



Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

GREENHOUSE GAS EMISSIONS PERMIT

Permit Register Number:	IE-GHG069-10380-2
Operator:	Electricity Supply Board 27 Lower Fitzwilliam Street Dublin 2
Installation Name:	ESB Marina Generating Station
Site Name:	ESB Marina Generating Station
Location:	Centre Park Road Cork Ireland

Introductory Note

This introductory note does not form a part of the Greenhouse Gas Emissions Permit.

This Greenhouse Gas Emissions Permit authorises the holder to undertake named activities resulting in emissions of Carbon Dioxide from the listed emission sources. It also contains requirements that must be met in respect of such emissions, including monitoring and reporting requirements. This Greenhouse Gas Emissions Permit places an obligation on the Operator to surrender allowances to the Agency equal to the annual reportable emissions of carbon dioxide equivalent from the installation in each calendar year, no later than four months after the end of each such year.

Contact with Agency:

If you contact the Agency about this Greenhouse Gas Emissions Permit please quote the following reference: Greenhouse Gas Emissions Permit N^o IE-GHG069-10380.

All correspondence in relation to this permit should be addressed to:

Email: help.ets@epa.ie

By Post: Climate Change Unit, Environmental Protection Agency
Regional Inspectorate, McCumiskey House,
Richview, Clonskeagh Road, Dublin 14

Updating of the permit:

This Greenhouse Gas Emissions Permit may be updated by the Agency, subject to compliance with Condition 2. The current Greenhouse Gas Emissions Permit will normally be available on the Agency's website at www.epa.ie and [ETSWAP](#).

Surrender of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially surrendered, a written application must be made to the on-line ETS portal, and written permission received from, the Agency through [ETSWAP](#).

Transfer of the permit or part of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially transferred to another Operator a joint written application to transfer this Greenhouse Gas Emissions Permit must be made (by both the existing and proposed Operators) to, and written permission received from, the Agency through the on-line ETS portal [ETSWAP](#).

Licence held pursuant to the Environmental Protection Agency Act 1992, as amended. (as of the date of this permit):

IPC/IE Licence Register Number
P0578-03

Status Log

Current Permit

Permit number	Date application received	Date Permit issued	Comment
IE-GHG069-10380-2	09 January 2014	30 July 2014	Change to the method for determination of activity data for De-minimis Gas Oil. Update of procedure descriptions.

Previous Permits

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG069-10380-1	GHG Permit Application	17 May 2013	06 June 2013	

End of Introductory Note

Glossary of Terms

For the purposes of this permit the terms listed in the left hand column shall have the meaning given in the right hand column below:

The Agency	Environmental Protection Agency.
Agreement	Agreement in writing.
Allowance	Permission to emit to the atmosphere one tonne of carbon dioxide equivalent during a specified period issued for the purposes of Directive 2003/87/EC by the Agency or by a designated national competent authority of a Member State of the European Union.
Annual Reportable Emissions	Reportable Emissions of carbon dioxide made in any calendar year commencing from 1 January 2005 or the year of commencement of the activity, whichever is the later.
A & V Regulation	Commission Regulation (EU) No 600/2012 of 21 June 2012 on the verification of greenhouse gas emission reports and tonne-kilometre reports and the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Category A Installation	As defined in Article 19.2 (a) of the M&R Regulation.
Category B Installation	As defined in Article 19.2 (b) of the M&R Regulation.
Category C Installation	As defined in Article 19.2 (c) of the M&R Regulation.
The Directive	Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
Emissions	The release of greenhouse gases into the atmosphere from sources in an installation.
EPA	Environmental Protection Agency.
Fall-Back Methodology	As defined in Article 22 of the M&R Regulation.
GHG	Greenhouse gas.
GHG Permit	Greenhouse gas emissions permit.
Greenhouse Gas	Any of the gases in Schedule 2 of the Regulations.
IPC/IE	Integrated Pollution Control/Industrial Emissions.
Installation	Any stationary technical unit where one or more activities listed in Schedule 1 to the Regulations are carried out. Also any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution. References to an installation include references to part of an installation.

Installation with low emissions	As defined in Article 47 of the M&R Regulation.
Major Source Streams	As defined in Article 19.3 (c) of the M&R Regulation.
M&R Regulation	Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Mis-statement	An omission, misrepresentation or error in the Operators reported data, not considering the uncertainty permissible pursuant to Article 12(1)(a) of Regulation (EU) no 601/2012.
N/A	Not applicable.
Monitoring Plan	The Plan submitted and approved in accordance with Condition 3.1 of this permit and attached at Appendix 1.
Non-conformity	Any act or omission by the Operator, either intentional or unintentional, that is contrary to the greenhouse gas emissions permit and the requirements of the Monitoring Plan.
The National Administrator	The person so designated in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC.
The Operator (for the purposes of this permit)	Electricity Supply Board
“operator”	Any person who operates or controls an installation or to whom decisive economic power over the functioning of the installation has been delegated.
Person	Any natural or legal person.
Reportable emissions	The total releases to the atmosphere of carbon dioxide (expressed in tonnes of carbon dioxide equivalent) from the emission sources specified in Table 2 and arising from the Schedule 1 activities which are specified in Table 1.
The Regulations	European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 (S.I. No 490 of 2012) and any amendments or revisions thereto.
The Verifier	A legal person or another legal entity carrying out verification activities pursuant to Regulation (EU) No 600/2012 and accredited by a national accreditation body pursuant to Regulation (EC) No 765/2008 and Regulation (EU) No 600/2012 or a natural person otherwise authorised, without prejudice to Article 5(2) of Regulation (EC) No 765/2008, at the time a verification report is issued.
The Registry	The Registry as provided for under Article 19 of Directive 2003/87/EC.

Schedule 1

Schedule 1 to the Regulations.



Reasons for the Decision

The Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of this permit, the Operator is capable of monitoring and reporting emissions in accordance with the requirements of the Regulations.

Activities Permitted

Pursuant to the Regulations the Agency issues this Greenhouse Gas Emissions Permit, subject to any subsequent revisions, corrections or modifications it deems appropriate, to:

The Operator:

Electricity Supply Board
27 Lower Fitzwilliam Street
Dublin 2

Company Registration Number: NA ESB Act 1927

to carry out the following

Categories of activity:

Annex 1 Activity

Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
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at the following installation(s):

ESB Marina Generating Station **Installation number:** 53

located at

Centre Park Road
Cork
Ireland

subject to the five conditions contained herein, with the reasons therefor and associated tables attached thereto.

Conditions

Condition 1. The Permitted Installation

- 1.1 This permit is being granted in substitution for the previous GHG permit granted to the Operator as listed in the Status Log of this GHG permit.
- 1.2 The Operator is authorised to undertake the activities and/or the directly associated activities specified in Table 1 below resulting in the emission of carbon dioxide:

Table 1 - Activities which are listed in Schedule 1 of the Regulations and other directly associated activities carried out on the site:

Installation No.: 53

Activity Description
Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
Directly Associated Activity Description
N/A

- 1.3 Carbon dioxide from Schedule 1 activities shall be emitted to atmosphere only from the emission sources as listed in Table 2 below:

Table 2 Emission Sources and Capacities:

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S1	Gas turbine Exhaust	277	MW
S3	Diesel Fire Pump	0.16	MW

- 1.4 The activity shall be controlled, operated and maintained so that emissions of carbon dioxide shall take place only as set out in this GHG Emissions Permit. The permit does not control emissions of gases other than carbon dioxide. All agreed plans, programmes and methodologies required to be carried out under the terms of this permit, become part of this permit.
- 1.5 This GHG Permit is for the purposes of GHG emissions permitting under the European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 and any amendments to the same only and nothing in this permit shall be construed as negating the Operator's statutory obligations or requirements under any other enactments or regulations unless specifically amended by the Regulations.
- 1.6 Any reference in this permit to 'installation' shall mean the installation as described in the Greenhouse Gas Emissions Permit application and any amendments approved by the Agency.

Reason: To describe the installation and clarify the scope of this permit.

Condition 2. Notification

- 2.1 No alteration to, or reconstruction in respect of, the activity or any part thereof which would, or is likely to, result in a change in:
- 2.1.1 the nature or functioning of the installation;
 - 2.1.2 the capacity of the installation as detailed in this permit;
 - 2.1.3 the fuels used at the installation;
 - 2.1.4 the range of activities to be carried out at the installation
- that may require updating of the GHG permit shall be carried out or commenced without prior notice to and without the prior written agreement of the Agency.
- 2.2 The Operator shall notify the Agency in writing of the cessation of all or part of any activity listed in Table 1 of this permit no later than one month from the date of cessation or by 31 December of the year of cessation, whichever is sooner.
- 2.3 The Operator shall apply for an update of this GHG Permit where there is a change to the Operator name and/or registered address of the Operator, within seven days of the change.
- 2.4 For installations or parts of installations which have not come into operation when the application for this permit was made the Operator shall notify the Agency of the date of commencement of the activity within seven days of commencement.
- 2.5 The Operator shall notify the Agency in writing within three days of becoming aware of any factors which may prevent compliance with the conditions of this permit.
- 2.6 The Operator shall submit to the Agency by 21 January of each year a declaration of operability. The declaration submitted shall be in the format required by the Agency.
- 2.7 All notifications required under Condition 2 above shall be made to the address given in the Explanatory Note included with this permit.

Reason: *To provide for the notification of updated information on the activity.*

Condition 3. Monitoring and Reporting

- 3.1 The Operator shall monitor and record greenhouse gas emissions on site in accordance with the M&R Regulation and the approved Monitoring Plan attached at Appendix 1 to this GHG permit and in compliance with any other guidance approved by the Agency for the purposes of implementing the Directive and/or the Regulations.
- 3.2 The Operator shall modify the monitoring plan in any of the following situations:
- 3.2.1 new emissions occur due to new activities carried out or due to the use of new fuels or materials not yet contained in the monitoring plan;
 - 3.2.2 the change of availability of data, due to the use of new measurement instrument types, sampling methods or analysis methods, or for other reasons, leads to higher accuracy in the determination of emissions;
 - 3.2.3 data resulting from the previously applied monitoring methodology has been found incorrect;
 - 3.2.4 changing the monitoring plan improves the accuracy of the reported data, unless this is technically not feasible or incurs unreasonable costs;

- 3.2.5 the monitoring plan is not in conformity with the requirements of the M&R Regulation and the Agency requests a change;
- 3.2.6 it is necessary to respond to the suggestions for improvement of the monitoring plan contained in the verification report.

The Operator shall notify any proposals for modification of the monitoring plan to the Agency without undue delay. Any significant modifications of the monitoring plan, as defined in Article 15 of the M&R Regulation, shall be subject to approval by the Agency. Where approved these changes shall be implemented within a timeframe agreed by the Agency.

3.3 Temporary changes to the monitoring methodology:

3.3.1 Where it is for technical reasons temporarily not feasible to apply the tier in the monitoring plan for the activity data or each calculation factor of a fuel or material stream as approved by the Agency, the Operator shall apply the highest achievable tier until the conditions for application of the tier approved in the monitoring plan have been restored. The Operator shall take all necessary measures to allow the prompt restoration of the tier in the approved monitoring plan. The Operator shall notify the temporary change to the monitoring methodology without undue delay to the Agency specifying:

- (i) The reasons for the deviation from the tier;
- (ii) in detail, the interim monitoring methodology applied by the Operator to determine the emissions until the conditions for the application of the tier in the monitoring plan have been restored;
- (iii) the measures the Operator is taking to restore the conditions for the application of the tier in the approved monitoring plan;
- (iv) the anticipated point in time when application of the approved tier will be resumed.

3.3.2 A record of all non-compliances with the approved monitoring plan shall be maintained on-site and shall be available on-site for inspection by authorised persons of the Agency and/or by the Verifier at all reasonable times.

3.4 The Operator shall appoint a Verifier to ensure that, before their submission, the reports required by Condition 3.5 below are verified in accordance with the criteria set out in Schedule 5 of the Regulations, the A&V Regulation and any more detailed requirements of the Agency.

3.5 The written report of the verified annual reportable emissions and the verification report in respect of each calendar year shall be submitted to the Agency by the Operator no later than 31 March of the following year. The reports shall be in the format required by the Agency and meet the criteria set out in the M&R and A&V Regulations.

3.6 The Operator shall enter the verified annual reportable emissions figure for the preceding year into the Registry no later than 31 March of the following year. This figure shall be electronically approved by the Verifier in the registry no later than 31 March of each year.

3.7 Where an Operator is applying the Fall-Back methodology, the Operator shall assess and quantify each year the uncertainties of all parameters used for the determination of the annual emissions in accordance with the ISO Guide to the Expression of Uncertainty in Measurement or another equivalent internationally accepted standard and include the verified results in the written report of the verified annual reportable emissions to be submitted to the Agency by 31 March each year.

3.8 An Operator shall submit to the Agency for approval a report containing the information detailed in (i) or (ii) below, where appropriate, by the following deadlines:

- (a) for a category A installation, by 30 June every four years;

- (b) for a category B installation, by 30 June every two years;
 - (c) for a category C installation, by 30 June every year.
 - (i) Where the Operator does not apply at least the tiers required pursuant to the first subparagraph of Article 26(1) and to Article 41(1) of the M&R Regulation, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply the required tiers. Where evidence is found that measures needed for reaching those tiers have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan and submit proposals for implementing appropriate measures and its timing.
 - (ii) Where the Operator applies a fall-back monitoring methodology, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply at least tier 1 for one or more major or minor source streams. Where evidence is found that measures needed for reaching at least tier 1 for those source streams have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan, submit proposals and a timeframe for implementing appropriate measures.
- 3.9 Where the verification report states outstanding non conformities, misstatements or recommendations for improvements the Operator shall submit a report to the Agency for approval by 30 June of the year in which the verification report is issued. This requirement does not apply to the Operator of an installation with low emissions where the verification report contains recommendations for improvements only. The report shall describe how and when the Operator has rectified or plans to rectify the non-conformities identified and to implement recommended improvements. Where recommended improvements would not lead to an improvement of the monitoring methodology this must be justified by the Operator. Where the recommended improvements would incur unreasonable costs the Operator shall provide evidence of the unreasonable nature of the costs. The Operator shall implement the improvements specified by the Agency in response to the report submitted in accordance with this Condition in accordance with a timeframe set by the Agency.
- 3.10 The Operator shall make available to the Verifier and to the Agency any information and data relating to emissions of carbon dioxide which are required in order to verify the reports referred to in Condition 3.5 above or as required by the Agency to facilitate it in establishing benchmarks and/or best practice guidance.
- 3.11 Provision shall also be made for the transfer of environmental information, in relation to this permit, to the Agency's computer system, as may be requested by the Agency.
- 3.12 The Operator shall retain all information as specified in the M&R Regulation for a period of at least 10 years after the submission of the relevant annual report.
- 3.13 A record of independent confirmation of capacities listed in this permit or agreed with the Agency in writing as minor emissions shall be available on-site for inspection by authorised persons of the Agency at all reasonable times.
- 3.14 The Operator shall keep records of all modifications of the monitoring plan. The records shall include the information specified in Article 16.3 of the M&R Regulation.
- 3.15 The Operator shall ensure that members of the public can view a copy of this permit and any reports submitted to the Agency in accordance with this permit at all reasonable times. This requirement shall be integrated with the requirements of any public information programme approved by the Agency in relation to any other permit or licence held by the Operator for the site.

Reason: To provide for monitoring and reporting in accordance with the Regulations.

Condition 4. Allowances

4.1 Surrender of Allowances

- 4.1.1 The Operator shall, by 30 April in each year, surrender to the Agency, or other appropriate body specified by the Agency, allowances equal to the annual reportable emissions in the preceding calendar year.
- 4.1.2 The number of allowances to be surrendered shall be the annual reportable emissions for the preceding calendar year plus such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due. This includes allowances to cover the amount of any annual reportable emissions in respect of which allowances were not surrendered in accordance with Condition 4.1.1 in the previous year, and the amount of any reportable emissions which were discovered during the previous year to have been unreported in reports submitted under Condition 3 in that or in earlier years.
- 4.1.3 In relation to activities or parts of activities which have ceased to take place and have been notified to the Agency in accordance with Condition 2.2 above, the Operator shall surrender to the Agency allowances equal to the annual reportable emissions from such activities in the preceding calendar year or part thereof, together with such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due as described in Condition 4.1.2 above.
- 4.1.4 The Operator may, from 2008 onwards, subject to the provisions of the Regulations and the relevant National Allocation Plan for that compliance year, surrender emission reduction units (ERUs) and certified emission reduction units (CERs) in place of allowances.

4.2 The holding, transfer, surrender and cancellation of allowances shall be in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC, any amendment or revision to the same and any guidance issued by the Agency or the National Administrator.

4.3 The Operator shall provide the National Administrator with all the necessary information for the opening of an Operator holding account for the installation described in Condition 1 of this permit within twenty working days of the issue of this permit, unless such an account is already open.

<i>Reason:</i>	<i>To provide for the surrendering, holding, transfer and cancellation of allowances in respect of reported emissions.</i>
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Condition 5. Penalties

- 5.1 Any Operator who fails to comply with Condition 4.1 above shall be subject to the provisions of the Regulations, including, but not limited to the payment of penalties.

Reason: To provide for the payment of excess emissions penalties as required under the Regulations.

Sealed by the seal of the Agency on this the 30 July 2014:

PRESENT when the seal of the Agency was affixed hereto:

Ms. Annette Prendergast
Inspector/ Authorised Person

Appendix 1 to Greenhouse Gas Emissions Permit Number IE-GHG069-10380

Monitoring Plan

1. Guidelines & Conditions

1. Directive 2003/87/EC as amended by Directive 2009/29/EC (hereinafter "the (revised) EU ETS Directive") requires operators of installations which are included in the European Greenhouse Gas Emission Trading Scheme (the EU ETS) to hold a valid GHG emission permit issued by the relevant Competent Authority and to monitor and report their emissions and have the reports verified by an independent and accredited verifier.

The Directive can be downloaded from:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:PDF>

2. The Monitoring and Reporting Regulation (Commission Regulation (EU) No 601/2012) (hereinafter the "MRR") defines further requirements for monitoring and reporting.

The MRR can be downloaded from:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:181:0030:0104:EN:PDF>

Article 12 of the MRR sets out specific requirements for the content and submission of the monitoring plan and its updates. Article 12 outlines the importance of the Monitoring plan as follows:

The monitoring plan shall consist of a detailed complete and transparent documentation of the monitoring methodology of a specific installation [or aircraft operator] and shall contain at least the elements laid down in Annex I.

Furthermore Article 74(1) states:

Member States may require the operator and aircraft operator to use electronic templates or specific file formats for submission of monitoring plans and changes to the monitoring plan as well as for submission of annual emissions reports tonne-kilometre data reports verification reports and improvement reports. Those templates or file format specifications established by the Member States shall at least contain the information contained in electronic templates or file format specifications published by the Commission

3. All Commission guidance documents on the Monitoring and Reporting Regulation will be published at the link below as they become available:

http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

(a) Information sources:

EU Websites:

EU-Legislation: <http://eur-lex.europa.eu/en/index.htm>

EU ETS general: http://ec.europa.eu/clima/policies/ets/index_en.htm

Monitoring and Reporting in the EU ETS: http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

Environmental Protection Agency Website:

<http://www.epa.ie>

Environmental Protection Agency Contact:

GHGpermit@epa.ie

2. Application Details

The Installation Name, Site Name and the address of the site of the installation are detailed below. The Site Name and address can be updated from the Organisation Details Page on the ETSWAP website. The Installation Name can only be updated by your Competent Authority.

Installation name	ESB Marina Generating Station
Site name	ESB Marina Generating Station
Address	Centre Park Road Cork Ireland

Grid reference of site main entrance	E169343 N71830
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Licence held pursuant to the Environmental Protection Agency Act 1992, as amended.	Yes
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IPC/IE Licence Register Number	Licence holder	Competent body
P0578-03	Electricity Supply Board	EPA

Has the regulated activity commenced at the Installation? Yes

Date of Regulated Activity commencement	01 January 2008
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This information is only required to identify the first relevant reporting year of an installation. If the installation was in operation from the beginning of 2008 and held a Greenhouse Gas Emissions Permit from this point, 1 January 2008 will be used where the actual date of commencement is not readily known.

3. About the Operator

The information about the "Operator" is listed below. The "Operator" is defined as the person who it is proposed will have control over the relevant Regulated Activities in the installation in respect of which this application is being made.

(b) Operator Details

The name of the operator and where applicable the company registration number are detailed below. These details can only be updated by the Environmental Protection Agency.

Operator name Electricity Supply Board

Company Registration Number NA ESB Act 1927

Operator Legal status

The legal status of the operator is: Company / Corporate Body

(c) Company / Corporate Body

Is the trading / business name different to the operator name? No

Details of the individual authorised to submit this application on behalf of the company / corporate body.

Title	Mr
Forename	Duncan
Surname	Clarke
Position	Manager of Environment & Sustainability

Registered office address

Address Line 1	27 Lower Fitzwilliam Street
Address Line 2	N/A
City/Town	Dublin 2
County	N/A
Postcode	N/A

Principal office address

Is the principal office address different to the registered office address? No

Holding company

Does the company belong to a holding company? No

(d) Operator Authority

Does the operator named above have the authority and ability to:

- | | |
|---|-----|
| a. manage site operations through having day-to-day control of plant operation including the manner and rate of operation | Yes |
| b. ensure that permit conditions are effectively complied with | Yes |
| c. control monitor and report specified emissions | Yes |
| d. be responsible for trading in Allowances so that at the | Yes |

end of a reporting period allowances can be balanced against reported emissions.

4. Service Contact

e. Service Contact

Name	Mr Ger Stapleton
Address / Email Address	ESB Marina Generating Station Centre Park Road Cork Ireland

5. Installation Activities

f. Installation Description

Below is a description of the installation and its activities, a brief outline description of the site and the installation and the location of the installation on the site. The description also includes a non-technical summary of the activities carried out at the installation briefly describing each activity performed and the technical units used within each activity.

The power plant consists of one gas turbine, type Frame 9B, designed by General Electric, with a maximum ISO output rating of 95MW (peak), 85MW (base) burning natural gas as its primary fuel with gas oil as a secondary fuel. Natural gas is provided from Bord Gas Eireann's (BGE's) natural gas AGI station in Centre Park Road. Gas Oil is stored in an oil farm, operated & maintained by ESB, (Previously operated & maintained by the National Oil Reserve Agency. (NORA). The thermal input capacity for the gas turbine exhaust and the diesel fire pump is 277.16 MW.

g. Annex 1 Activities

The table below lists the technical details for each Annex 1 activity carried out at the installation.

Note that 'capacity' in this context means:

- Rated thermal input (for combustion installations) which is defined as the rate at which fuel can be burned at the maximum continuous rating of the installation multiplied by the calorific value of the fuel and expressed as megawatts thermal.
- Production capacity for those specified Annex I activities for which production capacity determines ETS eligibility.

Annex 1 Activity	Total Capacity	Capacity units	Specified Emissions
Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)	277.16	MW	Carbon Dioxide

h. Site Diagram

The table below lists attachments (if available) that provide a simple diagram showing emissions sources source streams sampling points and metering/measurement equipment.

Attachment	Description
IPCL0003-Rev2.pdf	Site drawing

i. Estimated Annual Emissions

Detail of the estimated annual emission of CO₂ equivalent. This information enables categorisation of the installation in accordance with Article 19 of the MRR and is based on the average verified annual emissions of the previous trading period data OR if this data is not available or is inappropriate a conservative estimate of annual average emissions including transferred CO₂ excluding CO₂ from biomass.

Estimated Annual Emissions (tonnes CO_{2(e)}) 25000

Justification for the use of a conservative estimate of CO₂ emissions. In September 2009 the unit went from being a base loading plant running at high load for approximately 15 hours per day 5 days per week down to being a peaking unit only called on for very short periods of running. Emissions have been drastically reduced as a result. 258,733 tCO₂ in 2008, 158,412 tCO₂ in 2009, 106,450 tCO₂ in 2010, 35,823 tCO₂ in 2011, emissions to end Oct 2012 is 14,488 tCO₂ - this dramatic change in running regime and consequent reduction in emissions justifies the use of estimation. Estimation set based on 2011 and 2012 running.

Installation Category: A

6. Emissions Details

j. About your emissions

Annex I of the Monitoring and Reporting Regulations (MRR) requires that monitoring plans include a description of "the installation" and activities to be carried out and monitored including a list of emission sources and source streams. The information provided in this template relates to the Annex I activity(ies) comprised in the installation in question and should relate to a single installation. It includes any activities carried out by the operator and does not include related activities carried out by other operators.

k. Emission Sources

The table below lists all the emission sources at the installation, which may include directly associated activities/excluded activities.

Emission Source Reference	Emission Source Description
S1	Gas turbine Exhaust
S3	Diesel Fire Pump

The table below lists the emission sources which are linked to the Regulated Activities at the installation.

Emission Source Reference	Emission Source Description
S1	Gas turbine Exhaust
S3	Diesel Fire Pump

l. Emission Points

The table below lists all the emission points at the installation, which may include directly associated activities/excluded activities.

Emission Point Reference	Emission Point Description
A1-1	Gas Turbine Exhaust
A1-2	Diesel Fire Pump Exhaust

m. Source Streams (fuels and/or materials)

The table below lists the source streams which are used in Schedule 1 Activities at the installation.

Source Stream Reference	Source Stream Type	Source Stream Description
F1	Combustion: Other gaseous & liquid fuels	Natural Gas
F2	Combustion: Commercial standard fuels	Gas/Diesel Oil
F3	Combustion: Commercial standard	Gas/Diesel Oil

Source Stream Reference	Source Stream Type	Source Stream Description
	fuels	

n. Emissions Summary

The table below provides a summary of the emission source and source stream details in the installation.

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
F1	S1	A1-1	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
F2	S1	A1-1	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
F3	S3	A1-2	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)

o. Excluded Activities

Certain activities that result in greenhouse gas emissions may be excluded under the EU ETS Directive for example truly mobile sources such as vehicle emissions.

Do you have any excluded activities which need to be identified in your monitoring plan? No

7. Low Emissions Eligibility

p. Low Emissions Eligibility

The operator may submit a simplified monitoring plan for an installation where no nitrous oxide activities are carried out and it can be demonstrated that:

(a) the average verified annual emissions of the installation during the previous trading period was less than 25 000 tonnes CO_{2(e)} per year or;

(b) where this data is not available or inappropriate a conservative estimate shows that emissions for the next 5 years will be less than 25 000 tonnes CO_{2(e)} per year.

Note: the above data shall include transferred CO₂ but exclude CO₂ stemming from biomass.

Does the installation satisfy the criteria for installations with low emissions (as defined by Article 47 of the MRR)? No

8. Monitoring Approaches

q. Monitoring Approaches

Emissions may be determined using either a calculation based methodology ("calculation") or measurement based methodology ("measurement") except where the use of a specific methodology is mandatory according to the provisions of the MRR. [MRR Article 21].

Note: the operator may subject to competent authority approval combine measurement and calculation for different sources. The operator is required to ensure and demonstrate that neither gaps nor double counting of reportable emissions occurs.

Please specify whether or not you propose to apply the following monitoring approaches. Select all monitoring approaches that are applicable to you. The consecutive sections will become mandatory based on the selected approaches.

Calculation	Yes
Measurement	No
Fall-back approach	No
Monitoring of N ₂ O	No
Monitoring of PFC	No
Monitoring of transferred / inherent CO ₂	No

9. Calculation

r. Approach Description

The calculation approach including formulae used to determine annual CO₂ emissions:

Marina site is supplied with natural gas which is metered by BGE using either its service or standby metering installations, and a gas chromatograph. All of the gas supplied is combusted in Marina's OCGT plant.

At the end of each month BGE supplies a data file setting out for each day and hour of the month the gas flow hourly integrator readings corrected to 288.15 K and 101.325 kPa, and hourly averages of gross calorific value, specific gravity, and individual gas fractions in the gas mixture (namely CO₂, Nitrogen, and the paraffin gases from methane through to hexane). The gas volumes are corrected to 273.15 K and 101.325 kPa.

From this data the total nett energy supplied TJ [= Fuel Flow Nm³ * Average Net Calorific Value TJ/Nm³] and the emission factors tCO₂/TJ are calculated for the month (defined as from 06:00 hrs on 1st of the month to 06:00 on 1st of the following month). In calculating the Emission Factor for the conversion of tonnes of Carbon into CO₂ a conversion factor of 3.664 tonnes CO₂/tonne Carbon is used.

The quantity of CO₂ produced from combustion of natural gas during 2012 is expected to be of the order of 25,000 tonnes for the combustion of this fuel.

CO₂ tonnes = fuel flow [Nm³] * Net Calorific Value [TJ/Nm³] * Emission Factor [tCO₂/TJ] * Oxidation Factor

Marina site is supplied with gas oil (as a secondary fuel) on demand from an Oil Farm operated by ESB Marina. Gas oil supplied is metered by a fiscal standard, calibrated meter. All of the gas oil supplied through this meter is combusted in Marina's OCGT plant. Metered quantities of oil supplied in litres are read from the fiscal flow meter before and after distillate runs. These are recorded on the station CO₂ Calculation spreadsheet.

From the above data sources, the total net energy supplied TJ/t and the emission factor tCO₂/TJ is determined.

CO₂ tonnes = Fuel Flow [t] * Net Calorific Value [TJ/t] * Emission Factor [tCO₂/TJ] * Oxidation Factor

Oxidation Factor is 1.0 for both fuels.

Gas oil is delivered by a 5 gallon drum to a tank which supplies the diesel fire-pump. The gas oil delivered to the fire pump amounts to a few hundred litres annually. Consumption will be determined from an estimation based on hours run.

s. Measurement Devices

Below is a description of the specification and location of the measurement systems used for each source stream where emissions are determined by calculation

Also a description of all measurement devices including sub-meters and meters used to deduct non-Annex I activities to be used for each source and source stream.

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
F1	S1	MD1	Turbine meter	Min flow 130 m3/hr @ 20 b Abs equals 2,600 Sm3/hr; and a max flow 2,500 m3.hr @ 20 b abs equals 50,000 Sm3/hr	Sm3/hr	1.0	In BGE AGI, Centre Park Road
F1	S1	MD2	Turbine meter	Min flow 130 m3/hr @ 20 b Abs equals 2,600 Sm3/hr; and a max flow 2,500 m3.hr @ 20 b abs equals 50,000 Sm3/hr	Sm3/hr	1.0	In BGE AGI, Centre Park Road, Cork
F2	S1	MD3	Turbine meter	225 - 2250	litres / minute	0.04	ESB Marina Oil Tank farm
F3	S3	MD4	consumption is estimation based on run hours	NA	NA	1.0	Fire Pump House

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Under Control Of	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
F1	MD1	Continual	Trade partner	Yes	Yes	Yes
F1	MD2	Continual	Trade partner	Yes	Yes	Yes
F2	MD3	Batch	Operator	N/A	N/A	N/A
F3	MD4	Batch	Operator	N/A	N/A	N/A

t. Applied Tiers

The table below identifies the tiers applied against the relevant input data for each source stream and confirms whether a standard (MRR Article 24) or mass balance (MRR Article 25) approach is applied.

(i) The highest tiers as defined in Annex II of the MRR should be used by Category B and C installations to determine the activity data and each calculation factor (except the oxidation factor and conversion factor) for each major source stream. Category A installations should apply as a minimum the tiers listed in Annex V.

(ii) Operators may apply a tier one level lower than those referred to in sub paragraph (i) above for Category C installations and up to two levels lower for Category A and B installations with a minimum of tier 1 if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier. The justification for not applying the higher tier should be recorded when completing the tier table.

(iii) The competent authority may allow an operator to apply even lower tiers than those referred to in the sub paragraph (ii) with a minimum of tier 1 for a transition period of up to three years if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier and provides an improvement plan detailing how and by when at least the tier referred to in sub paragraph (ii) will be achieved. The improvement plan should be referenced in subsequent table and provided to the competent authority at the time of submission of this plan.

(iv) For minor source streams operators shall apply the highest tier which is technically feasible and will not lead to unreasonable costs with a minimum of tier 1 for activity data and each calculation factor. For de-minimis source streams operators may use conservative estimations rather than tiers unless a defined tier can be achieved without additional effort (MRR Article 26(2)).

(v) Installations with low emissions as identified in section 6(d) may apply as a minimum tier 1 for determining activity data and calculation factors for all source streams unless higher accuracy is achievable without additional effort.

* Note 1: For commercial standard fuels the minimum tiers listed in Annex V of the MRR may be applied for all activities in all installations.

* Note 2: If you are intending to apply a fall-back approach please complete the table below and select "n/a" for the tiers to be applied for each source stream where a fall-back approach is used. Section 10 "Fall-back" must also be completed for these source streams.

* Note 3: For biomass or mixed fuels the emission factor is the preliminary emission factor as defined in Definition 35 Article 3 of the MRR.

Source Stream Refs.	Emission Source Refs.	Measurement Device Refs.	Overall Metering Uncertainty (less than +/- %)	Applied Monitoring Approach	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied	Estimated Emissions tCO _{2(e)}	% of Total Estimated Emissions	Source Category	Highest Tiers Applied	Justification for not applying the highest tiers	Improvement Plan Reference (where applicable)
F1	S1	MD1, MD2	<1.5%	Standard	4	3	3	N/A	1	N/A	N/A	25000	99.36	Major	Yes	n/a	n/a
F2	S1	MD3	<1.5%	Standard	4	2a	2a	N/A	1	N/A	N/A	160	0.64	De-minimis	Yes	n/a	n/a
F3	S3	MD4	N/A	Standard	No tier	2a	2a	N/A	1	N/A	N/A	1	0	De-minimis	N/A	n/a	n/a

Total Estimated Emissions for Calculation (tonnes CO_{2(e)})

25161

u. Uncertainty Calculations

The table below lists evidence attached to the application that demonstrates compliance with the applied tiers in accordance with Article 12 of the MRR.

Attachment	Description
Marina Uncertainty Version 2.xls	Marina Uncertainty
BGE email confriming uncertainty of meters & temperature pressure compensation.doc	BGE email confriming uncertainty of meters & temperature pressure compensation.doc

v. Applied tiers

Applied tiers for each source stream

Source Stream Ref.	Emission Source Refs.	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied
F1	S1	4	3	3	N/A	1	N/A	N/A
F2	S1	4	2a	2a	N/A	1	N/A	N/A
F3	S3	No tier	2a	2a	N/A	1	N/A	N/A

w. Justification for Applied tiers

Justifications for the applied tiers for each major source stream where highest tiers are not currently achieved.

Source Stream Ref.	Emission Source Refs.	Justification for the applied tier	Improvement Plan Reference (where applicable)
N/A	N/A	N/A	N/A

10. Calculation Factors

x. Default Values

The table below lists, for each parameter, where default values are to be used for calculation factors.

Source Stream Refs.	Emission Source Refs.	Parameter	Reference Source	Default Value applied (where appropriate)
F1,F2,F3	S1,S3	OxF	MRR Annex II Section2.3	1
F2,F3	S1,S3	NCV, EF	EPA Country Specific Emission Factors	n/a

Sampling and Analysis

Do you undertake sampling and analysis of any of the parameters used in the calculation of your CO₂ emissions? Yes

y. Analysis

The table below lists, for each source stream, where calculation factors are to be determined by analysis.

Source Stream Refs.	Emission Source Refs.	Parameter	Method of Analysis	Frequency	Laboratory Name	Laboratory ISO17025 Accredited	Evidence Reference
F1	S1	NCV	ENISO 6976:2005	Continuous	Effectech	Yes	n/a
F1	S1	EF	Gas Chromatograph ENISO6974	Continuous	EffecTech	Yes	n/a

Detail about the written procedures for the above analysis.

Where a number of procedures are used details of an overarching procedure which covers the quality assurance of analyses methods and links together individual analytical methods is listed.

Title of procedure	Procedure for determining the quantity of CO ₂ emitted by the combustion of natural gas in Marina OCGT Plant
Reference for procedure	EMS 9.1-07
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure that all fuels consumed on site are sampled & analysed for carbon content and NCV to allow for the calculation of CO ₂ emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling & analysis will be used for the verification, auditing & calculation of CO ₂ (GHG) emissions. Natural Gas standard for EF is EN ISO06974. NCV is performed EN ISO 6976:2005. Annual performance assessment is conducted for the on-line gas chromatograph in accordance with EN ISO 10723:2012.
Post or department responsible for the procedure and for any data generated	Station Chemist/ Environmental CoOrdinator
Location where records are kept	Marina Microsoft Sharepoint & Hard copies
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	EN ISO 6976:2005, EN ISO 10723:2012, EN ISO06974 EN ISO 10715 Natural gas sampling guidelines

z. Sampling Plan

Details about the procedure covering the sampling plan for the analysis table above.

The procedure below covers the elements of a sampling plan as required by Article 33 of the MRR. Where a number of procedures are used, details of an overarching procedure which covers the sampling methods and links together individual sampling methods are listed.

Attachment	Description
Certificate 12_007_14 Marina AGI sn 114708.pdf	Certificate 12_007_14 Marina AGI sn 114708.pdf
Marina AGI Calibration Report.pdf	Marina AGI Calibration Report.pdf
Marina St.1 Cert no 635-2000 04-10-2000.pdf	Marina St.1 Cert no 635-2000 04-10-2000.pdf
Marina St.2 06-03-12.pdf	Marina St.2 06-03-12.pdf
Marina St. 1 06-03-12.pdf	Marina St. 1 06-03-12.pdf
EffecTech 0590Calibration Multiple_030.pdf	EffecTech 0590Calibration Multiple_030.pdf
Cert of Reg - IS EN ISO 9001 2008 - GWR - to 19Nov2014.pdf	BGE ISO9001 Certification
Marina St 2 Cert no 36011260 28-06-2005.pdf	NG Meter 2 cert

Attachment	Description
EMS 9.1-07 Proc for Determining Quantity CO2 Emitted from Natural Gas - Ver 6.0.doc	EMS 9.1-07 Proc for Determining Quantity CO2 Emitted from Natural Gas - Ver 6.0.doc

Title of procedure	Procedure for determining the quantity of CO2 emitted by the combustion of natural gas in Marina OCGT Plant
Reference for procedure	EMS 9.1-07
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure that all fuels consumed on site are sampled & analysed for carbon content and NCV to allow for the calculation of CO2 emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling & analysis will be used for the verification, auditing & calculation of CO2 (GHG) emissions. Natural Gas standard for EF is EN ISO06974. Annual performance assessment is conducted for the on-line gas chromatograph in accordance with EN ISO 10723:2012. EN ISO 10715 Natural gas sampling guidelines also applies.
Post or department responsible for the procedure and for any data generated	Station Chemist/ Environmental CoOrdinator
Location where records are kept	Marina Microsoft Sharepoint & Hard copies
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	EN ISO 10723:2012, EN ISO06974 EN ISO 10715 Natural gas sampling guidelines

aa. Sampling Plan Appropriateness

The procedure to be used to revise the appropriateness of the sampling plan.

Title of procedure	Procedure for determining the quantity of CO2 emitted by the combustion of natural gas in Marina OCGT Plant
Reference for procedure	EMS 9.1-07
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure that all fuels consumed on site are sampled & analysed for carbon content and NCV to allow for the calculation of CO2 emissions to the standard specified in the M&R Regulation. Information that is gathered in relation to fuel sampling & analysis will be used for the verification, auditing & calculation of CO2 (GHG) emissions. In relation to sample plan appropriateness -Should any change occur to the above sampling and analysis plan, the plan will be revised and the EPA informed and their approval sought. Sampling plan is included in the environmental management system as part of ISO 14001:2006.
Post or department responsible for the procedure and for	Station Chemist/ Environmental CoOrdinator

any data generated	
Location where records are kept	Marina Microsoft Sharepoint & Hard copies
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	EN ISO 10723:2012, EN ISO 10715 Natural gas sampling guidelines

Are stock estimates carried out as part of the emission calculations?	No
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bb. Tracking Instruments

The procedure used to keep track of instruments installed in the installation used for determining activity data.

Title of procedure	Procedure for determining the quantity of CO2 emitted by the combustion of natural gas in Marina OCGT Plant
Reference for procedure	EMS 9.1-07
Diagram reference	N/A
Brief description of procedure.	With the procedure, even though the GC & metering is outside the control of ESB Marina, ESB Marina will ensure that BGE use in date and calibrated instruments and gases. ESB Marina has a PM in place, policy number 0370000001 YE 001 to prompt BGE to change gases, requests monitoring checks from BGE for meters, calibrations, spot-checks conducted by themselves or a third party on their behalf. This ensures compliance with appropriate tiers on behalf of ESB Marina.

Post or department responsible for the procedure and for any data generated	Station Chemist/ Environmental CoOrdinator
Location where records are kept	Marina Microsoft Sharepoint & Hard copies
Name of IT system used	IDM Microsoft Sharepoint
List of EN or other standards applied	N/A

11. Management

cc. Monitoring and Reporting Responsibilities

Responsibilities for monitoring and reporting emissions from the installation are listed below:

Relevant job titles/posts and provide a succinct summary of their role relevant to monitoring and reporting are listed below.

Job Title / Post	Responsibilities
Plant Manager	Collect all invoices, conduct CO2 calculation, ensure compliance with GHG permit
Environmental Co-ordinator	Conduct internal reviews of systems to ensure compliance with permit and verification of CO2 calculations
Environmental Specialist Head office	Internal checks and Audit

Attachment	Description
Org Chart Marina OCGT.JPG	Org Chart Marina OCGT

dd. Assignment of Responsibilities

Details of the procedure used for managing the assignment of responsibilities for monitoring and reporting within the installation and for managing the competencies of responsible personnel in accordance with Article 58(3)(c) of the MRR:

This procedure identifies how the monitoring and reporting responsibilities for the roles identified above are assigned and how training and reviews are undertaken.

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	<p>The purpose of this procedure is to illustrate how CO2 Emissions are calculated for Marina OCGT according to the Monitoring and Reporting Plan as agreed with the EPA. The procedure details the roles & responsibilities of personnel in the station. A flowchart also illustrates roles & responsibilities. Monitoring and reporting responsibilities are assigned to people competent in the area and familiar with the GHG reporting. Personnel involved contribute as part of their day to day responsibilities & are involved for example in stock checks for in-house verification and for ESB Head office (e.g. Oilops) & EPA. Training and reviews occur at annual pre-verification stage or if personnel change positions or vacate a position. Segregation of duties is demonstrated in the EMS 11.2-03 Marina Monitoring and Reporting Protocol for CO2 Emissions . ver 14 attached. Duties are highlighted by different colours indicating different personnell involved. The Station manager or his appointee can act to verify all information for site and activities as appropriate. ESB Marina will meet the requirements of Article 58(3)(C) in terms of segregation and delegation of duties in the data flow & control activities.</p> <p>Under Article 61 ESB Marina will ensure all staff involved will be trained and competent to do the role they are responsible for. Environmental Services will audit this requirement at 6 monthly reviews to ensure ESB Marina is compliant with Article 61.</p>
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

ee. Monitoring Plan Appropriateness

Details of the procedure used for regular evaluation of the monitoring plan's appropriateness covering in particular any potential measures for the improvement of the monitoring methodology:

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. Section 3 reviews the calculation methodology. This procedure is reviewed as part of the certified environmental management system. Section 7 references 6 monthly cross checks by HO & verifier and this is how we manage monitoring plan appropriateness. The monitoring plan appropriateness is reviewed by on-site personnel prior to any changes in emission sources, source streams and metering and fuel analysis. All reviews cover checking emission sources and source streams for completeness and that any changes have been taken into account, assessing compliance with uncertainty thresholds for activity data and assessing potential measures for improvement of monitoring methodology. This is to ensure compliance with Article 69.1 of the Monitoring and Reporting Regulation.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

ff. Data Flow Activities

Details of the procedures used to manage data flow activities in accordance with Article 57 of the MRR:

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. The procedure details information flow and the links internally and externally. It highlights the interactions of third party involvement and station staff involvement in the process to ensure correct reporting. ESB Marina in doing so meets the requirements of Article 57.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator

Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A
List of primary data sources	Hourly Natural Gas consumption data and composition data supplied by BGE- reports and invoices
	Fiscal meter readings for each Gas Oil draw down
	Run hours estimate for the firepump
	Current country specific emission factor and NCV for Gas Oil.
Description of the relevant processing steps for each specific data flow activity.	CO2 Calculation Natural Gas
Identify each step in the data flow and include the formulas and data used to determine emissions from the primary data. Include details of any relevant electronic data processing and storage systems and other inputs (including manual inputs) and confirm how outputs of data flow activities are recorded	$\text{CO2t} = \text{Fuel supplied} * \text{Net Calorific Value} * \text{Emission Factor} * \text{Oxidation Factor}$ <p>Where Fuel supplied is in Nm3 (i.e., corrected to 273.15 degree K, 101.325 kPa)</p> <p>Emission Factor is expressed in tonnes CO2 per TJ supplied</p> <p>Oxidation factor is 1.0 per M&R Regulation</p> <p>In calculating the Emission Factor, the quantity of CO2 is calculated as 3.664 times the weight of carbon burned</p> <p>Gas Oil</p> $\text{CO2t} = \text{Fuel supplied} * \text{Net Calorific Value} * \text{Emission Factor} * \text{Oxidation Factor}$ <p>Where Fuel consumed is in tonnes, Net Calorific Value is in TJ/tonne, Emission Factor is in tCO2/TJ, Oxidation Factor is 1.0 per M&R Regulation. In calculating the Emission Factor, the quantity of CO2 is calculated as 3.664. Natural Gas consumption is based on data issued to Marina station by Bord Gais Eireann (BGE). This data derives from the volumetric flow measurement by 1 of 2 flow meters (1 service and 1 standby), referred to as Stream 1(MD1) and Stream 2 (MD2); and by an on-line gas chromatograph which provides a full gas analysis. The gas consumption will be internally cross-checked within the station by comparison with the gas turbine's MWH output and cycle efficiency.</p> <p>Gas Oil</p> <p>Gas oil is a secondary fuel at Marina used when natural gas</p>

is not available for physical reasons or for commercial reasons. Consumption of gas oil will be based on fiscal flow meter readings. These readings are registered by the flow meter's accumulator, a non-resettable digital counter. Readings are taken after each gas oil drawdown and records maintained. Consumption of gas oil in the diesel fire pump is of the order of hundreds of litres annually. Gas oil is delivered for transport and the fire pump. No invoices are retained as the 200 litre is topped up on an ad hoc basis. Consumption will be determined from an estimation of hours run. Emission Factor will be calculated from the carbon content and NCV as measured by a laboratory accredited to ISO17025 and using a conversion factor for Carbon to carbon dioxide of 3.664.

Natural Gas

The Bord Gais report to the station mentioned above will include the average gas analysis on an hourly basis. This analysis is generated from a Bord Gais Gas Chromatograph which samples the gas every 4 minutes and which is self-calibrating daily. The carbon content of the gas will be calculated from this analysis. Performance evaluation tests shall be conducted annually in accordance with ISO 10723 "Natural Gas Performance for on-line Analytical Systems" on the on-line gas chromatograph.

Performance evaluation tests are conducted by an EN ISO 17025 accredited Laboratory. Results of such tests shall be maintained on-site. Online analytical systems will be calibrated with certified reference materials supplied by an EN ISO 17025 accredited lab. A spreadsheet containing the data received from BGE calculates the weight of carbon in grams for each component gas in the gas mixture and from this and the gas volumes consumed, the quantity of CO₂ emitted in tonnes.

The calculation is as follows:

The spreadsheet calculates the weight of carbon in grams for each component gas in the gas mixture.

One Gram-Mole of methane (16 grams) occupies 22.414 litres at standard conditions (0°C, 1.01325b) Therefore 1 litre of pure methane weighs $16 \div 22.414$ grams. Methane fraction in the gas mixture is (say) 99%. Per litre of gas mixture, methane weighs $(99 \div 100) \times (16 \div 22.414)$ grams at standard conditions. Carbon weight in methane expressed as a fraction is $12 \div 16$ (Mol Wt of Carbon divided by Mol Wt of Methane). Therefore wt of carbon in grams per litre of gas mixture is

$$(12 \div 16) \times (99 \div 100) \times 16 \div 22.414 \text{ grams.}$$

This calculation is done for each component gas and the component carbon weights summed. This total weight in grams per litre is converted to CO₂ in grams per KCM. A factor of 3.664 is used. This figure is then multiplied by the gas flow rate in Sm³ per hour to produce a figure for CO₂ emitted per hour, expressed in tonnes. The volume of natural gas is adjusted to normal conditions (0C, 101.325 kPa). The total weight of CO₂ in grams per KCM is multiplied by the volume to give total CO₂ for the period. For periods of time (a number of hours) where natural gas analysis data is missing, the average analysis of the gas will be calculated for the valid data for that month. These average values will then be used for the period that the data is missing. Where there is data missing for a longer period, the EPA will be informed and an alternative will be agreed. Each month the average Natural Gas analysis will be calculated. The annual average analysis will be calculated using these monthly averages. This data will then be used with a software package to calculate the annual NCV to ISO6976. The emission factor will be calculated using CO₂ and NCV data. $EF = CO_2 / NCV$

5.2 Gas Oil

Gas oil consumption has been negligible for the past number of years, it was zero in 2008, was de minimus for 2009 and 2010, and is expected to be de minimus going forward. For de minimus usage, NCV and emissions factor data will be taken from Ireland's latest national inventory as submitted to the United Nations Framework Convention on Climate Change and published by the EPA. If consumption exceeds or is expected to exceed de minimus quantities, it is proposed that samples be taken independently 6 times per year and analysed for Carbon, NCV and Density by an accredited laboratory. The diesel fire pump gas oil NCV and emissions factor data will be taken from Ireland's latest national inventory as submitted to the United Nations Framework Convention on Climate Change and published by the EPA. The oxidation factor used will be 1.0 as per the guidelines for both Natural Gas and Gas Oil.

Spreadsheet

The spreadsheet is updated each month and reportable CO₂ emitted is crossed-checked with the CO₂ calculated from the Invoices and using standard factors for NCV and Emissions Factor as a cross-check on the integrity of the spreadsheet. Further cross-checks are carried out at six

monthly intervals.

Submit relevant documents to record data flow activities

Attachment	Description
EMS 11 2-03 Marina M R Protocol (GHG Procedure) for CO2 Emissions Version 14.doc	EMS 11 2-03 Marina M R Protocol (GHG Procedure) for CO2 Emissions Version 14.doc

gg. Assessing and Controlling Risks

Details of the procedures used to assess inherent risks and control risks in accordance with Article 58 of the MRR:

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. Section 13 details the risks. It deals with metering equipment, corrective actions, quality assurance, IT controls to mention but a few. Article 58 is covered by this section. ESB Marina will shall document, implement and maintain an effective control system to ensure that the annual emission report resulting from data flow activities does not contain misstatements and is in conformity with the monitoring plan and this Regulation.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

hh. Quality Assurance of Metering / Measuring Equipment

Details of the procedures used to ensure quality assurance of measuring equipment in accordance with Article 58 and 59 of the MRR.

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A

Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. Section 4, 5, 10 & 13 detail metering and measuring equipment, quality assurance, compliance and corrective actions. ESB Marina shall document, implement and maintain an effective control system to ensure that the annual emission report resulting from data flow activities does not contain misstatements and is in conformity with the monitoring plan and this Regulation.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

ii. Quality Assurance of Information Technology used for Data Flow Activities

Details of the procedures used to ensure quality assurance of information technology used for data flow activities in accordance with Article 58 and 60 of the MRR:

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. The station holds electronic and hardcopies. Access to spreadsheets are password controlled. We use a system called information document management or sharepoint, The information documentation management folders are read & write for personnel directly involved in GHG activities & read only for general staff. Back up, recovery and security of electronic files are managed outside of the station by IT security at ESB Head Office 7 are backed up every 24hrs. The control of the information technology system shall include access control, control of back up, recovery, continuity planning and security.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

jj. Review and Validation of Data

Details of the procedures used to ensure regular internal reviews and validation of data in accordance with Articles 58 and 62 of the MRR.

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. Section 8 details comparison with previous years data. External validation occurs annually and internal review occurs annually as detailed in section 7.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

kk. Corrections and Corrective Actions

Details of the procedures used to handle corrections and corrective actions in accordance with Articles 58 and 63 of the MRR:

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. Section 10 details corrective actions. The procedure details all close out mechanism from internal & external reports during validation for the reporting years. The whole process of gathering data for the EUTS will be reviewed and checked on an ongoing basis. If there is a problem with data or figures they are promptly addressed by means of an investigation. Data is reviewed and data corrected. If needed, procedures are amended. In the past preventative maintenance policies have been created to ensure that errors do not occur again. Any corrective actions or changes will be notified to the EPA in a timely manner if required. These notifications will be the responsibility of the Environmental Coordinator. ESB Marina is certified to ISO 14001 and is audited frequently by a third party.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

II. Control of Outsourced Activities

Details of the procedures used to control outsourced processes in accordance with Articles 59 and 64 of the MRR.

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. Section 4.1 details the cross checks carried out on the natural gas deliveries. The station requests BGE calibration data & maintenance records, gas oil deliveries and meter calibrations to ensure that activities outside of your control are monitored.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint
List of EN or other standards applied	N/A

mm. Record Keeping and Documentation

Details of the procedures used to manage record keeping and documentation:

Title of procedure	Marina Monitoring and Reporting Protocol for CO2 Emissions
Reference for procedure	EMS 11.2.03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to show how CO2 emissions are determined and described in a single protocol. Section 9 details documentation and record keeping. Section 8 details the spreadsheet storage details. ESB will meet the requirements of Article 66 and Annex IX. All records relating to the consumption of fuel shall be maintained on site by the Technical Services Engineer. All relevant information relating to quantity and calculation shall be entered into the stations Perform by the Technical Services Engineer. All records shall be maintained on site for a period of ten years.
Post or department responsible for the procedure and for any data generated	Environmental Co-ordinator
Location where records are kept	Microsoft Sharepoint, Marina Sharepoint site, EMS
Name of IT system used	Microsoft Sharepoint

List of EN or other standards applied N/A

nn. Risk Assessment

The results of a risk assessment that demonstrates that the control activities and procedures are commensurate with the risks identified:

Attachment	Description
Marina Risk Register for CO2 Process Version 3.doc	Marina Risk Register for CO2 Process Version 3.doc

oo. Environmental Management System

Does your organisation have a documented Environmental Management System? Yes

Is the Environmental Management System certified by an accredited organisation? Yes

The standard to which the Environmental Management System is certified: SGS - ISO 14001

12. Changes in Operation

pp. Changes in Operation

Article 24(1) of Commission Decision 2011/278/EC requires that Member States must ensure that all relevant information about any planned or effective changes to the capacity activity level and operation of an installation is submitted by the operator to the competent authority by 31 December each year. Article 12(3) of the MRR further provides that Member States may require information to be included in the monitoring plan of an installation for the purposes of meeting these requirements.

Details of the procedure used to ensure regular reviews are carried out to identify any planned or effective changes to the capacity activity level and operation of the installation that have an impact on the installation's allocation:

The procedure specified below cover the following:

- planning and carrying out regular checks to determine whether any planned or effective changes to the capacity activity level and operation of an installation are relevant under Commission Decision 2011/278/EC; and

- Procedures to ensure such information is submitted to the competent authority by 31 December of each year.

Title of procedure	Na
Reference for procedure	NA
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	NA
Post or department responsible for the procedure and for any data generated	Na
Location where records are kept	NA
Name of IT system used	N/A

13. Abbreviations

qq. Abbreviations Acronyms or definitions

Abbreviations acronyms or definitions that have been used in this monitoring plan:

Abbreviation	Definition
NCV	Net Calorific Value
EF	Emission Factor
OF	Oxidation Factor

14. Additional Information

Any other information:

Attachment	Description
N/A	N/A

15. Confidentiality

rr. Confidentiality Statement

It is the Environmental Protection Agency's policy to make information received by it in the course of its work open to inspection by any person on request. This is in accordance with the provisions of the European Communities (Access to Information on the Environment) Regulations 2007 to 2011.

In the event that you considered that some of the information being submitted of a confidential nature, then the nature of this information and the reasons why it should be considered confidential, with reference to the European Communities (Access to Information on the Environment) Regulations 2007 to 2011 and any amendments must be explicitly requested using the facility below. The Board of the Environmental Protection Agency will consider the requests and if the information can be deemed as confidential and necessary.

Notwithstanding any request for confidentiality, the Environmental Protection Agency explicitly reserves the right to release data to the Commission, including emissions and allocations to the public, on the basis that the data will be used for the purposes foreseen in Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

Please tick this box if you consider that any part of your false
form should be treated as commercially
confidential/sensitive:

END of Appendix I.