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Attachment C

C. Management of the Installation

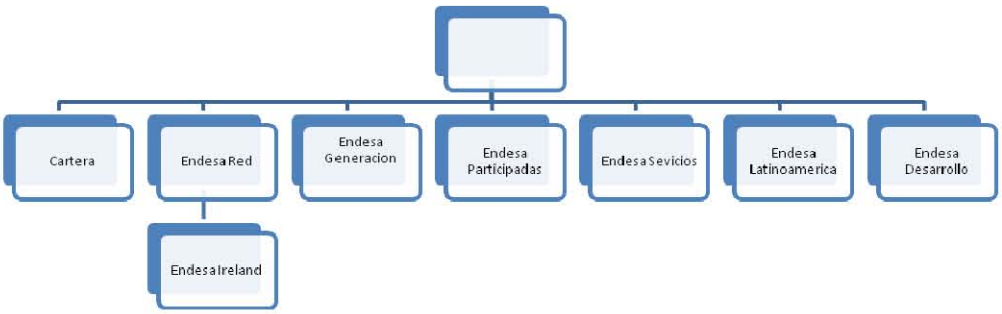
Details should be provided on the management structures for the activity. Organisational charts and all relevant environmental management policy statements, including provisions for ongoing assessment of environmental performance, are required.

C.1 Site Management and Control

The Management Team of the proposed Great Island CCGT power plant is shown in the organizational structure below (Figure C.1.1. *Organisational Chart*). This is similar to the current plant arrangement with the exception of a new role entitled "Energy Efficiency Manager".

Figure C.1.1 Organisational Chart

In terms of the relationship between Endesa Ireland Ltd and Endesa SA (Endesa International); Endesa Ireland Ltd is a wholly owned subsidiary (please view below) of Endesa SA.



Site specific management systems and operating procedures will be developed and implemented in accordance with corporate Endesa Ireland Ltd. procedures and policies. The systems and procedures will be continuously reviewed and developed in accordance with the principles of continuous improvement.

Endesa Ireland Ltd. will have ultimate responsibility for environmental, health and safety and issues related to the operation of the facility, including environmental monitoring and reporting obligations. Operations will be carried out in accordance with legislative requirements and the conditions of the IPPC licence and planning permission.

Similar to other CCGT power plants operating in Ireland, a suitably qualified and technically competent Maintenance Contractor, with previous experience maintaining power plants, will be contracted by Endesa Ireland Ltd. The Contractor will have responsibility for the day to day maintenance of the plant. The contract between Endesa Ireland Ltd. and the Maintenance Contractor will specifically address and include health and safety and environmental obligations and responsibilities. Endesa will retain overall responsibility for all legal requirements associated with the IPPC licence.

C.2 Roles and Responsibilities

Details of responsibilities for operational environmental, health and safety and quality control are specified hereunder. The Station Manager and the Chemist/Environmental and Health and Safety Manager are the key persons in the organization in terms of the planning, coordination, management and evaluation of the activities related to the Environment.

C.2.1 Station Manager

The Station Manager is the key person in terms of organization and responsibilities of the CCGT plant. He/She will report directly to the Production Manager of Endesa Ireland Ltd. In particular, the Station Manager will be directly responsible for the implementation of the corporate standards regarding Environmental, Health and Safety and Quality systems, policies and procedures.

Among the Station Manager's key responsibilities, the following ones might be highlighted:

Ensure site operations are carried out in accordance with site operating procedures and systems, manufacturer's specifications, site specific policies, and legislative requirements.

- Ensure that an appropriately authorized and technically competent contractor, with experience in maintaining power plants, is engaged under a maintenance contract.
- Ensure that all necessary resources are made available to personnel involved in the operation of the facility, including operations and maintenance, to ensure effective implementation of BAT and continuous improvement.
- Ensure compliance with the conditions of the IPPC licence and planning permission.
- Ensure systems and procedures are reviewed regularly and developed in accordance with best practice, with effective document control systems.
- Commit to the effective maintenance and review of the Environmental Management System (EMS).
- Ensure any local concerns relating to the operation of the facility are addressed at the earliest possible opportunity.
- Act as primary contact for relevant queries and complaints (especially neighbours).
- Implement the Planned Preventative Maintenance Programme (PPMP).
- Participate in cross-functional reviews, as required.
- Ensure that all personnel are suitably trained and technically competent to undertake their roles and assigned tasks.
- Ensure effective auditing systems are implemented and carried out.

- Ensure that all reports and monitoring results are submitted to the appropriate regulatory authorities within the specified timeframes.

- Ensure all personnel are made aware of their responsibilities to report incidents, accidents and near misses as well as opportunities for continuous improvement.

- Liaise with the Chemist/EHS Manager on environmental, health and safety performance.

C.2.2 Chemist/EHS Manager

The Chemist, Environmental, Health and Safety (Chemist/EHS) Manager will be the key person responsible for the effective implementation and control of the operational activities directly related to the Environment, such as IPPCL compliance, monitoring and control (i.e. emissions to the atmosphere and water), waste management, noise surveys, annual reporting, etc.

This Manager will be appointed by Endesa Ireland Ltd. as "Environmental Coordinator", assuming the role of key contact in terms of formal communications with the Environmental Protection Agency.

In order to ensure compliance with the conditions of the IPPC licence and an effective implementation of the Environmental Management System, he/she will:

- Ensure that corporate Endesa Ireland Ltd. "Environmental Policy" is made public and known by employees and contractors.

- Ensure monitoring, sampling, surveys and analysis are undertaken by suitably qualified and experienced persons/contractors (and the suitable CEMS/software in case of emissions to the atmosphere) in accordance with the appropriate conditions and schedules of the IPPC licence (affecting soil, groundwater, emissions, noise, etc. matters).

- Interpret monitoring and analytical data and report results to the regulatory authorities within the agreed timeframes.

- Ensure all abatement, control and monitoring equipment is within calibration.

- Develop and maintain an Environmental Risks and Aspects evaluation so that the impacts on the environment are identified and controlled.

- Ensure best practices in order to ensure that risks to the environment are minimized.

- Develop and maintain an Environmental Legislation Register and its compliance evaluation.

- Develop, maintain and manage the EMS, including the corresponding updated documentation and records and actions plans for continuous improvement.

- Undertake regular EMS reviews, management meetings and liaison with plant personnel.
- Ensure EMS document control, corrective actions, recommendations and non conformance systems are effective, reporting all non-compliances and corrective actions to the Station Manager at the earliest possible opportunity.
- Develop, implement and maintain non-compliance and complaint registers and systems.
- Proactively manage environmental complaints from the public in consultation with the Station Manager.
- Organize and coordinate periodic environmental training and awareness sessions, maintaining EHS training and qualification records for all employees
- Undertake regular inspections of waste and waste water areas, bunding, sampling and monitoring equipment. Communicate findings to the relevant personnel, as appropriate.
- Ensure that waste is appropriately stored and maintain records.
- Ensure waste is managed in accordance with the Waste Management Hierarchy. Accredited companies for waste removal (both non hazardous and hazardous wastes).
- Recycling and reuse of waste where possible.
- Ensure all waste contractors are appropriately licensed / permitted and keep a copy of their permits on site.
- Identify appropriate resource (including waste), energy, water minimisation and sustainability initiatives.
- Undertake energy, waste and water audits on site.
- Undertake COSHH assessments for all chemicals stored on site. Ensure compliance with the requirements of the REACH Directive. Regularly review new developments in raw materials selection.
- Undertake regular EMS, IPPC and planning condition reviews to ensure that environmental aspects and health and safety risk assessments are up to date.
- Develop and/or manage the undertaking of a Firewater Retention Study, Environmental Liability Risk Assessment and a Residuals Management Plan /Decommissioning Plan in accordance with the conditions of the IPPC licence and planning permission.

In order to ensure that Health and Safety procedures are implemented in an effective manner, he/she will:

- Ensure that corporate Endesa Ireland Ltd. "Health and Safety Policy" is made public and known by employees and contractors.
- Ensure best practices in order to ensure that risks to human health are minimized.
- Implement accident prevention measures, emergency response systems and a site emergency plan in consultation with the local emergency services.
- Ensure emergency response drills are undertaken in accordance with the recommendations of the emergency services.
- Ensure all health and safety and environmental suppliers and contractors are appropriately authorized.

In terms of environmental notifications, communication and official reporting, he/she will:
Coordinate the preparation and submission of the Annual Environmental Reports.

- Co-ordinate annual (external) verification under EU Emissions Trading Scheme (EU-ETS) legislation and protocol. Liaise with Endesa Ireland Ltd. Head Quarters on trading and improvements on Carbon Dioxide (CO_2) reductions and control policies.
- Notify appropriate agencies of non-compliances, breaches of conditions, incidents and accidents in accordance with agreed schedules and methods.
- Notify the EPA and other relevant regulatory authorities of any significant change to operations in accordance with agreed schedules and methods.

The Chemist/EHS Manager will coordinate his/her actions and activities with the rest of Managers when required. In particular he/she will interact with the Energy Efficiency Manager, Operations Manager and Maintenance Manager to address all aspects related to:

- the plan operation and maintenance (i.e. optimizing performance and emissions, correct calibration of measurement equipment, etc.)
- data required in the preparation of the Environmental Reports (i.e. generation, fuel consumption, etc.).
- cross-functional audits (internal and external) and meetings
- effective implementation of the Environmental and Health and Safety Policies
- the Planned Preventative Maintenance Programme (PPMP)

C.3 Technical Competence and Training

C.3.1 Technical Competence:

All personnel will be technically competent and suitably qualified to undertake their assigned tasks. Training records will be maintained on site and in Endesa Ireland Ltd. HQ, always updated and available for inspection.

Curriculum Vitae for all key personnel will be forwarded to the EPA on appointment, if requested.

C.3.2 Training:

All employees will receive comprehensive *induction training* prior to commissioning of the plant (key employees may be contracted in advance of operation to gain familiarity with facility operation through commissioning prior to plant commercial operation).

The training will focus on various operating procedures including the conditions of the IPPC licence and planning permission. Potential risks to the environment, general awareness, appropriate preventative measures, response and reporting procedures, all of those associated with specific roles, will be incorporated into the training programme.

In addition, all site personnel will receive periodic *training on Environmental Emergency Response, EMS and general Environmental Awareness Training*, incorporating resource (including waste), energy, water minimisation and noise control techniques. Training will include materials handling, the appropriate use of conditioning chemicals and cleaning materials and resource use minimization (water, electricity, etc.).

Additional *Health and Safety training*, including fire fighting and first aid, will be implemented in accordance with best practice and corporate developed systems (emergency drills will be also carried out from time to time).

Personnel with responsibilities for operations, maintenance, health and safety and the environment will also receive *Task Specific technical training*, as required.

A "Training Needs Matrix and Programme" will be developed and periodically updated in accordance with changing training needs. This programme will be cognisant of any incidents, amendments to site licence conditions, changes to legislation, operations, operating procedures, emergency response and best practice guidelines. Records of all training activities will be kept as well as the results of the corresponding quality controls carried out (trainer's evaluation, attendees' satisfaction, etc.). The Chemist/HSE Manager will coordinate with the Human Resources Officer (and with Endesa Ireland Ltd. HQ when required) to ensure that environmental and health and safety training needs are considered and carried out.

In any case, all personnel will be informed of their responsibilities to report any and all potential and actual non-compliance issues to the Chemist/HSE Manager. Change control measures and internal communication tools (emailing, information panels, etc.) will be implemented to ensure that all personnel are informed of any amendments to operating procedures and policies. The EMS auditing programme will facilitate the whole process.

C.4 Calibration and Maintenance Systems

As detailed previously, the Station Manager and Chemist/HSE Manager will all be responsible, to varying degrees, for the development, implementation and maintenance of a Planned Preventative Maintenance Programme (PPMP) incorporating equipment calibration and integrity testing.

Site specific maintenance and calibration procedures will be developed and implemented, together with its documentation. The relevant personnel will receive appropriate training in maintenance techniques, calibration and associated operating procedures and schedules, as required.

All abatement, control and monitoring equipment will be subject to regular inspections, checks and servicing in accordance with manufacturer's specifications, best practice guidelines, legal requirements or IPPC license requirements if they exist. Records of certifications, calibrations, checks, inspections and maintenance will be retained on site, available for inspection.

C.5 Waste Control System

Both hazardous and non-hazardous waste will be generated on site as a consequence of the electricity generation process. However, due to the nature of the activities carried out on site, the volume of waste generated will be relatively small.

- Waste will be managed in accordance with the Waste Management Hierarchy.
- The generation of waste will be prevented or minimized where possible.
- Waste will be recovered (always) and recycled (when possible). If this is not technically or economically feasible, waste will be simply disposed of through the appropriated service contractors.
- No waste management activities will take place on site.
- Procedures for the handling, containment, movement and management of waste will be developed.
- Potential opportunities for the prevention and minimization of waste generated will form an integral part of the EMS and will be considered as a potential continuous improvement target. Waste will be managed in accordance with all relevant statutory requirements and best practice guidelines.
- All waste contractors engaged by Endesa Ireland Ltd. will hold appropriate permits and licences. All waste will be managed in accordance with the *Waste Management Act 1996, as amended* and associated regulations. The EHS Manager will be responsible for maintaining records of waste licences and permits.
- Records of all waste movements will be retained on site and available for inspection. The records will include details of the waste contractors, dates of collection, quantities, records of final disposal/recovery, C1 and Transfrontier Shipment of Waste (TFS) forms, as appropriate and as per EMS corresponding procedures.
- Waste total movements will be reported in the Annual Environmental Report (AER) in accordance with the conditions of the IPPC licence.

See more details about Waste included in Section H of this Application.

C.6 Quality Control

A Quality Management System (QMS) will be developed for the facility in accordance with the requirements of ISO 9001:2000 and ISO 9004:2000 Quality management systems – Guidelines for performance improvements. The QMS will incorporate competency, awareness and training, communication, supplier confidence, procurement, efficiencies, record keeping and document control. Site specific record keeping and document control procedures will be developed.

The QMS will be subject to both internal and external audits. Corrective actions arising from the audits will be incorporated into the EMS where applicable.

C.7 Document Control

The Chemist/HSE Manager will be responsible for the implementation of record keeping and document control systems in accordance with the site specific procedures. He/she will be responsible for ensuring that:

- Documentation and records are kept up to date and all relevant employees are aware of their location.
- Appropriate numbering and filing systems are implemented.
- Document control numbers are assigned, as required, in accordance with document control procedures.
- Documents and records include details of the issuer and issue date, where relevant.
- Documents and records are held for the appropriate timeframe in accordance with relevant regulatory requirements.
- Documents and records are safely and securely stored and electronic copies are backed up at regular intervals.
- Document status is recorded on a master index.
- The procedures manual, training matrices, policies, risk assessments, legislation register and other health and safety, environmental and quality documentation are reviewed regularly and kept up to date.
- Change control forms are completed, as required.
- Corrective action forms are completed, as required.
- Document distribution lists are developed and issued, as required.

- Relevant departmental managers are aware of any changes to the document control systems.

- Copies of superseded controlled documents are stamped and retained for future reference.

C.8 Policy Statements

Copies of Endesa Ireland Ltd. corporate "Environmental Policy" and "Health and Safety Policy" Statements are respectively provided in Appendix C1 and C2 of Section C.

The policy statements (both Environmental and H&S) will be made public to the employees and displayed at prominent locations around the facility. These policies will be also forwarded to the contractors, so that their site works also comply with these standards.

C.9 Accreditations and Certifications

C.9.1 Environmental Management System and ISO 14001

The existing power station in Great Island (HFO plant) is ISO 14001 certified since 1999. This certification is maintained yearly (by means of annual external audit) and renewed every 3 year cycle. See Appendix C.3. – Current Certificate ISO 14001.

It is the intention of Endesa Ireland Ltd. to update and adapt the Environmental Management System which is now in place so that similar standards and corporate procedures are implemented in the new CCGT activity. Several existing chapters/documents will be included in the new EMS (directly or slightly modified) and some others will be developed and issued to incorporate the specific definitions and conditions of this new technology, in accordance with *ISO 14001:2004 International Standard Environmental Management Systems – Requirements with guidance for use* and/or *EMAS (EU Eco-Management and Audit Scheme).*

The EMS will provide the framework for environmental management at the facility, compliance with appropriate regulatory requirements and the implementation of the principles of continuous improvement.

The EMS includes all the elements and Sections that the ISO standard requires:

EMS 1 Policy Manual

EMS 2 Accident Prevention Policy

EMS 3 Legal and Other Requirements:

EMS 4 Environmental Programme Manual

EMS 5 Resources, Roles & Responsibilities

EMS 6 Training, Awareness & Competence

EMS 7 Communications

EMS 8 Document and Record Management

EMS 9 Operational Control

EMS 10 Emergency Preparedness & Response

EMS 11 Performance Monitoring & Measurement

EMS 12 Non-conformance, Preventive and Corrective Action

EMS 13 EMS Audit Manual

EMS 14 Management Review

The performance of policies, objectives, targets and other environmental aspects will be continuously assessed against the implementation and monitoring of processes, systems and procedures in accordance with *ISO 14001* methodology Plan-Do-Check-Act (PDCA).

Objectives and targets will be implemented through an annual Environmental Management Program (EMP) which will be reviewed and amended at regular intervals as required. The process will include the identification of aspects associated with environmental risks that the Operator can control and those which the Operator can influence. The significance of the aspects will be assessed and appropriate targets and action items will be incorporated accordingly into the EMS. Each step of the risk identification process will be documented and assessed at regular intervals, as required. Key personnel will be assigned responsibilities against specified timescales for the targets and action items identified.

The implementation of the EMS will include regular cross-functional management reviews, to ensure continuing sustainability, adequacy and effectiveness of the EMS. Opportunities for improvement will be identified and assessed. Targets and action items will be updated accordingly to ensure the successful implementation of the EMS. Each stage of the review process will be documented and progress will be assessed at defined intervals, as required.

(i) EMS Auditing

An EMS Auditing Programme will be developed including both internal and external audits. Implementation of the auditing programme will facilitate the assessment of the effectiveness of the EMS and operational compliance against regulatory and legislative requirements, IPPC licence and planning permission conditions, policies and best practice guidelines.

The scope of the individual audits will depend on the significance of the aspects identified, the associated significance rating and the findings of previous audits.

Internal audit reports will be produced identifying opportunities for improvement, best practice, non-conformances, corrective actions and positive findings, as appropriate. Recommendations for follow-up audits will also be provided. The findings of the audits will be reported to the Station Manager, reviewed by environmental management group at least biannually and incorporated into the EMS.

C.9.2 Health and Safety Management System and OSHAS 18001

A project is being conducted to upgrade the existing Safety Management System associated with the current HFO plant to a certified international standard. The OHSAS 18001:2007 system has been identified as the preferred certification/accreditation. The OHSAS 18001 accredited Safety Management System will then work in tandem with the existing ISO 14001 accredited Environmental Management System.

C.10 Hours of Operation

C.10.1 Proposed Hours of Operation

The proposed facility has been designed to operate 24 hours a day, 365 days a year.

C.10.2 Construction and Development Works

The development works will last for approximately thirty (30) months.

Subject to the granting of planning permit, it is anticipated that construction works will commence late 2010.

Normal construction activity works will be restricted to:

- Monday to Friday: from 08:00h to 20:00h;

- Saturdays: from 08:00h to 17:00h

On rare occasions it may be necessary to carry out certain construction activities outside of normal working hours. Construction works with a significant noise impact will be avoided outside of normal working hours. All construction development works will be complete prior to commissioning of the plant. No additional construction works are anticipated or planned at the time of submission of this application.

C.10.3 Other Relevant Hours of Operation

No additional operations are anticipated or planned.

Appendix C.1 Endesa Ireland Corporate "Environmental Policy"

endesa ireland

Endesa Ireland's Environmental Policy

Endesa Ireland regards environmental excellence as a fundamental value in the performance of its activities. Accordingly, it respects the environment and responds to the principles of sustainable development and sound environmental management, undertaking in this way to harness and conserve the resources it uses effectively.

To meet its environmental commitments, **Endesa Ireland** applies the following basic principles, which are included as key factors in its Environmental Policy:

- **Integration** of environmental management and sustainable development concept in the Company's corporate strategy, using environmental criteria documented in all planning and decision making processes.
- **Rational use** of resources and reduction of waste production, emissions, discharges and any other type of environmental impact through the application of continuous improvement programmes and the establishment of environmental objectives and targets.
- **Commitment** to the compliance with all relevant legislative and other requirements by means of a permanent monitoring of the environmental practices in all of its facilities and locations, reporting on the obtained results.
- **Conservation** of the power plants' surroundings by adopting measures designed to protect flora and fauna species and their natural habitats.
- **Implementation** of cleaner and more efficient technologies, as long as they are available and are economically affordable for the Company, encouraging research and development of renewable energies when suitable.
- **Promotion** of its employee's awareness with regard to the environmental protection and respect by communicating the Environmental Policy and making it public and available to all of them, developing specific training programmes and interacting with all types of stakeholders (authorities, institutions, local associations and interest groups).
- **Requiring** its contractors and suppliers the implementation and development of environmental policies aligned with those of **Endesa Ireland's** Environmental Policy, which shall be communicated to all of them.
- **Promotion** of a rational use and energy consume among users and society in general.

This strong commitment and the above basic principles of **Endesa Ireland's** Environmental Policy are applied consistently across all the environmental processes and activities that are carried out at all **Endesa Ireland's** facilities (Head Office and Power Plants).

Signed: Padraig Dunleavy

Station Manager
(On behalf of the management and staff)

15/2/10

Appendix C.2 Endesa Ireland Corporate "Health & Safety Policy"

endesa ireland

HEALTH, SAFETY, AND WORKING CONDITIONS POLICY

ENDESA IRELAND considers that continuous improvement of working conditions and health protection are fundamental values of its business culture. It has, therefore, established an Occupational Health and Safety System based on the OHSAS 18001:2007 standard, which includes the following commitments:

Commitment to nature and magnitude of risks:

ENDESA IRELAND's Occupational Health and Safety Management System is based on the identification of hazards and the evaluation and control of risks.

Commitment to compliance with legal requirements:

All ENDESA IRELAND's actions and its facilities must at least comply with the applicable occupational health and safety legislation in force, as well as with any other requirements endorsed by ENDESA IRELAND.

Working conditions, health and safety:

ENDESA IRELAND is committed to the continuous improvement of conditions in the workplace, as well as to the prevention of damage and harm to health. To fulfil this commitment, ENDESA IRELAND conducts several Occupational Health and Safety Management Programmes which involve all of its own workers and those of its contractors and suppliers.

Professional and personal conduct:

All personnel must act in accordance with applicable law, regulations, and contractual obligations, as well as with ENDESA IRELAND's standards and procedures and the Occupational Health and Safety Management System. Health and safety must be included in prevention management at all levels, and training will be given to those in authority on how to carry out their preventive functions.

Commitment to contractors:

The level of protection for contractors' personnel will be equivalent to that which ENDESA IRELAND provides for its own workers and will be implemented by effectively coordinating business activities and its procurement policy.

Commitment to information:

ENDESA IRELAND is responsible for providing information on all aspects of its business activities that may impact health and safety.

Commitment to training:

ENDESA IRELAND will give suitable training to all of its workers so that they can do their work safely.

Commitment to consultation and participation:

ENDESA IRELAND is committed to consult its workers' representatives on preventive measures and allow them to participate in all issues that may affect the workers' health and safety.

Commitment to our customers:

We are committed to the continuous improvement of our processes, system, and skills in order to guarantee the total quality and safety of the products, services, and facilities that we place at the disposal of our customers.

Commitment to the public:

We ensure that the public's ideas, interests, and concerns on issues that may affect their health and safety are taken into account in decision-making procedures that affect the community or the general public.

This Policy is available to the public. It has been documented and implemented and is reviewed regularly so that it may be changed as necessary. The workers and other interested parties are kept informed of the Policy and are provided with a framework for setting, measuring, and reviewing suitable health and safety targets and goals.

CEO ENDESA IRELAND

Carlos Temboury

October 2009

Appendix C.3 Current Certificate ISO 14001

Certificate IE99/50445

SGS

The management system of

Endesa Ireland Ltd.
Great Island Generating Station

Campile, New Ross,
Co. Wexford, Ireland

SYSTEM CERTIFICATION ISO 14001:2004 SGS

has been assessed and certified as meeting the requirements of

ISO 14001:2004

For the following activities

Power generation.

This certificate is valid from 23 April 2009 until 28 April 2011 and remains valid subject to satisfactory surveillance audits.
Re certification audit due before 28 April 2011
Issue 5. Certified since 28 April 1999

Authorised by

UKAS ENVIRONMENTAL MANAGEMENT 005

SGS United Kingdom Ltd Systems & Services Certification
Rossmore Business Park Ellesmere Port Cheshire CH65 3EN UK
t +44 (0)151 350-6666 f +44 (0)151 350-6600 www.sgs.com

SGS EMS 04 0308

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SGS

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Attachment D

D. Infrastructure and Development

Describe the plant, methods, processes, ancillary processes, abatement, recovery and treatment systems, and operating procedures for the activity, to include a copy of such plans, drawings or maps, (site plans and location maps, process flow diagrams), and such other particulars, reports and supporting documentation as are necessary to describe all aspects of the activity. Maps and drawings must be no larger than A3 size.
A development and operational history of the site should be included here.
Attachment No D should contain a list of all unit operations (processes) to be carried out, including flow diagrams of each with any relevant additional information.

D.1 Introduction

Endesa Ireland Ltd. is seeking an Integrated Pollution Prevention Control Licence for the operation of the Great Island new CCGT power plant while ensuring that operation and availability of the existing and current facility (Heavy Fuel Oil power plant) remains unchanged until the new facility is commissioned (circa Quarter 1, 2013) and the HFO plant is completely decommissioned.

The existing HFO plant will not operate simultaneously with the new plant. In any case, it would not be possible to export power from both facilities to the national grid simultaneously.

In the period of time lasting from the date in which the Final Decision of the Reviewed IPPCL is issued by the EPA until the date in which the existing HFO is completely decommissioned the conditions included in the License will have to cover the following two scopes:

- Operation of the existing HFO power plant, with the same limits and conditions that are set now in the current IPPCL so as not to affect current plant availability
- The future CCGT plant, with the additional conditions and limits set for the operating scenario of the new power plant.

Note: the current facility (HFO plant) will be decommissioned once the new plant is in commercial operation (COD) and therefore the current Residuals Management Plan for the HFO plant will be exercised at this time (circa Quarter 1, 2013).

D.2 Operational Information Requirements

D.2.1 Description of the Site and Site Activities

The proposed operational area occupies approximately 19 acres of the 143 acres of the Great Island Power Plant site. The proposed area is situated adjacent to an existing HFO power plant. This existing power plant is regulated by an IPPC licence P0606-02. Endesa Ireland Ltd. is developing a project addressing the technical design and future construction and operation of a new Combined Cycle Gas Turbine power plant with an envisaged commercial

operation date by Quarter 1, 2013, replacing the existing heavy fuel oil power plant. The proposed location of the new CCGT power plant is within the boundaries of the current licence as referenced above.

The new plant will operate on a continuously manned basis 24 hours a day, 365 days a year, with personnel working on a shift arrangement. The layout of the new plant is shown on Figure D.1.1.

Car parking is provided to the west of the site and a gatehouse is provided at the entrance. The site will be surrounded by perimeter fencing.

The CCGT will have a nominal capacity of 430 MW and will export electricity, via an underground cable, to the onsite existing switchyard.

The plant will normally operate on full load resulting in a plant efficiency of approximately 58 %.

Endesa Ireland Ltd. anticipates commencement of operations in Quarter 1, 2013. This timeline is estimated in accordance with the planning permit application, construction works, grid connection application and gas connection process.

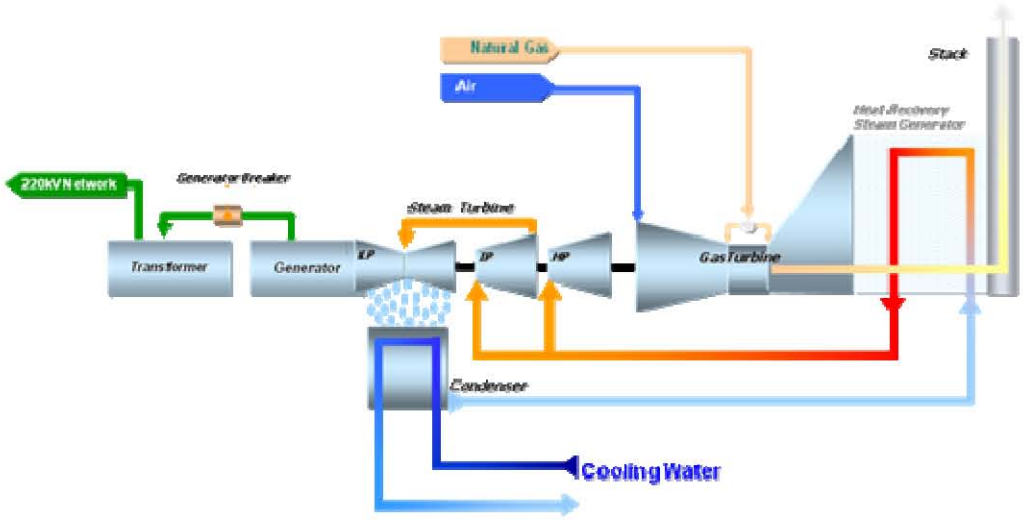
D.2.2 Combined Cycle Process

The CCGT plant incorporates the following processes:

A gas turbine, burning natural gas, drives a generator for electricity production. Exhaust gases from the gas turbine pass through a Heat Recovery Steam Generator (HRSG) to generate high-pressure steam. The steam generated in the HRSG drives a steam turbine, which also turns the generator providing additional electrical power. The steam is condensed back to water via a Condenser for re-use in the HRSG. This condenser is cooled by a once through direct cooling system.

A schematic and a detailed description of the CCGT process are provided hereunder:

Figure D.2.1 Combined Cycle Gas Turbine, Single Shaft



TRUE NORTH

Great Island Power Station

Road

HFO STRIP TANK

HEAT EXCHANGER

ANALYSER KIOSK

METERS

INSTRUMENT HOUSE

PIG TRAP

BOILER HOUSE

REGULATOR HOUSE

Security Fence

Overhead Piperack 6m Clearance

LAYDOWN AREA

LAYDOWN AREA

CW OUTFALL

Mud

Notes

1. ORDNANCE SURVEY IRELAND LICENCE NO. EN0034509
   © ORDNANCE SURVEY IRELAND/GOVERNMENT OF IRELAND
2. ALL CO-ORDINATES SHOWN RELATE TO IRISH NATIONAL GRID CO-ORDINATES.
3. ALL SITE LEVELS REFER TO MEAN SEA LEVEL VERTICAL DATUM AT POOLBEG.
4. GENERAL SITE LEVEL IS +7.00M O.D.

Legend:

Boundary for New Power Station

1	GAS TURBINE AND STEAM TURBINE BUILDING
2	GAS TURBINE
3	STEAM TURBINE
4	AIR INLET FILTER TO GAS TURBINE
5	ELECTRICAL ANNEX & CONTROL ROOM
6	HEAT RECOVERY STEAM GENERATOR (HSRG)
7	CCW SKID
8	OIL SEPERATOR (RELOCATED)
9	GAS FUEL TREATMENT SKID
10	DEMINERALISED WATER SUPPLY PUMPS (NOX ABATEMENT)
11	GENERATOR TRANSFORMER
12	UNIT AUXILIARY TRANSFORMER
13	NATURAL GAS COMPOUND AGI
14	DISTILLATE OIL STORAGE TANK
15	GAS COMPRESSOR
16	DEMIN WATER STORAGE TANK (1 x 6,000m³)
17	WATER TREATMENT PLANT BUILDING
18	MAIN STACK
19	FIRE PUMP HOUSE (INSIDE EXISTING BUILDING)
20	DISTILLATE FUEL OIL FORWARDING PUMP SKID
21	CW CULVERT
22	GAS MAIN
23	BOILER FEED WATER PUMPS
24	FIN FAN COOLER
25	RAILS IN ROAD FOR TRANSFORMER REMOVAL
26	CHEMICAL INJECTION SKID
27	CAUSTIC STORAGE TANK WITH BUND
28	ACID STORAGE TANK WITH BUND
29	GAS TURBINE OILY WATER DRAIN TANK
30	STARTING TRANSFORMER
31	EXCITATION TRANSFORMER
32	AUXILIARY TRANSFORMER
33	SEWAGE TREATMENT PLANT
34	BOILER WASTE WATER DRAIN TANK
35	N2/H2/CO2 STORAGE
36	PROCESS WATER DISCHARGE PIT
37	BLOWDOWN VESSEL
38	AUXILIARY BOILER
39	AUXILIARY BOILER FLUE STACK
40	CONTINUOUS EMMISSION MONITORING (CEM) SYSTEM
41	CONDENSATE POLISHER
42	DISTILLATE OIL SUPPLY PIPE TO GENERATOR
43	HFO FILLING PIPE IN CONCRETE TRENCH
44	DISTILLATE OIL FILLING PIPE IN CONCRETE TRENCH

0 25m 50m

Scale 1:500

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	07/05/10	CC	Issued for IPPCL	KMc	DMc

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Title

Combined Cycle Gas Turbine
Great Island, Co. Wexford

Proposed Overall Site Plan

Designed	D. McRandal		Eng.Chk.	K. McGarvey	
Drawn	C. Cunningham		Coordination	D. McRandal	
Dwg.Chk.	K. McGarvey		Approved	D. McRandal	
Scale	1:500	Project	257554		Status APR
		CAD file	Figure D.1.1		
Drawing No	Figure D.1.1				Rev P1

The combined cycle process consists of two thermodynamic cycles working together to produce electricity as efficiently as possible.

The first cycle comprises a gas turbine and an electrical generator coupled together on one main shaft, which rotates at high speed. The gas turbine consists of a compressor section, a combustion chamber and a turbine section. Air is drawn in through an intake filter, compressed and fed into the combustion chamber where fuel is injected and ignited. The resulting hot combustion gases passing through the turbine section rotate the shaft driving the compressor and the electrical generator to produce the rated electrical power output. Operation of a gas turbine, as described above, is referred to as open or simple cycle mode.

However, it is possible to generate approximately 50% more electricity from the hot exhaust gases by passing them through a HRSG or boiler, which uses the heat from the exhaust gases to generate steam, which is fed to a steam turbine. Exhaust gases from the CCGT are discharged to the atmosphere via a stack located at the outlet of the HRSG.

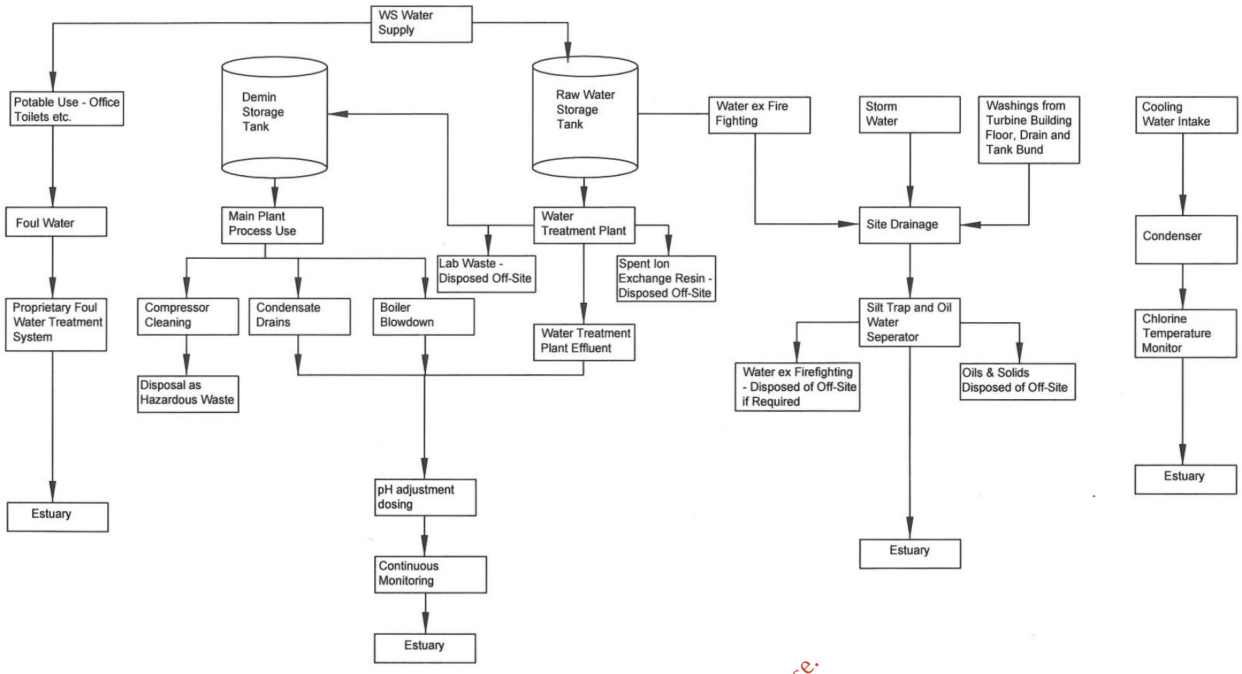
The high pressure steam produced in the HRSG is supplied through inter-connecting pipework to the steam turbine which is coupled to the same generator as the gas turbine (i.e. 'single shaft' design), further driving the generator to generate more electricity. The steam is expanded to vacuum conditions in the steam turbine to extract as much energy as possible. The steam is then fed to the Condenser where it is condensed back to water and fed back to the HRSG to generate more steam thereby conserving water within a closed cycle. The cooling required for the condensing the steam back to water is provided by once through cooling water from the local estuary as per the current HFO plant, albeit with the new CCGT requiring less cooling water from the estuary.

D.2.3 Water

(i) Water Flow Diagram

A schematic illustrating water supply, water treatment and waste water arising from the site is provided hereunder.

Figure D.3.1 Water Flows Diagram



Note: Information about water treatment and waste water discharges are discussed in detail in Attachments E.2 *Emissions to Surface Water* and I.2 *Assessment of Impacts on Receiving Waters* of this application.

A detailed description of all of the water treatments and waste water generated in the CCGT process is provided hereunder.

(ii) Water Treatment

Water will be required on site for the purposes of domestic type use, fire-fighting, feedwater to the HRSG and water injection (to minimise NO_x formation in the event of firing on distillate). Water will also be required from the estuary for cooling purposes as per current HFO plant, albeit in reduced quantities.

Water, of drinking water quality, will be pumped directly to the site from the local Wexford County Council water supply. Feed water for use in the HRSG and water injection will be directed from a dedicated raw water storage reservoir (9,500m^3) to an on-site water treatment plant for pH adjustment and demineralisation. The water will be treated by ion exchange and pH adjusted by Sulphuric Acid (H_2SO_4) and Sodium Hydroxide (NaOH). Demineralised water will be stored in a dedicated storage tank prior to use.

The water treatment plant will generate an effluent, comprising regeneration washings and concentrated dissolved salts, which will discharge into the process waste water discharge tank. It is anticipated that the ion exchange resin will be replaced once every three (3) to five (5) years.

High purity demineralised water will be required for use in the HRSG. The feedwater will be thermally de-aerated and dosed with conditioning chemicals including Carbohydrazide, Ammonium Hydroxide and Tri-sodium Phosphate, by controlled dosing, to prevent scaling and corrosion build-up in the HRSG. HRSG water will be subject to daily quality checks to ensure the water is within the required limits specified by the HRSG supplier.

(iii) Waste Water

Foul Waste Water

Foul water results from the use of potable water in the plant buildings (i.e. offices, toilets, etc.). It will be treated in a proprietary secondary water treatment system.

Treated foul water flow will be monitored prior to discharge in accordance with the EPA requirements.

Storm Waters and General Plant Washings

Storm Waters:

Surface water run-off will drain via a silt trap and oil/water interceptor to a surface water discharge point as per current emissions.

General Plant Washings and Tank bunds:

General plant washings, from within the turbine hall and tank bunds, will be directed via an oil/water interceptor to the discharge point. Water collected within tank bunds will require pumping to minimise the risk of accidental contamination. Oily waste and solids - collected in these silt trap and oil/water interceptor - will be removed from site for disposal by appropriately authorised contractors.

Compressor cleaning waste will be removed off site as hazardous waste. Compressor cleaning detergents will be stored in a locked cabinet with limited access.

Monitoring will be undertaken prior to discharge in accordance with EPA requirements.

Process Waste Water

It will be necessary to continuously "blow-down" approximately 1% of circulating water from the HRSG (i.e. 5 m^3/hr) in order to remove the build up of salts within the HRSG drums.

The blow-down water, condensate drain waste water and effluent arising from the water treatment plant, will be discharged to the process wastewater discharge tank where its quality and temperature will be monitored prior to discharge. The pH will be monitored and adjusted as required.

Dissolved oxygen, pH, conductivity and temperature will be continuously monitored, using an on-line analyser. If the waste water is within the limits, the waste water will be pumped to the

current discharge point in the estuary. The process waste water discharge outlet will be fitted with an automatic sampler which will sample water discharges over a given period as directed by the EPA. An on site laboratory will also be provided to facilitate additional monitoring of specific parameters on site as required.

In order to carry out maintenance works, it will be necessary to completely release the contents of the HRSG on rare occasions. The maximum discharge from the process waste water discharge tank is not anticipated to exceed 157.2m^3/day.

D.2.4 Combustion Process Control

The plant will operate on an advanced computerised control system which will ensure optimum combustion conditions and high boiler performance that supports the minimisation of emissions. The computerised control system will include a programme to ensure a safe and sequential system of shut down. The use of advanced materials, good plant and combustion chamber design the use of high performance monitoring and process control techniques and maintenance of the combustion system will further reduce the potential for atmospheric emissions.

D.2.5 Above Ground Installation

Under normal operating conditions the plant will be fired on natural gas. It is anticipated that the plant will utilise approximately 500*10^6 Nm^3 (0.5b.c.m) of natural gas per annum. The gas will be supplied to the site from the Bord Gáis Network (BGN). The gas will pass through a gas conditioning plant located in the Above Ground Installation (AGI) compound which will comprise the following:

- Liquid and dust separator.
- Dew point heater/boiler unit.
- Gas compressor (if required). Filter separator.
- Pressure reducing station.
- Electrical switchroom/control room.

The gas will be filtered, pre-heated, metered and pressure reduced prior to supply to the gas turbine, as required. The AGI asset will be owned, operated and maintained by Bord Gáis Networks and the Gas will be supplied and regulated by Gaslink, an independent system operator with responsibility for operating and maintaining gas transportation systems within Ireland.

D.2.6 Fuel Type

Natural gas is a clean fuel resulting in negligible emissions of Particulate Matter and Sulphur Dioxide, the main atmospheric pollutants of concern relating to natural gas firing are therefore Nitrogen Oxides (NO_x). The primary mechanism for the formation of NO_x in gaseous fuels is through the formation of NO_x from nitrogen in the air during the combustion process, referred to as “thermal NO_x”.

The gas turbine generator will be fitted with a dry low NO_x burner. Thermal NO_x is formed at high temperatures. The dry low NO_x burner optimises the air/fuel ratio producing a uniform low temperature flame in the combustion chamber to minimise the production of NO_x.

Although the CCGT will normally be fuelled by natural gas, distillate storage and pumping facilities will also be provided. The plant will only operate on distillate in the event of an interruption to gas supply and for short duration testing, as required by the system operator. (the duration of the testing has yet to be decided by the CER/Eirgrid)

To comply with the requirements of the Commission for Electricity Regulation (CER) the storage capacity of the back-up fuel supply should be such as to allow the plant to be operated continuously at its full output for maximum a period of five (5) days in a gas supply interruption event (i.e. approximately 11,000 m^3). Distillate will be stored in one of the refurbished current on site Heavy Fuel Oil tanks. The tank will be completely drained and cleaned with all internal traces of HFO removed. A thorough NDT (Non-Destructive Testing) inspection will be undertaken and any necessary repair works will be carried out. The existing earthen bund and concrete lining will be refurbished. This work will be subject to detailed method statements which will be developed and agreed with Wexford County Council and EPA prior to any refurbishment works taking place.

The necessary bund requirements have been developed in consultation with the Health and Safety Authority (HSA) during the planning process. A copy of this Report is appended to Section B.

Distillate will be limited to a maximum Sulphur content of 0.1% by contract with the supplier. Depending on technology used, water injection will be employed when the plant is operating on distillate to further reduce NO_x concentrations in the emissions to the atmosphere. Water will be injected directly into the combustion chamber. The evaporation of the water will require heat which is then not available to heat the flame decreasing the flame temperature and reducing the amount of NO_x produced.

D.2.7 Continuous Emissions Monitoring System

Exhaust gases from the CCGT will discharge to the atmosphere via a sixty (60) metre stack located at the outlet of the HRSG. The stack will incorporate an in-situ proprietary Continuous Emission Monitoring System (CEMS). The selection, installation, calibration, ongoing quality assurance and annual surveillance testing (cross-checks) of the CEMS will be undertaken in accordance with *EN 14181 – Quality Assurance of Automated Measuring Systems* and all relevant standards referred to therein.

D.2.8 Auxiliary Boiler

Certain suppliers require the use of an auxiliary boiler, of less than 5 MW, to provide heat to the plant during start up periods. The frequency of use will be limited to minimum events per year depending on the dispatch pattern of the CCGT. At this stage the CCGT is envisaged to be base-load therefore it would be limited to three (3) or four (4) events per annum and will last for a short duration.

D.2.9 Electrical Transformer

The electricity generated will be fed to a generator transformer where the voltage will be stepped up to 220 kV. The power generated will then be transferred to the onsite existing switchyard via an underground cable. The switchyard is and will continue to be owned by and maintained by ESB Networks. Specifications for operation and maintenance of the switchyard will be stipulated in the contract with the ESB Networks.

D.2.10 Emergency Diesel Generator

An emergency distillate generator will be provided to supply electricity to essential auxiliary systems in the event of an interruption to power supply or a low voltage supply from the national grid. The generator will not operate under normal conditions, other than for short duration testing for a maximum period of thirty (30) minutes per week.

D.2.11 Fire Fighting Equipment

The raw water reservoir will hold 1,140m^3 of raw water for fire fighting purposes in addition to a separate tank with a capacity of 500 m^3 dedicated for fire fighting. Fire fighting pumps located in the current fire pump house will be assessed for their capability/capacity and upgraded if necessary. The pumps will only be used in an emergency and for short duration testing for a maximum of 30 minutes, once a week. Fire water will be disposed of off site where necessary. A Fire Water Retention Study for the facility will be undertaken in accordance with the requirement of the EPA as may be specified in any revised Integrated Pollution Prevention Control Licence.

Water and foam based fire protection and suppression systems will be installed in accordance with National Fire Protection Association (NFPA) guidelines. The gas turbine area will be fitted with Carbon Dioxide (CO_2) suppression systems. Fire alarms and fire extinguishers will be placed in all buildings on site in accordance with best practice guidelines. Training in their use will be provided by a suitably qualified specialist. Fire doors will comply with *BS 476-22:1987 - Fire tests on building materials and structures.*

A Fire Emergency Response Plan will be developed, as part of the Emergency Response Plan, (current plan will be reviewed and updated where required) and implemented in consultation with the local fire department. The Operator will also be required to obtain a fire safety certificate from Wexford County Council Fire Service.

D.2.12 Chemical Storage and Use

Sulphuric Acid (H_2SO_4) and Sodium Hydroxide (NaOH), for use in the water treatment plant, will be stored in 33m^3 bunded bulk chemical storage tanks. The Sulphuric Acid tank will be fitted with a vapour trap. Gases will vent through the trap media and exit the tank via a vent.

Conditioning and laboratory chemicals will be stored in a chemical store within the water treatment plant. The storage room will be provided with appropriate ventilation and

temperature control. Drums and IBC's will be stored on drip trays / spill pallets. The store will be enclosed fully containing any spills within. A spill kit will be located in close proximity to the chemical store. Laboratory chemicals will be stored in relatively small quantities. Only experienced and trained personnel will be permitted access to the chemical store.

As required, conditioning chemicals will be transferred from the water treatment plant to replenish the dosing tanks located within the turbine hall. The transfer route will be kept clear of all obstacles to allow the safe transfer of chemicals. Dosing tanks will be fitted with level indicators and located within bunds. The contents of the drums will be transferred to the dosing tanks using dedicated filling pumps. Transfer of chemicals will be undertaken by trained personnel only. The dosing tank level indicators and bunds will be subject to regular inspections.

The gas turbine generator will be filled with Hydrogen as a closed circuit cooling medium. The hydrogen will be topped up by small amounts using a bottle storage system, as required. Stocks of Hydrogen will be stored in a designated area within the turbine hall in UN approved cylinders. Deliveries of Hydrogen will be supervised. The hydrogen system will be earthed and connections will be carried out by trained personnel only. The cylinders will be fitted with corrosion resistant leak proof valves. Leaks of Hydrogen and the ingress of air into the generator cooling system will be prevented through the use of seal oil at a pressure higher than that of the Hydrogen.

Cleaning products will be of a water based biodegradable nature wherever possible.. A hazardous detergent is however required for compressor cleaning. Hazardous compressor cleaning products will be segregated in a locked cabinet with limited access to prevent misuse.

Oils and greases used for the lubrication of the main mechanical components will be stored in a designated bunded area within the stores building.

All chemicals will be segregated in accordance with HSG 71 Chemical Warehousing – The Storage of Packaged Dangerous Substances.

D.2.13 Laboratory

HRSG water testing and environmental monitoring checks will be carried out in an on site laboratory, located within the water treatment plant. The analytical equipment and chemicals used will be determined by the requirements of the EPA.

D.2.14 Ancillary Services

Site buildings works will be minimised due to the reuse of existing administration building, workshops, mess room, stores, gatehouse, car parks, cooling water intake/outfall, raw water storage, tank farm, etc. Foul water arising from the occupied buildings will discharge to the foul water treatment system as per current practice and will be treated in the proposed new secondary treatment plant prior to discharge, as discussed previously. All waste arising will be categorised and managed in accordance with regulatory requirements.

D.2.15 Summary

Detailed information relating to emissions, abatement, materials handling and impacts can be found in the relevant sections of this application.

Key elements of the plant will be maintained as part of a Long Term Service Agreement (LTSA). All elements of abatement, monitoring and control equipment will be maintained as part of a Planned Preventative Maintenance Programme (PPMP). Operational activities, abatement and control techniques and accident prevention will be subject to site specific operating procedures. Environmental compliance will be facilitated through the Environmental Management System (EMS) certified with the ISO 14001 standards (the current facility has this system already in place and the new system will be developed as part of this and will supersede the current system when appropriate, as discussed in Section C). A summary of operational processes, emissions and abatement techniques and systems is provided in Table D.10.1 hereunder:

Table D.10.1 Summary of Operational Emissions, Abatement and Control Systems

Unit	Emission Type/Waste	Abatement Measure/Treatment System/Recovery System	Process Control System
Water Treatment Plant	Aqueous Effect	Treatment and monitoring in the process waste water discharge tank	Monitoring Inspections Preventative Maintenance
Water Treatment Plant	Ion Exchange Resin	Removal from site by approved, authorised waste contractors	Monitoring Inspections Preventative Maintenance EMS
Proprietary Secondary Treatment System	Treated Foul Water	Proprietary secondary treatment system and treatment, discharge and monitoring in the process water discharge tank	EMS Monitoring Inspections Preventative Maintenance
Surface Water Run-off	Surface Water run-off	Treatment/settlement in silt trap and pass though oil/water interceptor	Good Drainage Good Housekeeping Monitoring Inspections
General Maintenance	Turbine Hall and Tank Bund Cleaning	Pass through oil/water silt trap and treatment in process water discharge tank	Good Drainage Good Housekeeping Monitoring Inspections Preventative Maintenance
General Maintenance	Compressor Cleaning	(Annual Cleaning) Hazardous chemicals stored in controlled and locked cabinets. Washing/post cleaning products disposed of by approved waste contractor (disposed off-site)	Monitoring Inspections Preventative Maintenance EMS
General Maintenance	Contaminated domestic waste, rags, PPE, filters, etc.	Disposed off site, removal by approved, authorised waste contractor	Good Housekeeping EMS Document/Policy Control
HRSG	Empty Containers	Disposed off site, removal by approved, authorised waste contractor	Good Housekeeping EMS

			Document/Policy Control
Unit	**Emission Type/Waste**	**Abatement Measure/Treatment System/Recovery System**	**Process Control System**
HRSG	Boiler Blow-Down	Treatment and monitoring in the process waste water discharge tank	Monitoring Inspections PM
Laboratory	Spills/Leaks, Lab Waste	Removal from site by approved, authorised waste contractors	PM Doc Control Waste Contractor Approval EMS
Turbine Hall/Combustion area	Atmospheric Emissions	Proprietary secondary treatment system and treatment, discharge and monitoring in the process water discharge tank	EMS Monitoring Inspections PM/Computer Systems
Distillate Tanks	Spills/Leaks, Catastrophic failure	Treatment/settlement in silt trap and pass though oil/water interceptor	Good Drainage EMS Monitoring Inspections
Electricity Transformer	Spills/Leaks	Bunds, Fire water, surface water drawing system	Good Drainage Good Housekeeping Inspections Preventative Maintenance
AGI	Drainage/Leaks	Surface drainage system, pressure sensitive shut down valves, alarms and gas detectors	Monitoring Inspections Preventative Maintenance EMS Gaslink
Emergency Distillate Generator	Spills/Leaks, Atmospheric Emissions	Rarely used, drainage system on skid, surface water run off, oil interceptor	Good Housekeeping EMS Inspection and Monitoring
Fire Fighting	Firewater/leaks	Surface water drainage system, oil interceptor, etc.	PM

Systems			Inspection and Monitoring
Hydrogen	Leaks	Connection leak, Oil, surface drainage system	Inspections PM
Unit	**Emission Type/Waste**	**Abatement Measure/Treatment System/Recovery System**	**Process Control System**
Chemical Store	Spills / Leaks Waste	Drip Trays, Spill Kits,	Inspections Controlled Access Document Control Implementation of REACH
H_2SO_4 and NaOH Tanks	Spills/Leaks	Bunds Surface Water Drainage System Vapour Trap	PM Doc Control Waste Contractor Approval
Oils and Greases	Spills/Leaks	Bunds Surface Water Drainage System Vapour Trap	EMS Monitoring Inspections PM Surface Water Drainage
Ancillary Units	General Waste	Removal by approved contractors	Good Drainage EMS Monitoring Inspections

D.3 Development and Operational History of the Site

The site is currently brown-field surrounded by pasture in a mainly rural-agricultural setting. The site was developed by the Electricity Supply Board (ESB) in 1966. The power station was constructed in two stages, over agricultural lands. The first stage involved the commissioning of two 60 MW Units, in 1967 and 1968. Stage 2 involved the commissioning of a 120 MW Unit, in 1972.

According to the Geological Survey of Ireland (GSI, 2009) as set out in the Environmental Statement, the geology underlying the site comprises Ordovician Volcanics consisting of the Campile Formation with undifferentiated felsic volcanics. The Campile Formation is described as pale coloured rhyolites in grey and brown slaty mudstones with occasional andesites. A Phase 1 and Phase 2 assessment undertaken for ESB by URS in 2008 (Phase 1 and Phase 2 Environmental Site assessment, ESB Great Island Power Generating Station, URS, 2009) identified the following geology at the site:

- The overburden of the upper tier of the Station Grounds comprised a thin (less than 0.5 m thickness) layer of fine-grained sandy and silty topsoil overlying weathered bedrock. The geology of the parking bay areas is likely to be similar to that encountered in the upper tier.

- Near the 220 kV switching yard 1.75 metres thickness of loose brown clay was encountered overlying bedrock. On the lower tier, up to 6.5 metres of fill material was encountered along the southern margin, comprising a lower layer of clays with occasional boulders, underlying an upper layer of boulders.

- Near the northern margins of this lower tier, up to 3 metres of natural clays overlying bedrock were encountered.

Two areas of the site were subject to waste disposal operations. These were developed during the two main phases of construction of the Great Island Generating Station in the mid-1960s and early 1970s and were developed for the deposition of excess rock fill, building materials and spoil.

The northern segment of cell 1 ("station dump") was additionally used for general waste disposal during operation of the generating station between mid-1960s and mid-1990s. The wastes deposited in this area included fuel oil, boiler washings, laboratory waste, building rubble, canteen waste and asbestos removed during turbine overhauls and other maintenance activities. In 2005, with the agreement of the EPA, the landfill was capped.

In addition, Endesa Ireland Ltd. recently commissioned a Spanish engineering company called INERCO to carry out soil and ground water investigations on site. The results of these are discussed further in Section I.5.

The current site is regulated and monitored in accordance with the existing IPPC licence and all information in relation to landfilling/capped areas has been disclosed to the EPA under licence number P0606-02.

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Attachment E

E. Emissions

E.1 Emissions to Atmosphere

Details of all point emissions to atmosphere

Details of all point emissions to atmosphere should be supplied. Complete Table E.1(i) for Boiler Emissions and Table E.1(ii) and E.1(iii) for all other main emission points. Complete Table E.1(iv) for minor emission points.

A summary list of the emission points, together with maps and/or drawings (no larger than A3), and supporting documentation should be included as ***Attachment Nº E****. Plans of emission elevations, relevant roof heights, etc., should also be included, as should detailed descriptions and schematics of all abatement systems.*

The applicant should address in particular any emission point where the substances listed in the Schedule of S.I. 394 of 2004 are emitted.

For emissions outside the BAT guidance limit, a full evaluation of the existing abatement/treatment system must be provided. A planned programme of improvement towards meeting upgraded standards is required. This should highlight specific goals and a time scale, together with options for modification, upgrading or replacement as required to bring the emissions within the limits as set out in the BAT guidance note(s). These notes can be found on the EPA website at www.epa.ie.

E.1.1 Detail of all point emissions to atmosphere

(i) Introduction: Emissions to atmosphere from the existing HFO Plant

Great Island Power Plant, formerly operated by the Electrical Supply Board (ESB) currently operates on Heavy Fuel Oil (HFO) and has a maximum electrical export capacity of 240 MW.

There are three stacks in the HFO plant which are identified as “emission points” in the current IPPC Licence by the codes: A1-1, A1-2 and A1-3.

As specified in Condition 5.1 of the current IPPC Licence for the Great Island HFO fired Power Plant, no specified emission to atmosphere shall exceed the emission limit values set out in Schedule 1(i) of the IPPC Licence. This Schedule was amended on May 2008 by Technical Amendment B. Details on the current emission points and its corresponding Emission Limit Values are shown in the following tables.

Table E.1.1: ELV's for the current Power Plant atmospheric emissions — Common Stack for boilers 1 and 2
(1) Annual emissions from A1-1 and A1-2 shall be calculated in accordance with the NERP
(2) 400 mg/m^3 during soot blowing

Emission Point Reference nº	A1-1 and A1-2	
Rating	175 MW thermal input (per Boiler)	
Volume to be emitted	Maximum in any one day (per boiler)	4,306,947 m^3
	Maximum rate per hour (per boiler)	179,456 m^3
Minimum discharge height	137.5m above ground	

Parameter	Emission Limit Value mg/m^3	Annual emissions ceilings(1) (tonnes)	
		Unit 1	Unit 2
Oxides of Sulphur (as SO_2)	1700	770	723
Nitrogen Oxides (as NO_2)	850	204	191
Dust	250(2)	23	21

Table E.1.2: ELVs for the current Power Plant atmospheric emissions — Stack for boiler 3
(1) Annual emissions from A1-3 shall be calculated in accordance with the NERP
(2) 500 mg/m^3 during soot blowing

Emission Point Reference nº	A1-3	
Rating	305 MW thermal input	
Volume to be emitted	Maximum in any one day	7,541,044 m^3
	Maximum rate per hour	314,210 m^3
Minimum discharge height	137.5m above ground	

Parameter	Emission Limit Value mg/m^3	Annual emissions ceilings(1) (tonnes)
Oxides of Sulphur (as SO_2)	1700	1957
Nitrogen Oxides (as NO_2)	900	528
Dust	200(2)	58

The existing Heavy Fuel Oil (HFO) fired power plant will continue to operate keeping the Emission Limit Values (ELV's) agreed with the EPA and included in its current Licence (Licence Reg. NºP0606-02) until the new CCGT becomes operational and the current facility is decommissioned. The current air emission points will not be reused by the new development. This development will have a separate air emission point and is discussed further in this section. The atmospheric emission points for the proposed CCGT plant are illustrated in Figure E.1.1 as attached.

(i) Boiler Emissions

There will be no significant boiler emissions. Several technology suppliers require the use of an auxiliary boiler for start up heating. The plant supplier has not been determined to date. However, if an auxiliary boiler is required it will have a thermal input of less than 5 MW. It is therefore considered as a minor emission.

(ii) Main Emissions

Exhaust gases from the gas turbine will be emitted to atmosphere through a single flue stack with a height of 60 metres. The turbine will normally run on natural gas. During rare periods of interrupted gas supply or during plant testing, the plant will be fired on back-up distillate oil.

There will be one main emission point identified as:

- A2-1 Gas Turbine Main Stack

The plant will operate in accordance with the requirements of the *BAT Guidance Note on Best Available Techniques for the Energy Sector (Large Combustion Plant Sector), EPA, 2008*, the *Large Combustion Plant Regulations 2003 (SI 644/2003*) and the *Common Position adopted by the Council with a view to the adoption of a Directive on industrial emissions (Brussels, 16 November 2009)* as demonstrated in Attachment I.1, *Assessment of Atmospheric Emissions*.

A summary of the applicable limit values is provided hereunder:

	BAT Guidance Note		S.I. 644/2003		Directive on industrial emissions	
	Gas Fired	Distillate Oil Fired	Gas Fired	Distillate Oil Fired	Gas Fired	Distillate Oil Fired
NO_X	50	120	50	120	75	150
SO_2	10-35	120	35	-	-	200
PM	5	-	-	-	-	20
CO	-	100	-	-	100	-

Table E.1.1: Emission Limit Values (ELVs) for new Gas Turbines (mg/Nm^3)

(iii) Minor Emissions

There will be six new minor emission points as described hereunder:

- A3-1 Auxiliary Boiler Stack
- A3-2 Distillate Oil Fuel Tank Vent
- A3-4 Diesel Fired Fire Fighting Pump
- A3-5 Acid Tank vapour trap vent
- A3-6 Laboratory Fumehood
- A3-7 Air conditioning unit

Auxiliary Boiler Stack

The auxiliary boiler will provide heat during start up of the CCGT plant. Frequency of use will be limited to start up events and will last for a limited duration of approximately one day. The auxiliary boiler stack will be separate from the main CCGT stack. The auxiliary boiler will use the same fuels as the CCGT but its emissions will be equal to approximately 0.5% of those of the CCGT. The auxiliary boiler and main CCGT plant will not run simultaneously.

Distillate Oil Fuel Tank Vent

It is intended to refurbish one of the 5 existing 17,000 tonne capacity HFO storage tanks for the storage of distillate oil and increase the height of the existing bund wall by 2 metres. In accordance with the requirements of CER approximately 11,000 m^3 of distillate oil will be required to be stored.
There is the potential for very minor emission loss from the distillate oil tank during connection for refuelling. Storage, transfer and handling techniques will comply with *Reference Document on Best Available Techniques on Emissions from Storage, July 2006* and *IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities, EPA (2004).* As this is in accordance with BAT it is considered unlikely that fuel tank venting will be an issue.

Diesel Fired Fire Fighting Pump

The fire fighting pump will operate on diesel. The pump will be located within the fire pump house. The pump will only be used in an emergency and for short duration testing, for a maximum of 30 minutes once a week. The pump will have an electrical output of less than 1 MW.

Acid Tank vapour trap vent

Sulphuric Acid (H_2SO_4) and Sodium Hydroxide (NaOH), for use in the water treatment plant, will be stored in 33 m^3 bunded bulk chemical storage tanks. The Sulphuric Acid tank will be fitted with a vapour trap. Gases will vent through the trap media and exit the tank via a vent.

Laboratory Fumehood

A laboratory will be sited within the water treatment plant. The associated fume cupboard will vent to atmosphere from the roof of the water treatment plant.

Air Conditioning Unit

An air conditioning unit will be installed at the Administrative & Workshop building. Emissions due to air conditioning systems include greenhouse gases as HFCs and PFCs. However, these emissions are considered as minor emissions as their volumes are not significant.

Minor emissions from fuel burning include Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Carbon Dioxide (CO_2) and particulates. Natural gas is a clean fuel with negligible sulphur and particulate matter content. Diesel will be restricted to 0.1% Sulphur and will be of a high grade with limited particulate matter content. Emissions to atmosphere from the minor emission sources will not be significant.

E.1.2 Fugitive and potential emissions to atmosphere

Give summary details of fugitive and potential emissions in Table E.1(v).

In relation to activities listed in the Schedule of Council Directive 1999/13/EC on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations;

– specify the relevant category of activity in the Schedule
– specify how the requirements in relation to fugitive emissions will be met.

Full details and any supporting information should form ***Attachment E.1.B***

Potential sources of fugitive emissions include natural gas and distillate/diesel leaks from valves, flanges, seals, etc. and breathing and working losses from the distillate storage tanks. The final number and location of valves and flanges will not be determined until the CCGT detailed design is prepared. However, an indicative list of five principle fugitive emissions sources has been identified below:

- A4-1 Heat Recovery Steam Generator Pressure Release Valve(s)
- A4-2 Steam Emissions from Heat Recovery Steam Generator Vents
- A4-3 Breathing and Working Losses from Distillate Oil Tank
- A4-4 AGI Creep Relief Valve
- A4-5 Hydrogen Cylinders

Heat Recovery Steam Generator Pressure Release Valve(s)

The HRSG system will be fitted with Safety Relief Valves. In an emergency these valves will be employed to reduce pressure through the release of steam to the atmosphere. The type and number of valves installed is not yet determined.

AGI Creep Relief Valve

Above Ground Installation (AGI) will be developed by Gaslink/BGE Networks. The application will be applied for under the *Planning and Development (Strategic Infrastructure) Act, 2006.*
The AGI will be fitted with a pressure relief valve which will be activated in the event of excess pressure entering the AGI. The creep relief valve ensures that the shut-off valve is not

triggered, which would result in a loss of gas supply to the plant. The creep relief valve is a safety mechanism. It is considered that the creep relief valve will be activated on very rare occasions only in the event of a fault with the Bord Gáis system. An isolation valve within the AGI will also shut off supply to the site directly if required. Emergency shut-down valves on the internal gas pipeline will ensure complete shut-down of supply within 60 seconds of leak detection.

Breathing and Working Losses from Distillate Oil Tank

Some breathing and working losses from the distillate oil storage tank are anticipated. The tank will be fitted with a vapour recovery system to mitigate such losses and prevent the formation of vacuum overpressure.

Hydrogen Cylinders

Hydrogen acts as a generator coolant. The generator will be filled with Hydrogen as a closed circuit cooling medium. Stocks of Hydrogen will be stored in an enclosed designated storage area in UN approved cylinders. The cylinders will be fitted with corrosion resistant leak proof valves. Leaks of gases and the ingress of air into the generator cooling system will be prevented through the use of seal oil at a pressure higher than that of the relevant gases.

Table E.1(i) BOILER EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point: * Not applicable (N/A)

Emission Point Ref. Nº:	N/A	
Location:	N/A	
Grid Ref. (12 digit, 6E,6N):	N/A	
Vent Details	Diameter:	Height above Ground(m):
Date of commencement of emission:	N/A	

Characteristics of Emission:

Boiler rating Steam Output: Thermal Input:		kg/hr MW
Boiler fuel Type: Maximum rate at which fuel is burned % sulphur content:		kg/hr
NOx		mg/Nm^3 0^{o}C. 3% O_2(Liquid or Gas), 6% O_2(Solid Fuel)
Maximum volume** of emission		m^3/hr 0^{o}C, 3 % O_2 (liquid or gas), 6 % O_2 (solid fuel)
Temperature	^{o}C(max) ^{o}C(min)	^{o}C(avg)

*The auxiliary boiler has a thermal input of less than 5 MW. In accordance with EPA guidance the auxiliary boiler is included as a minor emission.

** Volume flow limits for emissions to atmosphere shall be based on Normal conditions of temperature and pressure, (i.e. 0oC,101.3kPa), dry gas; 3% oxygen for liquid and gas fuels; 6% oxygen for solid fuels.

(i) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up/shutdown to be included):*

Periods of Emission (avg)	N/A min/hr N/A hr/day N/A day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. Nº:	A2-1
Source of Emission:	Gas Turbine (firing on Natural Gas)
Location:	Main Stack (adjacent to Heat Recovery Steam generator)
Grid Ref. (12 digit, 6E,6N):	E268916, N114559
Vent Details Diameter: Height above Ground(m):	 6 metres 60 metres
Date of commencement:	Scheduled 2013

Characteristics of Emission:

(i) Volume to be emitted:			
Average/day	66,156,480 Nm^3/d	Maximum/day	66,156,480 Nm^3/d
Maximum rate/hour	2,756,520 Nm^3/h	Min efflux velocity	27.1 $m.sec^{-1}$
(ii) Other factors			
Temperature	89.9 °C(max)	89.9 °C(min)	89.9 °C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. ✓ dry. 15% $\%O_2$			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 24 hr/day 365 day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. Nº:	A2-1
Source of Emission:	Gas Turbine (firing on Distillate Oil)
Location:	Main Stack (adjacent to Heat Recovery Steam generator)
Grid Ref. (12 digit, 6E,6N):	E268916, N114559
Vent Details Diameter: Height above Ground(m):	 6 metres 60 metres
Date of commencement:	Scheduled 2013

Characteristics of Emission:

(i) Volume to be emitted:			
Average/day	71,694,720 Nm^3/d	Maximum/day	71,694,720 Nm^3/d
Maximum rate/hour	2,987,280 Nm^3/h	Min efflux velocity	29.3 $m.sec^{-1}$
(ii) Other factors			
Temperature	102.7 °C(max)	102.7 °C(min)	102.7 °C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. ✓ dry. 15% $\%O_2$			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 24 hr/day 7.3*day/yr

* The plant will operate on distillate oil in emergency situations and for short duration testing. The value provided is based on 2% of operating time per annum

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: **A2-1 (firing on Natural Gas)**

Parameter	Prior to treatment[1]				Brief description of treatment	As discharged[1]					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NO_x	N/A	N/A	N/A	N/A	Dry Low NO_x burners	50	50	143.64	143.64	1,258,286.4	1,258,286.4
SO_2	N/A	N/A	N/A	N/A	Negligible Sulphur Content	-	-	-	-	-	-
CO_2	N/A	N/A	N/A	N/A	Fuel Type	59,57	59,57	$1.47x10^5$	$1.47x10^5$	$1.29x10^9$	$1.29x10^9$
CO	N/A	N/A	N/A	N/A	Combustion Control	100	100	266	266	$2.3x10^6$	$2.3x10^6$
Particulate Matter	N/A	N/A	N/A	N/A	Particulate matter emissions minimised when firing on natural gas	5	5	4.68*	4.68*	40,996.8*	40,996.8*

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

* PM10 Mass Emission Rates

TABLE E.1 (iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: **A2-1 (firing on Distillate Oil)**

Parameter	Prior to treatment[1]				Brief description of treatment	As discharged[1]					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NO_x	N/A	N/A	N/A	N/A	Water Injection	120	120	415.08	415.08	3,636,100.8	3,636,100.8
SO_2	N/A	N/A	N/A	N/A	Very Low Sulphur Fuel (0.1%)	50	50	155.88	155.88	1,365,508.8	1,365,508.8
CO_2	N/A	N/A	N/A	N/A	Fuel Type	84,612	84,612	$2.0x10^5$	$2.0x10^5$	$8.8x10^7$	$8.8x10^7$
CO	N/A	N/A	N/A	N/A	Combustion Control	100	100	264	264	$1.2x10^5$	$1.2x10^5$
Particulate Matter	N/A	N/A	N/A	N/A	Fuel Type	50	50	56.16*	56.16*	491,961.6*	491,961.6*

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

* PM10 Mass Emission Rates

TABLE E.1(iv): EMISSIONS TO ATMOSPHERE - Minor atmospheric emissions

Emission point Reference Numbers	Description	Emission details[1]				Abatement system employed
		material	mg/Nm$^{3(2)}$	kg/h.	kg/year	
A3-1	Auxiliary boiler stack	NO_x SO_2 CO Particulate matter	Not significant	Not significant	Not significant	Intermittent operation. Low sulphur fuel.
A3-2	Distillate Oil Fuel Tank Vent	VOC's	Not significant	Not significant	Not significant	Infrequent small releases. Vapour recovery system.
A3-4	Diesel Fired Fire Fighting Pump	NO_x SO_2 CO Particulate matter	Not significant	Not significant	Not significant	Infrequent operation. Small release testing. Low sulphur diesel oil.
A3-5	Acid Tank Vapour Trap Vent	Trace vapour	Not significant	Not significant	Not significant	Absorbent media
A3-6	Laboratory Fumehood	Trace VOC's	Not significant	Not significant	Not significant	Infrequent small releases
A3-7	Air conditioning unit	HFC, PFC	Not significant	Not significant	Not significant	Infrequent small releases

1 The maximum emission should be stated for each material emitted, the concentration should be based on the maximum 30 minute mean.
2 Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C101.3kPa). Wet/dry should be clearly stated. Include reference oxygen conditions for combustion sources.

TABLE E.1(v): EMISSIONS TO ATMOSPHERE – Fugitive and Potential atmospheric emissions

Emission point ref. no. (as per flow diagram)	Description	Malfunction which could cause an emission	Emission details (Potential max. emissions)[1]		
			Material	mg/Nm^3	kg/hour
A4-1	HRSG pressure release valve(s)	Overpressure in HRSG	Steam	Not significant	Not significant
A4-2	Steam emissions from HRSG vents	Not Application – integral to steam/water cycle	Steam	Not significant	Not significant
A4-3	Breathing and working losses from distillate oil tank	Failure of vapour recovery system	Diesel	Not significant	Not significant
A4-4	AGI creep relief valve	Overpressure in AGI compound	Natural Gas	Not significant	Not significant
A4-5	Hydrogen cylinders	Failure of valves and seal oil	Hydrogen	Not significant	Not significant

[1] Estimate the potential maximum emission for each malfunction identified.

E.2 Emissions to Surface Waters

Tables E.2(i) and E.2(ii) should be completed.

A summary list of the emission points, together with maps/drawings (no larger than A3) and supporting documentation should be included as ***Attachment Nº E.2****.*

The applicant should address in particular any emission point where the substances listed in the Schedule of S.I. No. 394 of 2004 are emitted.

Details of all List I and List II substances listed in the Annex to EU Directive 76/464/EEC (as amended), contained in any emission must be presented. All surface water runoff and storm water drains discharging to surface water bodies must be included. A National Grid References (12 digit, 6E, 6N) must be given for all discharge points. The identity and type of receiving water (river, ditch, estuary, lake, etc.) must be stated.

For emissions outside the BAT guidance limit, a full evaluation of the existing abatement/treatment system must be provided. A planned programme of improvement towards meeting upgraded standards is required. This should highlight specific goals and a time scale, together with options for modification, upgrading or replacement as required to bring the emissions within the limits as set out in the BAT guidance note(s).

E.2.1 Details of Point Emissions to Surface Water

The locations of all the surface water emission points are illustrated on Figure E.2.1 as attached.

(i) Process Waste Water Discharge

Water Treatment Plant

Process waste water includes waste waters arising from the water treatment plant. Approximately 0.5m^3/hr of waste water, generated by the regeneration process of the resins in the water treatment plant, will be discharged to the neutralisation tank prior to discharge. Waste water from the water treatment plant will comprise the salts removed from the potable water formed during the backwash of the resins from the demineralisation process.

HRSG

Process waste water arising from the HRSG includes boiler blow-down and waste waters from condensate drains and boiler water sampling. Prior to re-entry to the HRSG the feedwater will be thermally de-aerated and pH controlled by addition of aqueous Ammonia (NH_3), as required. Tri-sodium Phosphate (Na_3PO_4) will also be added to prevent scaling and an oxygen scavenging chemical, dilute Carbohydrazide (CO(NHNH2)2), will be added, as required, to achieve the water quality required for optimum operation of the boiler. The

purpose of this treatment is to prevent corrosion of the HRSG and thus to extend its commercial life.

Boiler blow-down comprises water which has been circulating in the feedwater/steam cycle. In order to remove the build up of salts from the HRSG drums (which remain in the drum once the water has evaporated off), it is necessary to continually "blow-down" approximately 1% of the total 500m^3/hr of circulating water (i.e. 5 m^3/hr). Boiler blow-down will discharge from the boiler to a flash/blow-down vessel and collect in a new process waste water discharge pit.

Occasionally there may be a requirement to increase the blow-down rate from the HRSG. This happens normally under an intermittent operation which will last for a very short period of time. A typical flow rate is in the order of 45.5m^3/hr for a period of up to four hours. The new 200m^3 process waste water discharge pit has been sized to accommodate this intermittent blow-down.

In principle, if the volume of blow-down water is reduced, a small quantity of "fresh" demineralised water is being added to the system, which might end by causing a negative effect on the installation. Consequently the salt build-up in the drums is reduced. However, abnormal plant operations such as shutdowns, start-ups or excessive load cycling result in the addition of "fresh" demineralised water resulting in necessary blow-down. While blow-down water may have a high enough saline content to require removal from the HRSG drums, it should be noted that the saline content is generally much lower than that of the initial potable water supply.

There may also be some other additional process discharges from the system, but should be reduced quantities in all cases (i.e. leaks, boiler water samples, etc.).

A typical flow rate for these process waste waters will be 1.05m^3/hr.

Process Waste Water

All process waste water, including water treatment plant effluent, arising from the new CCGT power plant will be discharged under controlled conditions to outfall SW13. Refer to Figure E.2.1 Site Drainage Plan.

Treatment will include pH dosing and monitoring of same. The pH of the wastewater will be maintained at pH 6-9 by Sulphuric Acid/Sodium Hydroxide dosing, as required, prior to discharge.

The automated system will only discharge if the relevant parameters are within the limits to be specified in the revised IPPC licence. Discharge volumes will be measured via a flowmeter installed on the discharge line. In addition, the discharge will be fitted with an automatic sampler which will sample water discharges over a given period as directed by the EPA under the IPPC regime.

The overall average volume of process waste water discharge is estimated to be 6.55m^3/hr. This equates to approximately 38% of the effluent discharges from the existing plant, which are of a similar physicochemical make-up.

(ii) Cooling Water

A continuous flow of cooling seawater will be required to absorb heat from the steam turbine condenser and, depending upon the final design of the plant, from other heat exchangers associated with the proposed CCGT plant.

Cooling water will be abstracted from the Barrow Estuary, utilising the existing water intake and outfall systems, with some upgrade/refurbishment works in the cooling water pump house, as required. However the overall demand will be significantly reduced from the current maximum demand of 50,170m^3/hr to approximately 20,000m^3/hr, when the CCGT is fully operation i.e. the volume will be reduced by approximately 40%.

Cooling water will be screened through a series of fixed coarse screens and travelling fine screens, in order to remove debris from the cooling water prior to entering the pump chambers.

The screened cooling water will be pumped from the cooling water pump house to the steam turbine condenser and to the coolers of the closed cooling water system. The cooling water will then be discharged to the estuary via the existing outfall culvert.

In accordance with existing operations, cooling water will be chlorinated at the cooling water inlet by direct injection of Sodium Hypochlorite solution, as required, in order to control biological fouling of, and damage to, the condensers, principally by mussels which thrive in the conditions of fast flow encountered in warm cooling water systems. It is anticipated that approximately 5 litres per day of Sodium Hypochlorite may be used on occasions. Chlorine concentrations in the cooling water discharge will be maintained at a maximum concentration of 0.5 mg/l Chlorine measured at the cooling water outlet. It should be noted that use of biocides is currently very infrequent and this situation is unlikely to alter once the new CCGT plant has been commissioned.

It is intended to re-use as much of the existing cooling water (CW) system structures as possible (in accordance with Best Available Techniques, BAT). The allowable temperature rise through the cooling water system will remain unchanged at 12.0ºC above estuarine water temperature. However, as the volume of discharge is anticipated to decrease from 50,170m^3/hr to 20,000m^3/hr the maximum thermal load is anticipated to decrease from the existing 352 MWth to 291 MWth (refer the Hydrodynamic Modelling Report appended to Section I).

(iii) Foul Water

A new collection system, separate from the surface water system, will be required to connect the proposed CCGT plant to the foul collection system and treatment plant. The area of the site containing the Above Ground Installation (AGI) will not generate any foul water.

As the existing foul water treatment system currently occupies the area of land proposed for the CCGT plant a new proprietary secondary treatment system is proposed. The specification of the proposed system will guarantee treatment of the waste water to a treatment standard of

25mg/l Biological Oxygen Demand (BOD), 35mg/l Suspended Solids (SS), 5 mg/l of Ammonia (as N) and 2 mg/l of Total Phosphorous (as P).

The proposed system will be subject to maintenance contracts to assure compliance with the above mentioned standards. As there will be no net increase in the number of persons employed at the Great Island site over the present manpower levels, it is proposed that the new foul collection system for the CCGT will connect to the existing foul collection system discharging from the site via existing Outfall SW3.

During the construction phase temporary fully contained chemical portable toilets will be installed within the designated construction lay down area. It is anticipated that up to 35 portable toilets will be required during the peak construction period, with each portable toilet servicing approximately 14 construction workers. The contents of the portable toilets will be removed from the site to an appropriately authorised facility.

(iv) Surface Water Run Off

Surface water runoff will consist mostly of rainwater, but with an allowance for spillages and wash water. As this has the potential to become contaminated with oily substances in some areas, oil interceptors will be included downstream of the proposed collection systems. Bypass oil interceptors will also include silt trap units which will remove any excess silt or grit which may become entrained in the surface water.

The CCGT area will use a new collection system to convey water to the existing drainage network. The surface water will be treated via a Class 1 bypass oil interceptor and silt trap unit, prior to discharge via existing Outfall SW4 and SW12. Surface water runoff from the AGI area, and its access road, will also be conveyed by a new collection system and treated via a silt trap unit and bypass oil interceptor prior to discharge via existing Outfall SW1.

Surface water run-off, process waste water, water treatment plant effluent and treated foul water will be discharged through separate channels to the estuary post relevant treatment/screening.

Bunds

Tanks containing potentially polluting substances will be bunded. These substances include distillate fuel oil, and Sulphuric Acid and Sodium Hydroxide. Additional chemicals, e.g. Ammonia, Tri-sodium Phosphate and dilute Carbohydrazide used for HRSG feedwater chemical dosing, will be stored in bunded receptacles in a designated area within the Water Treatment Plant.

Certain hardstanding areas (i.e. chemical storage, transformer and tank farm bunds) will require surface water to be pumped, following a visual inspection, into the existing free-flowing channels, thereby mitigating against accidental release of spillages into the drainage network. All surface water runoff will be directed through a hydrocarbon interceptor and silt trap prior to discharge to the estuary.

General Site Washings

Cleaning products will be water based of a biodegradable nature, wherever possible, general plant washings will be discharged to the estuary via a hydrocarbon interceptor and silt trap. Compressor cleaning washings, which require the use of hazardous detergents, will be removed from site by an appropriately authorised waste contractor.

E.2.2 Emission Point References

Details of the surface water emission points are provided in Tables E.2 (i) and E.2(ii). The reference numbers described below are also applied in Attachment F.1.2 *Effluent Emission Treatment, Abatement and Control* and Attachment F.2.3 *Effluent Emissions Monitoring*.

- SW1 – Surface water run-off from the AGI area
- SW2 - Cooling water
- SW3 - Foul water treatment system
- SW4 – Surface water run-off from the CCGT area
- SW12 – Surface water run-off from the CCGT area
- SW13 - Process waste water

Note: SW1, SW2, SW3, SW4 and SW12 are all existing emission points. These emission points will be reused by the new CCGT once the HFO plant is decommissioned.

Table E.2.1 Rosslare monthly, annual mean and extreme meteorological values from 1961 – 1990

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature (ºC)													
Mean daily max	8.2	7.9	9.3	10.9	13.2	15.9	17.9	17.9	16.3	13.8	10.6	9.1	12.6
Mean Daily min	3.9	3.8	4.3	5.6	7.9	10.4	12.1	12.2	10.8	9	5.9	4.8	7.6
Mean	6.1	5.9	6.8	8.3	10.5	13.2	15	15	13.6	11.4	8.2	7	10.1
Absolute max	12.7	13	14.2	20.1	20.3	25.4	26.2	25.9	21.5	19.2	15.7	14	26.2
Absolute min	-4.4	-4.1	-2.5	-1	-0.3	4.7	5.2	6.2	2.6	0.7	-2.5	-3.1	-4.4
Mean no. of days with air frost	2.4	2	1.1	0.3	0	0	0	0	0	0	0.6	1.6	8
Mean no. of days with air ground frost	11.0	8.6	7.2	4.4	1.3	0	0	0	0.1	0.8	5.6	8.5	47.4
Relative Humidity (%)													
Mean at 0900UTC	86	85	84	82	81	82	82	84	84	86	85	86	84
Mean at 1500UTC	81	79	76	76	77	78	77	78	77	80	79	82	78
Sunshine (hours)													
Mean daily duration	1.94	2.47	3.87	5.74	6.88	6.59	6.29	5.86	4.79	3.27	2.5	1.75	4.33
Greatest daily duration	8.2	9.8	11.8	13.4	15.4	15.8	15.9	14	12.8	10.2	8.6	7.3	15.9
Mean no. of days with no sun	11	8	5	3	1	2	1	2	3	6	9	11	61
Rainfall (mm)													
Mean monthly total	94.8	69.9	67.8	55.7	55.8	50.6	50.7	68.7	73.3	94.9	97.1	97.8	877
Greatest daily total	44.9	33.4	48.9	27.9	31	32.6	79.1	61	63.6	54.8	56.7	44.8	79.1
Mean no. of days with >=0,22mm	18	15	16	14	14	13	11	13	14	16	16	17	176
Mean no. of days with >=1,0mm	14	11	12	10	10	8	8	9	10	12	13	13	129

Mean no. of days with >=5,0mm	7	5	5	4	4	3	3	4	5	6	6	7	59
Wind (knots)													
Mean monthly speed (m/s)	6.64	6.58	6.38	6.07	5.86	5.2	4.89	5.14	5.5	5.97	6.22	6.58	5.92
Max gust	76	76	66	75	57	51	50	56	72	87	71	80	87
Max, mean 10-minute speed	46	44	42	52	35	38	35	37	47	50	45	50	52
Mean no. of days with gales	2.5	1.5	1.1	1.3	0.3	0.2	0.1	0.2	0.5	0.9	1.3	1.9	11.7
Weather (mean no. of days with…)													
Snow or sleet	2.7	3.7	1.9	0.8	0.1	0	0	0	0	0	0.2	1.3	10.7
Snow lying at 0900UTC	0.8	0.7	0.2	0	0	0	0	0	0	0	0	0.1	1.8
Hail	1.8	1.1	2.5	2.1	1	0.3	0	0	0.1	0.4	1.2	1.2	11.8
Thunder	0.4	0.2	0.1	0.4	0.8	1	1	0.7	0.6	0.5	0.7	0.3	6.7
Fog	2	2.2	3.2	4.2	3.2	4.4	5	4.6	3.9	2.5	1.7	1.6	38.5

TABLE E.2(i): EMISSIONS TO SURFACE WATERS (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	SW1
Source of Emission:	AGI Area surface water run-off
Location :	Existing outfall A
Grid Ref. (12 digit, 6E,6N):	E 269056, N 114583
Name of receiving waters:	Barrow estuary
Flow rate in receiving waters:	Due to variable flow of the dynamic estuary and tidal conditions it is not appropriate to state exact figures for flow rates. Indicative flow rates are contained in section 3.2.4.2 of the hydrodynamic modelling report
Available waste assimilative capacity:	N/A*

Emission Details:

(i) Volume to be emitted			
Normal/day	2.95 m^3	Maximum/day	97.35 m^3
Maximum rate/hour	4.06 m^3		

* Not applicable: the characteristics of surface water run-off will be typical of rainfall in the area

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	___-___min/hr ___-___hr/day ___-___day/yr

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number: **SW1 (AGI Area surface water run-off)**

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*

* Not applicable: the characteristics of surface water run-off will be typical of rainfall in the area

TABLE E.2(i): EMISSIONS TO SURFACE WATERS (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	SW2
Source of Emission:	Cooling Water System
Location :	Cooling Water Outfall
Grid Ref. (12 digit, 6E,6N):	E 269030, N 114580
Name of receiving waters:	Barrow estuary
Flow rate in receiving waters:	Due to variable flow of the dynamic estuary and tidal conditions it is not appropriate to state exact figures for flow rates. Indicative flow rates are contained in section 3.2.4.2 of the hydrodynamic modelling report
Available waste assimilative capacity:	(Not available) kg/day

Emission Details:

(i) Volume to be emitted			
Normal/day	480,000 m^3	Maximum/day	480,000 m^3
Maximum rate/hour	20,000 m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 24 hr/day 365 day/yr

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number: **SW2 (Cooling water system)**

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
Temperature	-	-	-	-	Max. change in temperature above normal conditions = 12 ºC				-
Chlorine	-	-	-	-	0.5	0.5	240	87,600	-

TABLE E.2(i): EMISSIONS TO SURFACE WATERS (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	SW3
Source of Emission:	Foul water treatment system
Location :	Existing outfall B
Grid Ref. (12 digit, 6E,6N):	E 268905, N 114524
Name of receiving waters:	Barrow estuary
Flow rate in receiving waters:	Due to variable flow of the dynamic estuary and tidal conditions it is not appropriate to state exact figures for flow rates. Indicative flow rates are contained in section 3.2.4.2 of the hydrodynamic modelling report
Available waste assimilative capacity:	(Not available) kg/day

Emission Details:

(i) Volume to be emitted			
Normal/day	9.5 m^3	Maximum/day	9.5 m^3
Maximum rate/hour	9.5 m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 24 hr/day 365 day/yr

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number: SW3 (Foul water treatment system)

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
BOD (Biological Oxygen Demand)	-	-	-	-	25	25	0.0375	13.6875	-
SS (Suspended Solids)	-	-	-	-	35	35	0.0525	19.1625	-
Ammonia (as N)	-	-	-	-	5	5	0.0075	2.7375	-
Total Phosphorus	-	-	-	-	2	2	0.003	1.095	-

TABLE E.2(i): EMISSIONS TO SURFACE WATERS (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	SW4
Source of Emission:	CCGT area surface water run-off
Location :	Existing outfall F
Grid Ref. (12 digit, 6E,6N):	E 268694, N 114509
Name of receiving waters:	Barrow estuary
Flow rate in receiving waters:	Due to variable flow of the dynamic estuary and tidal conditions it is not appropriate to state exact figures for flow rates. Indicative flow rates are contained in section 3.2.4.2 of the hydrodynamic modelling report
Available waste assimilative capacity:	N/A*

* Not applicable: the characteristics of surface water run-off will be typical of rainfall in the area

Emission Details:

(i) Volume to be emitted			
Normal/day	31.71 m^3	Maximum/day	1045.02 m^3
Maximum rate/hour	43.55 m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	_-_min/hr _-_hr/day _-_day/yr

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number: **SW4 (CCGT Area surface water run-off)**

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*

* Not applicable: the characteristics of surface water run-off will be typical of rainfall in the area

TABLE E.2(i): EMISSIONS TO SURFACE WATERS (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	SW12
Source of Emission:	CCGT area surface water run-off
Location :	Existing outfall D
Grid Ref. (12 digit, 6E,6N):	E 268837, N 114588
Name of receiving waters:	Barrow estuary
Flow rate in receiving waters:	Due to variable flow of the dynamic estuary and tidal conditions it is not appropriate to state exact figures for flow rates. Indicative flow rates are contained in section 3.2.4.2 of the hydrodynamic modelling report
Available waste assimilative capacity:	N/A*

* Not applicable: the characteristics of surface water run-off will be typical of rainfall in the area

Emission Details:

(i) Volume to be emitted			
Normal/day	14.34 m^3	Maximum/day	472.62 m^3
Maximum rate/hour	19.69 m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	__-__min/hr __-__hr/day __-__day/yr

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number:**_____SW12 (CCGT Area surface water run-off)**

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*

* Not applicable: the characteristics of surface water run-off will be typical of rainfall in the area

TABLE E.2(i): EMISSIONS TO SURFACE WATERS (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	SW13
Source of Emission:	Process waste water
Location :	Existing outfall C
Grid Ref. (12 digit, 6E,6N):	E 268951, N 114600
Name of receiving waters:	Barrow estuary
Flow rate in receiving waters:	Due to variable flow of the dynamic estuary and tidal conditions it is not appropriate to state exact figures for flow rates. Indicative flow rates are contained in section 3.2.4.2 of the hydrodynamic modelling report
Available waste assimilative capacity:	(Not available) kg/day

Emission Details:

(i) Volume to be emitted			
Normal/day	157.2 m^3	Maximum/day	157.2 m^3
Maximum rate/hour	6.55 m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 24 hr/day 365 day/yr

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number: SW13 (Process waste water)

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
pH	-	-	-	-	6-9	6-9	-	-	-

E.3 Emissions to Sewer

Tables E.3(i) and E.3(ii) should be completed.

A summary list of the emission points, together with maps and/or drawings (no larger than A3) and supporting documentation should be included as ***Attachment N^{o} E.3****. Details of all List I and List II substances listed in the Annex to EU Directive 76/464/EEC (as amended), contained in any emission must be presented. All relevant information on the receiving sewer, including any effluent treatment/abatement systems, not already described, with schematics as appropriate should also be included in* ***Attachment N^{o} E.3****.*

For emissions outside BAT guidance limit (where given), a full evaluation of the existing abatement/treatment system must be provided. A planned programme of improvement towards meeting upgraded standards is required. This should highlight specific goals and a time scale, together with options for modification, upgrading or replacement as required to bring the emissions within any limits set out in the BAT guidance note(s).

E.3.1 Details of Emissions to Sewer

There will be no emissions to municipal (local authority) sewer.

TABLE E.3(i): EMISSIONS TO SEWER (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	N/A*
Location of connection to sewer:	N/A*
Grid Ref. (12 digit, 6E,6N):	N/A*
Name of sewage undertaker:	N/A*

Emission Details:

(i) Volume to be emitted			
Normal/day	N/A*	Maximum/day	N/A*
Maximum rate/hour	N/A*		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	N/A* _____min/hr _____hr/day _____day/yr

*Not Applicable: There will be no emissions to sewer

TABLE E.3(ii): EMISSIONS TO SEWER - Characteristics of the emission (1 table per emission point)

Emission point reference number :__________________Not Applicable____________________________

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*

*Not Applicable: There will be no emissions to sewer

E.4 Emissions to Ground

Describe the existing or proposed arrangements necessary to give effect to Articles 3,4,5,6, and 7 of Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution by certain dangerous substances.

The applicant should supply details of the nature and quality of the substance (agricultural and non-agricultural waste) to be landspread (slurry, effluent, sludges etc) as well as the proposed application rates, periods of application and mode of application (e.g., pipe discharge, tanker).

For emissions outside the BAT guidance limit, a full evaluation of the existing abatement/treatment system must be provided. A planned programme of improvement towards meeting upgraded standards is required. This should highlight specific goals and a time scale, together with options for modification, upgrading or replacement as required to bring the emissions within the limits as set out in the BAT guidance note(s).

E.4.1 Details of Emissions to Ground

There will be no emissions to ground.

E.5 Noise Emissions

Give particulars of the source, location, nature, level, and the period or periods during which the noise emissions are made or are to be made.

Table E.5(i) should be completed, as relevant, for each source.

Supporting information should form ***Attachment Nº E.5***

For emissions outside the EPA Guidance Note for Noise in elation to Scheduled Activities 2nd Edition (2006), a full evaluation of the existing abatement/treatment system must be provided. A planned programme of improvement towards meeting upgraded standards is required. This should highlight specific goals and a time scale, together with options for modification, upgrading or replacement as required to bring the emissions within the limits as set out in the Guidance Note.

E.5.1 Details of Noise Emissions

A noise impact assessment of the operational phase of the project was completed. This assessment took into consideration the existing baseline noise in the environment and assessed the potential impacts against nationally and internationally accepted criteria and noise limits.

Baseline noise conditions are outlined in Attachment I.7, *Noise Impact*.

Predicted noise levels at the noise sensitive receptors during operation do not exceed the assessment criteria. As part of the CCGT detailed design process, detailed modelling of the plant layout and operation will be carried out. Mitigation measures will be considered and implemented if they are required to ensure that the criteria are met.

Operation associated sound levels are depicted in Table E. 5 (i).

No significant residual impacts are predicted to occur at the noise sensitive receptors.

Table E.5(i): NOISE EMISSIONS - Noise sources summary sheet

Source	Emission point Ref. No[2]	Equipment Ref. No	Sound Pressure[1] dBA at reference distance	Octave bands (Hz) Sound Pressure[1] Levels dB (unweighted) per band									Impulsive or tonal qualities	Periods of Emission
				31	63	125	250	500	1K	2K	4K	8K		
Inlet Filter Face	N1-2010	-	106.4	69.6	88.8	91.9	93.4	96.8	98.0	104.2	91.0	86.9	No	Continuous
Stack Exit 90 degree directivity correction	N2-2010	-	103.9	71.6	91.8	100.9	99.4	89.8	90.0	76.2	67.0	579	No	Continuous
Stack breakout	N3-2010	-	94.9	64.6	85.8	91.9	90.4	77.8	73.0	53.2	41.0	33.9	No	Continuous
HRSG inlet	N4-2010	-	103.1	74.6	89.8	99.9	98.4	89.8	91.0	85.2	68.0	48.9	No	Continuous
HRSG body	N5-2010	-	98.2	66.6	85.8	95.9	92.4	83.8	85.0	77.2	60.0	40.9	No	Continuous
HRSG Accessories	N6-2010	-	98.6	66.6	83.8	92.9	94.4	90.8	90.0	79.2	70.0	60.9	No	Continuous
Turbine Compartment Vent Fans	N7-2010	-	103.8	62.6	75.8	93.9	92.4	94.8	95.0	95.2	99.0	93.9	No	Continuous
Exhaust Compartment Vent Fans	N8-2010	-	102.0	63.6	77.8	93.9	93.4	95.8	96.0	91.2	92.0	86.9	No	Continuous
Transformers x5	N9-2010	-	104.3	65.6	80.8	90.9	95.4	100.8	98.0	94.2	89.0	79.9	No	Continuous
Fin fan coolers x 15	N10-2010	-	93.0	64.1	75.3	83.4	90.9	83.3	83.5	76.7	70.5	61.4	No	Continuous
AGI	N11-2010	-	93.0	-	-	-	-	-	-	-	-	-	No	Continuous
Turbine Hall internal noise level	N12-2010	-	85.0	-	-	-	-	-	-	-	-	-	No	Continuous

1. For items of plant sound power levels may be used.

2. Emission point reference no.s reflect this revision of the IPPC licence

E.6 Tabular Data on Emission Points

Applicants should submit the following information for each emission point:

Point Code	***Point Type***	***Easting***	***Northing***	***Verified***	***Emission***
Provide label ID's assigned in section E	*A=Atmospheric* *SW=Surface Water* *SE = Sewer* *GW=Groundwater* *N = Noise* *SL=Soil/Ground* *WS=Waste*	*6E-digit GPS Irish National Grid Reference*	*6N-digit GPS Irish National Grid Reference*	*Y = GPS used* *N = GPS not used*	*e.g. SO_2, HCl, NH_3*

An individual record (i.e. row) is required for each emission point. Acceptable file formats include Excel, Access or other upon agreement with the Agency. A standard Excel template can be downloaded from the EPA website at www.epa.ie. This data should be submitted to the Agency on a separate CD-Rom containing sections B.2, E.6 and F.3.

E.6.1 Emission Point Data

Tabular data on emission points is submitted in Excel format on a separate CD-Rom.