

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Dŵr Cymru Cyfyngedig

Afan Combined Heat and Power
Facility

Afan Waste Water Treatment Works
Harbour Road
Phoenix Walk

Port Talbot Steelworks
Port Talbot
SA13 1RA

Permit number

EPR/ZP3032KQ

Afan Combined Heat and Power Facility

Permit Number EPR/ZP3032KQ

Introductory note

This introductory note does not form a part of the permit

The main features of the facility are as follows.

The installation is located within Afan Waste Water Treatment Works (WwTW), and covers an area of approximately 0.25ha. The centre of the installation is located at National Grid Reference SS 7612 8732.

The installation is bounded to the north and east by Port Talbot Steelworks with Margam Sands and Swansea Bay to the south and west. The nearest residential properties are approximately 1.8 km away being Margam to the north east and Aberafan to the north. Margam Moors SSSI and Eglwys Nunydd Reservoir SSSI lie approximately 2.9 km and 3.4 km to the south east respectively

Biogas will be generated during an Advanced Digestion process at the WwTW which will be captured and stored in two dual membrane gas storage bags, (2,000 m³ storage capacity each, predicted to be equivalent to 3.2 hours of production from the digesters). The biogas will then be transferred to the Combined Heat and Power (CHP) engines where it will be combusted in two spark ignition engines with a rated thermal input of 3.745 MW each, (1.56 MW_e output each).

The CHP engines will be used to generate electricity via an alternator and heat via the engine exhaust and cooling jacket. The electricity will be utilised within the WwTW with any surplus being transferred to the distribution network.

High grade heat will be recovered from the CHP engine exhaust and used to generate low pressure steam, whilst the low grade heat from the cooling jacket will be used to generate hot water for re-use in the Advanced Digestion process. Additional heat demand will be met by two supplementary fired waste heat boilers, (3.9 MW_{th} input each). The fuel used for supplementary firing will ordinarily be natural gas, but under certain circumstances (such as a CHP engine being unavailable) will be biogas.

A gas flare will be provided capable of burning biogas at a flow rate of 2,000 Nm³/hr, (compared to a predicted biogas production rate of 790 Nm³/hr).

Potential impacts from the installation arise from the emission of combustion products to air.

There are no significant emissions of noise or odour predicted and the activities will not give rise to any significant releases to land, water or sewer, (boiler blowdown, condensate and surface water run off are returned to the site drainage system, which leads to the head of the WwTW).

Flood risk has been addressed by developing the site infrastructure at a height above the maximum 1 in 1000 return period tide levels.

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

Status Log of the permit		
Detail	Date	Comments
Application EPR/ZP3032KQ/A001	Duly made 27/11/09	
Permit determined	26/05/10	

End of Introductory Note

Permit

Permit number

EPR/ZP3032KQ

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

Dŵr Cymru Cyfyngedig, (“the operator”),

whose registered office is

Pentwyn Road

Nelson

Treharris

Mid Glamorgan

CF46 6LY

company registration number **2366777**

to operate an installation at

Afan Combined Heat and Power Facility

Afan Waste Water Treatment Works

Harbour Road

Phoenix Walk

Port Talbot Steelworks

Port Talbot

SA13 1RA

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

Name	Date
	26/05/10

Avril Varley-Brown

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:

- (a) take appropriate measures to ensure that waste produced by the activities is avoided or reduced, or where waste is produced it is recovered wherever practicable or otherwise disposed of in a manner which minimises its impact on the environment;
- (b) review and record at least every four years whether changes to those measures should be made; and
- (c) 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
- (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 the Environment Agency.
 - (b) 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 specified in schedule 1, table S1.2 or otherwise required under this permit, 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.
- 2.3.2 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 hazard classification associated with the waste; and
 - (e) the waste code of the waste.

- 2.3.3 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.

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 table S3.1.

- 3.1.2 The limits given in schedule 3 shall not be exceeded.

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;
- (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;
- (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;
 - (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

- 3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:
- (a) point source emissions specified in table S3.1; and
 - (b) process monitoring specified in table S3.2.
- 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 3.3.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

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

- 4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

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

4.3 Notifications

- 4.3.1 The Environment Agency shall be notified without delay following the detection of:
- (a) 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) the breach of a limit specified in the permit; or
 - (c) any significant adverse environmental effects.
- 4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

- 4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.
- 4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:
- Where the operator is a registered company:
- (a) any change in the operator's trading name, registered name or registered office address; and
 - (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.
- Where the operator is a corporate body other than a registered company:
- (a) any change in the operator's name or address; and
 - (b) any steps taken with a view to the dissolution of the operator.
- In any other case:
- (a) the death of any of the named operators (where the operator consists of more than one named individual); and
 - (b) any change in the operator's name(s) or address(es).
- 4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:
- (a) the Environment Agency shall be notified at least 14 days before making the change; and
 - (b) the notification shall contain a description of the proposed change in operation.
- 4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.

4.4 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", in which case it may be provided by telephone.

Schedule 1 - Operations

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
Section 1.1, Part A(1)(b)(iii) - Burning waste as a fuel in an appliance with a rated thermal input of 3 MW or more but less than 50 MW	The combustion of biogas in combined heat and power (CHP) engines and boilers for the production of steam, hot water and electricity.	From receipt of biogas to export of electricity. The CHP engines shall consist of no more than two spark ignition engines with a maximum aggregate flow rate of 9,216 Nm ³ /hr, (7.49 MW _{th} , 3.12 MW _e). The boilers shall use biogas for supplementary firing and shall consist of no more than two boilers with a natural gas rated aggregate thermal capacity of 7.8 MW.
Directly Associated Activity		
Operation of a biogas flare	The flaring of biogas	From the receipt of the biogas to the release of combustion products from the flare stack
Storage and handling of wastes, including waste oils	Waste storage	From the generation of the waste through to its removal from the Installation. Only empty storage containers shall be stored in the open skips described in Section 2.5, Table 6 of the Supporting Information submitted as part of the application.
Biogas storage	Storage of biogas arising from the Advanced Digestion process at Afan WwTW	Storage of biogas prior to combustion in the CHP engines, supplementary firing in the boilers or flaring.
Surface water drainage	Surface water drainage	Discharge of site surface water to Afan WwTW
Water treatment and conditioning	Boiler water treatment and conditioning	From receipt of raw materials to discharge of effluent to Afan WwTW

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	Section 5 of the Part B Application Form	20/10/09, (duly made 27/11/09)

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 (as identified onsite plan at Schedule 7)	Source	Parameter	Limit (mg/Nm ³) ¹	Reference period	Monitoring frequency	Monitoring standard or method
A1- CHP unit 1 A2- CHP unit 2	Exhaust of spark ignition engines via individual, 24m unimpeded vertical stacks	Nitrogen Oxides (NOx expressed as NO ₂)	500	Hourly Mean	Annually. The first annual monitoring to be undertaken as part of the engine commissioning	In accordance with Agency guidance note M2 “Monitoring of stack emissions to air”.
		Carbon Monoxide	1,400			
		Sulphur dioxide	339			
A3 - Boiler unit 1 A4 - Boiler unit 2	Combustion products from boilers emitted via individual, 24m unimpeded vertical stacks	Nitrogen Oxides (NOx expressed as NO ₂)	170	Hourly Mean	Annually ²	
		Carbon Monoxide	75			
		Sulphur dioxide	160			
A5 - biogas flare with a combustion temperature of at least 1,000 °C and a residence time of at least 0.3 seconds	Combustion products from biogas flare via a 7.5m unimpeded vertical stack	Nitrogen Oxides (NOx expressed as NO ₂)	150	Hourly Mean	Annually ³	
		Carbon Monoxide	50			
		Sulphur dioxide	339			
		Operational temperature	>1000°C	Instantaneous reading	Annually ³	

¹ These limits do not apply during start up and shut down.

² Annual monitoring of the boilers is only required if notified by the Agency, (based on a percentage usage of supplementary firing on biogas).

³ Annual monitoring is only required when flare operates in excess of 10% of the time, taken on an annual assessment period.

Table S3.2 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Biogas feed to combustion plant	Hydrogen sulphide	Continuous	-	Monitoring location to be agreed in writing with the Environment Agency

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
Oxides of nitrogen Parameters as required by condition 3.5.1	A1, A2, A3*, A4*, A5*	Annual	26/05/10
Carbon Monoxide Parameters as required by condition 3.5.1	A1, A2, A3*, A4*, A5*	Annual	26/05/10
Sulphur dioxide Parameters as required by condition 3.5.1	A1, A2, A3*, A4*, A5*	Annual	26/05/10
Total VOCs Parameters as required by condition 3.5.1	A1, A2, A3*, A4*, A5*	Annual	26/05/10
Non-methane VOCs Parameters as required by condition 3.5.1	A1, A2, A3*, A4*, A5*	Annual	26/05/10
Hydrogen sulphide concentrations in biogas feed above 1,000 ppmv	Monitoring point as agreed under table S3.2 above	Every 3 months	26/05/10

*as required

Table S4.2: Annual production/treatment	
Parameter	Units
Electrical energy generated	MWh _e
Thermal energy generated	MWh _{th}

Table S4.3 Performance parameters		
Parameter	Frequency of assessment	Units
Total biogas input into the CHP engines	Annually	MWh (gross calorific value)
Total biogas input into the boilers	Annually	MWh (gross calorific value)
Engine and boiler efficiency	Annually	%
Hours of operation for CHP engines	Annually	hours
Operational hours of the flare	Annually	hours
Operational hours of boilers supplementary fired on biogas	Annually	hours and % of total operational hours
Abnormal operation of pressure release valves to be reported to the Environment Agency	Continuous	-
Water usage	Annually	m ³

Table S4.4 Reporting forms

Media/ parameter	Reporting format	Date of form
Emissions to air	Form Air 1 or other reporting format to be agreed in writing with the Environment Agency	26/05/10
Water usage	Form Water usage 1 or other reporting format to be agreed in writing with the Environment Agency	26/05/10
Energy generation	Form Energy 1 or other reporting format to be agreed in writing with the Environment Agency	26/05/10
Biogas input, operational hours and efficiency of various combustion plant. Abnormal operation of PRVs,	Form Performance 1 or other reporting format to be agreed in writing with the Environment Agency	26/05/10

Schedule 5 - Notification

These pages outline the information that the operator must provide.

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

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

Part A

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

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
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 limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

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

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
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 Dŵr Cymru Cyfyngedig

Schedule 6 - Interpretation

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

“*annually*” means once every year.

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

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

“*EP Regulations*” means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 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.

“*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.

“*year*” means calendar year ending 31 December.

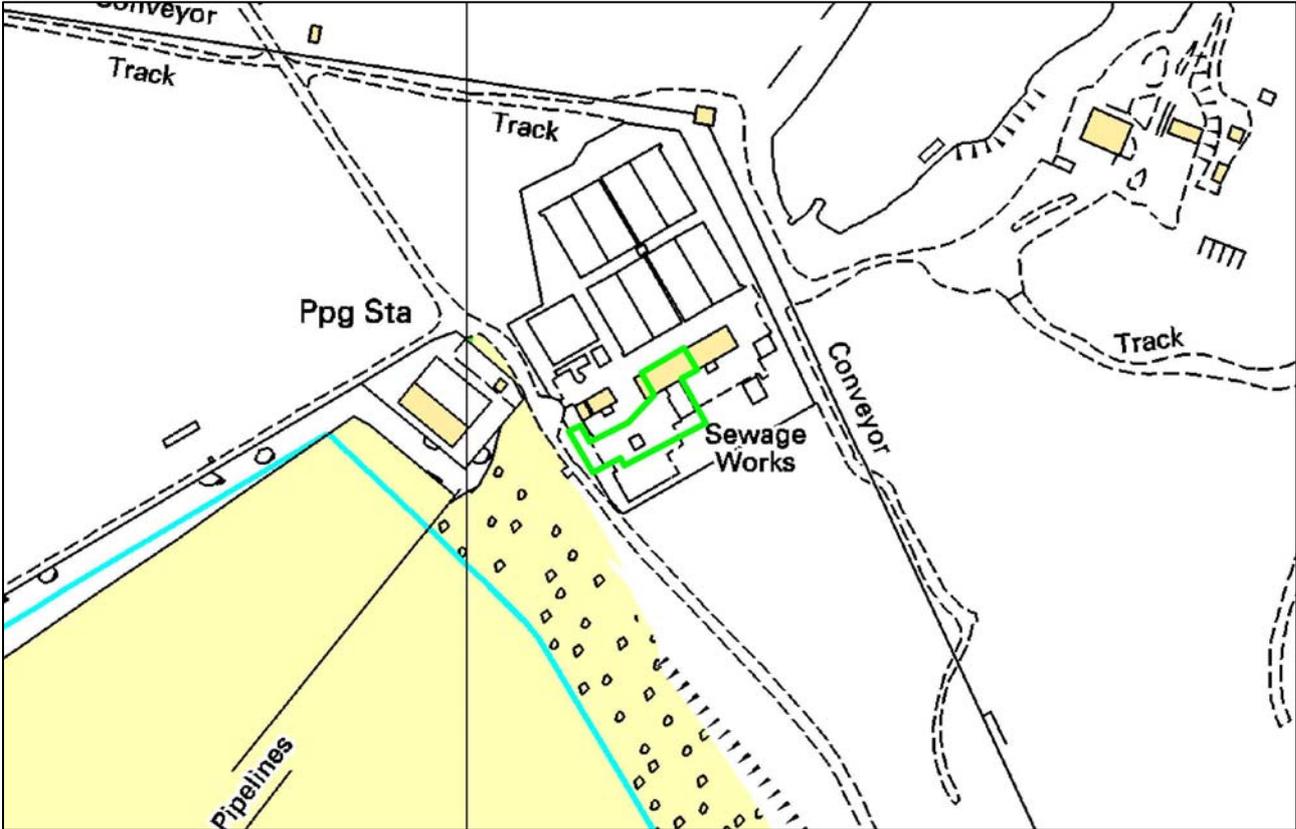
Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

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

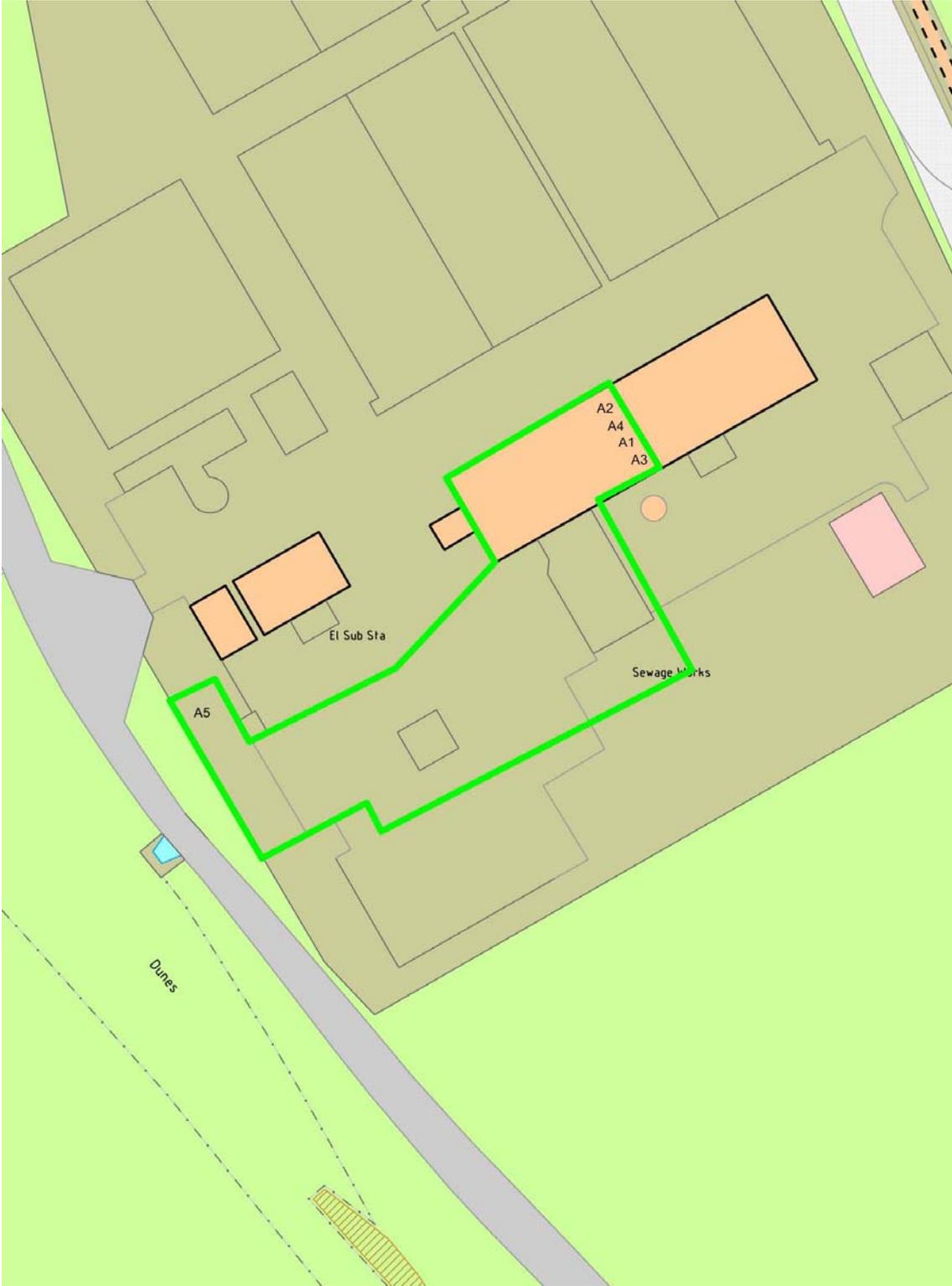
Schedule 7 - Site plan

Location plan



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Site layout plan



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