

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Barrow Green Hydrogen Limited

Barrow Green Hydrogen Plant

Meetings Industrial Estate

Park Road

Barrow-in-Furness

LA14 4TL

Permit number

EPR/YP3425MZ

Barrow Green Hydrogen Plant

Permit number EPR/YP3425MZ

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows.

The Barrow Green Hydrogen plant produces hydrogen gas through the electrolysis of purified water using electricity supplied from renewable sources. This activity falls under the following Schedule 1 listed activities of The Environmental Permitting (England and Wales) Regulations 2016:

- Section 4.2 Part (A)(1)(a)(i) – Producing inorganic chemicals such as gases: hydrogen.

The hydrogen is produced by six proton exchange membrane electrolyzers (5 MWe each) with a total electrical input rating of 30 MWe and a capacity to produce 12,816 kg of hydrogen per day. The electrolyzers are housed in container modules which include the raw water treatment and hydrogen gas purification. The hydrogen produced is sent via a third party pipeline to the neighbouring paper mill, with the third party responsible for the pipeline's installation, operation and maintenance. During periods of lesser demand, the hydrogen is chilled and stored within nine low pressure buffer tanks, each having 128,000 litre capacity.

The electrolyser feedstock water is potable water supplied by United Utilities and the electrical power used is 100% renewable electricity supplied from either behind the meter local sources or imports via a dedicated grid connection. The process effluent from the reverse osmosis treatment process is discharged from a sump to an attenuation lagoon that drains in turn to the Walney Channel to the west.

There are emissions to air of hydrogen from the electrolyser vents, and the by-product of oxygen is vented direct to atmosphere.

The site is centred on National Grid Reference (NGR) SD 19436 72080 and is 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 nearest designated habitats are 330 metres to the west of the facility at Morecambe Bay Special Area of Conservation (SAC) and Special Protection Area (SPA) and the Duddon Estuary Ramsar, Site of Special Scientific Interest (SSSI) and Special Protection Area. There is also the North Walney National Nature Reserve nearly 390 metres away.

The facility's environmental management system adheres to the ISO 14001 standard.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Application EPR/YP3425MZ/A001	Duly made 30/03/2026	Application for hydrogen production facility
Permit determined EPR/YP3425MZ	14/07/2026	Permit issued to Barrow Green Hydrogen Limited.

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/YP3425MZ

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2016

Barrow Green Hydrogen Limited ("the operator"),

whose registered office is

1 London Wall Place

London

EC2Y 5AU

company registration number 13625005

to operate an installation at

Barrow Green Hydrogen Plant

Meetings Industrial Estate

Park Road

Barrow-in-Furness

LA14 4TL

Name	Date
Stacey Tapsell	14/07/2026

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
 - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

- 1.2.1 The operator shall:
- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
 - (b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
 - (c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

- 1.3.1 The operator shall:
- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
 - (b) maintain records of raw materials and water used in the activities;
 - (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
 - (d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

- 1.4.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.
- 1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.2 The site

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- 2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation (“plan”) specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.
- 2.3.4 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
- (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazardous property associated with the waste, if applicable; and
 - (e) the waste code of the waste.
- 2.3.5 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

2.5 Pre-operational conditions

- 2.5.1 The activities shall not be brought into operation until the measures specified in schedule 1 table S1.4 have been completed.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1 and S3.2.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
 - (a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Odour

- 3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.
- 3.3.2 The operator shall:
 - (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
 - (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

- 3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.
- 3.4.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;
- (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

- 3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:
 - (a) point source emissions specified in tables S3.1 and S3.2;
 - (b) process monitoring specified in table S3.3
- 3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.
- 3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1 and S3.2 unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

- 4.1.1 All records required to be made by this permit shall:
 - (a) be legible;
 - (b) be made as soon as reasonably practicable;
 - (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
 - (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.
- 4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

- 4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

- 4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:
- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
 - (b) the annual production/treatment data set out in schedule 4 table S4.2; and
 - (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.
- 4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:
- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
 - (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and
 - (c) giving the information from such results and assessments as may be required by the forms specified in those tables.
- 4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.3 Notifications

- 4.3.1 In the event:
- (a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—
 - (i) inform the Environment Agency,
 - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
 - (iii) take the measures necessary to prevent further possible incidents or accidents;
 - (b) of a breach of any permit condition the operator must immediately—
 - (i) inform the Environment Agency, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
 - (c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.
- 4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.
- 4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (a) any change in the operator's name or address; and
- (b) any steps taken with a view to the dissolution of the operator.

In any other case:

- (a) the death of any of the named operators (where the operator consists of more than one named individual);
- (b) any change in the operator's name(s) or address(es); and
- (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

- (a) the Environment Agency shall be notified at least 14 days before making the change; and
- (b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 14 days' notice before implementation of any part of the site closure plan.

4.3.7 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:

- (a) a decision by the Secretary of State not to re-certify the agreement;
- (b) a decision by either the operator or the Secretary of State to terminate the agreement; and
- (c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
AR1	Section 4.2 Part A(1) (a) (i) – Producing inorganic chemicals such as hydrogen	Production of hydrogen gas by electrolysis of water in six proton exchange membrane electrolyzers with a total installed capacity of 30 MWe.	Receipt of raw materials to production of hydrogen gas which is then sent to the third party pipeline.
Directly Associated Activity			
AR2	Water demineralisation	Ion exchange, activated carbon filtration, water softening, reverse osmosis, membrane degassing and ultra-violet disinfection.	From the receipt of raw water to the production of demineralised water for consumption in the electrolysis process and including the generation of effluent eventually discharged to Walney Channel.
AR3	Hydrogen purification	Purification by removing trace oxygen in a DeOxo unit and then moisture in a dryer	From collection of hydrogen gas at electrolyser cathode to the output of purified hydrogen gas from the dryer.
AR4	Storage of hydrogen	Temporary hydrogen gas storage in tanks in the event of its immediate use not being required.	From receipt of hydrogen gas after purification to dispatch for use by neighbouring plant. Held in nine low pressure buffer tanks with maximum onsite storage capacity of 1,152,000 litres.
AR5	Electrolyser cooling	Closed loop water cooling system	Operation of cooling system.
AR6	Hydrogen venting	Hydrogen venting	During other than normal operating conditions (OTNOC) and dryer regeneration only.
AR7	Transformers	Two electrical transformers	--
AR8	Discharge to Surface Water	Combined surface water runoff and process waste water.	From facility to discharge point.

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application EPR/YP3425MZ/A001	The following sections of the application document titled 'Environmental Permit Application' dated 03 March 2026, Revision: 3 : Section 3 Site and Process Description	Duly made 30/03/2026

Table S1.2 Operating techniques		
Description	Parts	Date Received
	Section 4 Management Section 5 Resource Efficiency Section 6 Emissions Section 7 BAT Assessment Appendix E Accident Risk Assessment/Management Plan Appendix H Noise Management Plan	

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1	<u>Validation of emissions to water risk assessment</u> The operator shall submit a written report to the Environment Agency for assessment and written approval. The report must contain: • The monitoring data from a minimum of 12 samples from monitoring point W1, obtained under normal operating conditions throughout the first 12 months of operation (post commissioning period). Sampling particularly for pH, total organic carbon, metals and dissolved solids. • A comparison of the effluent composition identified by the samples and the expected composition described in application EPR/YP3425MZ/A001. • An impact assessment in line with our guidance <u>Surface water pollution risk assessment for your environmental permit - GOV.UK</u> for any substances that are present in higher concentrations in the samples compared to the expected composition. This should be based on the final discharge being to a marine environment. • For any substances that do not screen out in the above, the results of modelling. • Where the results of modelling show that a substance is liable to cause pollution, the operator shall provide proposals and timescales on how to manage the effluent to ensure the discharge has an insignificant impact on receiving waters. The operator must implement any proposals in the report in line with the timescales agreed with the Environment Agency's written approval.	Within 15 months of commencing operation of activity AR1 (post commissioning period).
IC2	<u>Emissions of hydrogen from venting</u> The operator shall submit a written report to the Environment Agency for assessment and written approval. The report must contain the proposed methodology to quantify and report any emissions of hydrogen from venting associated with the operations of the installation. The operator must implement the proposals in the report as agreed with the Environment Agency's written approval.	Within 6 months of commencing operation of activity AR1 (post commissioning period).

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC3	<u>Fugitive emissions and leak detection and repair (LDAR) programme</u> The operator shall submit a written plan to the Environment Agency for assessment and written approval. The plan must contain: • A proposal for a risk-based LDAR programme implementing the principles of LDAR to eliminate or reduce fugitive emissions of hydrogen due to its global warming potential. • Details of the monitoring techniques proposed to detect and quantify fugitive emissions of hydrogen, demonstrating how these comply with state-of-the-art emission monitoring for hydrogen, including, when applicable, any guidance issued or recommended by the Environment Agency. The operator must implement the proposals in the plan as agreed with Environment Agency's written approval.	Within 6 months of commencing operation of activity AR1 (post commissioning period).
IC4	<u>Validation of Noise Impact Assessment</u> The operator shall submit a written report to the Environment Agency for assessment and written approval. The report must contain: • An assessment of noise during normal operations in accordance with the procedures given in BS4142:2014 + A1:2019 (Rating industrial noise affecting mixed residential and industrial areas) and BS7445:2003 (Description and measurement of environmental noise) or other methodology as agreed with the Environment Agency. • Baseline sound level measurements retaken at the same receptors chosen for the noise impact assessment Appendix G within the application EPR/YP3425MZ. The assessment shall include but not be limited to: • A review of the noise sources from the facility. Where any noise source(s) are identified as exhibiting tonal contributions, they shall be quantified by means of frequency analysis. • A review of noise levels from static plant. • Considerations of on-site vehicle movements. • A review of the noise assessment against the noise risk assessment Appendix G provided within the application EPR/YP3425MZ to validate the application assessment. It should set out any potential mitigation required. The operator must implement any proposals identified within the report in accordance with the Environment Agency's written approval and within the approved timescales.	Within 4 months from commencement of operations.
IC5	The operator shall update the Environmental Risk assessment (ERA) and Accident Risk Assessment & Management Plan within one month of the completion of pre-operational condition 3. The updated ERA and Accident Risk Assessment & Management Plan shall be updated with reference to the reports submitted to comply with pre-operational condition 3.	Within 1 month of the completion of pre-operational condition 3.

Table S1.4 Pre-operational measures	
Reference	Pre-operational measures
PO1	Prior to the commencement of commissioning, the operator shall send a summary of the site's Environment Management System (EMS) to the Environment Agency including a copy of the full other than normal operating conditions (OTNOC) management plan. The plan will include: • a list of potential OTNOC situations in the operation of the site plant. • a definition of start-up and shut-down conditions having regard to any Environment Agency guidance on start-up and shut-down. • any updates on the design of critical equipment to minimise OTNOC.
PO2	The operator shall update the Site Condition Report with reference to our <u>H5 Guidance on Site Condition Reports</u> and submit this to the Environment Agency for written approval. The updated SCR must: • Incorporate the surface water receptors detailed in section 2.4 in the Curtins Flood Risk Assessment and Drainage Strategy report dated 01/12/2022 (Ref:082665-CUR-ZZ-XX-T-92001). • Specify that the pond referenced in section 2.0 in the existing SCR dated 19th January 2026 (Ref:416.066073.00001) is an existing, engineered attenuation pond and will be receiving site surface water run-off and process waste water prior to discharge into the drainage ditch located adjacent to the northern boundary of the site. • Include an updated Stage 1 to 3 assessment if propylene glycol and oils / greases are to be stored on site. • Include new soil and groundwater measurements to establish a baseline that accurately reflects the current condition of the soil and groundwater.
PO3	The operator shall submit to the Environment Agency for written approval a report to include the following: • A scaled drainage plan detailing above and below ground drainage systems on site. This shall include the waste water sump and associated below ground gravity drainage pipe and sump pump, attenuation pond and Class I Full Retention interceptor (located off site). • Inclusion of the dimensions of the waste water sump and proposed liner specification. • Inclusion of an 'as built' drawing for the existing attenuation pond detailing design / construction details and date constructed. • Inclusion of results of a survey assessing the attenuation pond against relevant industry standards and guidance to demonstrate the design of the attenuation pond incorporates adequate measures to prevent the pollution of soil, groundwater and surface water. The report shall be prepared with consideration of <u>BS EN 16993:2018 Geosynthetic barriers: Characteristics required for use in the construction of storage lagoons, secondary containment (above and below ground) and other containment applications for chemicals, polluted and produced liquids</u> The survey shall include but not be limited to the following:

Table S1.4 Pre-operational measures	
Reference	Pre-operational measures
	• A review of the design and construction specification to verify the engineered materials will be resistant to degradation or failure from any contaminants of concern present within the process waste water. • Inclusion of any Construction Quality Assurance (CQA) records for all attenuation pond materials and liners, accompanied by analytical or test data demonstrating adherence to approved standards. • Inclusion of information to demonstrate the waste water sump has been appropriately sized. • Inclusion of information such as the drainage plan and firefighting strategy to demonstrate how firewater runoff is adequately contained and prevented from entering the attenuation pond. • Inclusion of information to demonstrate the attenuation pond has been appropriately sized to contain both surface water run-off and process waste water. • Inclusion of information on the 'flow control device' that will be used to control outflow and prevent uncontrolled releases in the event of a leak or fire from the attenuation pond into the ditch located on the northern boundary. Where appropriate the report shall contain dates for the implementation of any remedial measures required or required improvements. The remedial measures shall be implemented by the operator from the date of approval by the Environment Agency.

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
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Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1-A6 on site plan in Schedule 7	Atmospheric Hydrogen Vent Stacks	Hydrogen	No limit set	--	No monitoring set	--
A7-A12 on site plan in schedule 7	Atmospheric Oxygen Vent Stacks	No parameter set	--	--	--	--
A13-A18 on site plan in Schedule 7	Emergency Hydrogen Vent Stacks	Hydrogen	No limit set	--	No monitoring set	--
A19-A24 on site plan in schedule 7	Emergency Oxygen Vent Stacks	No parameter set	--	--	--	--
A25 – A30 on site plan in schedule 7	Container Ventilation Outlets	No parameter set	--	--	--	--
A31 – A36 on site plan in schedule 7	Stack Ventilation Outlets	Air	--	--	--	--
A37 - A45 on site plan in schedule 7	Hydrogen Buffer Vessel PSVs	Hydrogen	No limit set	--	No monitoring set	--
A46 on site plan in schedule 7	Hydrogen Metering and Let Down Station PSV	Hydrogen	No limit set	--	No monitoring set	--

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1 on site plan in Schedule 7 emission to Walney Channel	Process waste water from water purification plant via attenuation pond	Flow	47m ³ /day	24-hour total	Continuous	MCERTS certified flow meter
		TOC	No limit set	Spot sample	Monthly for the first 12 months	EN 1484
		pH	No limit set	Spot sample		BS ISO 10523

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
		Total dissolved solids	No limit set	Spot sample		SCA Blue Book
		Dissolved metals (As, Cd, Cr, Cu, Pb, Hg, Ni, B, Fe and Mn)	No limit set	Spot sample		BS EN ISO 11885
W2 on site plan in Schedule 7 emission to Walney Channel	Site surface water runoff, roof water and process effluent	Visible oil and grease	No visible oil and grease	Instantaneous	Weekly	Visual inspection

Table S3.3 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Electrolysis process	Energy efficiency (kWh per kg H ₂)	Continuous	--	To be reported on an annual basis
Electrolysis process (including water demineralisation)	Water efficiency (kg water per kg H ₂)	Continuous	--	To be reported on an annual basis
Electrolysis process (including hydrogen purification and storage)	Emissions of hydrogen from venting (kg H ₂)	Continuous	As agreed in writing by the Environment Agency in response to improvement condition IC2	To be reported on an annual basis
		Event based	As agreed in writing by the Environment Agency in response to improvement condition IC2	To be reported on an annual basis
Electrolysis process (including hydrogen purification and storage)	Fugitive emissions of hydrogen (kg H ₂)	Annual	As agreed in writing by the Environment Agency in response to improvement condition IC3	To be reported on an annual basis

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to surface water	W1 and W2	Every 12 months	1 January

Table S4.2: Annual production	
Parameter	Units
Hydrogen gas production	tonnes

Table S4.3 Performance parameters		
Parameter	Frequency of assessment	Units
Water usage	Annually	tonnes
Water efficiency	Annually	kg water per kg H ₂
Energy usage	Annually	MWh
Energy efficiency	Annually	kWh per kg H ₂
Emissions of hydrogen from venting	Annually	kg H ₂
Fugitive emissions of hydrogen	Annually	kg H ₂

Table S4.4 Reporting forms		
Parameter	Reporting form	Form version number and date
Point source emissions to water (other than sewer)	Emissions to Water Reporting Form, or other form as agreed in writing by the Environment Agency	Version 2, February 2026
Water usage	Water Usage Reporting Form, or other form as agreed in writing by the Environment Agency	Version 1, 08/03/2021
Energy usage	Energy Usage Reporting Form, or other form as agreed in writing by the Environment Agency	Version 1, 08/03/2021
Other performance parameters	Other Performance Parameters Reporting Form, or other form as agreed in writing by the Environment Agency	Version 1, 08/03/2021
Process monitoring requirements	Form 'Process monitoring form' or other form as agreed in writing by the Environment Agency	Version 2, February 2026

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substance(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the breach of permit conditions not related to limits	
To be notified within 24 hours of detection	
Condition breached	
Date, time and duration of breach	
Details of the permit breach i.e. what happened including impacts observed.	
Measures taken, or intended to be taken, to restore permit compliance.	

(d) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substance(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“Hazardous property” has the meaning in Annex III of the Waste Framework Directive.

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

“year” means calendar year ending 31 December.

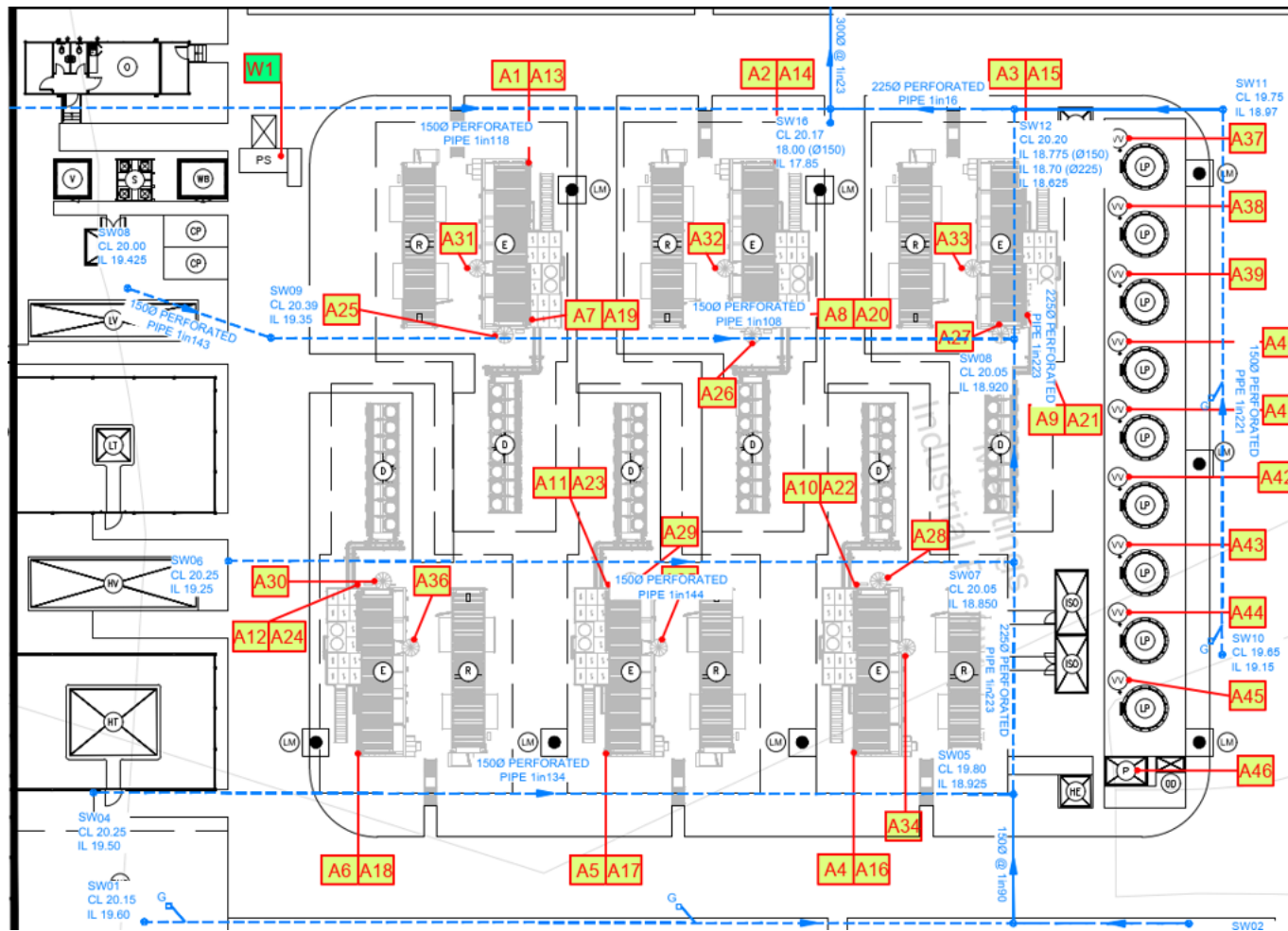
Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

Schedule 7 – Site plan and Emission Points





END OF PERMIT

Reporting Forms

Emissions to Water Reporting Form

Permit number: **EPR/YP3425MZ**

Operator: Barrow Green Hydrogen Limited

Facility name: Barrow Green Hydrogen Plant

Emissions to Water Reporting Form: version 2, February 2026

Reporting of emissions to water (other than to sewer) for the period from [DD/MM/YY] to [DD/MM/YY]

[illegible]

Emission point	Substance / parameter	Emission Limit Value	Reference period	Test method ¹	Result ²	Sample dates and times ³	Measurement uncertainty ⁴

Signed: *[Name]*

Date: *[DD/MM/YY]*

(Authorised to sign as representative of the operator)

Guidance for use: Use this form to report your monitoring results.

Example text is shown in bracketed grey italics. Replace the example text by entering your own site specific information. Complete columns 1 to 5 using the information from schedule 3 of your permit. Complete columns 6 to 8 with your monitoring data. Add additional rows as necessary.

¹ Where an internationally recognised standard test method is used, give the reference number. Where another method that has been formally agreed with the Environment Agency, give the appropriate identifier. In other cases, state the principal technique, for example gas chromatography.

² Give the result as the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, give the result as the 'minimum to maximum' of the measured values.

³ For non-continuous measurements give the date and time of the sample that produced the result. For continuous measurements give the percentage of the process operating time covered by the result.

⁴ Give the uncertainty associated with the quoted result at the 95% confidence interval. State any confidence intervals that are not 95%.

Process Monitoring Form

Permit number: EPR/YP3425MZ

Operator: Barrow Green Hydrogen Limited

Facility name: Barrow Green Hydrogen Plant

Process Monitoring Form: version 2, February 2026

Reporting of process monitoring for the period from *[DD/MM/YY]* to *[DD/MM/YY]*

Monitoring point description or source	Parameter	Reference period	Test method ¹	Result ²	Sample dates and times ³	Measurement uncertainty ⁴
<i>[e.g. Condenser V 2345]</i>	<i>[e.g. cooling water outlet temperature]</i>	<i>[e.g. instantaneous]</i>	<i>[if applicable]</i>	<i>[State result]</i>	<i>[State relevant dates and time periods]</i>	<i>[if applicable]</i>

Operator's comments

Signed: *[Name]*

Date: *[DD/MM/YY]*

(Authorised to sign as representative of the operator)

Guidance for use: Use this form to report your monitoring results.

Example text is shown in bracketed grey italics. Replace the example text by entering your own site specific information. Complete columns 1 to 5 using the information from schedule 3 of your permit. Complete columns 6 to 8 with your monitoring data. Add additional rows as necessary.

- ¹ Where an internationally recognised standard test method is used, give the reference number. Where another method that has been formally agreed with the Environment Agency, give the appropriate identifier. In other cases, state the principal technique, for example gas chromatography.
- ² Give the result as the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, give the result as the 'minimum to maximum' of the measured values.
- ³ For non-continuous measurements give the date and time of the sample that produced the result. For continuous measurements give the percentage of the process operating time covered by the result.
- ⁴ Give the uncertainty associated with the quoted result at the 95% confidence interval. State any confidence intervals that are not 95%.

Water Usage Reporting Form

Permit number: EPR/YP3425MZ

Operator: Barrow Green Hydrogen Limited

Facility name: Barrow Green Hydrogen Plant

Water Usage Reporting Form: version 1, 08/03/2021

Reporting of water usage for the year [YYYY]

Water source	Water usage (m ³)	Specific water usage (m ³ /unit)
Mains water	<i>[insert annual usage in m³ where mains water is used]</i>	<i>[insert annual usage in m³/unit where mains water is used]</i>
Site borehole	<i>[insert annual usage in m³ where water is used from a site borehole]</i>	<i>[insert annual usage in m³/unit where water is used from a site borehole]</i>
River abstraction	<i>[insert annual usage in m³ where abstracted river water is used]</i>	<i>[insert annual usage in m³/unit where abstracted river water is used]</i>
Other – <i>[specify other water source where applicable]. Add extra rows where needed]</i>	<i>[insert annual usage in m³ where applicable]</i>	<i>[insert annual usage in m³/unit where applicable]</i>
Total water usage	<i>[insert total annual water usage in m³]</i>	<i>[insert total annual water usage in m³/unit]</i>

Operator's comments

Signed: *[Name]*

Date: *[DD/MM/YY]*

(Authorised to sign as representative of the operator)

Guidance for use: Use this form to report your annual water usage.

Example text is shown in bracketed grey italics. Replace the example text by entering your own site specific information. Add additional rows as necessary.

Energy Usage Reporting Form

Permit number: EPR/YP3425MZ

Operator: Barrow Green Hydrogen Limited

Facility name: Barrow Green Hydrogen Plant

Energy Usage Reporting Form: version 1, 08/03/2021

Reporting of energy usage for the year [YYYY]

Energy source	Energy consumption / production (MWh)	Specific energy consumption (MWh/unit) ²
Electricity imported as delivered - source [specify source, e.g. supplied from the national grid]	<i>[insert annual consumption in MWh where electricity is imported]</i>	<i>[insert annual consumption in MWh/unit where electricity is imported]</i>
Electricity imported as primary energy 1 – conversion factor of [specify conversion factor used to convert electricity delivered to primary energy]	<i>[insert annual consumption in MWh where electricity is imported]</i>	<i>[insert annual consumption in MWh/unit where electricity is imported]</i>
Natural gas	<i>[insert annual consumption in MWh where natural gas is used]</i>	<i>[insert annual consumption in MWh/unit where natural gas is used]</i>
Gas oil – conversion factor of [specify conversion factor used to convert tonnes to MWh]	<i>[insert annual consumption in MWh where gas oil is used]</i>	<i>[insert annual consumption in MWh/unit where gas oil is used]</i>
Imported heat	<i>[insert annual consumption in MWh where heat is imported]</i>	<i>[insert annual consumption in MWh/unit where heat is imported]</i>
Other – <i>[specify other energy source and conversion factors where applicable, e.g. renewable fuel. Add extra rows where needed]</i>	<i>[insert annual consumption in MWh where applicable]</i>	<i>[insert annual consumption in MWh/unit where applicable]</i>
Electricity exported	<i>[insert annual production in MWh where electricity is exported]</i>	Not applicable
Heat exported	<i>[insert annual production in MWh where heat is exported]</i>	Not applicable

Other Performance Parameters Reporting Form

Permit number: EPR/YP3425MZ

Facility name: Barrow Green Hydrogen Plant

Operator: Barrow Green Hydrogen Limited

Other Performance Parameters Reporting Form: version 1,
08/03/2021

Reporting of other performance parameters for the period from [DD/MM/YY] to [DD/MM/YY]

Parameter	Units
[e.g. Total raw material usage]	[e.g. tonnes per production unit]

Operator’s comments

Signed: [Name]

Date: [DD/MM/YY]

(Authorised to sign as representative of the operator)

Guidance for use: Use this form to report the performance parameters (other than water and energy) required by your permit. Example text is shown in bracketed grey italics. Replace the example text by entering your own site specific information. The parameters to report and units to be used can be found in the 'Performance parameters' table in schedule 4 of your permit. Add additional rows as necessary.