

Proposed Power Plant at Great Island, Co. Wexford

Non-Technical Summary

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November 2009
Endesa Ireland Limited



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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	2 nd December 2009	A. Grohmann- Woerle K. Murphy D. Hassett	P. Kelly	C. O'Donovan	Final

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Non-Technical Summary

Introduction

Endesa Ireland Limited proposes to construct a 430 MW natural gas fired Combined Cycle Gas Turbine (CCGT) power plant within the confines of the existing operational power generating facility at Great Island, County Wexford. Refer to Figure 1: Site Location.

The primary fuel source for the proposed CCGT will be natural gas with distillate oil stored onsite as a back up fuel. The existing Great Island power plant currently operates on Heavy Fuel Oil (HFO) with a maximum electrical output capacity of 240 MW. The existing plant comprises three units, two 60 MW units and one 120 MW unit. All of the existing units are at the end of their useful life span.

Subject to planning permission being granted, it is anticipated, that the new power plant will be commissioned in 2012. Once the CCGT plant becomes operational, the existing HFO fired power plant will be decommissioned. Endesa will apply for planning permission to Wexford County Council for the demolition of the existing plant within six months of decommissioning of the existing generation plant.

Environmental Impact Statement

An Environmental Impact Statement (EIS) has been prepared in order to identify baseline environmental and socio-economic conditions in the area of the proposed development and predict potential beneficial and / or significant effects providing mitigation measures, where considered necessary. The EIS has been prepared in accordance with all relevant legislation, guidance and advice notes and has been submitted with the planning application in accordance with relevant legislative requirements. As a "Strategic Infrastructure" development this planning application is being made to An Board Pleanála and not to the local authority i.e. Wexford County Council.

The planning application and the EIS for the proposed development may be inspected free of charge or purchased on payment of a specified fee during public opening hours for a period of eight weeks commencing on 7th December 2009 at the following locations:

- The Offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1
- The Offices of Wexford County Council, County Hall. Spawell Road, Wexford

The full application may also be viewed / downloaded on the following website:

www.greatislandpowerproject.com

Submissions or observations may be made only to An Bord Pleanála ("the Board") at 64 Marlborough Street, Dublin 1 and must be received by the Board no later than 17:30 on 5th February 2010.

This document is a non-technical summary providing a brief overview of the development and associated impacts and mitigation. It is recommended that the main EIS document is reviewed in order to obtain detailed information regarding this development.



Notes

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- GENERAL SITE LEVEL IS +7.00M O.D.

Site Boundary —
Property Boundary —

1:10000 0 500m 1000m

Rev	Date	Drawn	Description	Chk'd	App'd
P5	05/11/09	AV	Issued with Planning Application	KMc	DMc
P4	27/10/09	AV	Revised as per Endesa Comments	KMc	DMc
P3	23/10/09	AV	Revised as per Endesa Comments	KMc	DMc
P2	30/09/09	AV	Revised as per Endesa Comments	KMc	DMc
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Title
Combined Cycle Gas Turbine (CCGT)
Great Island, Co. Wexford

Site Location

Designed	Drawn	Uwg.Crk.	Eng. Chk.	Coordination	Approved	Chk'd	App'd
	vj/avil	vj/avil					

Scale **1:10000** Project **257554** Status **APR**
CAD File **Figure 1** Drawing No. **Figure 1** Rev **P5**

Revised: Figure 1.dwg, Plotted by hmc4208 on Tue 26 09:28:45am

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Background to the Project

Security of electricity supply is identified as crucial for the economy in the Government White Paper entitled *Delivering a Sustainable Energy Future for Ireland (Energy Policy Framework 2007 – 2020)*. The paper highlights the need for robust electricity networks and electricity generating capacity to ensure consistent and competitive supply of energy.

Maintaining “security of supply” is critically important, not only to satisfy Ireland’s own requirements but also to attract inward investment. It was with this in mind that the Commission for Energy Regulation (CER) directed ESB to divest some of their assets in order to introduce much needed competition into the energy market while complimenting the current policy of liberalisation of the electricity market. This divestment strategy has been supported by the Irish Government’s White Paper on energy, which sets out Ireland’s energy policy framework to 2020, providing for the divestment and repowering of certain ESB generating plant in order to aid security of supply, integrate renewable generation, liberalise the electricity market and promote competition.

Endesa Ireland Limited, a subsidiary of Endesa (the leading utility in the Spanish electricity system), was established as an operating company on 8th January 2009, following the acquisition of certain generation assets from ESB. These assets comprised four sites namely Great Island in Wexford, Tarbert in Kerry, Rhode in Offaly and Tawnaghmore in Mayo.

The development considered in this planning application involves constructing a new CCGT generating station on the existing generation site in Great Island. The new development will provide significant improvements and a substantial increase in operating efficiency over older generating plant, similar to that currently operating in Great Island.

Endesa’s acquisition and redevelopment of Great Island power plant is therefore in line with Government Policy in this regard.

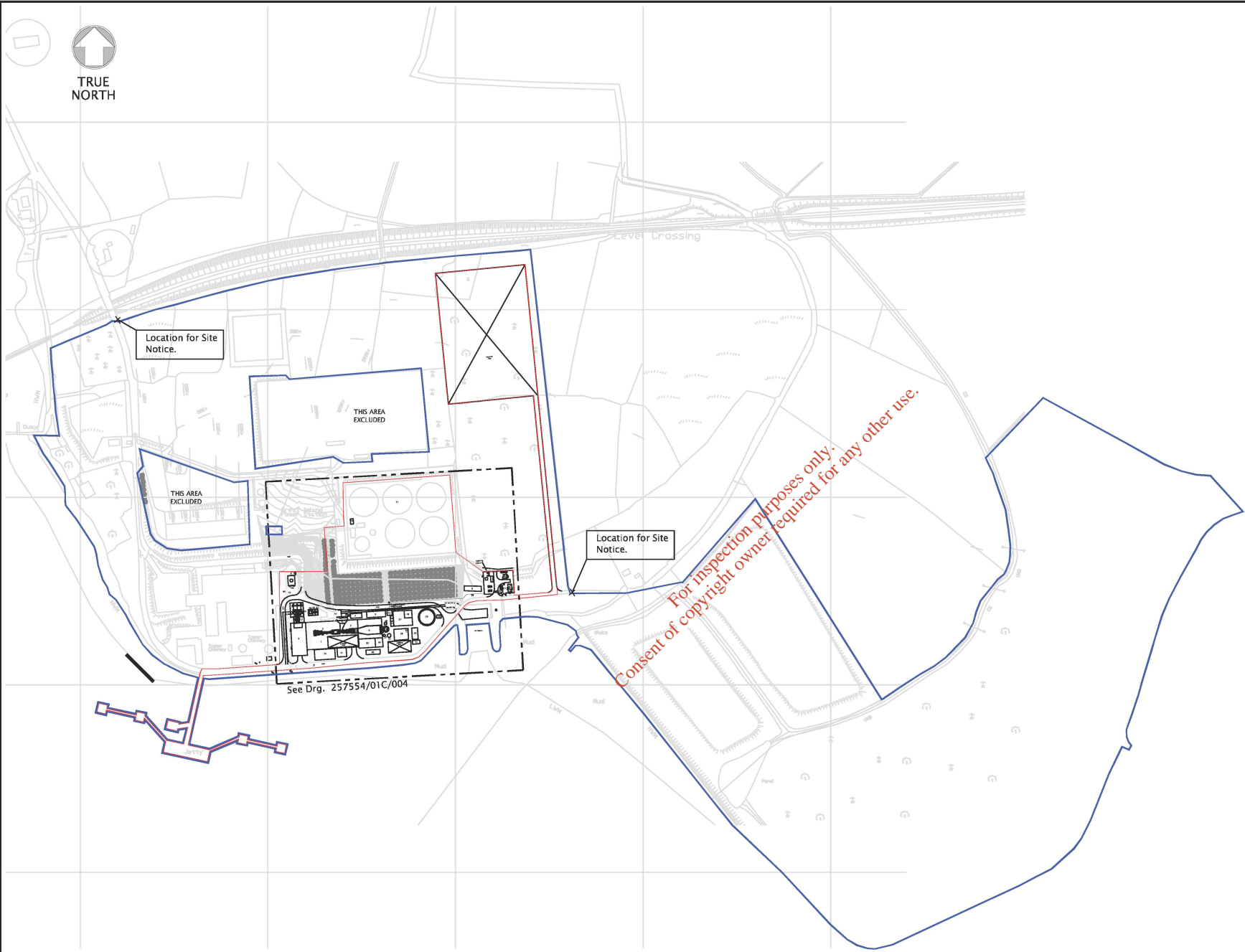
A number of electricity generating options have been considered including CCGT, Open Cycle Gas Turbine (OCGT), conversion of the existing units and large scale combined heat and power plants. Following an assessment of the options available it was determined that a natural gas fired 430 MW CCGT power plant would provide the optimum choice for the Great Island redevelopment.

Site Description

The Great Island site is an existing power generating plant located in the townland of Great Island, County Wexford.

The development site is brownfield and located within the confines of the existing operational power plant facility. The Great Island power plant occupies an area of approximately 58 hectares (143 acres). The proposed development site will occupy approximately 8 hectares (19 acres). Refer to Figure 2: Proposed Development Site.

The site is located at the confluence of the River Suir and River Barrow, on the shores of Waterford Harbour. The River Barrow, the River Suir, and the neighbouring Estuary, are designated as Special Areas of Conservation (SAC). The Barrow River Estuary is a proposed Natural Heritage Area (pNHA).

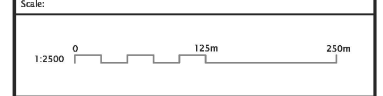


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Legend:

Site Boundary —

Property Boundary —



Rev	Date	Drawn	Description	Ch'kd	App'd
P7	11/11/09	AV	Issued with Planning Application	KMcC	DMcR
P6	05/11/09	AV	Revised as per Endesa Comments	KMcC	DMcR
P5	13/10/09	AV	Revised as per Endesa Comments	KMcC	DMcR
P4	22/10/09	AV	Revised as per Endesa Comments	KMcC	DMcR
P3	30/09/09	AV	Revised as per Endesa Comments	DC	DMcR
P2	28/08/09	AV	Issued for Approval	DC	DMcR
P1	30/07/09	VF	Issued for Approval	DC	DMcR

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Title
**Combined Cycle Gas Turbine
Great Island, Co. Wexford**

Proposed Development Site

Designed	D. Heffernan	Eng. Chk.	D. Carr	
Drawn	C. Cunningham	Coordination	D. Heffernan	
Dwg. Chk.	C. Cunningham	Approved	D. Heffernan	
Scale	1:2500	Project	257554	Status
Drawing No	Figure 2	CAD File	Figure 2	APR
	Figure 2			Rev
				P7

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Filename: Figure 2.dwg, Plotted by hse41085 on 26/07/2013 11:41am

Proposed Power Plant at Great Island, Co. Wexford

The nearest area of settlement is at Cheekpoint, County Waterford, located approximately 700 metres to the south of the site. In County Wexford, the nearest significant area of settlement is Campile, located approximately 3.75 kilometres to the east. The nearest occupied dwelling is located approximately 450 metres to the northwest of the development site. The nearest school is located approximately 5 kilometres to the north east.

The surrounding area is predominantly characterised by agricultural lands. The Waterford to Wexford railway line runs under the site access road immediately north of the ownership boundary. Agricultural lands are located further north of the site and to the east.

Access to the site is gained via a local road, the L8072, which connects the site to the R733, located approximately 5 kilometres to the east of the development site. The R733 connects with the N25, approximately 11 kilometres to the north east. During the construction phase it is intended to utilise a temporary parking bay for HGV access adjacent to the L8072, in proximity to the R733 junction, as illustrated in Figure 1.

The proposed development site and the existing operating units are wholly owned by Endesa Ireland Limited.

Description of the Development

A CCGT power plant works on the principle of optimising the efficiency of electricity generation. In a CCGT plant, a Gas Turbine (GT) generates electricity and the waste heat from the GT is used to make superheated steam via a Heat Recovery Steam Generator (HRSG), i.e. boiler, to generate additional electrical power in a Steam Turbine (ST). Low pressure steam from the steam turbine is condensed back to water and fed back to the HRSG. Any hot gases remaining from the process are emitted to atmosphere via an exhaust gas stack. Refer to Figure 3 Site Layout.

The proposed plant will utilise the existing cooling water intake and outlet systems to condense steam for use in the HRSG. High purity feed water, for use within the HRSG, will also be required. This water will be sourced from the mains supply operated by Wexford County Council.

The exhaust stack will extend to 60 metres in height, which is significantly less than the existing two stacks, which each measure 137.5 metres.

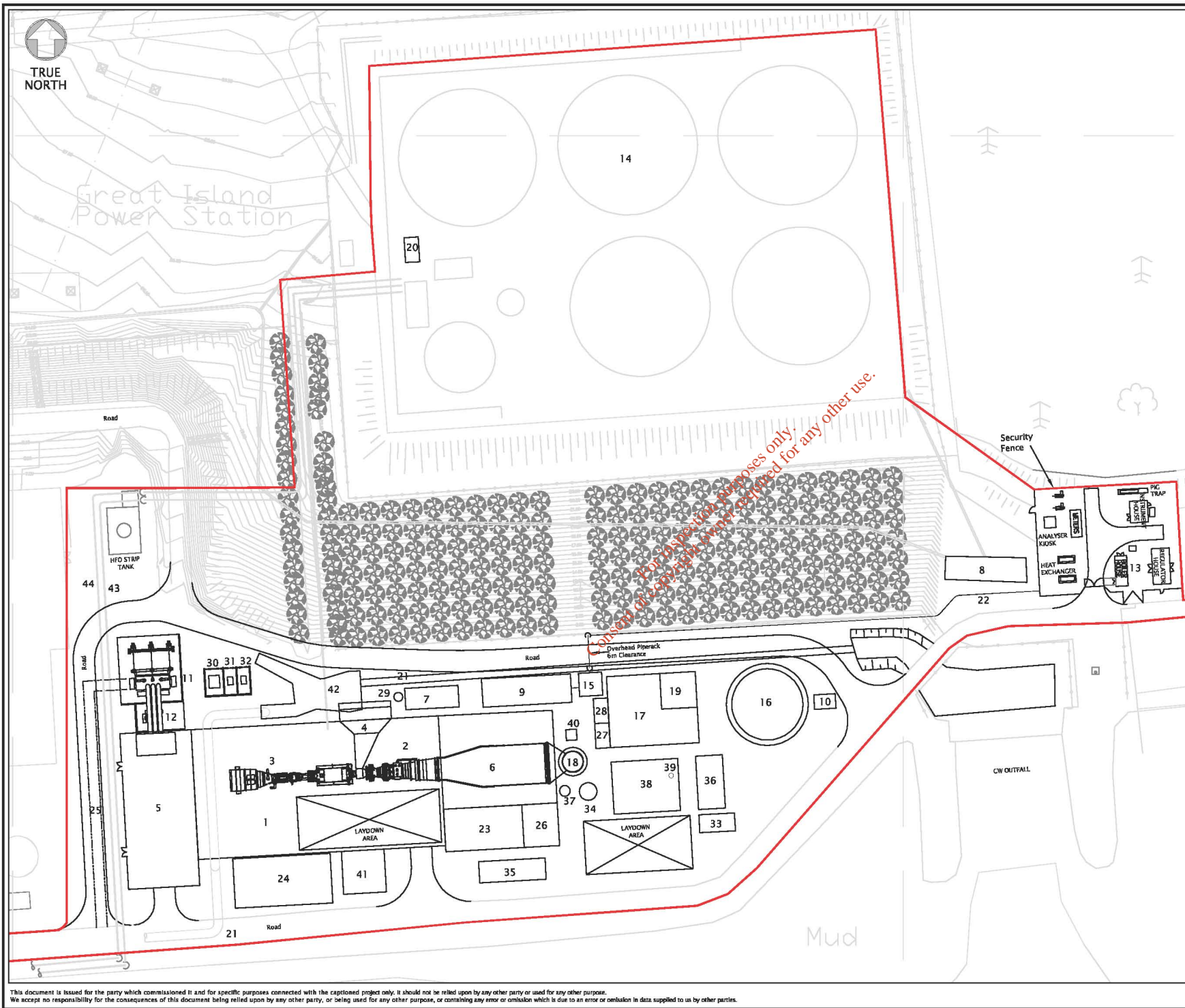
Electrical power from the new plant will be exported to the existing 220 kV switchyard on site and exported to the regulated electricity market.

Natural gas, supplied from the Bord Gáis Networks (BGN) grid, will be the primary fuel source for the facility. To comply with the requirements of CER a stock of distillate oil will be stored on site, in sufficient capacity to run the plant for five days in the event of an interruption to the natural gas supply. The volume of distillate oil required will be approximately 10,000 Tonnes and its Sulphur content will be limited to 0.1%.

Ancillary services will include a water treatment plant, water storage tanks, wastewater discharge tanks, one distillate storage tank, bulk chemical storage tanks (Sulphuric Acid and Sodium Hydroxide), an Above Ground Gas Installation, AGI (comprising gas compressor, gas metering, pressure reducing, heating and filtering skids) and minor ancillary buildings. Existing control and administration buildings, workshops, canteen, stores and fuel storage tanks will be utilised.



TRUE NORTH



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- Legend
- Boundary for New Power Station
- GAS TURBINE AND STEAM TURBINE BUILDING
 - GAS TURBINE
 - STEAM TURBINE
 - AIR INLET FILTER TO GAS TURBINE
 - ELECTRICAL ANNEX & CONTROL ROOM
 - HEAT RECOVERY STEAM GENERATOR BARGE
 - CSW SHED
 - OIL SEPARATOR (RELOCATED)
 - GAS FUEL TREATMENT SHED
 - DESINERALSISED WATER SUPPLY PUMPS (WICK ABATEMENT)
 - GENERATOR TRANSFORMER
 - UNIT AUXILIARY TRANSFORMER
 - NATURAL GAS COMBUSTION AIR
 - DISTILLATE OIL STORAGE TANK
 - GAS COMPRESSOR
 - DRAIN WATER STORAGE TANK (x 6,000m³)
 - WATER TREATMENT PLANT BUILDING
 - MAIN STACK
 - FIRE PUMP HOUSE (ON SITE EXISTING BUILDING)
 - DISTILLATE FUEL OIL FORWARDING PUMP SHED
 - CSW CULVERT
 - GAS MAIN
 - BOILER FEED WATER PUMPS
 - FIN FAN COOLER
 - RAILS IN ROAD FOR TRANSFORMER REMOVAL
 - CHEMICAL INJECTION SHED
 - CAUSTIC STORAGE TANK WITH BUND
 - ACID STORAGE TANK WITH BUND
 - GAS TURBINE OIL WATER DRAIN TANK
 - STARTING TRANSFORMER
 - EXCITATION TRANSFORMER
 - AUXILIARY TRANSFORMER
 - SEWAGE TREATMENT PLANT
 - BOILER WASTE WATER DRAIN TANK
 - H2/H2/CSW STORAGE
 - PROCESS WATER DISCHARGE PIT
 - BLOWDOWN VESSEL
 - AUXILIARY BEWER
 - AUXILIARY BOILER FUEL STACK
 - CENTRIFUGES (SHOWERING MONITORING CSW) SYSTEM
 - CENTRIFUGES POLISHER
 - DISTILLATE OIL SUPPLY PIPE TO GENERATOR
 - HFO FILLING PIPE IN CONCRETE TRENCH
 - DISTILLATE OIL FILLING PIPE IN CONCRETE TRENCH

Rev	Date	Drawn	Description	Cr/kl	App'd
P8	05/11/09	AV	Issued with Planning Application	KMC	DMC
P7	23/10/09	AV	Revised as per Endesa Comments	KMC	DMC
P6	30/09/09	AV	Revised as per Endesa Comments	KMC	DMC
P5	28/08/09	AV	Issued For Approval	KMC	DMC
P4	30/07/09	CHC	Issued For Approval	KMC	DMC
P3	17/07/09	CHC	Issued for Approval	KMC	DMC
P2	14/07/09	CHC	Issued for Approval	KMC	DMC
P1	13/07/09	CHC	Issued for Approval	KMC	DMC

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Title
**Combined Cycle Gas Turbine
Great Island, Co. Wexford**

Site Layout

Designed	D. McInerail	Eng. Chk.	K. McCarvey	
Drawn	C. Connelighan	Coordination	D. McInerail	
Thwq. Chk.	K. McCarvey	Approved	D. McInerail	
Scale	1:500	Project	257554	Status
		CAD File	Figure 3	APR
Drawing No	Figure 3			Rev
				P8

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Proposed Power Plant at Great Island, Co. Wexford

The new CCGT power plant will require the construction of a gas pipeline connection to the AGI. BGN and Gaslink (the systems operator with responsibility for operating, maintaining and developing the Irish gas transportation system) will be responsible for the routing and construction of the gas pipeline. The connection to the gas supply will be subject to a separate planning process by BGN / Gaslink.

Subject to planning permission being granted, it is anticipated that construction will commence in the fourth quarter of 2010. Civil, mechanical, electrical works and commissioning of plant are expected to last for approximately 30 months. Construction activities are expected to peak between March 2011 and February 2012. It is anticipated that a maximum of 500 construction workers will be employed during the peak construction period. Temporary facilities will be provided within the proposed construction laydown area and will include portacabins, welfare facilities and laydown areas.

Normal working hours during the construction period are expected to be Monday to Friday 08:00 to 20:00 and Saturday 08:00 to 17:00. During certain stages of the construction phase it is expected that some work will have to be carried out outside of normal working hours, however this will be kept to a minimum. Construction works with a significant noise impact will be avoided outside of normal working hours.

Legislation

The proposed power plant will operate under an Integrated Pollution, Prevention and Control (IPPC) licence as regulated by the Environmental Protection Agency (EPA). The licence will set operational, monitoring and reporting conditions. Under the regime the operator is obliged to employ Best Available Technique (BAT) technology and follow BAT guidance documents ensuring emissions from the facility do not impact significantly on the environment and are in compliance with the Large Combustion Plant Directive. The existing facility currently operates under IPPC Licence Registration Number P0606-02. This licence will be revised to include the proposed development. Endesa is in ongoing consultation with EPA regarding the required IPPC licence amendments. In addition, the facility will continue to be required to operate under the Greenhouse Gas Emissions Permit regime enforced by EPA.

In order to comply with Commission for Energy Regulations regulations, it will be necessary to store approximately 10,000 Tonnes of distillate oil on site as a backup fuel in the event of interruption to the natural gas supply. The distillate oil will be limited to 0.1% sulphur as per regulatory requirements. Due to the quantity of distillate being stored on site the proposed facility will be designated a Lower-tier Seveso site under the Seveso II Directive. In accordance with the regulations Endesa is required to develop comprehensive plans, risk assessments and systems to ensure high levels of protection are implemented to prevent the occurrence of major accidents. A Land Use Planning assessment has been completed in this regard. The assessment is being considered by the appropriate regulatory body, the Health and Safety Authority, as part of this planning application.

Endesa will also require an authorisation to construct and a licence to operate from CER.

Planning and Policy Context

National, regional and local development policies support the appropriate development of key economic infrastructure in the south east region of Ireland. The proposed development will contribute to fulfilling the objectives of the National Spatial Strategy which designates Waterford City as a gateway, which will be supported by the 'hub' settlements of Kilkenny and Wexford. Together, these three settlements will form a nationally strategic "growth triangle". The Regional Planning Guidelines for the South East Region support the development and improvement of key economic infrastructure such as energy generation and

Proposed Power Plant at Great Island, Co. Wexford

transmission networks and telecommunications, which are considered essential for the continued development of the south east region. It is a policy of the Wexford County Development Plan to encourage economic development in a sustainable manner in order to create employment opportunities for all sectors of the community. The proposed development is consistent with the established use of the Great Island site.

Environmental Impact Assessment (EIA)

The impacts of the construction and operational phases of the proposed development have been assessed in consultation with statutory bodies in accordance with EIA legislation and guidance. The impacts related to the proposed development are summarised under the following environmental topics.

- Human Beings – Land Use
- Human Beings – Socio-economics
- Traffic
- Human Beings – Noise and Vibration
- Flora and Fauna – Terrestrial
- Flora and Fauna – Marine
- Soils, Geology and Hydrogeology
- Surface Water
- Air Quality and Climate
- Landscape and Visual
- Material Assets – Archaeology, Architectural and Cultural Heritage
- Material Assets – Utilities
- Interactions of the Foregoing

Endesa has carried out extensive consultation in relation to the Great Island power plant proposal with stakeholders, including members of the public, local residents, businesses, institutions, representative individuals and organisations, statutory bodies and bodies with environmental responsibility and interest. Comments on the proposed development were also invited from the public by means of public consultations held on the 7th September 2009 in Cheekpoint, County Waterford and on the 8th September 2009 in Horeswood, County Wexford.

Human Beings – Land Use

A desk-based assessment of the impacts on land use was undertaken to assess information relating to zoning, tourism, amenities and recreation and community facilities within the vicinity of the proposed development site.

There are no schools, hospitals or churches located within 1 kilometre of the site. However, a school and a GAA pitch are located approximately 5 kilometres from the proposed development site. A number of residential houses are located in Cheekpoint which is located less than 1 kilometre from the site, on the opposite side of the estuary. A number of one-off houses and a railway line are located in proximity to the site boundary. Also, a number of planning applications have been granted permission in proximity to the site. The construction of the proposed power plant is located entirely within the confines of a brownfield site and is consistent with current activities on the site i.e. the activities associated with the operation of the proposed power plant will not change significantly from those associated with existing land use.

Increased traffic and HGV movements during the construction phase will have a negative short term impact on the local community, primarily due to potential traffic disruption on local roads. Impacts on local landowners in the area, such as impacts on cattle movements, may result in some temporary and short-term negative impacts on these operations. A temporary parking bay will be provided, limiting Heavy Goods Vehicle (HGV) movements, adjacent to the local access road. A detailed Traffic Management Plan will be developed as part of a Construction Environmental Management Plan (CEMP), in consultation with local landowners to ensure disruption to landowners is minimised as far as practicable.

Overall, impacts on land use in the surrounding area are considered to be of low to no significance, once mitigation measures are implemented.

Human Beings – Socio-economics

A desk-based assessment of the impacts on socio-economics was undertaken to assess information relating to recent trends in population, employment and economic activity in the vicinity of the proposed development.

It is likely that the proposed development will increase the population of the area in the short term during the construction phase, as it is probable that there will be an influx of construction workers. Construction workers will positively impact on businesses in surrounding settlements that will provide workers with services including accommodation, food, and entertainment creating employment opportunities in the local service industry. This will be a significant positive medium term impact on the local economy.

There is a potential for negative impacts during construction due to visual impacts, increased noise, traffic and dust. However, these will cease following completion of construction. During the construction period a CEMP, incorporating mitigation measures for reducing traffic, dust, noise and visual impacts will be implemented in order to minimise any negative impacts on the receiving environment. During the operation of the proposed power plant, it is considered that there will be a significant positive impact on the local and national economy.

Overall, impacts on the socio-economic environment of the area are considered to be positive.

Traffic

An assessment was undertaken in order to assess the impact of the proposed development on traffic. The existing, 2009, base traffic conditions at three critical junctions in the vicinity of the proposed development site were identified. The traffic conditions at these critical junctions have been assessed for the future year 2012 for two scenarios, the Do Nothing Scenario and the Do Something Scenario i.e. with the development. The Do Something Scenario assigns the peak construction traffic associated with the development to the traffic carrying network. The analysis indicates that the junctions will operate within capacity in 2012 in the Do Nothing Scenario and also in the 2012 Do Something Scenario.

Pavement integrity testing has been carried out along the entirety of the 5 kilometre section of local road accessing the development site. The current Annual Average Daily Traffic (AADT) and percentage HGV content along with the estimated construction and operational phase traffic volumes have been used to determine the quantum of remedial works required along the section of local road to achieve a twenty year residual life. A wet mix / clause 804 overlay varying between 150 to 200 mm has been suggested along the entire length of the local road which will result in an improvement to the structural strength of the existing access road.

Given that the width and alignment of the 5 kilometre section of local road accessing the development site is not sufficient to allow for two Heavy Goods Vehicles travelling in opposing directions to safely pass each other a traffic management plan has been developed. The traffic management plan proposed the installation of a parking bay at either end of the local road. Sufficient space has been allocated on the Great Island site for the operation of one of the said parking bays. A location for the construction of a temporary parking bay immediately after the junction of the local road and the R733 has been identified on agricultural lands located adjacent to the north-east of the affected section of local road. The acquisition of this portion of land has been negotiated with the affected land owner and the construction of a parking bay at this location for the duration of the construction programme is anticipated. Refer to Figure 1: Site Location.

Human Beings – Noise and Vibration

Power plants are not considered to be a source of operational vibration which could give rise to nuisance or damage to properties. Construction of the facility is considered to be the only period where there could be any potential vibration impacts. Given the distance from the proposed location to the closest sensitive receptor (approximately 300 metres from the main gate or approximately 450 metres from the construction area) it is considered unlikely that any construction activity could cause a vibration impact at the sensitive receptors.

A noise impact assessment of the construction phase and operational phase of the project was completed. This assessment took into consideration the existing baseline noise environment and assessed the potential impacts against nationally and internationally accepted criteria and noise limits likely to be enforced by the EPA as part of the operational plants revised IPPC licence.

Construction is likely to be audible in the vicinity of the development, although due to the temporary and transient nature of works, this will not result in any significant long term impacts. Construction traffic will result in a significant change in the noise environment but will not exceed the assessment criteria. No significant residual impacts are predicted to occur at the noise sensitive receptors.

Predicted noise levels at the noise sensitive receptors during operation do not exceed the typical EPA noise limits.

Flora and Fauna

Terrestrial Ecology

A habitat survey and protected mammal surveys were conducted at Great Island. An area of ground on the southern section of the Great Island site is contained within the Barrow River Estuary pNHA. This section of the site consists of reclaimed land from the estuary, which was reclaimed circa 1966 when the original plant was constructed. The site of the proposed CCGT consists of a number of existing built structures and paved areas and an area of recolonising bare ground. This area is not of any conservation value and no terrestrial habitats of ecological value are present.

On the northern boundary of the site an area of immature planted woodland will be partially impacted by the works as it will be used as a laydown area during construction. A small section of hedgerow and grassy verge along the access road to the site may be removed for the provision of a parking bay.

Overall, the proposed development site and proposed parking bay are evaluated as being of local importance (lower value). The proposed CCGT site consists of made ground and is not of any ecological value. However, the proposed laydown area has some ecological value in terms of feeding areas for bats and as a refuge for foxes, bats and other small mammals and is evaluated as Lower Value, Locally Important.

No rare or protected habitats or flora were identified during the survey. No bat roosts, badger setts or otter holts were identified within the site. Mitigation measures are proposed to prevent impacts on breeding birds, hedgehogs and water quality.

Marine Ecology

Great Island power plant is located adjacent to several designated areas of conservation:

- River Barrow and River Nore Special Area of Conservation (SAC);
- Lower River Suir SAC;
- Barrow River Estuary proposed Natural Heritage Areas (pNHA);
- Ballyhack pNHA; and
- Waterford Harbour pNHA.

These designated areas of conservation are regarded as high value as they have been designated to protect and conserve species and habitats of concern or importance. There are no Special Protection Areas (SPAs) or Important Bird Areas (IBAs) designated for the protection of birds in the project area. It is not expected that project activities will impact the marine flora and fauna of the Barrow River Estuary proposed Natural Heritage Areas (pNHA). Much of the benthic species known to exist in the intertidal and subtidal area surrounding the power plant are common in Irish estuaries. However, the mudflats surrounding the power plant contain many species which are dependent upon such a habitat for survival and are therefore regarded as being of medium value. The rocky intertidal area surrounding the power plant and the subtidal benthic community are regarded as being a habitat of low conservational value.

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Impacts to these communities from the construction phase are expected to be minor as works will be restricted to within the power plant site boundary.

Cooling water will be extracted via the existing cooling water intake culverts. The potential for fish to be impinged (damaged by the screens at the intake) by the fine screens employed by the proposed system will remain, however, Endesa will develop a technical solution in consultation with the Southern Regional Fisheries Board (SRFB) to determine the most appropriate and effective technology to mitigate against entrainment of fish species into the cooling water system, to ensure that impacts to smolts and other fish are minimised to an acceptable level. In particular this is expected to take place after commissioning of the new plant, circa 2013. The temperature of the cooling water discharged from the power plant will remain unchanged during operation, however as the volume of water discharged will decrease substantially, the maximum thermal load is anticipated to also decrease from current conditions. Associated impacts on the existing water quality and marine ecology are not expected to deteriorate or be further disturbed from the effects of the current plume.

Due to combinations of the proposed mitigation measures, the magnitude of impacts and the positive changes from the current situation, the proposed activities will not have an adverse effect on the integrity of the sites or the qualifying features of the conservation objectives of the Natura 2000 sites. Therefore significant impacts are not likely to occur.

Soils, Geology and Groundwater

The baseline soils, geology and groundwater assessment included a desktop study and a review of the findings of an intrusive environmental assessment. Baseline soils identified included fine-grained sandy and silty topsoil, loose brown clay, stiff silty sandy clays with boulders and Made Ground consisting mainly of gravel. Bedrock geology included rhyolites in grey and brown slaty mudstones with occasional andesites. Soil samples were taken during the intrusive environmental assessment and exceedances of the screening criteria were determined in a number of the samples collected.

Once the baseline was completed, an impact assessment was made on the identified constraints. Impacts can be split into two different phases, construction impacts and operation impacts.

The principal source of construction impacts are removal of soils and sediment, contamination mobilisation, contamination of groundwater and settlement. The removal of contaminated soils and sediment is a positive impact as contamination sources are removed. Mitigation measures involve the reuse of materials where possible, a waste management plan and appropriate material storage areas. In general the residual impacts are low to not significant.

The principal source of operational impacts is related to degradation of below ground structures by ground conditions. The residual impacts, once mitigation measures are implemented, are low to not significant.

Surface Water

An assessment of the surface water quality and hydrology of the receiving environment in the vicinity of the proposed development, the predicted and potential impacts of the proposed development and the mitigation measures needed, if any, to address any significant impacts with respect to water consumption, process waste water, cooling water, foul water, surface water and flood risk was undertaken.

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As part of the proposed development an on-site water treatment plant will be required, where water for use in the Heat Recovery Steam Generator will be demineralised to achieve a high purity. Wastewater from the demineralisation plant will comprise water containing the salts removed from the raw water or neutralised backwash of the resins from the demineralisation process. The pH of the wastewater will be maintained by acid or alkali addition, as required. The raw feedwater to the water treatment plant, which is of drinking water quality, will be supplied from the existing on-site reservoir which in turn is supplied from the Wexford County Council supply.

The feedwater used in the HRSG will be thermally de-aerated to remove oxygen and chemically treated to prevent corrosion of the tubes and components of the water / steam cycle.

Four distinct waste water streams will be discharged from the site; process waste water, surface water run-off, treated foul water (from sanitary facilities, wash rooms, mess rooms etc.) and cooling water.

The process waste water to be discharged from the site comprises water from the demineralisation plant and boiler blow down comprising water which has been circulating in the water / steam cycle. The process waste water to be discharged contains levels of salts that are considered too high for the HRSG however, the levels are generally lower than that of the original "raw" feedwater. The process waste water will be collected in a process water discharge pit which will include pH dosing, monitoring and recirculation units. 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.

All surface water run-off collected on site will be treated via a silt trap unit and bypass oil interceptor prior to discharge. Foul waste water will be treated in a new proprietary secondary treatment system to specified limits prior to discharge. A continuous flow of cooling water will also be required to condense steam from the HRSG. Cooling water will be abstracted from, and discharged to, the Barrow Estuary, in accordance with existing operations, utilising the existing water intake and outfall systems.

The effluent discharges from the site will be of a similar composition to discharges from the existing plant; however, the volumes will be significantly reduced. As a consequence it is considered that the proposed development will not have a significant adverse impact on the receiving environment, when compared with the existing situation.

Potential construction phase impacts arising from this development are typical of those associated with any civil engineering activity and mainly relate to contamination of surface waters with suspended solids predominantly. The implementation of mitigation measures during the construction phase will ensure that the impact of the proposed development on water resources will not be significant.

A preliminary flood risk assessment has determined that the proposed finished floor level is appropriate for the development site in terms of flood risk.

Air Quality and Climate

A detailed air quality assessment has been undertaken to determine the effects of the proposed development on local air quality, and climate as part of the EIA process.

During both the construction and operational phases of the development there are no predicted impacts on the macro and micro climate.

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Baseline air quality concentrations have been derived from the Environmental Protection Agency annual report. Concentrations of all relevant pollutants are well below the respective air quality standards within the study area.

Assessment of construction phase impacts has identified that there is a 'minor' risk that the proposed development would cause significant dust effects. Appropriate mitigation measures have therefore been proposed, which will be implemented as part of a CEMP, to minimise the risk of significant impacts.

The proposed plant will be designed to minimise emissions from the stack via inherent emissions control technologies in order to achieve emission limits established by Irish and European Union Legislation.

Emissions from the proposed plant have been assessed through detailed dispersion modelling following good practice guidance. A suitable stack height has been determined for effective dispersion of pollutants taking into account nearby buildings and terrain.

The results of the dispersion modelling reported in this assessment show that concentrations of all relevant pollutants are predicted to remain well below the relevant air quality standards when the plant is firing on either natural gas or distillate fuel oil. The predicted impacts of the maximum Process Contributions for all pollutants are concluded to be of negligible to slight adverse significance.

Impacts on Designated Sites as a result of atmospheric Nitrogen Oxide (NO_x) concentrations, acid deposition, and nitrogen deposition have been assessed. All Process Contributions are less than one percent of the relevant Environmental Quality Standards except at the Lower River Suir where Process Contributions of NO_x and nitrogen deposition are above one percent of the critical level and relevant critical load. However, total NO_x concentrations and nitrogen deposition rates (including background concentrations) at the Lower River Suir remain well below the relevant criteria and hence are not significant in air quality terms. The ecological assessment has concluded that the air quality effects at the Lower River Suir site are negligible.

Detailed dispersion modelling of the operational phase predicts that the significance of effects of the proposed plant on human health and sensitive ecological receptors would be categorised as 'negligible' overall.

Landscape and Visual

The impact of the proposed Great Island power plant on landscape character and landscape resources and visual amenity was assessed.

The geographic scope of the landscape and visual impact assessment covers a 20 kilometre radius from the centre of the proposal. This area of search was selected in recognition of the potential for tall structures associated with the proposal to affect landscape character and visual amenity for a distance of up to 20 kilometres from the centre of the proposal.

The character of the receiving landscape is assessed to be adversely affected because of the visibility of the proposal from the wider landscape. These impacts on landscape character are assessed with reference to County landscape character assessment data for Counties Wexford and Kilkenny. In the absence of available landscape character data for County Waterford, broad character areas were identified for the purpose of the assessment. The significance of the impact takes account of the fact that the proposals will be seen from within these landscapes in association with the existing Great Island power plant.

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Significant adverse impacts are assessed to arise in some of the receiving landscape of County Wexford. The 'Wexford Coasts – South Coastal Area' will be directly affected by the proposal, which will be located within this landscape character area. Indirect impacts on the character of this landscape will also arise as a result of the visibility of the proposal and the significance of this is assessed to be low. A low impact significance is predicted to arise also for 'Wexford Lowlands – South Area' and 'Wexford Lowlands – Barrow River Corridor' landscape character areas.

An adverse impact of low significance is assessed to arise in the 'Kilkenny South Eastern Hills' and the 'Kilkenny Suir Valley' landscape character areas in County Kilkenny. In County Waterford, an impact that is not significant is assessed to arise in the 'Waterford City Urban Character Area'. An impact of low significance is assessed to arise in the 'River Suir Corridor Landscape Character Area'.

Impacts on the Local Landscape Character Areas (LLCAs) are assessed to arise and the levels of significance are assessed to be low and medium for the 'Industrialised landscape of Great Island' LLCA and the 'Rivers Suir and Barrow farmed landscapes with settlements' LLCA respectively.

Impacts on designated landscapes, scenic routes and views are assessed to arise. In County Kilkenny, an adverse impact of medium significance is assessed to arise for Views over the confluence of Rivers Suir and Barrow at Snow Hill, County Kilkenny. An impact of low significance is assessed to arise for the Area of High Amenity Barrow Suir Estuary, between New Ross and Wexford, bordered by rivers and by road no 674.

In County Waterford, an adverse impact of medium significance is assessed to arise for the 'Visually Vulnerable Landscape at the confluence of the Rivers Suir and Barrow. An impact of low significance is assessed to arise at the Scenic Route SR15 in the vicinity of Cheekpoint.

Adverse impacts on the setting of cultural assets in terms of landscape and visual amenity are assessed to arise at Dunbrody Abbey. The impact significance is low.

Adverse visual impacts of a medium significance are assessed to arise near the confluence of Rivers Barrow and Suir, County Kilkenny and Cheekpoint, County Waterford. Adverse visual impacts of a low significance are assessed to arise at the following viewpoints:

- Settlement of Ballinlaw on Western edge of River Barrow, County Kilkenny
- Settlement of Parkwood on R683 Road Route
- Dunbrody Abbey
- River Suir shoreline near Ballyhack

Visual impact significance takes account of the fact that the existing Great Island power plant will continue to be present in the view and will be larger in scale in the view than the proposed Great Island power plant. The quality of the existing view at each viewpoint location is therefore already adversely affected by the existing power plant. Hence the significance of visual impact at each viewpoint location is lower than would be the case if the site was an undeveloped area with no existing power plant facilities.

Material Assets

Archaeology, Architectural and Cultural Heritage

The impact of the proposed Great Island power plant on archaeology, architecture and cultural heritage was assessed. The existing environment directly relating to the archaeology, architecture and cultural heritage in the vicinity of the proposed development was described, addressing the potential impacts of the proposed development and the mitigation measures needed to address the likely significant impacts. For this purpose a comprehensive desk top study and a field inspection were undertaken.

It was found that no items of archaeological, architectural or cultural heritage value were extant on the subject site. However, the proposed development site was seen to have the potential to yield sub surface archaeological material. The site is located within an archaeologically rich landscape being within two kilometres of 17 RMPs (Record of Monuments and Places). The closest recorded monument, approximately 0.15 kilometres from the boundaries of the development site, is **WX039-028001-005**, a castle-ringwork, an Anglo-Norman masonry castle, an unclassified castle, an unclassified enclosure and a leper hospital.

In addition, as construction traffic will approach the site from the north, it will be necessary to construct a temporary parking bay approximately 3.5 kilometres north of the power plant. No items of archaeological, architectural or cultural heritage value were noted as being extant within the boundaries of the proposed location. However, the proposed location does have the potential to yield sub surface archaeological material.

In light of these results, it is recommended that archaeological monitoring should be conducted by a qualified archaeologist during the site clearance and excavation works within the development site and at the location of the parking bay. It is not anticipated that any residual impacts of significance will remain if the appropriate archaeological mitigation measures are put in place.

Utilities

A small number of utility services have been identified within the site, which comprises any utilities that could potentially be affected by elements associated with the proposed development. These include standard utilities associated with the water supply (a water main, owned by the local authority provides water to the water reservoir in the north of the site) and telecommunication services to and off site. In addition, there are two substations (220 kV and 110 kV) located in the northern part of the site which are connected to the national grid network via overhead power lines crossing the northern part of the site.

All utilities that cross the area of the proposed development will be protected, lowered or raised, relocated or diverted during the construction phase as necessary to avoid any disruption. All works will be carried out in ongoing consultation with the relevant statutory undertakers and County Council representatives and will comply with their requirements (including health and safety) and all relevant codes of practice.

All works associated with the construction of the new power plant will occur within the existing power plant site and no third party services are likely to be impacted upon. With mitigation measures in place the magnitude of all impacts on utilities during construction is considered to be of low magnitude and is therefore not considered to be significant. The operation of the proposed power plant will improve on the existing level of power supply to the regional and national network. Where unavoidable and unforeseeable

disruptions occur, stakeholders will be notified as soon as possible. With these mitigation measures in place the operation of the scheme will not impact on utility services.

Interactions of the Foregoing

While all environmental factors are inter-related to some extent, the significant interactions and inter-dependencies were taken into consideration by the specialist environmental consultants when drafting their technical reports. Consequently these interactions were integrated into the individual sections of the main environmental impact statement. A summary overview of the interactions is provided in Chapter 18 of the EIS.

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