

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Dow Silicones UK Limited

**Barry Silicon Based Manufacturing
Installation
Barry Plant
Cardiff Road
Barry
Vale of Glamorgan
CF63 2YL**

Permit number
EPR/BR9685IX

Barry Silicon Based Manufacturing Installation

Permit number EPR/BR9685IX

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows.

The installation consists of four sites that are linked technically. These are operated by Dow Silicones UK Limited, Navigator Terminal and Cabot Carbon Limited. This permit relates to the Dow Silicones site. The primary function of the Dow Silicones site is the manufacture of silicone and silicone intermediates. Silicones are extremely versatile materials that can be manufactured in the form of fluids or elastomeric products for uses that include lubrication, sealing, bonding, releasing, de-foaming and other varied industrial applications.

The site incorporates a large number of chemical processes that are highly integrated. The main process stages are described below.

Silicon metal is ground to a fine powder and fed to fluidised bed reactors where it is reacted with chloromethane to produce a mixture of chlorosilanes. These are then separated into individual monomers by distillation and either used further on-site, shipped to other sites for further processing or sold. If necessary the mix of chlorosilane monomers can be adjusted to meet specific requirements in a dedicated re-arranger plant.

Two of the separated monomers, dimethyldichlorosilane and methyldichlorosilane are hydrolysed to produce polydimethylsiloxane and methyl hydrogen cyclic siloxanes respectively. These are either further processed on-site or shipped off-site. Hydrogen chloride, produced as a by-product from the hydrolysis reaction and also returned from the adjacent Cabot Carbon site, is used as a feedstock, together with methanol for the chloromethane production process.

A mixture of trichlorosilane and silicon tetrachloride is produced from silicon powder and recovered anhydrous hydrochloric acid. This is blended with methyltrichlorosilane before being piped to Cabot Carbon for use in their fumed silica production process. Cabot Carbon also receives a hydrogen supply from Dow Silicones. This is produced as a by-product of the trichlorosilane/silicon tetrachloride process. Dow Silicones also receives fumed silica from Cabot Carbon for use as a principle ingredient in the manufacture of silicon rubber.

A variety of individual processes are used for the manufacture of a range of specialist products from the produced intermediate materials. These include processes for the manufacture of silicone gums and elastomeric products, siloxane fluids, speciality silicone based polymers, siloxanes and silanes. In addition a small multipurpose development plan of new silicone based products.

The site is served by dedicated utility plants that provide steam, nitrogen, process water, compressed air and hot oil (for heating the process plant). In addition a natural gas stream reforming plant provides hydrogen. A dedicated combined heating and power plant (CHP) on an adjacent site provides electrical power and additional steam. The adjacent Navigator Terminal Site provides bulk storage facilities for feedstock materials and product intermediates.

The process vents from the fluidised bed reactors and chloromethane plant are abated using compression and water/cryogenic condensation with the residual vent being sent to the energy recovery unit (ERU) which destroys organic species and produces steam for the site. Vents containing silanes and chlorosilanes are abated using absorption units, a dedicated recovery unit and condensation, prior to the final abatement in the ERU. Liquid process effluents are treated in the site waste water plant. Effluent streams from Cabot Carbon are also processed by this plant. The treatment process includes a primary water treatment stage that neutralises acidic material and precipitates out dissolved metals. A secondary biological treatment process removes organic species. Final discharge is to the River Cadoxton.

Spent Sulphuric Acid from the chloromethane process is currently sent off-site for recovery. The operator has a waste management centre where all wastes are segregated according to hazard perception for shipment off-site for recycling or disposal. This site also has a waste activity permit.

Two sites of special scientific interest (SSSI's) are located within 2km of the site, these are Cog Moors and Hayes Point to Bendrick Rock. A single Natura 2000 site, the Severn Estuary, is located within 10km of the site. Other local receptors include residential housing within 50m of the North-East site boundary.

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 BR9685IX	Received 07/08/2005	
Requests for information BR9685IX	Requests dated 30/09/2005 07/10/2005 21/10/2005 25/10/2005 03/11/2005 09/11/2005	Responses dated 12/10/2005 25/10/2005 03/11/2005 08/11/2005 15/11/2005 17/11/2005 Summary responses 24/01/2006 21/02/2006 21/06/2006
Request to extend determination BR9685IX	Request dated 14/12/2005	Request accepted 09/01/2006
Permit determined BR9685IX	06/06/2006	
Application HP3138UU	Duly made 01/05/2007	
Additional information received HP3138UU	08/05/2007	
Request for additional information HP3138UU	Request dated 15/05/2007	Response dated 30/05/2007
Variation notice issued HP3138UU	27/06/2007	

Status log of the permit

Description	Date	Comments
Application EPR/BR9685IX/V003	Duly made 08/09/2008	
Variation notice issued EPR/BR9685IX/V003	19/11/2008	
Application EPR/BR9685IX/V004	Duly made 07/12/2009	
Additional information received EPR/BR9685IX/V004	05/02/2010	
Additional information received EPR/BR9685IX/V004	08/03/2010	
Variation notice issued EPR/BR9685IX/V004	08/03/2010	
Application EPR/BR9685IX/V005	Duly made 24/12/2010	
Additional information received EPR/BR9685IX/V005	10/02/2011	
Variation notice issued EPR/BR9685IX/V005	11/03/2011	
Application EPR/BR9685IX/V006	Duly made 22/12/2011	Minor technical variation to include a very low viscosity fluids (VLVF) project and an ethylene replacement project. Also to vary and update the permit to modern conditions.
Additional information received EPR/BR9685IX/V006	21/02/2012	Information regarding the maintenance vent for Methyl chloride tankers to add to the variation.
Variation determined EPR/BR9685IX/V006	22/03/2012	Varied and consolidated permit issued in modern condition format.
Agency variation determined EPR/BR9685IX/V007	21/03/2013	Agency variation to implement the changes introduced by IED.
Application EPR/BR9685IX/V008	Duly made 29/07/2016	Changes as described in variation and consolidation notice introductory note
Variation determined EPR/BR9685IX/V008	03/10/2016	Varied and consolidated permit issued in modern condition format.
Application EPR/BR9685IX/V009	Duly made 03/01/2018	
Variation determined EPR/BR9685IX/V009	07/02/2018	Company name changed to Dow Silicones UK Limited
Application EPR/BR9684IX/V010	Duly made 30/03/2021	Normal variation to include two new authorised released points due to expansion in production resulting in increased siloxane emissions, and to include a new limit for Total Organic Carbon (TOC)

Status log of the permit

Description	Date	Comments
Variation determined EPR/BR9685IX/V010	28/07/2021	

Other Part A installation permits relating to this installation

Operator	Permit number	Date of issue
Cabot Carbon Ltd	EPR/BU2110IS	30/03/2006
Navigator Terminal	EPR/KP3734SH	01/06/2006

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number
EPR/BR9685IX

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/BR9685IX/V010 authorising,

Dow Silicones UK Limited ("the operator"),
whose registered office is

Barry Plant
Cardiff Road
Barry
Vale of Glamorgan
CF63 2YL

company registration number **00486170**

to operate a regulated facility at

Barry Silicon Based Manufacturing Installation
Barry Plant
Cardiff Road
Barry
Vale of Glamorgan
CF63 2YL

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

Signed

Date

Holly Noble	28th July 2021
--------------------	----------------------------------

Authorised on behalf of Natural Resources Wales

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.

1.5 Multiple operator installations

- 1.5.1 Where the operator notifies Natural Resources Wales under condition 4.3.1 (a) or 4.3.1 (c), the operator shall also notify without delay the other operator(s) of the installation of the same information.

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
 - (a) 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 Natural Resources Wales.
 - (b) If notified by Natural Resources Wales that the activities are giving rise to pollution, the operator shall submit to Natural Resources Wales 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 Natural Resources Wales.
- 2.3.2 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.
- 2.3.3 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.

- 2.3.4 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 Natural Resources Wales.
- 2.4.2 Except in the case of an improvement which consists only of a submission to Natural Resources Wales, the operator shall notify Natural Resources Wales 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 Total annual emissions from the emission points set out in tables schedule 3 S3.1 and S3.2 of a substance listed in schedule 3 table S3.3 shall not exceed the relevant limit in table S3.3.
- 3.1.4 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 Natural Resources Wales that the activities are giving rise to pollution, submit to Natural Resources Wales 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 Natural Resources Wales.
- 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 Monitoring

- 3.3.1 The operator shall, unless otherwise agreed in writing by Natural Resources Wales, 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 S3.4;
- 3.3.2 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.
- 3.3.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.3.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by Natural Resources Wales.
- 3.3.4 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 Natural Resources Wales.

3.4 Odour

- 3.4.1 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 Natural Resources Wales, 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.
- 3.4.2 The operator shall:
- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to odour, submit to Natural Resources Wales 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 Natural Resources Wales.

3.5 Noise and vibration

- 3.5.1 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 Natural Resources Wales, 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.
- 3.5.2 The operator shall:
- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to noise and vibration, submit to Natural Resources Wales 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 Natural Resources Wales.

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 Natural Resources Wales, 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 Natural Resources Wales.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to Natural Resources Wales using the contact details supplied in writing by Natural Resources Wales.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to Natural Resources Wales by 31 January (or other date agreed in writing by Natural Resources Wales) 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 Natural Resources Wales, 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 Natural Resources Wales, 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.
- 4.2.5 The operator shall submit an annual solvent management plan in order to demonstrate compliance with the requirements of the Industrial Emissions Directive, by 31 January each year in respect of the previous year.

4.3 Notifications

- 4.3.1 (a) In the event 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 Natural Resources Wales,
 - (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) in the event of a breach of any permit condition the operator must immediately—
- (i) inform Natural Resources Wales, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
- (c) in the event 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 Where Natural Resources Wales has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform Natural Resources Wales when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to Natural Resources Wales at least 14 days before the date the monitoring is to be undertaken.
- 4.3.4 Natural Resources Wales 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.

- 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) Natural Resources Wales 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 Natural Resources Wales 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, Natural Resources Wales 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 “without delay” or “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 and WFD Annex I and II operations	Limits of specified activity and waste types
A1	S4.2 A(1)(a)(i) – Producing inorganic chemicals such as – gases (for example ammonia, hydrogen chloride, hydrogen fluoride, hydrogen cyanide, hydrogen sulphide, oxides of carbon, sulphur compounds, oxides of nitrogen, hydrogen, oxides of sulphur, phosgene).	Natural gas steam reformer for hydrogen production	Receipt of fuel to production and storage of hydrogen, associated cooling system and emission of combustion gases.
A2	S3.1 B(c) – Slaking lime for the purpose of making calcium hydroxide or calcium magnesium hydroxide.	W806 and W1206 lime slakers	Receipt of raw materials and storage, production of slaked lime, storage, associated emissions.
A3	S4.1 A(1)(a)(vi) – Producing organic chemicals such as – organic compounds containing halogens (for example halocarbons, halogenated aromatic compounds and acid halides).	W931 and W718 methyl chloride plant	Receipt and storage of reactants, chemical processing and associated abatement plant, product storage, associated emissions.
A4	S4.2 A(1)(a)(iv) – Producing inorganic chemicals such as – salts (for example ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate, cupric acetate, ammonium phosphomolybdate).	W307 and W308 phosphonitrile chloride process	Receipt and storage of reactants, chemical processing and associated abatement plant, product storage, associated emissions. The Pilot Plant (W308) has been physically decommissioned and the material is no longer produced.

Table S1.1 activities

Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
A5	S4.2 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).	W343 rearranger unit, W813 chlorocarbon reactor, W930/W714 fluidised bed reactors, W348 TCS/STC process, W930 DPR hydrogenolysis, W922 methylhydrogen cyclics, W410 continuous hydrolysis unit, W410/W407 vinyl polymer processes, W705/W716/W920 hydrolysis, W306/W406/W405 silicone fluids plant, W309 silicone fluid process, W410 acetoxysilane process, W115 gum rig process, W422 polymerisation reactor process, W410 release modifier process and paper coating blenders, W410 amino polymer process, W307/W308 pilot plant, W115 catalyst unit	The Pilot Plant (W308) has been physically decommissioned.
A6	S4.7 A(1)(a) - Any activity for the manufacture of a chemical which may result in the release of ammonia into the air, other than an activity in which ammonia is only used as a refrigerant.	W115 Mixing plant	Receipt and storage of reactants, chemical processing and abatement plant, product storage, associated emissions.
A7	S5.1 A(1)(c) - The incineration, other than incidentally in the course of burning landfill gas or solid or liquid waste, of any gaseous compound containing halogens.	W949 Energy Recovery Unit	Receipt of waste gases, combustion, abatement plant, associated emissions.
A8	S5.4 A(1)(a)(i) – Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day (or 100 tonnes per day if the only waste treatment facility is anaerobic digestion) involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC concerning urban waste-water treatment – biological treatment.	W806 Effluent treatment process	Receipt, storage and treatment of process effluent and contaminated surface water, discharge to the River Cadoxton.
Directly Associated Activity			
A9	W424 and W940	Silicon grinders	Receipt of raw materials, grinding, associated abatement and emissions.

Table S1.1 activities

Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
A10	W948, W420 and W322	Hot oiler heaters <20MW thermal input	Production of hot oil for site and emission of combustion gases.
A11	W404, W406, W408, W414, W708, W801, W802, W810	Tanks farms	Storage of raw materials, intermediates and products, associated emissions.
A12	W911, W342	Cooling towers	Site cooling towers and associated emissions.
A14	W413 and W411	Storm water collection sump and river water filtration unit	Un-contaminated storm water run-off from site and discharge to the River Cadoxton.
A14	W1205 and W1206 W805	Quench process Medusa process	Receipt of material for quenching/encapsulation, treatment, product storage and associated emissions.
A15	W946	Chlorosilane recovery unit	Receipt of silanes, treatment with HCl, despatch of chlorosilanes and associated emissions.
A16	W709	Absorber and fridge	Absorption of Chlorosilanes.
A17	W945	Basics refrigeration unit	Refrigeration capacity for W930 and W941.
A18	W707, W717, W941	Distillation process	Receipt of crude feedstock, distillation and despatch of refined product.

Table S1.2 Operating techniques

Description	Parts	Date Received
Application	The response to questions 2.1 and 2.2 given in Section B2.1, B2.2 and Appendix 4 & 7 of the application	17/08/2005
Further information	Two new separation processes	24/01/2006
Application for variation EA/EPR/BR9685IX/V004	Amended Appendix 4, Section 9	01/12/2009
Application for variation EA/EPR/BR9685IX/V005	An amended and consolidated Appendix 4 containing modification to Sections 2, 5, 6, 9, 10, 11 and 15. Note Section 7 still remains excluded	10/02/2011
Application for variation EA/EPR/BR9685IX/V006	Appendix A – the main activities: Section 16 update, Section 14 update. Appendix D – Non Technical Summary, Appendix E Environmental Assessment, Appendix H New Raw Materials	22/12/2011
	Emails - Information regarding the maintenance vent for Methyl Chloride tankers to add to the variation	21/02/2012 & 07/03/2012
Application for variation EPR/BR9685IX/V008	An amended and consolidated Site Document Appendix 4 containing modifications to Sections 1, 2, 9, 10, 13, 14, 15, 16 and 17	24/05/2016
Application for variation EPR/BR9685IX/V008	Appendix K – Environmental Assessment – Updates to Sections 1, 2, 9, 10, 13 and 14	24/05/2016

Table S1.2 Operating techniques

Description	Parts	Date Received
Application for variation EPR/BR9685IX/V008	Appendix M – Site Plan	24/05/2016
Application for variation EPR/BR9685IX/V008	Email with updated Appendix B Section 14	26/08/2016
Application for variation EPR/BR9685IX/V010	Information submitted in response to our request for further information at duly making stage Application form A, C2, C3 and F, Appendices D and E of the application pack Safety data sheets submitted during the permit determination	Email on 12/03/2021 Application on 15/07/2020 Email on 10/05/2021

Table S1.3 Improvement programme requirements

Reference	Requirement	Date
IP33	The operator shall undertake the monitoring of dust emissions of the newly authorised vent point A120 and shall submit a report to Natural Resources Wales, confirming the calculated values and actual values match, together with confidence limits, that can be achieved by the existing air emission abatement equipment.	Completed
IP34	The operator shall undertake further Energy Recovery Unit reduced residence time trials in order to establish the effect on emissions to air and water. The operator shall submit a report to Natural Resources Wales, confirming the acceptable operating residence time achievable while minimising emissions and maximising recovery of energy. The benefits of reduced venting and increased DPR recovery shall also be quantified.	Completed

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	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1 – Point A1 on site plan BDC 00114420	W424 Grinding Plant bag filter vent	-	-	-	-	-
A2 – Point A2 on site plan BDC 00114420		-	-	-	-	-
A3 – Point A3 on site plan BDC 00114420		-	-	-	-	-
A4 – Point A4 on site plan BDC 00114420	W940 Grinding Plant bag filter vent	-	-	-	-	-
A5 – Point A5 on site plan BDC 00114420		-	-	-	-	-
A6 – Point A6 on site plan BDC 00114420		-	-	-	-	-
A7 – Point A7 on site plan BDC 00114420		-	-	-	-	-
A8 – Point A8 on site plan BDC 00114420	W714 Fluidised Bed Reactor bag filter vent , located on W709	-	-	-	-	-
A9 – Point A9 on site plan BDC 00114420		-	-	-	-	-
A10 – Point A10 on site plan BDC 00114420	W714 Fluidised Bed Reactor bag filter vent	-	-	-	-	-

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
A11 – Point A11 on site plan BDC 00114420						
A12 – Point A12 on site plan BDC 00114420	W714 Fluidised Bed Reactor vent via condenser	Chloromethane	1000 kg/day, ⁽²⁾ 250 kg/h ⁽²⁾	-	Continuous when ERU not available	US EPA Method 18
A13 – Point A13 on site plan BDC 00114420	W930 Fluidised Bed Reactor catalyst filter vent	-	-	-	-	-
A14 – Point A14 on site plan BDC 00114420	W930 Fluidised Bed Reactor Bag filter vent	-	-	-	-	-
A15 – Point A15 on site plan BDC 00114420						
A16 – Point A16 on site plan BDC 00114420						
A17 – Point A17 on site plan BDC 00114420						
A18 – Point A18 on site plan BDC 00114420						
A19 – Point A19 on site plan BDC 00114420	Not assigned	-	-	-	-	-
A20 – Point A20 on site plan BDC 00114420	W716 Hydrolysis Plant vent via condenser	-	-	-	-	-
A21 – Point A21 on site plan BDC 00114420	Not assigned	-	-	-	-	-

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
A22 – Point A22 on site plan BDC 00114420	W716 Hydrolysis Plant vent via absorber	-	-	-	-	-
A23 – Point A23 on site plan BDC 00114420	W705 Hydrolysis plant via scrubber	-	-	-	-	-
A24 – Point A24 on site plan BDC 00114420	W716 Hydrolysis Plant vent via scrubber	-	-	-	-	-
A25 – Point A25 on site plan BDC 00114420	W705/ W716 Hydrolysis Plant vent via scrubber	-	-	-	-	-
A26 – Point A26 on site plan BDC 00114420	W920 Hydrolysis Plant vent via scrubber	Siloxanes	-	-	Quarterly	Method agreed with Natural Resources Wales
A27 – Point A27 on site plan BDC 00114420	W920 Hydrolysis Plant vent via condenser	Siloxanes	-	-	Quarterly	Method agreed with Natural Resources Wales
A28 – Point A28 on site plan BDC 00114420	W920 Hydrolysis Plant tanker loading vent	-	-	-	-	-
A29 – Point A29 on site plan BDC 00114420	W343 Rearranger Plant vent via scrubber	-	-	-	-	-
A30 – Point A30 on site plan BDC 00114420	W718 Chloromethane Plant sulphuric acid tank vent	-	-	-	-	-
A31 – Point A31 on site plan BDC 00114420	W802 Tank Farm tank vent	-	-	-	-	-
A32 – Point A32 on site plan BDC 00114420						

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
A33 – Point A33 on site plan BDC 00114420	W718 Chloromethane Plant vent via condenser and absorber	Chloromethane	1000 kg/day, ⁽²⁾ 250 kg/h ⁽²⁾	-	Continuous when ERU not available	US EPA Method 18
		Methanol	60 kg/h			
A34 – Point A34 on site plan BDC 00114420	W931 Chloromethane Plant vent via condenser and absorber	Chloromethane	1000 kg/day, ⁽²⁾ 250 kg/h ⁽²⁾	-	Continuous when ERU not available	US EPA Method 18
		Methanol	60 kg/h			
A35 – Point A35 on site plan BDC 00114420	W1206 Quench treatment area bag filter vent	-	-	-	-	-
A37 – Point A37 on site plan BDC 00114420	W1206 Quench treatment area vent via scrubber	-	-	-	-	-
A38 – Point A38 on site plan BDC 00114420						
A39 – Point A39 on site plan BDC 00114420						
A40 – Point A40 on site plan BDC 00114420	W946 Chlorosilane Recovery Unit vent via W806 scrubber	-	-	-	-	-
A41 – Point A41 on site plan BDC 00114420	W949 Energy recovery Unit via 30M stack ⁽⁵⁾	Particulates	10 mg/m ³	Hourly average	Annually	BS EN 13284-1
		Hydrogen chloride	10 mg/m ³ ⁽⁴⁾	Annual average	Monthly	BS EN 1911
		Chlorine	10 mg/m ³	Annual average	Monthly	US EPA Method 26
		Carbon monoxide	50 mg/m ³ ⁽⁴⁾	Hourly average	Annually	BS EN 15058
		Oxides of nitrogen, as NO ₂	100 mg/m ³	Hourly average	Annually	BS EN 14792
		Dioxins and furans	0.1 ng/m ³	-	Annually	BS EN1948: Parts 1, 2 and 3 MID
A42 – Point A42 on site plan BDC 00114420	Waste water treatment plant bag filter vent	-	-	-	-	-

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
A43 – Point A43 on site plan BDC 00114420	W922 Methylhydrogen Cyclics Process vent via scrubber	Hydrogen chloride	10 mg/m ³	Hourly average	Quarterly	BS EN 1911
A45 – Point A45 on site plan BDC 00114420	W922 Methylhydrogen Cyclics process tank vent	-	-	-	-	-
A46 – Point A4 on site plan BDC 00114420	W922 Methylhydrogen Cyclics process tanker vent	-	-	-	--	-
A47 – Point A47 on site plan BDC 00114420	W420 Hot oil unit vent via 18.3m stack	-	-	-	-	-
A48 – Point A48 on site plan BDC 00114420	W948 Hot oil unit vent via 30m stack	-	-	-	-	-
A49 – Point A49 on site plan BDC 00114420	W1206 Quench treatment area via scrubber	-	-	-	-	-
A50 – Point A50 on site plan BDC 00114420	W957 Hydrogen plant vent via 19m stack	Oxides of nitrogen, as NO ₂	200 mg/m ³	Hourly average	Annually	BS EN 14792
		Carbon monoxide	200 mg/m ³	Hourly average	Annually	BS EN 15058
A51 – Point A51 on site plan BDC 00114420	W940 Grinder Plant bag filter vent	-	-	-	-	-
A52 – Point A52 on site plan BDC 00114420	W920 Hydrolysis vent via scrubber	-	-	-	-	-
A53 – Point A53 on site plan BDC 00114420	W922 Methylhydrogen Cyclics Process separator vent	-	-	-	-	-
A54 – Point A54 on site plan BDC 00114420	-	-	-	-	-	-

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
A55 – Point A55 on site plan BDC 00114420	W348 TCS Process bag filter vent	-	-	-	-	-
A56 – Point A56 on site plan BDC 00114420		-	-	-	-	-
A57 – Point A57 on site plan BDC 00114420	W348 TCS Process vent via scrubber	Hydrogen chloride	10 mg/m ³	Hourly average	Quarterly	During each spent bed transfer to W348
		Chloromethane	2 kg/h	-	During each spent bed transfer to W348	BS EN 13649
A58 – Point A58 on site plan BDC 00114420	W306 fluids GIC Process vent	-	-	-	-	-
A59 – Point A59 on site plan BDC 00114420	W306 fluids HVF Process vent	-	-	-	-	-
A60 – Point A60 on site plan BDC 00114420	W306 fluids DC1107 process vent via condenser	Class B VOC's	-	-	Quarterly	BS EN 13649
A61 – Point A61 on site plan BDC 00114420	W404 Tank Farm vent	-	-	-	-	-
A62 – Point A62 on site plan BDC 00114420		-	-	-	-	-
A63 – Point A63 on site plan BDC 00114420		-	-	-	-	-
A65 – Point A65 on site plan BDC 00114420	W406 Fluids splitter process vent via condenser	Siloxanes	-	-	Quarterly	Method agreed with Natural Resources Wales
A66 – Point A66 on site plan BDC 00114420	W406 Tank Farm vent	-	-	-	-	-

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
A67 – Point A67 on site plan BDC 00114420		-	-	-	-	-
A68 – Point A68 on site plan BDC 00114420	W422 polymerisation process vent via condenser, and W405, Very Low Viscosity Fluids Process	Siloxanes	-	-	Quarterly	Method agreed with Natural Resources Wales
		Class B VOC's	-	-	Quarterly	BS EN 13649
A69 – Point A69 on site plan BDC 00114420	W322 Hot oil unit vent via 15m stack	-	-	-	-	-
A70 – Point A70 on site plan BDC 00114420	W322 Hot oil vent via condenser	-	-	-	-	-
A71 – Point A71 on site plan BDC 00114420	W322 Hot oil unit tank vent	-	-	-	-	-
A72 – Point A72 on site plan BDC 00114420	W410 Batch vinyl polymer process vent via condenser	-	-	-	-	-
A73 – Point A73 on site plan BDC 00114420		-	-	-	-	-
A74 – Point A74 on site plan BDC 00114420	W410 Amino Polymer Process (Textiles) vent via condenser	-	-	-	-	-
A75 – Point A75 on site plan BDC 00114420	W410 Acetoxysilane/CHU process vent via scrubber	-	-	-	-	-
A76 – Point A76 on site plan BDC 00114420	W410 Acetoxysilane process bag filter vent	-	-	-	-	-
A77 – Point A77 on site plan BDC 00114420	W410 Release modifier process vent via condenser	-	-	-	-	-

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
A78 – Point A78 on site plan BDC 00114420		Class A VOCs	-	-	Quarterly	BS EN 13649
A79 – Point A79 on site plan BDC 00114420	W407 continuous vinyl polymer process vent via condenser	Siloxanes	-	-	Quarterly	Method agreed with Natural Resources Wales
A80 – Point A80 on site plan BDC 00114420	W407 continuous vinyl polymer process vent via 25m stack	-	-	-	-	-
A81 – Point A81 on site plan BDC 00114420	W408 Tank Farm vent	-	-	-	-	-
A82 – Point A82 on site plan BDC 00114420	-	-	-	-	-	-
A83 – Point A83 on site plan BDC 00114420	W414 Tank farm vent	-	-	-	-	-
A84 – Point A84 on site plan BDC 00114420		-	-	-	-	-
A85 – Point A85 on site plan BDC 00114420	W307 Multipurpose/development process vent via scrubber	Siloxanes	-	-	Quarterly	Method agreed with Natural Resources Wales
A86 – Point A86 on site plan BDC 00114420	W309 Silicone Fluids Process vent	-	-	-	-	-
A87 – Point A87 on site plan BDC 00114420		-	-	-	-	-
A88 – Point A88 on site plan BDC 00114420		-	-	-	-	-

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
A89 – Point A89 on site plan BDC 00114420	W115 Elastomers Mixing Process vent via scrubber	-	-	-	-	-
A90 – Point A90 on site plan BDC 00114420	W115 Elastomers Mixing Process vent via dust cartridge	-	-	-	-	-
A91 – Point A91 on site plan BDC 00114420		-	-	-	-	-
A92 – Point A92 on site plan BDC 00114420		-	-	-	-	-
A94 – Point A94 on site plan BDC 00114420	W115 Elastomers Gum unit vent via condenser	-	-	-	-	-
A95 – Point A95 on site plan BDC 00114420	W115 Elastomers mixing plant bag filter vent	-	-	-	-	-
A96 – Point A96 on site plan BDC 00114420		-	-	-	-	-
A97 – Point A97 on site plan BDC 00114420	-	-	-	-	-	-
A98 – Point A98 on site plan BDC 00114420	-	-	-	-	-	-
A99 – Point A99 on site plan BDC 00114420	-	-	-	-	-	-
A100 – Point A100 on site plan BDC 00114420	-	-	-	-	-	-

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
A101 – Point A101 on site plan BDC 00114420	-	-	-	-	-	-
A102 – Point A102 on site plan BDC 00114420	-	-	-	-	-	-
A103 – Point A103 on site plan BDC 00114420	-	-	-	-	-	-
A104 – Point A104 on site plan BDC 00114420	-	-	-	-	-	-
A105 – Point A105 on site plan BDC 00114420	-	-	-	-	-	-
A106 – Point A106 on site plan BDC 00114420	-	-	-	-	-	-
A107 – Point A107 on site plan BDC 00114420	-	-	-	-	-	-
A108 – Point A108 on site plan BDC 00114420	W410 Amino Polymer Process vent	-	-	-	-	-
A111 – point A111 on revised air vent drawing	W930 FBR Catalyst Powder unloading system vent	-	-	-	-	-

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
A112 – point A112 on site plan BDC 00114420	W205 4401 tilt mixer vent	-	-	-	-	-
A113 – point A113 on site plan BDC 00114420	W205 301 small tilt mixer vent	-	-	-	-	-
A114 – Point A114 on site plan BDC 00114420	W1205 200 DPR Quench vent	-	-	-	-	-
A116 – point A116 on site plan BDC 00114420	W922 Methylhydrogen cyclics process 2 nd separator vent	-	-	-	-	-
A117 – point A117 on site plan BDC 00114420	W810 HCl storage tank water scrubber vent	-	-	-	-	-
A118 – point A118 on site plan BDC 00114420	W808	-	-	-	-	-
A119 – point A119 on site map BDC 00114420	W414 Tanker	-	-	-	-	-
A120 – point A120 on site map BDC 00114420	W930 Catalyst charging	Particulates	No visible release	-	-	-

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
A121– point A121 on site map BDC 00114420	WWT Scubber	-	-	-	-	-
A122 – point A122 on site map BDC 00114420	W424 Bucket conveyor	-	-	-	-	-
A123	W405 Rework tank	Siloxanes	-	-	Quarterly	Method agreed with Natural Resources Wales
A124	W405 Final product storage tank	Siloxanes	-	-	Quarterly	Method agreed with Natural Resources Wales

Note 1: See section 6 for reference conditions.

Note 2: Limit is cumulative for A12, A33, A34 and A40.

Note 3: During phosphonitrile production.

Note 4: No monthly value to exceed 150% (15 mg/m³) of annual average limit.

Note 5: For emission point W949 the emission concentrations shall be reported at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 11% dry. This is as previously agreed between NRW and the operator.

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 BDC 00114420 in application	Discharge from effluent treatment plant	Flow	11,000 m ³ /day	-	Continuous	MCERTS self-monitoring of effluent flow scheme
			625 m ³ /hour	-		
		Temperature	40°C ⁽¹⁾	Instantaneous	Continuous	Standard temperature sensor

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
		pH	6 - 9	Instantaneous	Continuous	BS ISO 10523
		Suspended solids	30 mg/l ⁽¹⁾	Daily composite	Daily	BS EN 872 SCA blue book 105
		BOD	20 mg/l	-	Monthly	SCA blue book 130 ISBN 0117522120
		Copper	0.1 mg/l ⁽¹⁾	Daily composite	Daily	BS ISO 17294-2:2004, BS 6068-2.89
		Zinc	0.5 mg/l ⁽¹⁾	Daily composite	Daily	
		Hydrocarbon oil	No visible sheen	-	Weekly	BS EN ISO 9377-2 SCA blue book 77 ISBN 0117517283
		TOC	100 mg/l ⁽³⁾	Yearly average	Continuous	EN 1484
		pH	6 - 9	-	Weekly	BS 6068-2.50:1995, ISO 10523
		Suspended solids	30 mg/l ⁽²⁾	-	Weekly	
		BOD	20 mg/l ⁽²⁾	-	Monthly	
W2 on site plan BDC 00114420 in application	Untreated discharge from 413 spill pond					

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
		COD	125 mg/l ⁽²⁾	-	Monthly	BS ISO 15705:2002, BS 6068-2.34, SCA blue book 215
		Copper	0.15 mg/l ⁽²⁾	-	-	BS ISO 17294-2:2004, BS 6068-2.89
		Zinc	0.25 mg/l ⁽²⁾	-	Following each transfer from W809 to W413	-
		Hydrocarbon oil	No visible sheen	-	Monthly	BS EN ISO 9377-2 SCA blue book 77, ISBN 0117517283

Note 1: Not more than 5% of samples shall exceed the emission limit value in the reporting period

Note 2: No spot sample shall exceed the emission limit value by more than 50%.

Note 3: The 100mg/l yearly average limit for TOC is conditional on both of the following conditions being fulfilled:

Condition A: Abatement efficiency $\geq 90\%$ as a yearly average (including both pretreatment 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)
- Nitrification is used

Table S3.3 Annual limits

Substance	Medium	Limit (including unit)
Chloromethane	Air	60,000 kg
Total non-methane volatile organic compounds ⁽¹⁾	Air	150,000 kg

Note 1: Including siloxanes and silanes

Table S3.4 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
A12	Methane	Continuous	US EPR Method 18	Only when ERU not available
A12	Non-methane hydrocarbons	Continuous	US EPR Method 18	Only when ERU not available
A26	Class B VOCs	Annually	BS EN 13649	-
A48	Oxides of Nitrogen as NO ₂	Annually	BS EN 14792	-
A48	Carbon monoxide	Annually	BS EN 15058	-
ERU	Process availability ⁽¹⁾	Continuous	Process monitoring	To be reported to Natural Resources Wales annually
A114 ⁽²⁾	Non-methane hydrocarbons	Annually	BS EN 13649	-
	Siloxanes		Method agreed With Natural Resources Wales	
A1-A11, A13-A18, A29, A35, A38, A39, A42, A49, A51, A55, A56, A79, A90, A92, A95-A107, A111-A113	Particulates	-	-	No visible releases of dust with no evidence of desposition in vicinity of stack discharge
A47, A48, A69	Smoke	-	-	No visible smoke except for the first 15 minutes of start-up from cold
W1 – Storm water released via W1	Total oxygen demand (TOD)	Continuous	-	Monitoring of TOD, flow is stopped on detection of contamination
W806 – Tertiary scrubber	-	-	-	Monitoring of TOD, flow is stopped on detection of contamination

Note 1: Based on the availability to process 100% of W714 FBR vent.

Note 2: Sampling to be carried out during period when releases from the batch based process are greatest.

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 air Parameters as required by condition 3.5.1.	A12, A26, A33, A34, A40, A41, A48, A50, A57, A85	Every 12 months	1 January
Emissions to air Parameters as required by condition 3.5.1.	A26, A27, A43, A57, A60, A65, A68, A78, A79, A85, A123, A124	Every 3 months	1 January, 1 April, 1 July, 1 October
Emissions to water Parameters as required by condition 3.5.1	W1, W2	Every 3 months	1 January, 1 April, 1 July, 1 October

Table S4.2: Annual production/treatment

Parameter	Units
Production of Polydimethylsiloxane	tonnes

Table S4.3 Performance parameters

Parameter	Frequency of assessment	Units
Water usage	Annually	tonnes
Energy usage	Annually	MWh
Total raw material used	Annually	tonnes
Unit Recovery Unit	Annually	%
Waste disposal and/or recovery	Annually	tonnes

Table S4.4 Reporting forms

Media/parameter	Reporting format	Date of form
Air – Annual reporting of emissions	Form BR9685IX/A1 or other as agreed in writing with Natural Resources Wales	22/03/2012
Air – Quarterly reporting of emissions	Form BR9685IX/A2 or other form as agreed in writing with Natural Resources Wales	22/03/2012
Air A41 Annual reporting of Hydrogen Chloride emissions	Form BR9685IX/A3 or other form as agreed in writing with Natural Resources Wales	22/03/2012
Air A41 Annual reporting of Chlorine emissions	Form BR9685IX/A4 or other form as agreed in writing with Natural Resources Wales	22/03/2012
Air A41 Annual reporting of Chloromethane emissions	Form BR9685IX/A5 or other form as agreed in writing with Natural Resources Wales	22/03/2012
Water – Quarterly reporting of emissions to water	Form BR9685IX/W1 or other form as agreed in writing with Natural Resources Wales	22/03/2012
Energy Usage	Form BR9685IX/E1 or other form as agreed in writing with Natural Resources Wales	22/03/2012
Waste Return	Form BR9685IX/R1 or other form as agreed in writing with Natural Resources Wales	22/03/2012
Water Usage	Form BR9685IX/WU1 or other form as agreed in writing with Natural Resources Wales	22/03/2012

Table S4.4 Reporting forms

Media/parameter	Reporting format	Date of form
Performance Indicators	Form BR9685IX/PI1 or other form as agreed in writing with Natural Resources Wales	-
ERU availability	Form BR9685IX/ERU1 or other form as agreed in writing with Natural Resources Wales	22/03/2012

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 activity that gives rise to an incident or accident which significantly affects or may significantly affect the environment	
To be notified Immediately	
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) Notification requirements for the breach of a permit condition	
To be notified immediately	
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	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) In the event 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:

To be notified immediately	
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 Natural Resources Wales 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.

“background concentration” means such concentration of that substance as is present in:

- for emissions to surface water, the surface water quality up-gradient of the site; or
- for emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge.

“disposal” or “D” 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 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

“hazardous waste” has the meaning given in the Hazardous Waste (Wales) Regulations 2005 (as amended)

“hazardous substance” means a substance classified as hazardous as a consequence of fulfilling the criteria laid down in parts 2 to 5 of Annex I to Regulation (EC) No 1272/2008

“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.

“quarter” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“recovery” or “R” means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“Waste code” means the six digit code referable to a type of waste in accordance with the list of wastes established by Commission Decision 2000/532/EC as amended from time to time (the ‘List of Wastes Decision’) and in relation to hazardous waste, includes the asterisk.

“Waste Framework Directive” or “WFD” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste

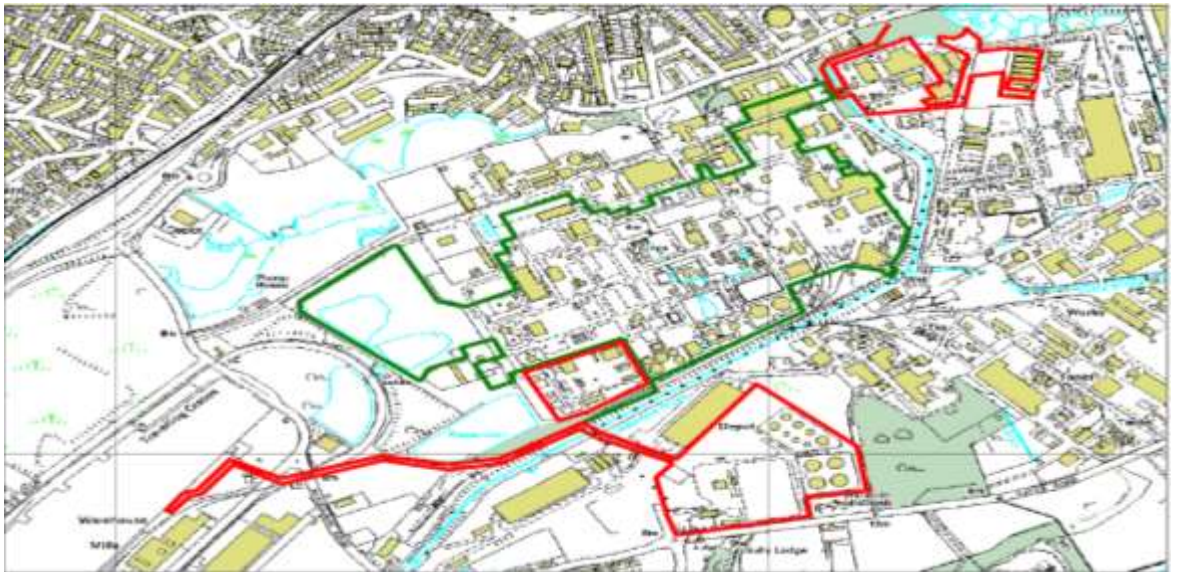
“year” means calendar year ending 31 December.

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:

- (a) 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
- (b) 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



Note: The area edged in red on the site plan represents the extent of the installation covered by the permits of other operators of the installation.

END OF PERMIT