



# Permit with introductory note

## The Environmental Permitting (England & Wales) Regulations 2016

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Surface Transforms PLC  
Surface Transforms Liverpool  
Acornfield Road  
Knowsley Industrial Park  
Liverpool  
L33 7UF

### **Permit number**

EPR/WP3439QP

# Surface Transforms Liverpool

## Permit number EPR/WP3439QP

### Introductory note

#### **This introductory note does not form a part of the permit**

The main features of the permit are as follows.

The installation is located at national grid reference SJ 43856 98784 and is bound by access roads to the north, east and south and by industrial buildings to the west.

The installation manufactures carbon ceramic brake parts for use in the automotive and aerospace industry. This is undertaken by a number of consecutive steps which fall under the following Industrial Emissions Directive (IED) Schedule 1 listed activity descriptions:

Section 1.2 Part A(1)(f)(iv) - Activities involving the pyrolysis, carbonisation, distillation, partial oxidation or other heat treatment of other carbonaceous material.

Section 6.2 Part A(1)(a) - Producing carbon or hard-burnt coal or electro-graphite by means of incineration or graphitisation.

Section 4.2 Part A(1)(a)(v) - Producing inorganic chemicals such as, non-metals, metal oxides, metal carbonyls or other inorganic compounds (for example calcium carbide, silicon, silicon carbide, titanium dioxide).

Precursor fibre is needed to form a pre-form with the necessary dimensions for the final discs. They are then subjected to full carbonisation in a vacuum furnace by pyrolytic heating to create carbon discs. There is one of these furnaces operating on the site.

The carbon discs are then subject to Chemical Vapour Infiltration (CVI), where carbon vapour is infiltrated at a high temperature and under vacuum in a graphitisation process to form the carbon/ceramic discs. This process is repeated until the discs have attained the required density.

The ceramic discs are subjected to a melt infiltration (MIST) process, where powdered silicon is added to each disc. This is heated in an induction coil furnace, melting the silicon which reacts with the carbon fibres to yield carbon, silicon and silicon carbide in a heterogeneous material.

Machining is undertaken to create the final product and finishing coatings are applied. There are three coating processes within six fume booths.

A thermal oxidiser is in place to reduce emissions to air from the carbonisation and CVI process. Emissions from the CVI process are also reduced by a cryogenic plate which condenses out the polyaromatic hydrocarbons (PAHs). There is an improvement condition to recover energy whilst treating the CVI off-gas.

A stand-by dispersion stack will also be in place equipped with carbon filters for use if the thermal oxidiser goes off-line.

There are no emissions to water from the installation.

The site operates under an Environmental Management System (EMS) certified to ISO 14001.

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

<b>Status log of the permit</b>		
<b>Description</b>	<b>Date</b>	<b>Comments</b>
Application EPR/WP3439QP/A001	09/04/19	Duly made Application for a permit for brake disc manufacture
Additional information received	31/07/19	Coating processes
Initial request for information sent 18 July 2019 (air quality assessment)	15/11/19	Updates to Best Available Technique (BAT) and air quality assessments and site plan
Notice requesting further information dated 06 November 2019		
Additional information received	13/12/19	Definition of commissioning
Permit determined EPR/WP3439QP	17/12/19	Permit issued to Surface Transforms PLC

End of introductory note

# Permit

## The Environmental Permitting (England and Wales) Regulations 2016

### Permit number

**EPR/WP3439QP**

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

**Surface Transforms PLC** (“the operator”),

whose registered office is

**Image Business Park  
Acornfield Road  
Knowsley Industrial Park  
Liverpool  
L33 7UF**

company registration number **03769702**

to operate an installation at

**Surface Transforms Liverpool  
Acornfield Road  
Knowsley Industrial Park  
Liverpool  
L33 7UF**

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Philip Lamb	17/12/2019

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.

## **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 table in schedule 3 to this permit:

- (a) point source emissions specified in table S3.1.

- 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 table S3.1, 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; and
  - (b) the performance parameters set out in schedule 4 table S4.2 using the forms specified in table S4.3 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 S4.3 ; 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 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, 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 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.

4.3.4 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.

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

4.3.6 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 1.2 Part A(1)(f)(iv)  Activities involving the pyrolysis, carbonisation, distillation, partial oxidation or other heat treatment of other carbonaceous material.	Heating and carbonisation of polyacrylonitrile preform.  Full carbonisation in a vacuum furnace (one unit) by pyrolytic heating to create a carbon based disc.	From receipt of polyacrylonitrile material and other raw materials to the output of fully carbonised material and release of gases via the thermal oxidiser at emission point A10.
AR2	Section 6.2 Part A(1)(a)  Producing carbon or hard-burnt coal or electro-graphite by means of incineration or graphitisation.	Deposition of carbon onto carbon based disc and heated to form ceramic/graphite disc.  Carbon fibre parts from the carbonisation process are infiltrated with additional carbon using a carbon vapour infiltration (CVI) process in a heated vacuum furnace (three units, CVI 2, CVI 3 and CVI 4).	From receipt of fully carbonised brake parts to the output of densified carbon fibre brake parts and release of gases.  CVI 2 via cryogenic plate system with release at emission point A1. <sup>Note 1</sup>  CVI 3 via cryogenic plate system with release via the thermal oxidiser at emission point A10. <sup>Note 1</sup>  CVI 4 via a cryogenic plate system with release via the thermal oxidiser at emission point A10. <sup>Note 1</sup>
AR3	Section 4.2 Part A(1)(a)(v)  Producing inorganic chemicals such as, non-metals, metal oxides, metal carbonyls or other inorganic compounds (for example calcium carbide, silicon.	Infusion of silicon into carbon fibre disc in a furnace (seven units), forming silicon carbide, in a Melt Infiltration process (MIST).	From receipt of densified carbon fibre disc to production of a ceramic disc and release of gases at emission points A2 and A11.

<b>Table S1.1 activities</b>			
<b>Activity reference</b>	<b>Activity listed in Schedule 1 of the EP Regulations</b>	<b>Description of specified activity</b>	<b>Limits of specified activity</b>
	silicon carbide, titanium dioxide)		
	<b>Directly Associated Activity</b>		
AR4	Directly Associated Activity	Thermal oxidiser abatement plant	From the outlet of the carbonisation furnace (activity ref AR1 in this table), to discharge to air at emission point A10.  From the outlet of the CVI process (CVI 3 and CVI 4) (activity ref AR2 in this table), to discharge to air at emission point A10. <sup>Note 1</sup>
AR4	Directly Associated Activity	Three surface coating processes within six fume booths	From receipt of emissions from the coating processes, to discharge to air at emission points A5, A6, A7, A12, A13 and A14.
Note 1: Refer to improvement condition IC03 in table S1.3 of this permit. It is anticipated that emissions from CVI 2, CVI 3 and CVI 4 will be via emission point A16 on completion of this improvement condition.			

<b>Table S1.2 Operating techniques</b>		
<b>Description</b>	<b>Parts</b>	<b>Date Received</b>
Application EPR/WP3439QP/A001	The response to Section 3a, technical standards, provided in Part B3 of the application form.	09/04/19
Further information EPR/WP3439QP/A001	Coating processes.	31/07/19
Further information EPR/WP3439QP/A001	Technical standards detailed in 'Assessment of Best Available Techniques and Technical Description' document, reference 3910-2467-BAT, version 1.3, dated 14 November 2019. This supersedes the original assessment received 09/04/19.  Including use of the stand-by dispersion stack at emission point A15.	15/11/19
Emissions Modelling Assessment, provided with Application EPR/WP3439QP/A001	Report reference 4013-2467-B, version 1.3, dated 15 November 2019.  Air quality parameters, including volumetric flow rate.  The CVI processes are not operated simultaneously with the carbonisation process.  % operation of stand-by dispersion stack (emission point A15).	15/11/19
Further information EPR/WP3439QP/A001	Definition for the end of commissioning.	13/12/19

<b>Table S1.3 Improvement programme requirements</b>		
<b>Reference</b>	<b>Requirement</b>	<b>Date</b> <small>Note 1</small>
IC01	<p><b><u>Carbonisation (via thermal oxidiser)</u></b></p> <p>The operator shall carry out an assessment of the impact of emissions to air from the carbonisation process (activity reference AR1 in table S1.1 of this permit) at emission point <b>A10</b> (thermal oxidiser). The assessment shall include all potential emissions, including but not necessarily limited to ammonia, hydrogen cyanide, acrylonitrile and NOx. A report on the assessment shall be made to the Environment Agency.</p> <p>Representative emissions monitoring data obtained over a six month period, shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application.</p> <p>An assessment shall be made of the impact of each parameter against the relevant Environmental Standard (ES). In the event that the assessment shows that an ES can be exceeded, the report shall include proposals for further investigative work.</p>	9 months following commissioning of the carbonisation process
IC02	<p><b><u>Carbon vapour infiltration (via thermal oxidiser)</u></b></p> <p>The operator shall carry out an assessment of the impact of emissions to air from the CVI processes (activity ref AR2 in table S1.1 of this permit) at emission point <b>A10</b> (thermal oxidiser). The assessment shall include all potential emissions, including, but not necessarily limited to oxides of nitrogen (NOx), carbon monoxide (CO), formaldehyde and non-methane volatile organic compounds (NMVOCs). A report on the assessment shall be made to the Environment Agency.</p> <p>Representative emissions monitoring data obtained over a six month period, shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application.</p> <p>An assessment shall be made of the impact of each parameter against the relevant Environmental Standard (ES). In the event that the assessment shows that an ES can be exceeded, the report shall include proposals for further investigative work.</p>	9 months following commissioning of CVI 3
IC03	<p><b><u>Energy Recovery - CVI</u></b></p> <p>The operator shall investigate all Best Available Techniques in the form of an options appraisal and cost benefit analysis for recovering energy from the waste gas releases from all CVI processes (activity ref AR2 in table S1.1 of this permit). A summary report shall be provided to the Environment Agency including the specification, thermal input and compliance requirements associated with the chosen option.</p> <p>If necessary, the report shall include an updated assessment of all potential emissions to air, including, but not necessarily limited to NOx, CO, formaldehyde and NMVOCs. A report on the assessment shall be made to the Environment Agency.</p> <p>An assessment shall be made of the impact of each parameter against the relevant Environmental Standard (ES). In the event that the assessment shows that an ES can be exceeded, the report shall include proposals for further investigative work.</p>	9 months following commissioning of CVI 3

<b>Table S1.3 Improvement programme requirements</b>		
<b>Reference</b>	<b>Requirement</b>	<b>Date</b> <sup>Note 1</sup>
IC04	<p><b><u>CVI processes</u></b></p> <p>The operator shall carry out an assessment of the impact of emissions to air from the CVI processes (activity ref AR2 in table S1.1 of this permit) at emission point <b>A16</b>. The assessment shall include all potential emissions, including, but not necessarily limited to NO<sub>x</sub>, CO, formaldehyde and NMVOCs. A report on the assessment shall be made to the Environment Agency.</p> <p>Representative emissions monitoring data obtained over a six month period, shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application.</p> <p>An assessment shall be made of the impact of each parameter against the relevant Environmental Standard (ES). In the event that the assessment shows that an ES can be exceeded, the report shall include proposals for further investigative work.</p>	9 months following commissioning of CVI 4 <sup>Note 2</sup>
<p>Note 1: Commissioning defined in Schedule 6 (Interpretation) of this permit.</p> <p>Note 2: CVI waste gas management may be affected by the outcome of IC03 in which case this condition shall be reviewed.</p>		



## Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
-	-

## Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location <sup>Note 1</sup>	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1	CVI 2	Total volatile organic compounds (VOCs) (as carbon)	No limit set	Extractive sample over a period of representative operation	6 monthly <sup>Note 2</sup>	BS CEN/TS 13649
		Specific individual poly-cyclic aromatic hydrocarbons (PAHs), as specified in Schedule 6 of this permit	No limit set	-	-	-
A2	MIST exhaust 1	Particulate matter	No limit set	-	-	-
A3	Dust extraction unit 1	Particulate matter from machining	No limit set	-	-	-
A4	Dust extraction unit 2	Particulate matter from machining	No limit set	-	-	-
A5	Fume booth exhaust 1	Total volatile organic compounds (VOCs) (as carbon)	No limit set	-	-	-
A6	Fume booth exhaust 2	Total volatile organic compounds (VOCs) (as carbon)	No limit set	-	-	-
A7	Fume booth exhaust 3	Total volatile organic compounds (VOCs) (as carbon)	No limit set	-	-	-

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location <sup>Note 1</sup>	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A10	Thermal oxidiser serving carbonisation process <sup>Note 4</sup>	Ammonia	Note 3	Extractive sample over a period of representative operation	Six monthly <sup>Note 6</sup>	Procedural requirements of BS EN 14791
		Hydrogen cyanide				TGN M22
		Acrylonitrile				Note 9
		Oxides of nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )				BS EN 14792
A10	Thermal oxidiser serving CVI processes <sup>Note 5</sup>	None methane volatile organic compounds (NMVOCs)	Note 3	Extractive sample over a period of representative operation	Six monthly <sup>Note 6</sup>	Note 9
		Carbon monoxide (CO)				BS EN 15058
		Formaldehyde				Sampling BS CEN/TS 13649, analysis to NIOSH 2016 or NIOSH 2539 for aldehyde screening
		Oxides of nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )				BS EN 14792
A11	MIST exhaust 2	Particulate matter	No limit set	-	-	-
A12	Fume booth exhaust 4	Total volatile organic compounds (VOCs) (as carbon)	No limit set	-	-	-
A13	Fume booth exhaust 5	Total volatile organic compounds (VOCs) (as carbon)	No limit set	-	-	-
A14	Fume booth exhaust 6	Total volatile organic compounds (VOCs) (as carbon)	No limit set	-	-	-

<b>Table S3.1 Point source emissions to air – emission limits and monitoring requirements</b>						
<b>Emission point ref. &amp; location</b> <small>Note 1</small>	<b>Source</b>	<b>Parameter</b>	<b>Limit (including unit)</b>	<b>Reference period</b>	<b>Monitoring frequency</b>	<b>Monitoring standard or method</b>
A15	Stand-by dispersion stack (equipped with carbon filters) for the thermal oxidiser, serving the carbonisation process and CVI processes.	No parameters set <small>Note 7</small>	No limit set	-	-	-
A16	Genset exhaust serving CVI 2, CVI 3 and CVI 4	None methane volatile organic compounds (NMVOCs)	No limit set	Extractive sample over a period of representative operation	Six monthly <small>Note 8</small>	<small>Note 9</small>
		Carbon monoxide (CO)				BS EN 15058
		Formaldehyde				Sampling BS CEN/TS 13649, analysis to NIOSH 2016 or NIOSH 2539 for aldehyde screening
		Oxides of nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )				BS EN 14792
<p>Note 1: Emission points on site plan in Schedule 7 of this permit.</p> <p>Note 2: Monitoring frequency may be reduced by prior agreement in writing with the Environment Agency.</p> <p>Note 3: Emission limits and monitoring requirements shall be subject to the outcome of IC01 and IC02 in table S1.3 of this permit.</p> <p>Note 4: Carbonisation process, activity AR1 in table S1.1 of this permit.</p> <p>Note 5: CVI processes, activity AR2 in table S1.1 of this permit.</p> <p>Note 6: Monitoring shall be monthly for the first six months of representative operation in accordance with IC01 and IC02 in table S1.3 of this permit.</p> <p>Note 7: Operational hours shall be monitored in accordance with table S4.2 of this permit.</p> <p>Note 8: Emission limits and monitoring requirements shall be subject to the outcome of IC03 and IC04 in table S1.3 of this permit.</p> <p>Note 9: Method to be agreed in writing with the Environment Agency.</p>						

<b>Table S3.2 Point source emissions to water (other than sewer) – emission limits and monitoring requirements</b>						
<b>Emission point ref. &amp; location</b>	<b>Source</b>	<b>Parameter</b>	<b>Limit (including unit)</b>	<b>Reference period</b>	<b>Monitoring frequency</b>	<b>Monitoring standard or method</b>
W1	Uncontaminated surface water from the installation	-	-	-	-	-

## Schedule 4 – Reporting

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

<b>Table S4.1 Reporting of monitoring data</b>			
<b>Parameter</b>	<b>Emission or monitoring point/reference</b>	<b>Reporting period</b>	<b>Period begins</b>
Emissions to air Parameters as required by condition 3.5.1.	A1, A10 <sup>Note 1</sup> , A16 <sup>Note 2</sup>	Every 6 months	1 January, 1 July
Note 1: Subject to the outcome of IC01 and IC02 in table S1.3 of this permit.			
Note 2: Subject to the outcome of IC03 and IC04 in table S1.3 of this permit.			

<b>Table S4.2 Performance parameters</b>		
<b>Parameter</b>	<b>Frequency of assessment</b>	<b>Units/tonne of carbon product</b>
Energy usage	Annually	MWh
Total waste	Annually	tonnes
Operating hours of thermal oxidiser (emission point A10) as a % of the installation operating hours	Annually	% operation
Operating hours of stand-by dispersion stack (emission point A15)	Annually	No of occasions and cumulative hours for current calendar year

<b>Table S4.3 Reporting forms</b>		
<b>Media/parameter</b>	<b>Reporting format</b>	<b>Date of form</b>
Air	Form air 1 or other form as agreed in writing by the Environment Agency	2019
Performance indicators	Form performance 1 or other form as agreed in writing by the Environment Agency	2019

# 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	

<b>(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</b>	
<b>To be notified within 24 hours of detection</b>	
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	
Substances(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>(b) Notification requirements for the breach of a limit</b>	
<b>To be notified within 24 hours of detection unless otherwise specified below</b>	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

<b>(b) Notification requirements for the breach of a limit</b>	
<b>To be notified within 24 hours of detection unless otherwise specified below</b>	
Measures taken, or intended to be taken, to stop the emission	

<b>Time periods for notification following detection of a breach of a limit</b>	
<b>Parameter</b>	<b>Notification period</b>

<b>(c) Notification requirements for the detection of any significant adverse environmental effect</b>	
<b>To be notified within 24 hours of detection</b>	
Description of where the effect on the environment was detected	
Substances(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.

“commissioning” will end and the furnace will be operational at the point of sign off from the supplier, which will take place at the end of the installation factory acceptance test. This will be the point at which the operator takes over the equipment from the supplier by signing the acceptance handover documentation.

“disposal”. Means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“emissions to land” includes emissions to groundwater.

“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 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.

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

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

“PAH” means Poly-cyclic aromatic hydrocarbon, and comprises Anthanthrene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[b]naph(2,1-d)thiophene, Benzo[c]phenanthrene, Benzo[ghi]perylene, Benzo[a]pyrene, Cholanthrene, Chrysene, Cyclopenta[c,d]pyrene, Dibenzo[ah]anthracene, Dibenzo[a,i]pyrene Fluoranthene, Indo[1,2,3-cd]pyrene, Naphthalene

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.

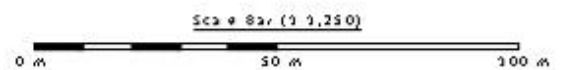
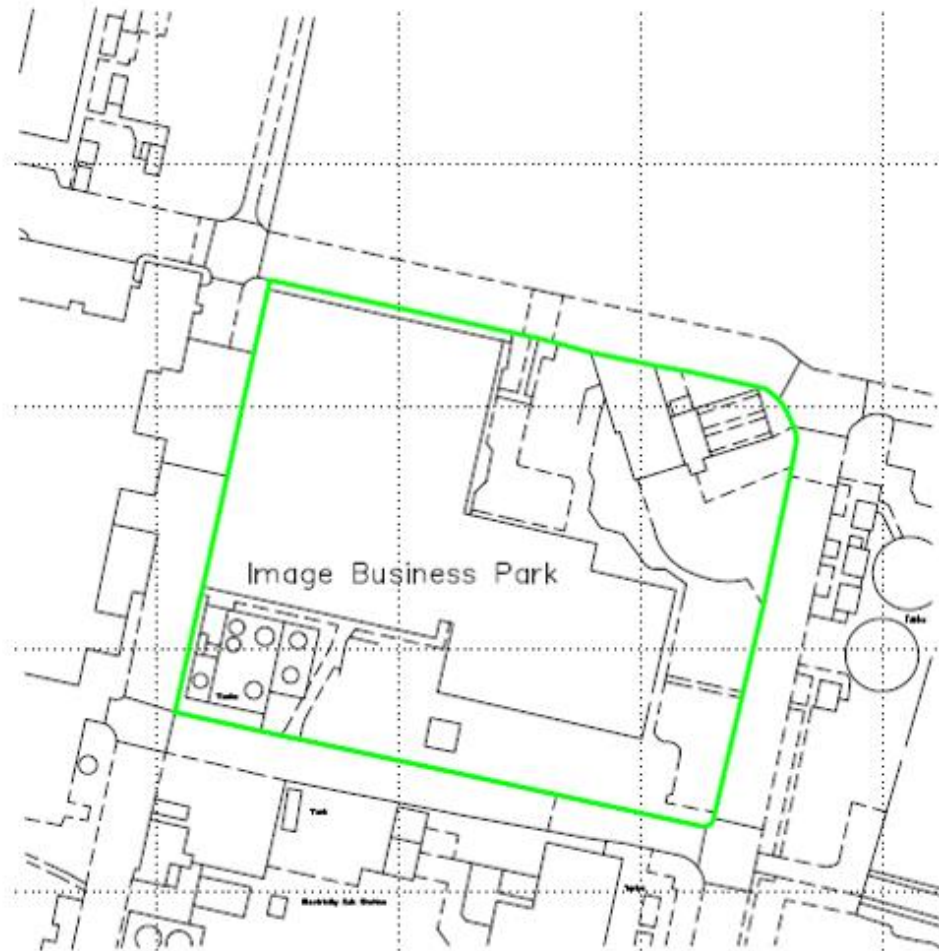
Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- 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.

“year” means calendar year ending 31 December.

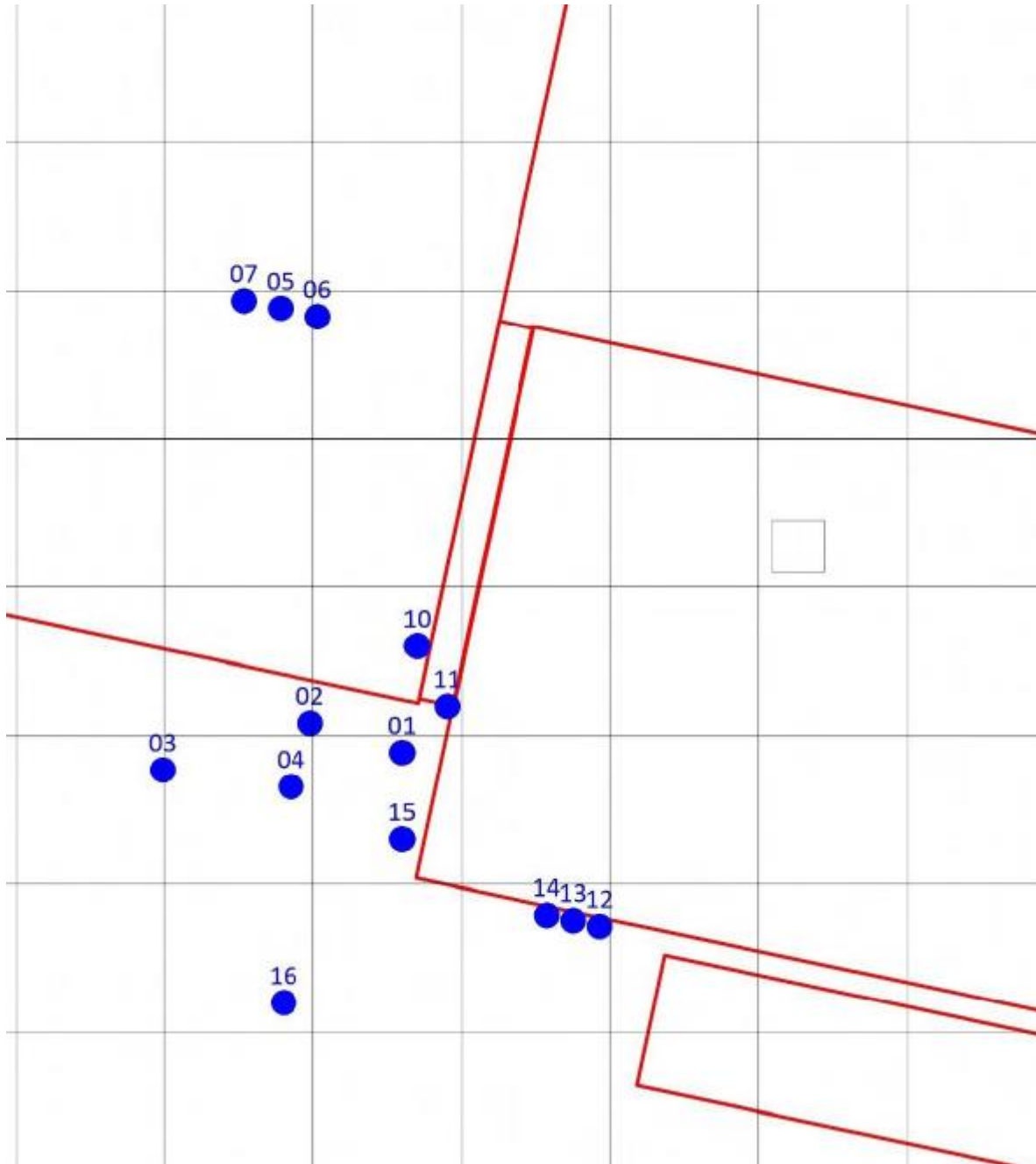
# Schedule 7 – Site plan

Site installation boundary



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Site emission points



END OF PERMIT