroughly.
If skin irritation or rash occurs: Get medical advice/attention.

After eye contact: Rinse opened eye for several minutes under running water.

After swallowing: If swallowed, seek medical advice immediately and show this container or label.
Do NOT induce vomiting.

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Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

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Trade name: Maintenance Oil

(Contd. of page 2)

4.2 Most important symptoms and effects, both acute and delayed Dizziness

4.3 Indication of any immediate medical attention and special treatment needed If swallowed or in case of vomiting, danger of entering the lungs.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents: CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

For safety reasons unsuitable extinguishing agents: Water with full jet

5.2 Special hazards arising from the substance or mixture Formation of toxic gases is possible during heating or in case of fire.
Carbon monoxide (CO)
carbon dioxide (CO2)

5.3 Advice for firefighters

Protective equipment: Mouth respiratory protective device.
Do not inhale explosion gases or combustion gases.
Wear self-contained respiratory protective device.
General measures for chemical fires.

Additional information Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.
Cool endangered receptacles with water spray.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures Ensure adequate ventilation
Keep away from ignition sources.
Wear protective clothing.

For non-emergency personnel No action shall be taken involving any personal risk or without suitable training.

For emergency responders Wear protective equipment. Keep unprotected persons away.

6.2 Environmental precautions: Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.

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Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

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Trade name: Maintenance Oil

(Contd. of page 3)

6.3 Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders).
Dispose of the material collected according to regulations.
Dispose contaminated material as waste according to section 13.
Ensure adequate ventilation.

6.4 Reference to other sections See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling Use only in well ventilated areas.
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.

General protective and hygienic measures: Wash hands before breaks and at the end of work.
Do not inhale gases / fumes / aerosols.
Do not eat, drink, smoke or sniff while working.
Do not carry product impregnated cleaning cloths in trouser pockets.

Information about fire - and explosion protection: Keep respiratory protective device available.

Handling: Even a small sip can lead to life-threatening damage to the lungs. Keep rags filled with this liquid out of the reach of children.

7.2 Conditions for safe storage, including any incompatibilities

Storage:

Requirements to be met by storerooms and receptacles: Store only in the original receptacle.

Information about storage in one common storage facility: Not required.

Further information about storage conditions: Keep container tightly sealed.
Store in cool, dry conditions in well sealed receptacles.

Storage class: VCI storage class (VCI = German Association of the Chemical Industry): 10

7.3 Specific end use(s) No further relevant information available.

(Contd. on page 5)

Safety data sheet

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Trade name: Maintenance Oil

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with limit values that require monitoring at the workplace:	
64742-48-9 aliphatic hydrocarbons, C10-C13 n-alkanes, i-alkanes, cyclics, aromatics < 2 %	
TWA	Short-term value: 1200 mg/m³ CEFIC-HSPA
34590-94-8 Dipropylene glycol monomethyl ether	
IOELV	Long-term value: 308 mg/m³, 50 ppm Skin

DNELs		
34590-94-8 Dipropylene glycol monomethyl ether		
Oral	DNEL Verbraucher (Langzeit - systemische Effekte)	36 mg/kg KGew. /Tag
Dermal	DNEL Verbraucher (Langzeit - systemische Effekte)	121 mg/cm²
Inhalative	Worker (chronic - Systemic health effec)	308 mg/m³
	DNEL Verbraucher (Lanzeit - systemische Effekte)	37.2 mg/m³

PNECs	
34590-94-8 Dipropylene glycol monomethyl ether	
PNEC sea water	1.9 mg/l
PNEC fresh water	19 mg/l
PNEC sediment (fresh water)	70.2 mg/kg
PNEC sediment (sea water)	7.02 mg/kg
PNEC soil	2.74 mg/kg
PNEC sewage treatment plant	4,168 mg/l
interrupted release	190 mg/l

Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls

Appropriate engineering controls Ensure good ventilation/exhaustion at the workplace.

Individual protection measures, such as personal protective equipment

General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.
Avoid contact with the eyes and skin.
Immediately remove all soiled and contaminated clothing
Do not inhale gases / fumes / aerosols.
The usual precautionary measures are to be adhered to when handling chemicals.
Do not eat, drink, smoke or sniff while working.

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according to Regulation (EC) No 1907/2006, Article 31

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Trade name: Maintenance Oil

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Do not carry product impregnated cleaning cloths in trouser pockets.
See Section 7 for information on safe handling.

Respiratory protection: Use suitable respiratory protective device only when aerosol or mist is formed.
Not necessary if room is well-ventilated.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
Half mask with round thread connection EN 148-1 (screw-on filter) and combination filter A1 - P2 according to German DIN EN 14387.
Use a properly fitted, air-purifying or air-fed repirator complying with an approved standard if a risk assessment indicates this is necessary.

Hand protection Protective gloves and protective skin cream
To avoid skin problems reduce the wearing of gloves to the required minimum.
Protective gloves
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Material of gloves The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

For the permanent contact gloves made of the following materials are suitable: Nitrile rubber, NBR
Recommended thickness of the material: ≥ 0.4 mm
For the mixture the penetration time has to be at least 480 minutes (Permeation according to EN 374 Part 3: Level 6).

As protection from splashes gloves made of the following materials are suitable: Nitrile rubber, NBR

Eye/face protection Tightly sealed goggles

Body protection: Protective work clothing

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Physical state Fluid

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Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

Printing date 19.04.2024 Version number 7.0 (replaces version 6.0) Revision: 19.04.2024

Trade name: Maintenance Oil

(Contd. of page 6)

Colour:	According to product specification
Odour:	Characteristic
Odour threshold:	Not determined.
Melting point/freezing point:	Undetermined.
Boiling point or initial boiling point and boiling range	Undetermined.
Flammability	Not applicable.
Lower and upper explosion limit	
Lower:	Not determined.
Upper:	Not determined.
Flash point:	>60 °C (DIN EN ISO 2719)
Auto-ignition temperature:	210 °C
Decomposition temperature:	Not determined.
pH	Mixture is non-polar/aprotic.
Viscosity:	
Kinematic viscosity at 20 °C	40-60 s (DIN EN ISO 2431/4mm) >21 mm²/s (40°C) (calculated)
Dynamic:	Not determined.
Solubility	
water:	Not miscible or difficult to mix.
Partition coefficient n-octanol/water (log value)	Not determined.
Vapour pressure:	Not determined.
Density and/or relative density	
Density at 20 °C:	0.85-0.95 g/cm³ (DIN 51757)
Relative density	Not determined.

9.2 Other information	
Appearance:	
Form:	Fluid
Important information on protection of health and environment, and on safety.	
Ignition temperature:	Product is not selfigniting.
Explosive properties:	Product does not present an explosion hazard.
Solvent content:	
VOC (EC)	Not applicable.
Change in condition	
Evaporation rate	Not determined.

Information with regard to physical hazard classes	
Explosives	Void
Flammable gases	Void
Aerosols	Void
Oxidising gases	Void

(Contd. on page 8)

Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

Printing date 19.04.2024 Version number 7.0 (replaces version 6.0) Revision: 19.04.2024

Trade name: Maintenance Oil

(Contd. of page 7)

Gases under pressure	Void
Flammable liquids	Void
Flammable solids	Void
Self-reactive substances and mixtures	Void
Pyrophoric liquids	Void
Pyrophoric solids	Void
Self-heating substances and mixtures	Void
Substances and mixtures, which emit flammable gases in contact with water	Void
Oxidising liquids	Void
Oxidising solids	Void
Organic peroxides	Void
Corrosive to metals	Void
Desensitised explosives	Void

SECTION 10: Stability and reactivity

10.1 Reactivity No further relevant information available.

10.2 Chemical stability

Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions Reacts with fabric soaked in the product (e.g. cleaning wool).

10.4 Conditions to avoid Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5 Incompatible materials: No further relevant information available.

10.6 Hazardous decomposition products: Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx)
Formation of toxic gases is possible during heating or in case of fire.

Additional information: Warning:
Wash out any used cloth impregnated with this product immediately after use or store in an airtight container (danger of self-ignition)

*

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity Based on available data, the classification criteria are not met.

LD/LC50 values relevant for classification:		
64742-48-9 aliphatic hydrocarbons, C10-C13 n-alkanes, i-alkanes, cyclics, aromatics < 2 %		
Oral	LD50	>5,000 mg/kg (rat)

(Contd. on page 9)

Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

Printing date 19.04.2024 Version number 7.0 (replaces version 6.0) Revision: 19.04.2024

Trade name: Maintenance Oil

(Contd. of page 8)

Dermal	LD50	>5,000 mg/kg (rat)
Inhalative	LC50 / 4h	>5 mg/l (rat)
Hydrocarbons, C13-C18, n-alkanes, isoalkanes,cyclics, <2% aromatics		
Oral	LD50	>5,000 mg/kg (rat)
34590-94-8 Dipropylene glycol monomethyl ether		
Oral	LD50	>5,000 mg/kg (rat)
Dermal	LD50	>19,020 mg/kg (rat)
		13,000–14,000 mg/kg (rabbit)
Inhalative	LC50 / 4h	1,667 mg/l (rat)
	LC50 / 72h	0.76 mg/l (selenastrum capricornutum)
13463-67-7 titanium dioxide - aerodynamic diameter >10 µm		
Oral	LD50	>20,000 mg/kg (rat)
Dermal	LD50	>10,000 mg/kg (rabbit)

Skin corrosion/irritation At long or repeated contact with skin it may cause dermatitis due to the degreasing effect of the solvent.

Serious eye damage/irritation Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation Based on available data, the classification criteria are not met.

Germ cell mutagenicity Based on available data, the classification criteria are not met.

Carcinogenicity Based on available data, the classification criteria are not met.

Reproductive toxicity Based on available data, the classification criteria are not met.

STOT-single exposure Based on available data, the classification criteria are not met.

STOT-repeated exposure Based on available data, the classification criteria are not met.

Aspiration hazard Based on available data, the classification criteria are not met.

Subacute to chronic toxicity: Based on available data, the classification criteria are not met.

Additional toxicological information: The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version.

11.2 Information on other hazards

Endocrine disrupting properties
None of the ingredients is listed.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity:	
64742-48-9 aliphatic hydrocarbons, C10-C13 n-alkanes, i-alkanes, cyclics, aromatics < 2 %	
EC50 / 48h	>1,000 mg/l (Daphnia magna)

(Contd. on page 10)

Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

Printing date 19.04.2024 Version number 7.0 (replaces version 6.0) Revision: 19.04.2024

Trade name: Maintenance Oil

(Contd. of page 9)

IC50 / 72h	>1,000 mg/l (algae)
LC50 / 96h	>1,000 mg/l (fish)
34590-94-8 Dipropylene glycol monomethyl ether	
EC50 / 48h	70.2 mg/l
	1,919 mg/l (Daphnia magna)
LC50 / 96h	5.3 mg/l (Oncorhynchus mykiss (Regenbogenforelle))
LC50 / 48h	10.2 mg/l (Oncorhynchus mykiss (Regenbogenforelle))

12.2 Persistence and degradability No further relevant information available.

12.3 Bioaccumulative potential No further relevant information available.

12.4 Mobility in soil No further relevant information available.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Endocrine disrupting properties The product does not contain substances with endocrine disrupting properties.

12.7 Other adverse effects

Additional ecological information:

General notes: Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water

Danger to drinking water if even small quantities leak into the ground.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Recommendation Must not be disposed together with household garbage. Do not allow product to reach sewage system.

Disposal must be made according to official regulations.

European waste catalogue	
08 01 12	waste paint and varnish other than those mentioned in 08 01 11
15 01 04	metallic packaging

Uncleaned packaging:

Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agents: Solvent naphtha

Osmo Brush Cleaner and Thinner

(Contd. on page 11)

Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

Printing date 19.04.2024 Version number 7.0 (replaces version 6.0) Revision: 19.04.2024

Trade name: Maintenance Oil

(Contd. of page 10)

SECTION 14: Transport information

14.1 UN number or ID number	
ADR, ADN, IMDG, IATA	Not applicable
14.2 UN proper shipping name	
ADR, ADN, IMDG, IATA	Not applicable
14.3 Transport hazard class(es)	
ADR, ADN, IMDG, IATA	
Class	Not applicable
14.4 Packing group	
ADR, IMDG, IATA	Not applicable
14.5 Environmental hazards:	
Marine pollutant:	No
14.6 Special precautions for user	Not applicable.
14.7 Maritime transport in bulk according to IMO instruments	Not applicable.
UN "Model Regulation":	Not applicable

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Directive 2012/18/EU
Named dangerous substances - ANNEX I None of the ingredients is listed.

DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II

None of the ingredients is listed.

REGULATION (EU) 2019/1148

Annex I - RESTRICTED EXPLOSIVES PRECURSORS (Upper limit value for the purpose of licensing under Article 5(3))

None of the ingredients is listed.

Annex II - REPORTABLE EXPLOSIVES PRECURSORS

None of the ingredients is listed.

Regulation (EC) No 273/2004 on drug precursors

None of the ingredients is listed.

(Contd. on page 12)

Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

Printing date 19.04.2024 Version number 7.0 (replaces version 6.0) Revision: 19.04.2024

Trade name: Maintenance Oil

(Contd. of page 11)

Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors
None of the ingredients is listed.

National regulations:

VOC (EC) Not applicable.

15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

*

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases H304 May be fatal if swallowed and enters airways.
EUH066 Repeated exposure may cause skin dryness or cracking.

Classification according to Regulation (EC) No 1272/2008 The classification of the mixture is generally based on the calculation method using substance data according to Regulation (EC) No 1272/2008.

Department issuing SDS: product safety department

Contact: Hr. Dr. Starp

Version number of previous version: 6.0

Abbreviations and acronyms:
ADR: Accord relatif au transport international des marchandises dangereuses par route
(European Agreement Concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOC: Volatile Organic Compounds (USA, EU)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPvB: very Persistent and very Bioaccumulative
Asp. Tox. 1: Aspiration hazard – Category 1

Sources ESIS : European chemical Substances Information System
ECHA Portal
Safety data sheets from raw material suppliers

**** Data compared to the previous version altered.*** Additions, Deletions, Revisions
Updated according to regulation (EU) 2020/878 amending regulation (EC) No: 1907/2006 (REACH)

Activated Carbon Ph. Eur.

article number: **274P**
Version: **1.0 en**

date of compilation: 2024-07-15

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Identification of the substance	**Activated Carbon** Ph. Eur.
Article number	274P
EC number	931-328-0
CAS number	7440-44-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses:	Laboratory chemical Laboratory and analytical use
Uses advised against:	Do not use for private purposes (household). Food, drink and animal feedingstuffs.

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co. KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone:+49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet:	Department Health, Safety and Environment
e-mail (competent person):	**sicherheit@carlroth.de**

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
National Poisons Information Service City Hospital	Dudley Rd	B187QH Birming- ham	844 892 0111	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS
This substance does not meet the criteria for classification.

2.2 Label elements

Labelling
not required

2.3 Other hazards

Dust explosion hazards.

Results of PBT and vPvB assessment
According to the results of its assessment, this substance is not a PBT or a vPvB.

Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	Activated Carbon
Molecular formula	C
Molar mass	12,01 $^{g}/_{mol}$
CAS No	7440-44-0
EC No	931-328-0

SECTION 4: First aid measures

4.1 Description of first aid measures



General notes
Take off contaminated clothing.

Following inhalation
Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact
Rinse skin with water/shower.

Following eye contact
Rinse cautiously with water for several minutes. In all cases of doubt, or when symptoms persist, seek medical advice.

Following ingestion
Rinse mouth. Call a doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed
Symptoms and effects are not known to date.

4.3 Indication of any immediate medical attention and special treatment needed
none

SECTION 5: Firefighting measures

5.1 Extinguishing media



Suitable extinguishing media
co-ordinate firefighting measures to the fire surroundings!
water, foam, dry extinguishing powder, ABC-powder

Unsuitable extinguishing media
water jet

5.2 Special hazards arising from the substance or mixture

Danger of dust explosion.

Hazardous combustion products

In case of fire may be liberated: Carbon monoxide (CO), Carbon dioxide (CO_2)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures



For non-emergency personnel

Control of dust.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains. Take up mechanically.

Advice on how to clean up a spill

Take up mechanically.

Other information relating to spills and releases

Place in appropriate containers for disposal.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

No special measures are necessary.

Advice on general occupational hygiene

Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Store in a dry place.

Incompatible substances or mixtures

Observe hints for combined storage.

Consideration of other advice:

Ventilation requirements

Use local and general ventilation.

Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [mg/m³]	STEL [mg/m³]	Ceiling-C [mg/m³]	Notation	Source
GB	dust		WEL	10			i	EH40/2005
GB	dust		WEL	4			r	EH40/2005
GB	graphite	7440-44-0	WEL	10			i, dust	EH40/2005
GB	graphite	7440-44-0	WEL	4			r	EH40/2005

Notation

Ceiling-C	Ceiling value is a limit value above which exposure should not occur
dust	As dust
i	Inhalable fraction
r	Respirable fraction
STEL	Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

Human health values

Relevant DNELs and other threshold levels

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	1,84 mg/m³	human, inhalatory	worker (industry)	chronic - local effects

Environmental values

Relevant PNECs and other threshold levels

End-point	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	10 mg/kg	terrestrial organisms	soil	short-term (single instance)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection



Use safety goggle with side protection.

Skin protection



- **hand protection**

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374.

- **type of material**

NBR (Nitrile rubber)

- **material thickness**

>0,11 mm

- **breakthrough times of the glove material**

>480 minutes (permeation: level 6)

- **other protection measures**

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection



Respiratory protection necessary at: Dust formation. Particulate filter device (EN 143). P1 (filters at least 80 % of airborne particles, colour code: White).

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	solid
Form	powder
Colour	black
Odour	odourless
Melting point/freezing point	>3.500 °C
Boiling point or initial boiling point and boiling range	not determined
Flammability	this material is combustible, but will not ignite readily
Lower and upper explosion limit	50 g/m³ (UEL)
Flash point	not applicable
Auto-ignition temperature	560 °C
Decomposition temperature	not relevant
pH (value)	not applicable (neutral)
Kinematic viscosity	not relevant
Solubility(ies)	
Water solubility	not determined

Partition coefficient	
Partition coefficient n-octanol/water (log value):	0,78 (Lit.)
Vapour pressure	not determined
Density and/or relative density	
Density	2,31 $^{g}/_{cm^3}$ at 20 °C (ECHA)
Relative vapour density	not relevant (solid)
Bulk density	350 – 450 $^{kg}/_{m^3}$
Particle characteristics	
Particle size	20 – 60 µm
Other safety parameters	
Oxidising properties	none

9.2 Other information

Information with regard to physical hazard classes:	hazard classes acc. to GHS (physical hazards): not relevant
Other safety characteristics:	
Dust explosion class	ST 1 Weak explosive (rate of pressure; Kst > 0 - < 200 bar m/s)
Maximum explosion pressure	7,2 bar

SECTION 10: Stability and reactivity

10.1 Reactivity
Dust can form an explosive mixture with air.

10.2 Chemical stability
The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Violent reaction with: strong oxidiser, Peroxides

10.4 Conditions to avoid
There are no specific conditions known which have to be avoided.

10.5 Incompatible materials
There is no additional information.

10.6 Hazardous decomposition products
Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification acc. to GHS
This substance does not meet the criteria for classification.

Acute toxicity
Shall not be classified as acutely toxic.
GHS of the United Nations, annex 4. May be harmful if swallowed.

Acute toxicity					
Exposure route	**Endpoint**	**Value**	**Species**	**Method**	**Source**
oral	LD50	>2.000 $^{mg}/_{kg}$	rat		ECHA

Skin corrosion/irritation
Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation
Shall not be classified as seriously damaging to the eye or eye irritant.

Respiratory or skin sensitisation
Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity
Shall not be classified as germ cell mutagenic.

Carcinogenicity
Shall not be classified as carcinogenic.

Reproductive toxicity
Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure
Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure
Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

- **If swallowed**
Data are not available.
- **If in eyes**
Data are not available.
- **If inhaled**
cough, breathing difficulties
- **If on skin**
Data are not available.
- **Other information**
none

11.2 Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

11.3 Information on other hazards
There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity
Shall not be classified as hazardous to the aquatic environment.

12.2 Persistence and degradability
Theoretical Oxygen Demand: 2,664 $^{mg}/_{mg}$
Theoretical Carbon Dioxide: 3,664 $^{mg}/_{mg}$

12.3 Bioaccumulative potential
Does not significantly accumulate in organisms.

n-octanol/water (log KOW)	0,78 (Lit.)

12.4 Mobility in soil
Data are not available.

12.5 Results of PBT and vPvB assessment
Data are not available.

12.6 Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

12.7 Other adverse effects
Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods


Consult the appropriate local waste disposal expert about waste disposal.

Sewage disposal-relevant information
Do not empty into drains.

Waste treatment of containers/packagings
Handle contaminated packages in the same way as the substance itself. Completely emptied packages can be recycled.

13.2 Relevant provisions relating to waste
The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

13.3 Remarks
Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions. Non-contaminated packages may be recycled.

SECTION 14: Transport information

14.1	**UN number or ID number**	not subject to transport regulations
14.2	**UN proper shipping name**	not assigned
14.3	**Transport hazard class(es)**	none

14.4	**Packing group**	not assigned
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user
There is no additional information.

14.7 Maritime transport in bulk according to IMO instruments
The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

International Maritime Dangerous Goods Code (IMDG) - Additional information
Not subject to IMDG.

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information
Not subject to ICAO-IATA.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant provisions of the European Union (EU)

Seveso Directive

2012/18/EU (Seveso III)			
No	**Dangerous substance/hazard categories**	**Qualifying quantity (tonnes) for the application of lower and upper-tier requirements**	**Notes**
	not assigned		

Deco-Paint Directive

VOC content	0 %
VOC content	0 $^{g}/_{l}$

Industrial Emissions Directive (IED)

VOC content	0 %
VOC content	0 $^{g}/_{l}$

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
not listed

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)
not listed

Water Framework Directive (WFD)
not listed

Regulation on the marketing and use of explosives precursors
not listed

Regulation on drug precursors
not listed

Regulation on substances that deplete the ozone layer (ODS)
not listed

Regulation concerning the export and import of hazardous chemicals (PIC)
not listed

Regulation on persistent organic pollutants (POP)
not listed

National regulations(GB)

List of substances subject to authorisation (GB REACH, Annex 14) / SVHC - candidate list
not listed

Restrictions according to GB REACH, Annex 17
not listed

Other information
Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

National inventories

Country	Inventory	Status
AU	AIIC	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed (ACTIVE)
VN	NCI	substance is listed

Legend

AIIC	Australian Inventory of Industrial Chemicals
CICR	Chemical Inventory and Control Regulation
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NCI	National Chemical Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
ED	Endocrine disruptor
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/open-government-licence/)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
GB REACH	The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/758 (as amended)
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL	Short-term exposure limit
TWA	Time-weighted average
UEL	Upper explosion limit (UEL)
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative
WEL	Workplace exposure limit

Key literature references and sources for data

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and

is solely intended for this product.

Safety data sheet

acc. to Safe Work Australia - Code of Practice

Sodium chloride ≥99,5 %, p.a., ACS, ISO

article number: **3957**
Version: **GHS 3.1 en**
Replaces version of: 2024-03-02
Version: (GHS 3)

date of compilation: 2020-01-17
Revision: 2024-09-18

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Identification of the substance	**Sodium chloride** ≥99,5 %, p.a., ACS, ISO
Article number	3957
CAS number	7647-14-5
Alternative name(s)	Common salt

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses:	Laboratory chemical Laboratory and analytical use
Uses advised against:	Do not use for private purposes (household). Food, drink and animal feedingstuffs.

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co. KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone:+49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet:	Department Health, Safety and Environment
e-mail (competent person):	**sicherheit@carlroth.de**

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 West-mead, NSW	131126	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

This substance does not meet the criteria for classification.

2.2 Label elements

Labelling

not required

2.3 Other hazards

Results of PBT and vPvB assessment
According to the results of its assessment, this substance is not a PBT or a vPvB.

Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	Sodium chloride
Molecular formula	NaCl
Molar mass	58.44 $^{g}/_{mol}$
CAS No	7647-14-5

SECTION 4: First aid measures

4.1 Description of first aid measures



General notes
No special measures are necessary.

Following inhalation
Provide fresh air.

Following skin contact
Brush off loose particles from skin.

Following eye contact
Rinse cautiously with water for several minutes.

Following ingestion
Rinse mouth. Call a doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed
Symptoms and effects are not known to date.

4.3 Indication of any immediate medical attention and special treatment needed
none

SECTION 5: Firefighting measures

5.1 Extinguishing media



Suitable extinguishing media
co-ordinate firefighting measures to the fire surroundings!
water, foam, alcohol resistant foam, dry extinguishing powder, ABC-powder

Unsuitable extinguishing media
water jet

5.2 Special hazards arising from the substance or mixture
Non-combustible.

5.3 Advice for firefighters
In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures



For non-emergency personnel
No special measures are necessary.

6.2 Environmental precautions
Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill
Covering of drains. Take up mechanically.

Advice on how to clean up a spill
Take up mechanically.

Other information relating to spills and releases
Place in appropriate containers for disposal.

6.4 Reference to other sections
Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
No special measures are necessary.

Advice on general occupational hygiene
Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities
Store in a dry place.

Incompatible substances or mixtures
Observe hints for combined storage. Incompatible materials: see section 10.

Consideration of other advice:

Specific designs for storage rooms or vessels
Recommended storage temperature: 15 – 25 °C

7.3 Specific end use(s)
No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

This information is not available.

Human health values

Relevant DNELs and other threshold levels

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	2,069 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	2,069 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
DNEL	295.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
DNEL	295.5 mg/kg bw/day	human, dermal	worker (industry)	acute - systemic effects

Environmental values

Relevant PNECs and other threshold levels

End-point	Threshold level	Organism	Environmental com-partment	Exposure time
PNEC	5 $^{mg}/_{l}$	aquatic organisms	freshwater	short-term (single instance)
PNEC	500 $^{mg}/_{l}$	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	4.86 $^{mg}/_{kg}$	terrestrial organisms	soil	short-term (single instance)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection



Use safety goggle with side protection.

Skin protection



• hand protection

Hand protection is not required.

Respiratory protection



Respiratory protection necessary at: Dust formation. Particulate filter device (EN 143). P1 (filters at least 80 % of airborne particles, colour code: White). Usually no personal respirative protection necessary.

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	solid
Form	crystalline
Colour	colourless
Odour	odourless
Melting point/freezing point	801 °C at 1 atm (ECHA)
Boiling point or initial boiling point and boiling range	>1,450 °C
Flammability	non-combustible
Lower and upper explosion limit	not relevant (solid)
Flash point	not applicable
Auto-ignition temperature	not determined
Decomposition temperature	not relevant
pH (value)	5 – 7 (in aqueous solution: 100 $^{g}/_{l}$, 20 °C)
Kinematic viscosity	not relevant
Solubility(ies)	
Water solubility	317 $^{g}/_{l}$ at 20 °C (ECHA)
Partition coefficient	
Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
Vapour pressure	not determined
Density and/or relative density	
Density	2.17 $^{g}/_{cm^3}$ at 20 °C
Relative vapour density	not relevant (solid)
Bulk density	~1,140 $^{kg}/_{m^3}$
Particle characteristics	No data available.
Other safety parameters	
Oxidising properties	none

9.2 Other information

Information with regard to physical hazard classes:	hazard classes acc. to GHS (physical hazards): not relevant
Other safety characteristics:	
Surface tension	73.03 $^{mN}/_{m}$ (23 °C), (ECHA)

SECTION 10: Stability and reactivity

10.1 Reactivity
This material is not reactive under normal ambient conditions.

10.2 Chemical stability
The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions
No known hazardous reactions.

10.4 Conditions to avoid
There are no specific conditions known which have to be avoided.

10.5 Incompatible materials
There is no additional information.

10.6 Hazardous decomposition products
Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification acc. to GHS
This substance does not meet the criteria for classification.

Acute toxicity
Shall not be classified as acutely toxic.
GHS of the United Nations, annex 4. May be harmful if swallowed.

Acute toxicity

Exposure route	Endpoint	Value	Species	Method	Source
oral	LD50	3,000 $^{mg}/_{kg}$	rat		TOXNET
dermal	LD50	>10,000 $^{mg}/_{kg}$	rabbit		TOXNET

Skin corrosion/irritation
Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation
Shall not be classified as seriously damaging to the eye or eye irritant.

Respiratory or skin sensitisation
Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity
Shall not be classified as germ cell mutagenic.

Carcinogenicity
Shall not be classified as carcinogenic.

Reproductive toxicity
Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure
Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure
Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

- **If swallowed**
vomiting, nausea, excessive thirst
- **If in eyes**
Data are not available.
- **If inhaled**
Data are not available.
- **If on skin**
Data are not available.
- **Other information**
none

11.2 Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

SECTION 12: Ecological information

12.1 Toxicity
Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)

Endpoint	Value	Species	Source	Exposure time
LC50	5,840 $^{mg}/_{l}$	fish	ECHA	96 h

Aquatic toxicity (chronic)

Endpoint	Value	Species	Source	Exposure time
EC50	2,430 $^{mg}/_{l}$	algae	ECHA	120 h
NOEC	252 $^{mg}/_{l}$	fish	ECHA	33 d

12.2 Persistence and degradability
Data are not available.

12.3 Bioaccumulative potential
Data are not available.

12.4 Mobility in soil
Data are not available.

12.5 Results of PBT and vPvB assessment
Data are not available.

12.6 Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

12.7 Other adverse effects
Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods



Consult the appropriate local waste disposal expert about waste disposal.

Sewage disposal-relevant information
Do not empty into drains.

Waste treatment of containers/packagings
Handle contaminated packages in the same way as the substance itself. Completely emptied packages can be recycled.

13.3 Remarks
Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions. Non-contaminated packages may be recycled.

SECTION 14: Transport information

14.1	**UN number**	not subject to transport regulations
14.2	**UN proper shipping name**	not assigned
14.3	**Transport hazard class(es)**	not assigned
14.4	**Packing group**	not assigned
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user
There is no additional information.

14.7 Transport in bulk according to IMO instruments
The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

Transport informationNational regulationsAdditional information(UN RTDG)
Not subject to transport regulations. UN RTDG

International Maritime Dangerous Goods Code (IMDG) - Additional information
Not subject to IMDG.

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information
Not subject to ICAO-IATA.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

There is no additional information.

National regulations(Australia)

Australian Inventory of Chemical Substances(AICS)

Substance is listed.

Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

National inventories

Country	Inventory	Status
AU	AIIC	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
JP	ISHA-ENCS	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed (ACTIVE)
VN	NCI	substance is listed

Legend

AIIC	Australian Inventory of Industrial Chemicals
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
ISHA-ENCS	Inventory of Existing and New Chemical Substances (ISHA-ENCS)
KECI	Korea Existing Chemicals Inventory
NCI	National Chemical Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.3		Endocrine disrupting properties: Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.	yes
15.1		National inventories: change in the listing (table)	yes

Abbreviations and acronyms

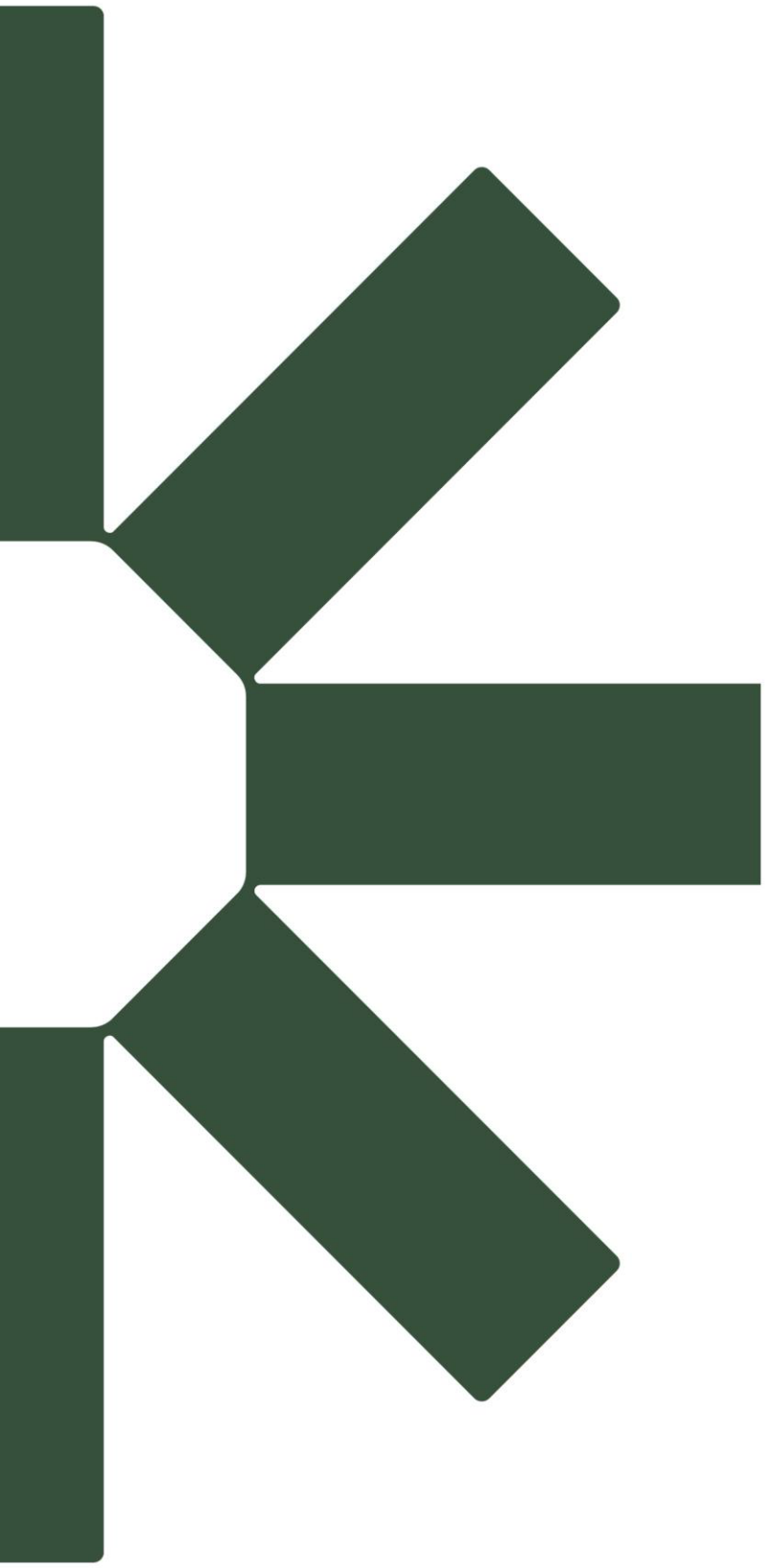
Abbr.	Descriptions of used abbreviations
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
ED	Endocrine disruptor
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
NLP	No-Longer Polymer
NOEC	No Observed Effect Concentration
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
UN RTDG	UN Recommendations on the Transport of Dangerous Good
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Safe Work Australia's Code of Practice for Labelling of Workplace Hazardous Chemicals (under WHS Regulations).
UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

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