

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Thorpe Marsh Power Ltd

Thorpe Marsh Power Station
Near Barnby Dun
Doncaster
DN3 1ET

Permit number

EPR/RP3238KG

Thorpe Marsh Power Station

Permit Number EPR/RP3238KG

Introductory note

This introductory note does not form a part of the permit

The main features of the facility are as follows.

Thorpe Marsh Power Station is a gas-fired combined cycle gas turbine (CCGT) power station operated by Thorpe Marsh Power Ltd. The site covers an area of 25 hectares and is centred at National Grid Reference SE 6053 0985.

It is located within the County of South Yorkshire on part of the site of the former coal-fired Thorpe Marsh Power Station which ceased operation in the early 1990's. The site is bounded to the North by disused railway sidings, to the west by Thorpe Marsh Drain and to the east by the River Don. The nearest residential areas are the villages of Barnby Dun (1.5km south east), Kirk Sandall (2km south) and 8km to the south west is the centre of Doncaster.

The site lies within a flood risk area, a groundwater Source Protection Zone and is underlain by a minor aquifer. The site is underlain by alluvium deposits and Bunter sandstone. There are three licensed groundwater abstractions within 2 km of the site with the potential to be on private water supply.

The principal activity is listed under Section 1.1 A(1)(a): Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more.

This comprises:

- Two CCGT modules having a combined total thermal input of 1600MW and capable of a total maximum production output of around 860MW of electricity. Each module consists of one natural gas fired gas turbine and a steam turbine which are both connected via a single shaft to a hydrogen-cooled electricity generator;
- One natural gas fired auxiliary boiler with a thermal input of 15MW used infrequently for support for cold start-up of the CCGT's;
- One natural gas fired open cycle gas turbine (OCGT) of 230MW thermal input used for grid support;
- One diesel driven emergency electricity generator with a thermal input of 3MW used infrequently for power station start-up when disconnected from the electricity grid;
- One diesel driven firewater pump with a thermal input of 3MW; and
- Two gas fired heaters for warming the gas supply at the Gas Reception Facility (GRF) each with a thermal input of 1MW.

Details of the release points of combustion gases from the combustion activity are tabled below.

Table of combustion gas release points		
Combustion process	Number of stacks	Stack Height (metres)
Combined cycle gas turbines	One stack (windshield) containing three flues	60
Open cycle gas turbine		
Auxiliary boiler	One	40
Diesel electricity generator	One	Local exhaust
GRF heaters	Two	Local exhaust
Diesel fire pump	One	Local exhaust

The combustion gases from the gas turbines pass into dedicated heat recovery steam generators (HRSG's). High pressure superheated steam raised in each HRSG powers its dedicated steam turbine. Expanded low pressure steam from each steam turbine passes to a bank of electrical fan driven modular air blast chillers where it condenses and returns to the process as boiler feed water.

Mains water is purified in an ion exchange resin demineralisation plant for use as boiler feed water. Ion exchange resins are regenerated in situ using chemicals such as sulphuric acid and caustic soda which are stored in bunded bulk tanks on site. There are also small bunded storage facilities for intermediate bulk containers of aqueous solutions of hydrazine and ammonia used for corrosion inhibition of the steam circuit.

Thorpe Marsh Power Station is required to meet the relevant provisions of the Large Combustion Plant Directive (LCPD) for new gas turbines. This Directive also requires examining the technical and economic feasibility of providing for combined heat and power (CHP) and where confirmed developing accordingly bearing in mind the market and distribution situation. This Installation will not operate immediately as a CHP plant but has to incorporate appropriate measures to avoid barriers to securing CHP opportunities should they arise during the commercial life cycle of the plant.

Emissions to air from the gas turbines contain the following substances, for which the Agency has set emission limits in this permit, and are:

- Oxides of nitrogen (NO_x) comprising nitric oxide and nitrogen dioxide created by the chemical combination of atmospheric oxygen and nitrogen in the high temperature combustion zone of the gas turbine. Creation is minimised by the use of lean premix sequential dry low NO_x staged combustors; and
- Carbon monoxide (CO) from incomplete fuel combustion.

Emissions limits to air of carbon dioxide are not set by this permit but by a separate permit granted by the Environment Agency under the EU Emissions Trading Scheme.

The installation is required under Section 36 of the Electricity Act 1989 to be Carbon Capture Ready (CCR). Government has determined that CCR should be assessed during this consenting process and that no new power station of a type covered by the LCPD at or over 300MWe will be consented unless it can be demonstrated to be CCR. The operator has to demonstrate through this process that there will be no foreseeable technical or space barriers to retrofit.

As well as carbon dioxide, water is a main product of combustion released from the stacks. Occasionally during periods of high atmospheric relative humidity when combined with low temperature this water vapour may condense and form a visible plume.

The releases to air from the gas turbines are monitored continuously and substances measured include NO_x and CO along with other operational parameters, which measure combustion performance such as temperature, moisture and oxygen content. Continuous Emission Monitors (CEM's) are required to meet the Environment Agency's standards contained in its published monitoring guidance.

Surface and other site drainage water, boiler water blow-down and raw water treatment plant discharges are released to sewer controlled by a separate discharge consent issued by Yorkshire Water.

There are no consented releases to controlled waters or groundwater from the activities on this site.

Most main items of equipment, with potential to generate noise, are housed within buildings, which provide a high level of acoustic attenuation.

Natural gas is supplied to site from the national gas grid at grid pressure. There is an above ground GRF where the gas is metered and maintained at the specified temperature and pressure for use by the gas turbines and auxiliary boiler.

There is one site protected under the Conservation (Natural Habitats, &c) Regulations 1994 (SI 1994 NO. 2716) (Natura 2000) within 10 km of the site and there are no Sites of Special Scientific Interest protected under the Countryside and Rights of Way Act 2000 within 2 km of the site.

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/RP3238KG/A001	Duly made 05/01/11	
Additional information received	30/03/11	Review of CHP opportunities
Additional information received	06/04/11	OCGT BAT assessment
Additional information received	12/04/11	Revised air quality modelling assessment
Additional information received	17/05/11	Further revised air quality modelling assessment
Additional information received	21/07/11	Revised site plan
Permit determined	26/07/11	

End of Introductory Note

Permit

Permit number

EPR/RP3238KG

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

Thorpe Marsh Power Ltd (“the operator”),

whose registered office is

1 Merton Mansions

Bushey Road

Merton

London

SW20 8DQ

company registration number 06637894

to operate an installation at

Thorpe Marsh Power Station

Near Barnby Dun

Doncaster

DN3 1ET

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

Name	Date
Thomas Ruffell	26/07/2011

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.

1.2.2 The operator shall:

- (a) take appropriate measures such that opportunities for CHP may be capitalised upon should they become technically and economically feasible;
- (b) review the opportunities for CHP within a radius of 15km of the installation at least every four years. A report detailing the outcome of the review shall be submitted to the Environment Agency for approval within 2 months of the review; and
- (c) take any further appropriate measures identified by a review in accordance with the Environment Agency's written approval.

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 (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 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 open cycle gas turbine may be used for no more than 500 hours per year.
- 2.3.4 The auxiliary boiler and diesel generator may be used for no more than 500 hours each per year.
- 2.3.5 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.
- 2.3.6 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.4 Improvement programme

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

2.5 Pre-operational conditions

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

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2 and S3.3.
- 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 schedule 3 tables S3.1, S3.2 and S3.3 of a substance listed in schedule 3 table S3.4 shall not exceed the relevant limit in table S3.4.

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 tables S3.1, S3.2 and S3.3;
 - (b) process monitoring specified in table S3.5;
- 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) unless otherwise agreed in writing by the Environment Agency. Newly installed CEMs, or CEMs replacing existing CEMs, shall have MCERTS certification and have an MCERTS certified range which is not greater than 2.5 times the daily emission limit value (ELV) specified in schedule 3 table S3.1. The CEM shall also be able to measure instantaneous values over the ranges which are to be expected during all operating conditions. If it is necessary to use more than one range setting of the CEM to achieve this requirement, the CEM shall be verified for monitoring supplementary, higher ranges
- 3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1 and S3.2 unless otherwise agreed in writing by the Environment Agency.

3.6 Monitoring for the purposes of the Large Combustion Plant Directive

- 3.6.1 All LCP monitoring required by this permit shall be carried out in accordance with the provisions of Annex VIII of the Large Combustion Plant Directive.
- 3.6.2 If the monitoring results for more than 10 days a year are invalidated within the meaning set out in schedule 3, the Operator shall:
- (a) within 28 days of becoming aware of this fact, review the causes of the invalidations and submit to the Environment Agency for approval, proposals for measures to improve the reliability of the continuous measurement systems, including a timetable for the implementation of those measures; and
 - (b) implement the approved measures.
- 3.6.3 Continuous measurement systems on emission points from the LCP shall be subject to quality control by means of parallel measurements with reference methods at least once every calendar year.
- 3.6.4 Unless otherwise agreed in writing by the Environment Agency in accordance with condition 3.6.5 below, the operator shall carry out the methods, including the reference measurement methods, to use and calibrate continuous measurement systems in accordance with the appropriate CEN standards.

- 3.6.5 If CEN standards are not available, ISO standards, national or international standards which will ensure the provision of data of an equivalent scientific quality shall be used, as agreed in writing with the Environment Agency.
- 3.6.6 Where required by a condition of this permit to check the measurement equipment the operator shall submit a report to the Environment Agency in writing, within 28 days of the completion of the check.

3.7 Air Quality Management

- 3.7.1 The emissions from the activities shall not contribute significantly to any exceedance of EU air quality limit values or objectives of the Air Quality Strategy for England, Scotland, Wales and Northern Ireland for oxides of nitrogen, nitrogen dioxide and carbon monoxide.

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 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.

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

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

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

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

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

4.3.8 The operator shall inform the Environment Agency in writing of the closure of any LCP within 28 days of the date of closure.

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 EPR Regulations	Description of specified activity	Limits of specified activity
Section 1.1 A(1) (a) Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more	Combined cycle gas turbines and associated heat recovery steam generators Two units at 800MWth each.	From receipt of natural gas from the GRF through to the discharge of combustion gases from the stacks and the export of steam to the steam system.
	Open cycle gas turbine. One unit at 230MWth.	From receipt of natural gas from the GRF through to the discharge of combustion gases from the stack.
	Auxiliary boiler One unit at 15MWth.	From receipt of natural gas from the GRF through to the discharge of combustion gases from the stack.
	Diesel emergency electricity generator One unit at 3MWth.	From receipt of distillate fuel oil through to the discharge of combustion gases from the exhaust.
	GRF gas heaters Two units at 1MWth each	From receipt of natural gas through to the discharge of combustion gases from the stacks.
Directly Associated Activity	Chemicals and liquid fuels storage	From receipt of water treatment chemicals and distillate fuel oil to despatch for use.
	Pressure reduction and cleaning systems for natural gas (GRF)	From receipt of natural gas from the National Gas Grid through to despatch to the gas turbines and auxiliary boiler.
	Generation and export of electricity.	From receipt of steam at the steam turbines to discharge of boiler blowdown to sewer , condensate return to HRSGs and the direct generation of electricity from the gas turbines and export of electricity to the national grid.
	Water purification	From receipt of towns water to despatch for use in HRSGs to discharge of regeneration effluent to sewer.
	Surface water drainage	From rainwater collection system, oily water separators, sumps and drains to sewer.
	Waste handling and storage	From waste generation and storage to waste despatch.
	Diesel fire pump (3MWth)	From receipt of distillate fuel oil through to the discharge of combustion gases from the exhaust.

Table S1.2 Operating techniques

Description	Parts	Date Received
Application EPR/RP3238KG/A001	All management and control techniques described in the application	05/01/11

Table S1.3 Improvement programme requirements

Reference	Requirement	Date
IP1	<p>A written report shall be submitted to the Environment Agency at the Reporting Address for approval. The report shall include the results of commissioning, providing details of the performance of the installation against the conditions of this Permit and also contain a summary of any minor operational changes to the information referred to in Table S1.2 proposed.</p> <p>The approved minor operational changes shall be implemented from the date of approval or such other date as may be specified in that approval.</p>	6 months after the completion of commissioning of the first gas turbine.
IP2	<p>A written report shall be submitted to the Environment Agency at the Reporting Address for approval. The report shall include the results of noise surveys in accordance with the Combustion Technical Guidance Note and Horizontal Guidance H3 Part 2 (Guidance on Noise Assessment and Control) and, where appropriate, the report shall contain an assessment of whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise noise from the activities covered by this permit. The report shall also contain a time-scale for the implementation of any individual measures identified as appropriate following the review.</p> <p>The approved individual measures shall be implemented from the date of approval or such other date as may be specified in that approval.</p>	21 months after the completion of commissioning of the first gas turbine.
IP3	<p>A written site closure plan shall be submitted to the Environment Agency at the Reporting Address for approval. The report shall demonstrate that the installation can be decommissioned to avoid any pollution risk and the site of operation returned into a satisfactory state. The plan should comply with the requirements of the Combustion Technical Guidance Note and Horizontal Guidance Note H5 (Guidance on Site Condition Report).</p> <p>The approved site closure plan shall be implemented from the date of approval or such other date as may be specified in that approval.</p>	24 months after the completion of commissioning of the first gas turbine.
IP4	<p>A written report shall be submitted to the Environment Agency at the Reporting Address for approval. The report shall include the results of an assessment of whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution for the activities covered by this permit. The report shall be in sufficient detail to allow a permit review. The report shall also contain a time-scale for the implementation of any individual measures identified to improve the performance of the installation, including emissions control performance, as appropriate following the review.</p> <p>The approved individual measures shall be implemented from the date of approval or such other date as may be specified in that approval.</p>	48 months after the completion of commissioning of the first gas turbine.

Table S1.4 Pre-operational measures

Reference	Pre-operational measures
PO01	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation, a written commissioning plan shall be submitted to the Environment Agency at the Reporting Address for approval. The plan shall include written procedures containing actions to be taken to ensure that appropriate measures will be used to minimise releases under all anticipated operating conditions and shall include but not be restricted to:</p> <ul style="list-style-type: none"> ➤ The timetable for the commissioning of the gas turbines; ➤ The expected emissions to the environment during each of the stages of commissioning; ➤ The mitigation measures that will be taken in respect of emissions to the environment during each stage; ➤ The expected duration of commissioning activities; ➤ The actions that will be taken to protect the environment and notify the Environment Agency should emissions exceed the limits specified in the Permit; ➤ Any additional (beyond that required by the Permit) monitoring to be undertaken; ➤ Proposals for the monthly reporting of progress to the Environment Agency. ➤ Noise impact assessment measures for test running equipment during the commissioning phase where there is a necessity to run individual items for short periods without full noise control mitigation measures in place, and consideration of the need for temporary attenuators for venting whilst purging of pipework and equipment before normal duty operation. Consideration of scheduling of activities with potential for higher than normal noise levels should be demonstrated being carried out at times of the day to cause the least impact on sensitive receptors. <p>The approved commissioning plan shall be implemented from the date of approval or such other date as may be specified in that approval.</p>
PO02	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation, a written procedure shall be submitted to the Environment Agency at the Reporting Address for approval. The procedure shall detail the measures to be used so that monitoring equipment, personnel and organisations employed for the emissions monitoring programme shall have either MCERTS certification or accreditation in accordance with condition 3.6.3.</p> <p>The approved procedure shall be implemented from the date of approval or such other date as may be specified in that approval.</p>
PO03	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation, a written accident management plan shall be submitted to the Environment Agency at the Reporting Address for approval. The plan should comply with the requirements the Combustion Technical Guidance Note.</p> <p>The approved accident management plan shall be implemented from the date of approval or such other date as may be specified in that approval</p>

PO04	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation, a written emissions management plan shall be submitted to the Environment Agency at the Reporting Address for approval. The report shall detail the measures to be used to control emissions of substances not controlled by emission limits and shall be accordance with the Combustion Technical Guidance Note and Horizontal Guidance Note H5 (Guidance on Site Condition Report).</p> <p>The approved emissions management plan shall be implemented from the date of approval or such other date as may be specified in that approval.</p>
PO05	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation a written noise and vibration management plan shall be submitted to the Environment Agency at the Reporting Address for approval. The report shall detail the measures to be used to control emissions of noise and shall be accordance with Appendix 4 (noise management plan) of Horizontal Guidance Note H3 Part 2 (Guidance on Noise Assessment and Control).</p> <p>The approved noise and vibration management plan shall be implemented from the date of approval or such other date as may be specified in that approval</p>
PO06	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation a copy of the site's Environment Management System (EMS) shall be submitted to the Environment Agency at the Reporting Address for approval. The EMS shall be developed in line with the requirements set out in the Combustion Technical Guidance Note and Horizontal Guidance Note H6 (Guidance on Environmental Management Systems).</p> <p>The Operator shall indicate whether the Environment Management System has been certified by an external body or if appropriate submit a schedule containing a date by which time the EMS will have been certified.</p> <p>The approved EMS shall be implemented from the date of approval or such other date as may be specified in that approval.</p>
PO07	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation, a written energy efficiency management plan shall be submitted to the Environment Agency at the Reporting Address for approval. The plan should comply with the requirements the Combustion Technical Guidance Note and Horizontal Guidance Note H2 (Guidance on Energy Efficiency).</p> <p>The approved energy efficiency management plan shall be implemented from the date of approval or such other date as may be specified in that approval</p>
PO08	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation a written report shall be submitted to the Environment Agency at the Reporting Address for approval. The report shall contain plans detailing the location of any underground sumps, pipe-work, culverts, process and surface water drains, sewer system or other sub-surface structures within the Installation boundary, along with any associated discharge points. The report shall also contain plans detailing the location and nature of hard-standing, kerbing and secondary containment for raw materials and wastes storage areas.</p> <p>A proposed preventative maintenance schedule for these structures shall be submitted with the plans.</p> <p>The approved preventative maintenance schedule shall be implemented from the date of approval or such other date as may be specified in that approval.</p>

PO9	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation a written report shall be submitted to the Environment Agency at the Reporting Address for approval. The report should identify and provide details of those appropriate measures (CHP ready) for the provision of future minimum CHP capacity which do not impose an energy efficiency burden upon it when implemented but not utilised and should provide a plan for implementing and maintaining those measures so identified.</p> <p>These shall include but not be restricted to</p> <ul style="list-style-type: none"> ➤ •Steam extraction and control facilities; ➤ •Space for facilities for generating hot water for export; ➤ •Space for associated pipework and services; ➤ •Space to increase the capacity of the raw water treatment plant; and ➤ •Space for the accommodation of additional instrumentation and control systems. <p>The approved appropriate measures shall be implemented from the date of approval or such other date as may be specified in that approval.</p>
P010	<p>At least six months (or such other date as agreed in writing by the Environment Agency) before any fuel is burned in the installation a written report shall be submitted to the Environment Agency at the Reporting Address for approval.</p> <p>The report shall detail the management techniques which the operator proposes to implement to minimise releases of oxides of nitrogen and carbon monoxide from the open cycle gas turbine, GRF heaters, auxiliary boiler and emergency generator and a methodology for the calculation of annual releases of oxides of nitrogen.</p> <p>The approved management techniques shall be implemented from the date of approval or such other date as may be specified in that approval.</p>

Schedule 2 - Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels

Raw materials and fuel description	Specification
Distillate fuel oil (gas oil)	Not more than 0.1% w/w sulphur content

Schedule 3 – Emissions and monitoring

Note

For the purposes of this Schedule, the following interpretations shall apply:

- For the continuous measurement systems fitted to the LCP release points defined in Table S3.1 (a) the validated hourly and daily averages shall be determined from the measured valid hourly average values after having subtracted the value of the 95% confidence interval.
- The 95% confidence interval for oxides of nitrogen of a single measured result shall be taken to be 20%.
- The 95% confidence interval for carbon monoxide of a single measured result shall be taken to be 10%.
- An invalid hourly average means an hourly average period invalidated due to malfunction of, or maintenance work being carried out on, the continuous measurement system. Any day, in which more than three hourly averages are invalid shall be invalidated. However, to allow some discretion for zero and span gas checking, or cleaning (by flushing), an hourly average period will count as valid as long as data has been accumulated for at least two thirds of the period (40 minutes). Such discretionary periods are not to exceed more than 5 in any one 24-hour period unless agreed in writing by the Environment Agency. Where plant may be operating for less than the 24-hour period, such discretionary periods are not to exceed more than one quarter of the overall valid hourly average periods unless agreed in writing by the Environment Agency.
- Valid data is collected when the unit is operating during periods when limits in table S3.1 (a) apply. A valid hour is obtained if at least 40 minutes of CEM data are available within a fixed one hour clock period.
- A validated daily average is calculated for all calendar days during which the total period of valid data is 6 hours or longer. A validated daily average is then the arithmetic average without weighting of the validated hourly averages within the reporting period.
- The limits in table S3.1 (a) do not apply during start-up, shutdown, coupling or flashbacks.

Table S3.1(a) Point source emissions to air- emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit mg/m³	Reference period	Monitoring frequency	Monitoring standard or method		
A1 and A2 [Point A1 and A2 on site plan in Schedule 7]	Combined cycle gas turbines	Oxides of nitrogen	85	Maximum validated hourly average	Continuous	BS EN 15267-3 ¹		
			50	Daily average of validated hourly averages				
			40	95% of validated hourly averages within a calendar year				
		Carbon monoxide	200	Maximum validated hourly average				
			100	Daily average of validated hourly averages				
			80	95% of validated hourly averages within a calendar year				
		Sulphur dioxide	No limit set					Permanent sampling access not required
		Particulate matter						

Notes

1. MCERTS certification for the appropriate determinands and ranges is evidence of compliance with BS EN 15267-3.

Table S3.1(b) Other 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
A3 [Point A3 on site plan in Schedule 7]	Open cycle gas turbine	No parameters set				Permanent sampling access not required
A4 (Point A4 on site plan in Schedule 7)	Auxiliary boiler					
A5 and A6 (Point A5 and A6 on site plan in Schedule 7)	Natural gas heater vents on natural gas pressure reducing station					
Natural gas vents	On-site distribution system					
Hydrogen vents	Steam turbine generator cooling					
Emergency pressure relief vents	Pressure vessels					
Tank vents	Liquid chemicals and fuel oils storage tanks					
A7 and A8 Diesel engine exhausts	Diesel engine exhausts emergency generator and fire pump					

Table S3.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
-	-	-	-	-	-	-

Table S3.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
S1 on site plan in schedule 7 emission to Yorkshire Water Sandall Treatment Works	Site surface drainage, boiler blowdown and water treatment plant effluent	No parameters set	-	-	-	Permanent sampling access not required

Table S3.4 Annual limits to air

Substance	Installation Annual Emission Limit ¹	Emission Points
Oxides of nitrogen	2000 tonnes	A1 – A8

¹ Includes start up, shut down, malfunction and breakdown.

Table S3.5 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Natural gas	Flow	Continuous	Flowmeter MCERTS	-
Operating hours (OCGT)	Hours	Continuous	-	-
Operating hours (auxiliary boiler)	Hours	Continuous	-	-
Operating hours (diesel generator)	Hours	Continuous	-	-

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
NO _x and CO emission limit compliance.	A1 and A2	Quarterly	From the date fuel is first burned in the installation
Mass emission data for SO ₂ , NO _x and dust (excluding start up and shut down).	A1 to A3	Quarterly and annually	
Mass emission data for NO _x (including start up and shut down).	A1 to A8	Quarterly and annually	

Table S4.2 Reporting of performance parameters

Parameter	Frequency of assessment	Units
Energy consumption (CCGTs and OCGT)	Annually	TJ and tonnes
Operating hours (OCGT, auxiliary boiler and diesel generator)	Quarterly and annually	Hours
CEM Invalidation (CCGTs)	Annually	Hours and days

Table S4.3 Reporting forms

Media / parameter	Reporting format ¹	Agency recipient	Starting point	Date of form
Air	Form Air 1 LCPD continuous monitoring	SI	From the date fuel is first burned in the installation	Permit Issue
	Form Air 2 LCPD continuous measurement systems invalidation log	SI		
	Form Air 3 LCPD monthly and cumulative releases	SI & Central office		
	Form Air 4 NO _x monthly and cumulative releases	SI		
	Form Air 5 Operational hours	SI		
Energy usage	Form Energy 1	SI & Central office		

1. or other format as agreed in writing by the Environment Agency

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	EPR/RP3238KG
Name of operator	Thorpe Marsh Power Ltd
Location of Facility	Thorpe Marsh Power Station
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 Thorpe Marsh Power Ltd

Schedule 6 - Interpretation

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

“*agency recipient*” means where this is “SI” the Environment Agency site inspector for the installation and where this is “Central Office” this is to an address of an Environment Agency national function separately notified to the operator.

“*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.

“*assessment year*” means any complete calendar year except that the first assessment year for the purposes of this permit shall run from the date fuel is first burned in the installation.

“*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.

“*CEM*” means continuous emission monitor.

“*CEN*” means European Committee for Standardisation.

“*Climate Change Agreement*” means an agreement made between the Secretary of State and the operator, either directly or through the offices of any association of which he is a member, in which he agrees to secure energy efficiency improvements as set out in a plan agreed with the Secretary of State in that agreement in return for a discount from the amount he would otherwise pay as a Climate Change Levy.

“*Combustion Technical Guidance Note*” means How to comply with your environmental permit. Additional guidance for Combustion Activities – (SGN1.01) dated March 2009 published by Environment Agency

“*commissioning*” means all activities between the end of construction of equipment and plant and its commercial operation date.

“*emissions to land*” includes emissions to groundwater.

“*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 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.

“*ISO*” means International Organization for Standardization.

“*large combustion plant*” or “*LCP*” is a combustion plant or group of combustion plants discharging waste gases through a common windshaft or stack, where the total thermal input is 50 MW or more, based on gross calorific value.

“*Large Combustion Plant Directive*” means Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants (O.J. L 309/1, 27.11.2001).

“*management system*” means Environmental Management System (EMS) complying with the Environment Agency’s Horizontal Guidance Note H6, Environmental Management Systems published April 2010.

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

“*monitoring*” includes the taking and analysis of samples, instrumental measurements (periodic and continual), calibrations, examinations, tests and surveys.

“*natural gas*” means naturally occurring methane with no more than 20% by volume of inert or other constituents.

“*oxides of nitrogen (NO_x)*” means nitric oxide (NO) plus nitrogen dioxide (NO₂) expressed as NO₂

“permitted installation” means the activities and the limits to those activities described in schedule 1 table S1.1 of this Permit.

“quarterly” for reporting means after each 3 month period, January to March; April to June; July to September and October to December.

“shut down” means the operation of the gas turbines from Stable Export Limit to no generation.

“start up” means the operation of the gas turbines until stable combustion at the Stable Export Limit has been reached.

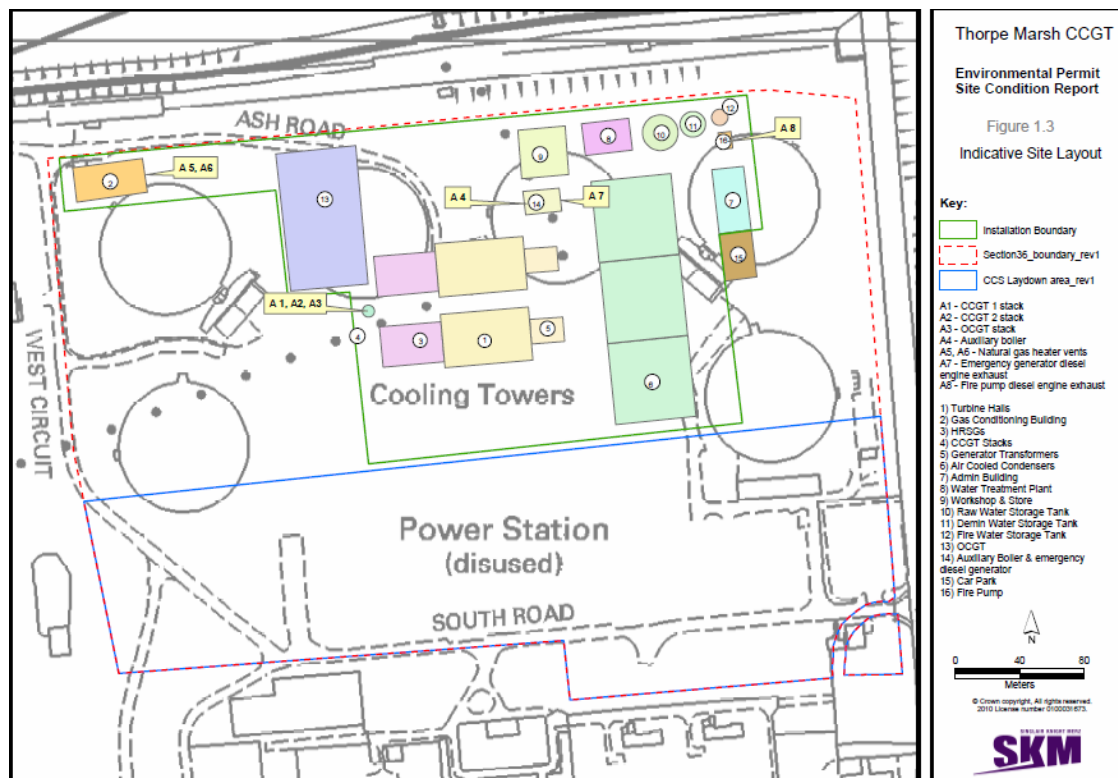
“year” means calendar year ending 31 December.

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;
- (b) in relation to gas turbines or compression ignition engines; the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 15%, dry, for liquid and gaseous fuels; and.
- (c) 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



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