



Energy for
generations

Corduff FlexGen

APPENDIX E

Updated Appropriate Assessment Screening Report

Submission to: Fingal County Council

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Change History of Report

Date	New Revision	Author	Summary of Change
23.03.2020	001	GH	Minor edits to Project Description
09.09.2020	002	GH	Additional information added in response to Request for Further Information FCC Reg. Ref. FW20A/0053

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1 Introduction

The Electricity Supply Board (ESB) is proposing to develop 75 MWe (megawatts electrical) of flexible thermal generation (FlexGen) on a site located adjacent to the existing 220 kV Corduff Substation located north of Blanchardstown within the Fingal County Council (FCC) administrative area in North Dublin.

As part of that planning application, ESB Engineering and Major Projects (E&MP) has prepared this report presenting the information required to assist FCC, as the Competent Authority, to undertake a Screening for Appropriate Assessment (AA) of the proposed project, in accordance with the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) and Section 42 of the European Communities (Birds and Natural Habitats) Regulations 2011.

The proposed FlexGen development will comprise a modular aero derivative gas turbine referred to in this instance as thermal peaker plants / FlexGen, due to their operational nature. The plant will be primarily fuelled with natural gas with diesel available as a back-up fuel in accordance with the Commission for Regulation of Utilities (CRU) requirement for 72 hours of fuel storage. The proposed new development will connect into the existing Corduff 220kV substation.

The purpose of this report is to demonstrate whether the proposed development, either alone or in combination with other plans and projects, are likely to have significant effects on a European Site(s) in view of the site's conservation objectives.

It should be noted that this is an updated report arising from a Request for Further Information (RFI) in relation to planning application Fingal County Council (FCC) Reg. Ref. FW20A/0053. The update of the report is primarily to address point 2 of the RFI which requested:

- An updated AA Screening to provide a full appraisal of the potential impacts on air quality of the operational development;
- Full details of the source and volumes of demineralised water and appraisal of any implications for European sites; and
- An updated review of the in-combination effects.

2 Statement of Competence

This report was prepared by Geoff Hamilton, Senior Ecologist with ESB E&MP. He has over 14 years' experience in the fields of ecological assessment, agri-environment scheme design and implementation, rural stakeholder consultation and environmental advocacy.

He has been involved in a wide range of infrastructure projects for local authorities and private commercial clients and has carried out a significant number of field surveys to inform Environmental Impact Assessments (EIA), Ecological Impact Assessments (EclA), AA Screening Reports and Natura Impact Statements (NIS).

He has particular experience in the production of ecological reports relating to electricity generation developments such as power stations, wind farms and solar

farms. He holds a Master's degree in Zoology and is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

3 Regulatory Context

The EU Habitats Directive 92/43/EEC provides legal protection for habitats and species of European importance through the establishment of a network of designated conservation areas known as the Natura 2000 Network. The Natura 2000 network includes sites designated as Special Areas of Conservation (SAC) under the EU Habitats Directive and Special Protection Areas (SPA) designated under the EU Birds Directive 79/209/EEC. These are collectively referred to as 'European Sites'.

The Habitats Directive was initially transposed into Irish national law in 1997, with the European Communities (Natural Habitats) Regulations, SI 94/1997. These Regulations have since been amended by SI 233/1998 & SI 378/2005. The European Communities (Birds and Natural Habitats) Regulations 2011 consolidate and replace the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats)(Control of Recreational Activities) Regulations 2010.

The requirements for an Appropriate Assessment are set out under Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC which state:

6(3) Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 sites) but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the sites conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

6(4) If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

Definitions of conservation status, integrity and significance used in this assessment are defined in accordance with 'Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC' (European Commission, 2000 & 2018).

- The conservation status of a natural habitat is defined as the sum of the influences acting on a natural habitat and its typical species that may affect

its long-term natural distribution, structure and functions as well as the long-term survival of its typical species.

- The conservation status of a species is defined as the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its population.
- The integrity of a Natura 2000 site is defined as the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified.
- Significant effect should be determined in relation to the specific features and environmental conditions of the protected site concerned by the plan or project, taking particular account of the site's conservation objectives.

3.1 Appropriate Assessment Process

Key stages in the AA process are set out below, as per European and Irish Government guidance (EC 2000, EC 2001, DEHLG 2010 and EC 2018). Stages 1 and 2 relate to Article 6 (3) of the Habitats Directive and Stages 3 and 4 relate to Article 6 (4). The outcome of each successive stage determines if a further stage in the process is required.

Stage 1. Screening for Appropriate Assessment

The first step in the screening process is to determine if the plan or project is directly connected to or necessary for the management of a European Site. The process then identifies whether a plan or project, either alone or in combination with other plans or projects, is likely to have significant effects on a European Site in view of its conservation objectives.

Stage 2. Appropriate Assessment

This stage considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European Site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. A NIS must be prepared as part of this stage of the process. The AA is carried out by the competent authority, and is supported by the NIS.

Stage 3. Alternative Solutions

If Stage 2 of the process concludes that there is likely to be significant effects to a European Site, Stage 3 then examines any alternative solutions or options that could enable the plan or project to proceed without adverse effects on the integrity of a European Site.

Stage 4. Imperative Reasons of Overriding Public Interest (IROPI)/Derogation

Stage 4 is the main derogation process of Article 6(4) which examines whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project that will have adverse effects on the integrity of a European Site to proceed in cases where it has been established that no less damaging alternative solution exists.

4 Methodology

4.1 Assessment Criteria

This assessment has been undertaken in accordance with all relevant legislation and best practice guidelines:

- Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission.
- European Communities (Birds and Natural Habitats) Regulations 2011, as amended;
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (Department of the Environment Heritage and Local Government, Revision 1, 2010);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (European Commission 2013); and
- Managing Natura 2000 sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission, 2018)
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, European Commission (2001); and
- Managing Natura 2000 Sites (European Commission, 2000). Assessment of plans and projects significantly affecting Natura 2000 sites. (European Commission, 2001).
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC - Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. (European Commission 2007);

4.2 Desk Review

A desktop study was conducted to examine the potential zone of influence of the proposed FlexGen development, to identify any European Sites within that area which could be impacted.

Available information consulted in the preparation of this AA Screening report included:

- The identification of all European Sites within 15 km of the study area and subsequent review of all associated Site Synopses and Conservation Objectives documents as appropriate. This encompasses Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).
- Conservation Status Assessment Reports (CSARs), Backing Documents and Maps prepared in accordance with Article 17 of the Habitats Directive (npws.ie);
- An examination of contemporary and historic mapping and aerial imagery for the Corduff site and its surroundings to determine broad habitat types and

successive land use change;

- A review of relevant ecology-related reports for previous and proposed developments in the proximity of the existing Corduff 220 kV substation.

Geographic Information System (GIS) data relating to European sites, protected species distribution, hydrological connectivity and water quality was accessed using the National Parks and Wildlife Service (NPWS), Environmental Protection Agency (EPA) and Water Framework Directive online mapviewers and was further interrogated locally using ArcGIS. The National Biodiversity Data Centre (NBDC) mapviewer was also consulted, with regards to the potential distribution of protected habitats and species within the study area.

4.3 Potential Zone of Impact

The guidance states that *'A distance of 15km is currently recommended in the case of plans and derives from UK guidance (Scott Wilson et al., 2006). For projects, the distance could be much less than 15km and in some cases less than 100m, but this must be evaluated on a case-by-case basis....'* (DEHLG, 2010)

The potential zone of influence is defined as:

- Areas directly within the land take for the proposed development
- Areas which will be temporarily affected;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution and disturbance (e.g. noise)

Given the relatively small scale and confined nature of the proposed development, the potential zone of impact was determined to be within a 15 km radius. Therefore, all European Sites within a 15 km radius have been included for assessment in this report.

5 Screening for Appropriate Assessment

5.1 Introduction

Screening determines whether appropriate assessment is necessary by examining:

1. Whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of the site, and
2. The potential effects of a project or plan, either alone or in-combination with other projects or plans, on a European Site in view of its conservation objectives and considering whether these effects will be significant (DEHMG, 2010).

The proposed development is not directly connected with or necessary to the management of any European Site.

Screening for AA involves the following:

1. Description of project
2. Identification of relevant European Sites and compilation of information on their qualifying interests and conservation objectives
3. Identification of effects – direct, indirect and cumulative and determination as to their likely significance
4. Conclusions of the Screening Report.

5.2 Description of Project

5.2.1 Existing Environment

The ESB landholding at Corduff is characterised as follows:

- An ESB national supply store for warehousing/maintenance purposes is located to the south of the proposed FlexGen development, with associated outbuildings and access road extending to R121 and N3 (Exit 3).
- An ESB substation (220 kV Corduff Substation) comprising primarily electrical equipment is located to the north of the proposed FlexGen development. There is an access track connecting the substation to the ESB warehousing compound which passes to the east of the proposed FlexGen development.

The footprint of the proposed development relates to an undeveloped area of land between the aforementioned store and substation (refer to Figure 2-1). This area formerly comprised agricultural land which was subsequently planted with trees to dissuade unsanctioned grazing of horses at the site. Species utilised for this planting are almost exclusively fast-growing willow hybrids; planting was carried out in the early 2000's and the site has rapidly matured into woodland with some areas of canopy reaching 10-12 m in height. Tree density reduces as one progresses towards the north of the site, where there are a number of areas of open rank grassland with a large component of ruderal broadleaf species, particularly rosebay willowherb and creeping thistle. An overgrown hedgerow comprising hawthorn and ash runs along an

old ditch which forms the eastern, western and northern boundaries of the site. A mature treeline comprising Scot's pine, beech, sycamore and ash defines the southern boundary between the development site and the ESB stores compound.

The planted area is likely to be utilised by a number of locally resident bird species for nesting and/or foraging. Species recorded during site visits are as follows: Starling, mistle thrush, robin, rook, jackdaw, magpie, woodpigeon, wren, blackbird, dunnock and chaffinch.

With regard to mammal species, rabbit signs are widespread throughout the site. Fox scat was recorded on the site, though no evidence of dens were noted during surveys. Irish hare is known to occur in the locality and has the potential to utilise the open grassland areas within the site for foraging. Other ubiquitous mammal species such as hedgehog and rabbit may also occur. No evidence of badger foraging or setts were observed during site visits; there is no suitable habitat for otter in the immediate locality.

Several bat species are known to occur along the Tolka valley. Foraging bats could be expected to occasionally occur along the mature peripheral treelines at the site. Based on the habitat survey findings, there are no trees within the proposed development footprint (i.e. requiring removal) with any potential to act as bat roosts (i.e. trees with cavities, crevices, limb fractures, loose bark, etc). Given the predominantly urbanised nature of the environs of the proposed development, which is also adjacent to intensive tillage fields comprising minimal hedgerows, the suitability of the development site for bats is considered to be low.

The proposed development will require the removal of approximately 3 hectares (ha) of planted willow woodland, established between 2000 and 2005. It is envisaged that felling would be subject to the requirements of the Forestry Act 2014 and the Forestry Regulations 2017 (SI No 191 of 2017). A felling license will therefore be applied for from the Forest Service.

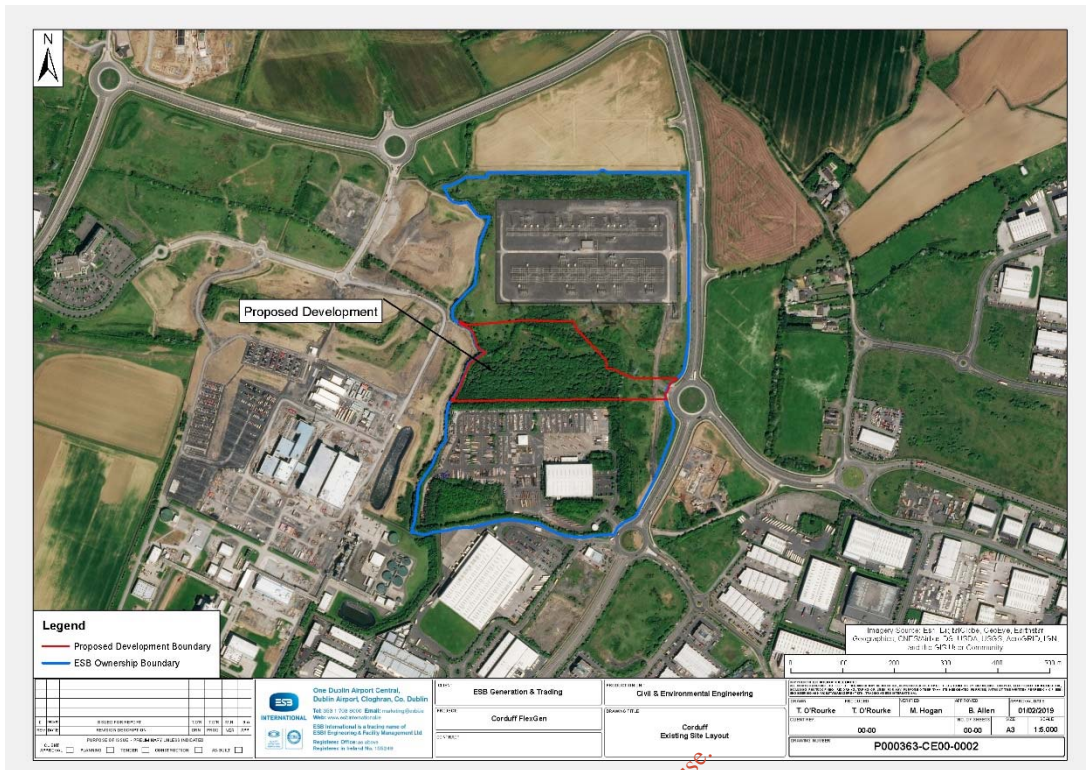


Figure 5-1: Thermal Site Location Map

5.3 Description of the Proposed Development

The 75 MWe FlexGen development is proposed to be developed on a 4.8 ha site in Corduff.

5.3.1 FlexGen Description

The 75 MWe FlexGen development will generally comprise the following key elements:

- The compound (c. 3.5 hectare (ha) secure compound);
- One (1) modular aero derivative gas turbine generator in a packaged enclosure;
- Gas turbine generator auxiliaries, including a continuous emissions monitoring system (CEMS) hut, water wash cart, lube oil skid, fin fan coolers, liquid fuel forwarding skid, water injection skid enclosure, and Gaseous Fire Suppression Cabinet;
- One (1) exhaust stack complete with integrated CO catalyst for emissions control and access ladders/stairways and platforms;
- Associated electrical infrastructure and modules including transformers and other plant;
- Control, Electrical and Building Services modules;

- Electrical connection at 110 kV to the existing Corduff Substation to the north of site;
- Associated gas supply equipment including a gas receiving and metering station, pressure regulation and compression equipment;
- Water supply, storage and treatment;
- Fire-fighting systems;
- Liquid fuel (fuel oil) storage and treatment facility;
- Welfare and car parking facilities; and
- All necessary ancillary works.

The key elements are the gas turbine and the associated exhaust stack.

It should be noted that the drawings and documents have been prepared based on best available information at March 2020. The final FlexGen plant arrangement will be subject to detailed design prior to construction and will be dependent on commercial and technical issues at the time of procurement. Dimensions of plant produced by different manufacturers often have minor variations however the total structure height and footprints will not exceed that indicated by the accompanying planning drawings. Furthermore the operating parameters such as air output and noise output will be within the specifications outlined herein.

The FlexGen development will be broadly similar to that shown in Figure 5-2.



Figure 5-2 Typical FlexGen Plant

For ease of understanding of the elements and limited scale of the proposed development, Table 2-1 identifies the various dimensions associated with each of the proposed key aspects of the FlexGen plant as illustrated by the accompanying planning drawings.

Table 5-1 FlexGen Development Dimensions

Building / Plant / Equipment	Dimensions (Length x Width x Height)
Turbine Module including stack	c. 10.4 m x 29.0 m x 30 m
Continuous Emissions Monitoring System (CEMS) Hut	c. 2.4m x 5.4m x 2.7m
Gaseous Fire Suppression Cabinet	c. 4.3m x 2.6m x 2.2m
Liquid Fuel Forwarding Pump Skid	c. 2.4m x 1.4m x 2.4m
Water Injection Skid Enclosure	c. 3.9m x 3.0m x 3.7m
Water Wash Cart	c. 4.8m x 2.2m x 1.8m
Generator Circuit Breaker	c. 7m x 3m x 6.6m
Fin Fan Coolers (x2)	c. 14.7 m x 3.8m x 5 m
Lube Oil Skid	c. 2.7m x 1.4m x 3.3m
Bunded Transformer Compound containing Main Step Up Transformer and Unit Transformer	c. 15 m x 13 m x 5.6 m
Bunded Transformer Compound containing House Transformer	c. 3.3m x 3.3m x 2.5m
Gas Reducing Building	c. 8m x 6m x 6m
Gas Compressor Building	c. 16 m x 8 m x 6 m
Gas Compressor Coolers	c. 7 m x 4 m x 4 m
Compressed Air & Fire Suppression Building	c. 6 m x 6 m x 3 m
Welfare Facilities	c. 15m x 10 m x 5.1m
Gas Receiving and Metering Area	c. 40 m x 30 m x 4.7 m
Fire-Fighting Pumps	c. 10 m x 7.5 m x 3 m
Fire / RAW Water Tank	c. Dia. = 16 m, Height = 16 m

Building / Plant / Equipment	Dimensions (Length x Width x Height)
Demineralised Water Tank	c. Dia. = 14 m, Height = 12 m
Water Treatment Plant & Pumps	c. 20 m x 10 m x 5.4 m
Power Control Module	c. 17.8m x 5.7m x 4.7m
Emergency Diesel Generator	c. 7.4 m x 3 m x 2.6 m
Liquid Fuel Tank	c. Dia. = 14 m, Height = 12 m Bund = 36 m x 36 m x 1.5m
Liquid Fuel Treatment Area	c. 26 m x 15 m x 5.1 m
Car Parking	c. 25 m x 5 m
Electrical/Control Room	c. 17.8 m x 5.7 m x 4.7 m
Comms. /C&I Module	c. 17.8m x 5.7m x 4.7m
Liquid Fuel Unloading Area	c. 25 m x 17 m
Pipe Bridge(s)	c. 3m x 10.2m x 7.5m
Spare Parts Storage Container	c. 12.2m x 2.4m x 2.6m

5.3.1.1 The FlexGen Compound

The compound includes all equipment and plant associated with the FlexGen development as outlined by the following sections, in addition to internal access roads, laydown areas, welfare facilities and site attenuation.

5.3.1.2 Turbine Module

The turbine module comprises the gas turbine in an individual packaged unit. The footprint of the turbine and generator enclosure(s) is 10.4m x 29.0m and the turbine plant proposed, aside from the stack, will extend to a proposed height of 15.6 m. The proposed stack will extend to a maximum height of 30 m.

The accompanying planning drawings demonstrate plans and elevations for each of the proposed plant / buildings which illustrate their overall heights.

An aero derivative gas turbine is proposed for a variety of reasons including the following:

- To facilitate the increased generation of renewables on the national grid;
- Fast start up durations from cold to full power generation in approximately 5 minutes;
- Best Available Technology (BAT) efficiency of 38% to 43%;
- Low emissions;

- Can operate on both fuel gas and liquid fuel (fuel oil) as a back-up fuel (As per CRU requirements); and
- High reliability.

As is typical for aero derivative type gas turbines, the unit will be housed in a packaged enclosure which is the manufacturer's standard design approach. This turbine is capable of dual fuel operation and includes all of the following items of plant and equipment which are necessary for the operation of the plant:

- Air Inlet Filter Housing;
- Gas turbine generator package in enclosure(s);
- Vent air outlet; and
- Exhaust stack.

In addition to the above, a number of auxiliary plant items are required for turbine operation, including:

- Lube oil skid; and
- Fin fan coolers.
- Gaseous Fire Suppression Cabinet
- Water Wash Cart
- Water Injection Skid and Enclosure
- Liquid Fuel Forwarding Pump Skid
- Generator Circuit Breaker
- Continuous Emissions Monitoring System

Detailed design of the plant will be carried out following selection / confirmation of the turbine supplier.

5.3.1.3 Associated Electrical Plant

Other electrical infrastructure included within the FlexGen compound include the following:

- Control & electrical building;
- Electrical Balance of Plant (BoP) Control Room;
- House transformer; and
- Compressed Air & Fire Suppression Building.

All of the above are illustrated by Drawing No. QP000032-01-D460-025-001-000 "Proposed Site Layout" (1:500).

In addition, an emergency diesel generator is provided.

5.3.1.4 Gas Infrastructure

The main fuel for the site will be supplied by Gas Networks Ireland (GNI) to the gas receiving and metering system on site.

Gas supply equipment required includes the following:

- Gas receiving and metering system;
- Gas reducing station;

- Gas compressor building;
- Gas compressing cooler; and
- Associated gas piping system.

All of the above are illustrated by the various drawings accompanying this planning application.

The connection to the Gas Transmission System will be provided by GNI in accordance with their statutory role and the equipment will be housed in a separate area with a dedicated internal entrance.

5.3.1.5 Water Supply, Storage and Treatment

Raw water, potable water and demineralised water will be required for the FlexGen development as follows:

1. Potable water will be required for domestic purposes (drinking water, toilets etc.).
2. Demineralised water will be required for water injection into the gas turbines for NO_x (Nitrogen Oxides) emissions control.
3. Raw / fire water for emergency response.

The potable water will be provided by means of a new metered connection to an existing public water main to the east of the site.

5.3.1.6 Fuel Oil Storage and Treatment

The proposed development also includes a liquid fuel (fuel oil) tank with associated pump/treatment house and a liquid fuel unloading area. This will be the back-up fuel for the plant in case natural gas is unavailable.

The liquid fuel will be stored in one (1) dedicated liquid fuel tank on the south western side of the site with a capacity of up to approximately 1,500 m³. This will store enough fuel for three days in accordance with the Commission of Energy Regulations (CER) requirements.

In addition to the storage tank the proposed fuel oil facilities also include the following:

- Liquid fuel bund; and
- Liquid fuel treatment building.

The liquid fuel tank will be bunded for environmental protection in accordance with requirements of the EPA's guidance note "*Storage and Transfer of Materials for Scheduled Activities 2004*". The liquid fuel will be transferred from the liquid fuel tank to the turbine through an appropriately designed piping system, details of which will be determined during the detailed design phase of the project.

5.3.1.7 Electrical Cables and Connections

To minimise ground disturbance and facilitate ease of routine maintenance it is proposed that onsite cables between the FlexGen plant and their associated ancillary equipment will be laid above ground. The exact details are subject to detailed design and will be confirmed by the electrical designer following a procurement process.

5.3.1.8 Grid Connection

Electrical equipment proposed for the export of the generated electricity to the existing 220 kV Corduff substation, which is a node on the national electricity transmission grid (Note: Connection is at 110 kV based on the most suitable connection point available into the Corduff 220 kV substation), will be via the following:

- Generator Step Up Transformer; and
- Underground (UG) grid connection cables.

One main generator step up transformer will be required on site. This will step up the voltage for export to the national grid system from medium voltage (MV) to high voltage (HV). This transformer will have an appropriate bund constructed and fire protection including blast walls, if necessary. It should be noted that the electrical components associated with the FlexGen project do not function as part of the electricity transmission system, as operated by EirGrid, they merely allow power to be transformed to appropriate voltages so that the generator can export electricity.

5.3.1.9 Site Access

Access to the property will be via the existing entrance at a roundabout on the eastern boundary of the site. The proposed access to the FlexGen site from the property boundary will cross beneath existing overhead 220 kV lines. The existing entrance provides access/egress to the ESB Networks High Voltage Substation, including 24-hour emergency operation and maintenance access when required. This entrance also provides access to maintain the lands where the development is proposed, and a soak-away associated with the ESB Networks stores facility positioned within the lands where the development is proposed.

5.3.1.10 Services

Surface Water Drainage: The majority of the proposed facility will be surfaced with permeable stone and surface water generated on this area will largely infiltrate to ground as per the Greenfield conditions. Surface water generated on the impermeable elements of the proposed development, including a turbine module, transformer bunds and laydown areas, will be collected in an underground drainage network and conveyed via swales to the proposed attenuation system. Surface water discharge from the Flexible site will be at a controlled rate to an unnamed watercourse to the west of the site. The proposed development will be in accordance with Industrial Emissions Directive (IED) Licence requirements.

Demineralised water will be taken from the proposed water treatment plant in the generating station and held in a storage tank. It is expected that the demineralised water will be sprayed into the turbine ignition and will leave through the stack as vapour. The estimated process water discharging from the turbine into the proposed surface water drainage system will be minimal.

During the operational phase of the proposed development, run-off from all elements of the development vulnerable to spills including the proposed oil filled transformer bunds and laydown areas will be treated through the use of a Class 1 Full Retention

oil separator to remove silt and oil prior to discharging into the proposed Surface Water Drainage Network.

Full details of the proposed drainage system for the site including calculations for the proposed treatment and attenuation, are provided in the Drainage & Services Report, attached as **Appendix 5**.

Foul Wastewater Drainage: The foul water from the proposed welfare facility shall discharge to an existing 225 mm public foul sewer line to the east of the site. If the invert level of the public foul line is elevated relative to the proposed development the use of a pumping chamber and rising main will be adopted as necessary.

Lighting: External lighting is proposed throughout the FlexGen compound. A lighting plan will be undertaken during the detailed design of the FlexGen plant.

5.3.1.11 Ancillary Development – Temporary & Enabling Works

The construction works, in summary, will involve site clearance and preparation, laying of foundations for plant and buildings, structural steelwork and cladding, installation of plant and equipment, concrete works hard surfacing and paving, landscaping and fencing.

The following sections identify the various temporary works and provisions required during the construction phase.

Temporary Construction Compound; A temporary construction compound will be required for the duration of the construction works, which will be used to store equipment and supplies and will include laydown areas and provide all the necessary temporary facilities such as porta-cabins, staff welfare facilities, car parking, etc. All areas under construction will be located within a secure perimeter fence and temporary lighting supplied as necessary.

Construction Equipment; Construction equipment used will be typical of a project of this scale; including heavy duty earthmoving and excavating equipment, heavy goods vehicles (HGV's), concrete trucks, mobile cranes and hoists.

Site Clearance; In order to facilitate the proposed development, the site will be cleared and prepared for development. The internal access roadway will be constructed to provide vehicular access to the site. The construction of the internal access road will include construction of a culvert/bridge over the existing field drain as part of site clearance and internal access roadway construction.

The proposed development will require the removal of approximately 3 ha of planted willow woodland, established between 2000 and 2005.

Temporary Site Facilities; A temporary compound will be used to accommodate the contractors' facilities during the construction of the development. The compound is expected to contain a number of portable site offices for the Contractors' and the Owner's Engineering staff, a meeting room, a canteen, drying room, toilet facilities and containerised storage units.

Exact details of the temporary site compound will be included in the Construction Environmental & Management Plan (CEMP), agreed with the contractor prior to Commencement of Works.

Temporary Provision of Potable Water; The water supply proposed for construction works will be provided by means of the existing connection in the vicinity of the site.

Telecommunications; Existing telecommunications infrastructure will be utilised during the construction period. During operation, operation and monitoring will be facilitated by an installed communications system.

Power Supply; During the construction phase, electric power will be provided using diesel generators or a local supply. A permanent LV power supply from the existing network will be provided for the operational phase.

Construction Phase; The works required for the construction of the proposed FlexGen development will include the following stages of works:

- Site investigation to inform final design;
- Temporary site compound and laydown areas established for the works;
- Clearance of trees and vegetation;
- Protection of existing open drain (possible ha-ha ditch) channel;
- Excavation, levelling and grading;
- All associated site drainage systems and associated installations;
- Construction of cable ducting throughout the compound;
- Construction of reinforced concrete foundations to support the gas turbine generator, oil and water storage tanks and auxiliary equipment items, with piling and / or ground improvements, where necessary;
- Installation / construction of pipework and tanks associated with gas, water, and fuel oil including environmental control infrastructures such as bunds;
- Fire-fighting system including water storage tank, pipework and hydrants;
- Construction of liquid fuel unloading and treatment areas;
- Construction gas supply equipment including a gas receiving and metering station, pressure regulation and compression equipment;
- Construction of welfare facilities, internal road access and parking;
- Construction of perimeter fencing;
- Installation of access gates;
- Construction of permanent maintenance laydown areas;
- Construction of transformer compound including bunds and fire walls, if required;
- Complete electrical installations, SCADA System etc.;
- Installation of gas turbine generator package and associated auxiliary skids, modules, associated apparatus and transformers;
- Installation of exhaust stack, CO catalyst and access ladders/stairways and platforms;

- Installation of electrical balance of plant modules;
- Installation of control modules, equipment and facilities for operators;
- Installation of modules for building services provisions, such as IT and telecoms.
- Commission and test plant;
- Demobilise temporary offices; and
- Reinstatement works, site finishing and landscaping.

5.4 Description of European Sites

5.4.1 Designated Sites

The proposed development site is not within or immediately adjacent to any European Site. There are a number of European sites within 15 km of the proposed FlexGen development (see Figure 5.2). The Qualifying Features/Special Conservation Interests for the respective European Sites are presented in Table 5.1. The NPWS site synopses for both sites are reproduced in Appendix 1.

Table 5.1 European sites within 15 km of the proposed development site

European Site	Conservation Objective	Qualifying Features/ Special Conservation Interests
<p>South Dublin Bay and River Tolka Estuary SPA (004024)</p> <p>14 km southeast of proposed development</p>	<p>To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.</p>	<p>Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]</p> <p>Oystercatcher (<i>Haematopus ostralegus</i>) [A130]</p> <p>Ringed Plover (<i>Charadrius hiaticula</i>) [A137]</p> <p>Grey Plover (<i>Pluvialis squatarola</i>) [A141]</p> <p>Knot (<i>Calidris canutus</i>) [A143]</p> <p>Sanderling (<i>Calidris alba</i>) [A144]</p> <p>Dunlin (<i>Calidris alpina</i>) [A149]</p> <p>Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]</p> <p>Redshank (<i>Tringa totanus</i>) [A162]</p> <p>Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</p> <p>Roseate Tern (<i>Sterna dougallii</i>) [A192]</p> <p>Common Tern (<i>Sterna hirundo</i>) [A193]</p> <p>Arctic Tern (<i>Sterna paradisaea</i>) [A194]</p> <p>Wetland and Waterbirds [A999]</p>
<p>South Dublin Bay SAC (000210)</p> <p>14.5 km southeast of proposed development</p>	<p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for</p>	<p>Mudflats and sandflats not covered by seawater at low tide [1140]</p> <p>Annual vegetation of drift lines [1210]</p> <p>Salicornia and other annuals colonising mud and sand [1310]</p> <p>Embryonic shifting dunes [2110]</p>

	which the SAC has been selected.	
The Rye Water Valley / Carton SAC (001398) 11 km southwest of proposed development	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.	Petrifying springs with tufa formation (Cratoneurion) [7220] Narrow-mouthed Whorl Snail <i>Vertigo angustior</i> [1014] Desmoulin's Whorl Snail <i>Vertigo moulinsiana</i> [1016]
Malahide Estuary SPA 12.5 km northeast of proposed development	To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.	Great Crested Grebe <i>Podiceps cristatus</i> [A005] Brent Goose <i>Branta bernicla hrota</i> [A046] Shelduck <i>Tadorna tadorna</i> [A048] Pintail <i>Anas acuta</i> [A054] Goldeneye <i>Bucephala clangula</i> [A067] Red-breasted Merganser <i>Mergus serrator</i> [A069] Oystercatcher <i>Haematopus ostralegus</i> [A130] Golden Plover <i>Pluvialis apricaria</i> [A140] Grey Plover <i>Pluvialis squatarola</i> [A141] Knot <i>Calidris canutus</i> [A143] Dunlin <i>Calidris alpina alpina</i> [A149] Black-tailed Godwit <i>Limosa limosa</i> [A156] Bar-tailed Godwit <i>Limosa lapponica</i> [A157] Redshank <i>Tringa totanus</i> [A162]
Malahide Estuary SAC 12.5 km northeast of proposed development	To maintain the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.	Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]
	To restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes)[2130]

	has been selected.	
	Qualifying Interest no longer applies	Spartina swards (<i>Spartinion maritima</i>) [1320]
<p>North Bull Island SPA</p> <p>14 km east of proposed development</p>	<p>To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.</p>	<p>Brent Goose <i>Branta bernicla hrota</i> [A046] Shelduck <i>Tadorna tadorna</i> [A048] Teal <i>Anas crecca</i> [A052] Pintail <i>Anas acuta</i> [A054] Shoveler <i>Anas clypeata</i> [A056] Oystercatcher <i>Haematopus ostralegus</i> [A130] Golden Plover <i>Pluvialis apricaria</i> [A140] Grey Plover <i>Pluvialis squatarola</i> [A141] Knot <i>Calidris canutus</i> [A143] Sanderling <i>Calidris alba</i> [A144] Dunlin <i>Calidris alpina alpina</i> [A149] Black-tailed Godwit <i>Limosa limosa</i> [A156] Bar-tailed Godwit <i>Limosa lapponica</i> [A157] Curlew <i>Numenius arquata</i> [A160] Redshank <i>Tringa totanus</i> [A162] Turnstone <i>Arenaria interpres</i> [A169] Black-headed Gull <i>Chroicocephalus ridibundus</i> [A179]</p>
<p>North Dublin Bay SAC</p> <p>12 km east of proposed development</p>	<p>To maintain the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.</p> <p>To restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.</p>	<p>Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330] Petalwort <i>Petalophyllum ralfsii</i> [1395] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</p> <p>Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190]</p>

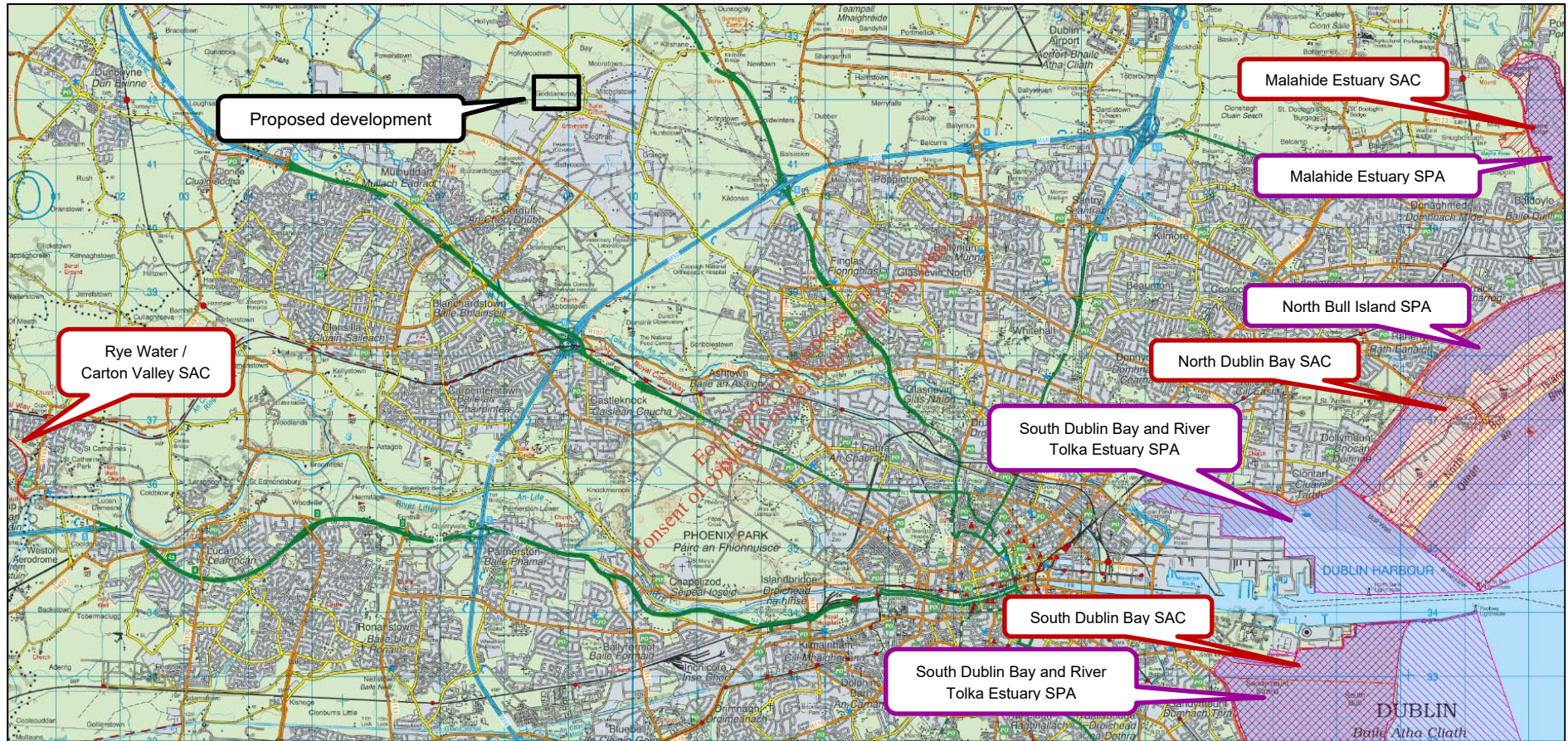


Figure 5.2: European Sites within 15 km of proposed development

5.5 Assessment of Potential Impacts

5.5.1 Hydrological impact pathways

The closest European Site to the proposed development site is 11 km to the southwest, associated with the Rye Water tributary of the River Liffey. There is no hydrological connectivity between the proposed development site and this SAC. Given the absence of a feasible impact pathway between the proposed development site and this SAC, there is no potential for the proposed construction works and operational activities of the FlexGen development to directly impact upon this European Site.

The remainder of the European Sites are associated with the coastal and intertidal habitats of Dublin Bay and Malahide estuary. The proposed development site is located within the surface water catchment of the Tolka River (a very minor unnamed tributary of the Tolka River is located outside the western boundary of the site). This tributary flows west before turning south and joining the Pinkeen River, which discharges to the Tolka River approximately 1.5 km downstream. The Tolka River subsequently flows southeast through the urbanised areas of Dublin before discharging to the Tolka estuary at Fairview. In total, this hydrological connection is approximately 16 km in length.

Given the relatively minor nature of site development works required, the prevailing flat topography of the works area and the large separation distance between the proposed development site and the European Sites associated with Dublin Bay, there is no potential for the proposed construction works and operational activities of the FlexGen development to impact any European Site via a hydrological pathway.

It is also noted that during operation, demineralised water will be required for water injection into the gas turbines for NO_x (Nitrogen Oxides) emissions control. This will be prepared on-site at the proposed water treatment plant, with the raw water being sourced from the mains supply to the site. The volume of water taken from the mains supply is estimated to be 8.3 litres per second during peak demand, with an average demand of 6.0 litres per second.

Demineralised water will be taken from the proposed water treatment plant in the generating station and held in a storage tank. It is expected that the demineralised water will be sprayed into the turbine ignition and will leave through the stack as vapour. The estimated process water discharging from the turbine into the proposed surface water drainage system will be minimal.

As detailed in the Drainage and Services Report, the emissions control system will ensure operational adherence of the water treatment plant in accordance with IED Licence Requirements. It is expected that there will be an annual discharge from the water treatment plant as part of its maintenance. This effluent will be managed in one of the following ways:

Option 1: Discharge to the FlexGen development surface water drainage system subject to a licence granted under Section 4 of the Local Government (Water Pollution) Act, 1977.

Option 2: Effluent to be removed from site in a tanker and disposed of at a licenced waste disposal facility.

In case of any emergencies a shutdown valve will be provided at the discharge point from the treatment plant before entering the proposed drainage network.

As a consequence, the likelihood of significant impacts to any European Site arising as a result of raw water abstraction or subsequent discharges for the production and usage of demineralised water during the FlexGen operational phase is considered to be negligible. **No significant impacts are therefore considered likely.**

5.5.2 Atmospheric impact pathways

To consider the potential for indirect impacts to European Sites as a consequence of atmospheric emissions from the operational FlexGen phase, the Air Dispersion Modelling report (AWN Consulting 2020) was reviewed. As noted in Section 5.3.1 of this report, the proposed FlexGen will operate as a peaking plant and comprises an aero-derivative gas turbine which will run primarily on natural gas with a dual-fuel ability to run on diesel as a back-up fuel source.

The air dispersion modelling input data consisted of information on the physical environment (including existing and proposed building dimensions and terrain features), design details and estimated process emissions data for the proposed FlexGen plant and five years of appropriate hourly meteorological data. Using this input data the model predicted ambient ground level concentrations beyond the site boundary for each hour of the modelled meteorological years. The model post-processed the data to identify the location and maximum of the worst-case ground level concentration. This worst-case concentration was then added to the background concentration to give the worst-case predicted environmental concentration (PEC). The PEC was then compared with the relevant ambient air quality limit value to assess the significance of impacts associated with the proposed emissions from the site. Throughout the study a worst-case approach was taken for both fuel types.

Natural Gas Worst-case Scenario: Assumes that the proposed FlexGen operates for every hour of the year running on natural gas. This is an unrealistic scenario that has been modelled to ensure all possible meteorological conditions over the course of each year have been considered.

Under this scenario, for NO₂ the results indicate that the ambient ground level concentrations are below the relevant air quality limit values for NO₂. Emissions from the facility including background lead to an ambient NO₂ concentration which is 36% of the maximum 1-hour limit value (measured as a 99.8th percentile) and 46% of the annual limit value at the worst-case off-site receptor for the worst-case year modelled (2018). Contours of annual NO₂ concentration are seen to fall below 0.05 ug/m³ within 2.5 km east of the FlexGen site. Consequently, any increase in concentrations of NO₂ at the respective European Sites (all over 10 km from the FlexGen site) is considered to be negligible. **No significant impacts are therefore considered likely.**

The CO modelling results for the Worst-case Gas Scenario indicate that the ambient ground level concentrations are below the relevant air quality limit value for CO. Emissions from the facility including background lead to an ambient CO concentration which is 31.2% of the maximum 8-hour limit value at the worst-case off-site receptor for the worst-case year modelled (2015). The contribution of CO emissions from the proposed FlexGen plant to the ambient off-site concentrations are considered to be insignificant when compared with the limit value. Consequently, any increase in concentrations of CO at the respective European Sites (all over 10 km from the FlexGen site) is considered to be negligible. **No significant impacts are therefore considered likely.**

Diesel Worst-case Scenario: Assumes that the proposed FlexGen plant operates for 1,000 hours per year running on diesel. This represents an unrealistic scenario as the proposed FlexGen plant will only operate on diesel in the unlikely event of an interruption to the natural gas supply to the site which would likely be resolved within a few hours.

The modelling results for the Worst-case Diesel Scenario demonstrate that ambient pollutant concentrations (including background) beyond the site ownership boundary are well below the applicable ambient air quality limit values at all off-site receptors modelled for all pollutants assessed. Consequently, any increase in diesel fuel-related pollutants at the respective European Sites (all over 10 km from the FlexGen site) is considered to be negligible. **No significant impacts are therefore considered likely.**

5.6 Potential In-Combination Effects

In order to take account of in-combination or cumulative effects, plans and projects that are completed, approved but uncompleted, or proposed (but not yet approved) should be considered in this context (European Commission, 2001).

The proposed FlexGen will require two grid connections, namely an electrical grid connection and a gas grid connection. The location of the proposed FlexGen is proximal to both distribution grids and as a consequence the connection routes are relatively short and will not require significant development works. No actively flowing watercourses are transected by the proposed grid connection routes. Planning drawing QP000032-01-D460-003-001-001, which shows the grid connection routes is reproduced in **Appendix 3** of this report.

The electrical grid connection will comprise an underground cable extending from the northern side of the FlexGen site to the western side corner of the Corduff 220 kV substation. One of two potential route options will be followed, entering the substation through the southern boundary, or running along the western perimeter fence and entering the compound from the northwestern corner. The underground cable will be installed using standard trenching and ducting methods during the main construction phase of the FlexGen project. Given the restricted spatial nature of the electrical grid connection trench, **it is not considered that its construction and operation will lead to any significant in-combination effects on any European Sites.**

The gas grid connection will comprise a new main extending from the roundabout at the entrance to the ESB Ballycoolin Stores property. The main will be installed using standard trenching and ducting. One of two potential route options will be followed, the first following the Ballycoolin Stores property fenceline (outside the mature treeline), with the alternative option running north along the Corduff Road before turning west at the main site entrance and following the proposed access road. Both options terminate in the southeastern corner of the development site. The gas main will be installed during the main construction phase of the FlexGen project. Given the restricted spatial nature of the gas grid connection trench, **it is not considered that its construction and operation will lead to any significant in-combination effects on any European Sites.**

The currently undeveloped lands to the north of Corduff substation are zoned C6 (Mixed/general commercial/industrial/enterprise uses) and R1 (New/proposed residential); these are expected to be developed in the coming years. Development works are currently underway in the lands due west of the FlexGen site, as part of a large biopharma campus. Adjacent developments (under construction or permitted/proposed) have also been subject to Screening for AA, the respective reports of which also conclude no likely significant effects to European Sites.

There may be some temporal overlap in the works associated with the FlexGen development and the current and proposed developments in the immediate locality. However, given the contained footprint of the FlexGen development and the relatively minor scale of the works associated with the construction, in-combination impacts are considered to be negligible, particularly given the considerable separation distance noted in Section 5.4.

5.7 Conclusion of the Screening Report

Given the contained nature of the proposed development, the separation distance from European Sites and the absence of any significant impact pathways, the proposed development is not expected to have a negative impact on any European Sites.

This AA Screening Report has established that the proposed development is not likely to have any significant effects on the Conservation Objectives of any European Site, alone or in combination with other projects or plans. Therefore, an Appropriate Assessment is not required for the proposed development.

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Appendix 1 – NPWS Site Synopses

SITE NAME: SOUTH DUBLIN BAY AND RIVER TOLKA ESTUARY SPA

SITE CODE: 004024

The South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included.

In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. There is a bed of Dwarf Eelgrass (*Zostera noltii*) below Merrion Gates which is the largest stand on the east coast. Green algae (*Ulva* spp.) are distributed throughout the area at a low density. The macro-invertebrate fauna is well-developed, and is characterised by annelids such as Lugworm (*Arenicola marina*), *Nephtys* spp. and Sand Mason (*Lanice conchilega*), and bivalves, especially Cockle (*Cerastoderma edule*) and Baltic Tellin (*Macoma balthica*). The small gastropod Spire Shell (*Hydrobia ulvae*) occurs on the muddy sands off Merrion Gates, along with the crustacean *Corophium volutator*. Sediments in the Tolka Estuary vary from soft, mixotrophic muds with a high organic content in the inner estuary to exposed, well-aerated sands off the Bull Wall. The site includes Booterstown Marsh, an enclosed area of saltmarsh and muds that is cut off from the sea by the Dublin/Wexford railway line, being linked only by a channel to the east, the Nutley stream. Sea water incursions into the marsh occur along this stream at high tide. An area of grassland at Poolbeg, north of Irishtown Nature Park, is also included in the site.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern and Arctic Tern. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of the SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is an important site for wintering waterfowl, being an integral part of the internationally important Dublin Bay complex – all counts for wintering waterbirds are five year mean peaks for the period 1995/96 to 1999/2000. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. An internationally important population of Light-bellied Brent Goose (368) occurs regularly and newly arrived birds in the autumn feed on the Eelgrass bed at Merrion. At the time of designation the site supported nationally important numbers of a further nine species: Oystercatcher (1,145), Ringed Plover (161), Grey Plover (45), Knot

(548), Sanderling (321), Dunlin (1,923), Bar-tailed Godwit (766), Redshank (260) and Black-headed Gull (3,040). Other species occurring in smaller numbers include Great Crested Grebe (21), Curlew (127) and Turnstone (52). Little Egret, a species which has recently colonised Ireland, also occurs at this site.

South Dublin Bay is a significant site for wintering gulls, with a nationally important population of Black-headed Gull, but also Common Gull (330) and Herring Gull (348). Mediterranean Gull is also recorded from here, occurring through much of the year, but especially in late winter/spring and again in late summer into winter.

Both Common Tern and Arctic Tern breed in Dublin Docks, on a man-made mooring structure known as the E.S.B. dolphin – this is included within the site. Small numbers of Common Tern and Arctic Tern were recorded nesting on this dolphin in the 1980s. A survey in 1995 recorded nationally important numbers of Common Tern nesting here (52 pairs). The breeding population of Common Tern at this site has increased, with 216 pairs recorded in 2000. This increase was largely due to the ongoing management of the site for breeding terns. More recent data highlights this site as one of the most important Common Tern sites in the country with over 400 pairs recorded here in 2007.

South Dublin Bay is an important staging/passage site for a number of tern species in the autumn (mostly late July to September). The origin of many of the birds is likely to be the Dublin breeding sites (Rockabill and the Dublin Docks) though numbers suggest that the site is also used by birds from other sites, perhaps outside the state. This site is selected for designation for its autumn tern populations: Roseate Tern (2,000 in 1999), Common Tern (5,000 in 1999) and Arctic Tern (20,000 in 1996).

The South Dublin Bay and River Tolka Estuary SPA is of ornithological importance as it supports an internationally important population of Light-bellied Brent Goose and nationally important populations of a further nine wintering species. Furthermore, the site supports a nationally important colony of breeding Common Tern and is an internationally important passage/staging site for three tern species. It is of note that four of the species that regularly occur at this site are listed on Annex I of the E.U. Birds Directive, i.e. Bar-tailed Godwit, Common Tern, Arctic Tern and Roseate Tern. Sandymount Strand/Tolka Estuary is also a Ramsar Convention site.

Site Name: South Dublin Bay SAC**Site Code: 000210**

This site lies south of the River Liffey in Co. Dublin, and extends from the South Wall to the west pier at Dun Laoghaire. It is an intertidal site with extensive areas of sand and mudflats. The sediments are predominantly sands but grade to sandy muds near the shore at Merrion Gates. The main channel which drains the area is Cockle Lake.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats

[1210] Annual vegetation of drift lines

[1310] Salicornia and other annuals colonising mud and sand

[2110] Embryonic shifting dunes

The bed of Dwarf Eelgrass (*Zostera noltii*) found below Merrion Gates is the largest stand on the east coast. Green algae (*Enteromorpha* spp. and *Ulva lactuca*) are distributed throughout the area at a low density. Furoid algae occur on the rocky shore in the Maretimo to Dún Laoghaire area. Species include *Fucus spiralis*, *F. vesiculosus*, *F. serratus*, *Ascophyllum nodosum* and *Pelvetia canaliculata*.

Several small, sandy beaches with incipient dune formation occur in the northern and western sectors of the site, notably at Poolbeg, Irishtown and Merrion/ Booterstown. The formation at Booterstown is very recent. Drift line vegetation occurs in association with the embryonic and incipient fore dunes. Typically drift lines occur in a band approximately 5 m wide, though at Booterstown this zone is wider in places. The habitat occurs just above the High Water Mark and below the area of embryonic dune. Species present are Sea Rocket (*Cakile maritima*), Frosted Orache (*Atriplex laciniata*), Spear-leaved Orache (*A. prostrata*), Prickly Saltwort (*Salsola kali*) and Fat Hen (*Chenopodium album*). Also occurring is Sea Sandwort (*Honkenya peploides*), Sea Beet (*Beta vulgaris* subsp. *maritima*) and Annual Sea-blite (*Suaeda maritima*). A small area of pioneer saltmarsh now occurs in the lee of an embryonic sand dune just north of Booterstown Station. This early stage of saltmarsh development is here characterised by the presence of pioneer stands of glassworts (*Salicornia* spp.) occurring below an area of drift line vegetation. As this is of very recent origin, it covers a small area but ample areas of substrate and shelter are available for the further development of this habitat.

Lugworm (*Arenicola marina*), Cockles (*Cerastoderma edule*) and annelids and other bivalves are frequent throughout the site. The small gastropod *Hydrobia ulvae* occurs on the muddy sands off Merrion Gates.

South Dublin Bay is an important site for waterfowl. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. The principal species are Oystercatcher (1215), Ringed Plover (120), Sanderling (344), Dunlin (2628) and Redshank (356) (average winter peaks 1996/97 and 1997/98). Up to 100 Turnstones are usual in the south bay during winter. Brent Goose regularly occur in numbers of international importance (average peak 299). Bar-tailed Godwit (565), a species listed on Annex I of the E.U. Birds Directive, also occur.

Large numbers of gulls roost in South Dublin Bay, e.g. 4,500 Black-headed Gulls in February 1990; 500 Common Gulls in February 1991. It is also an important tern roost in the autumn, regularly holding 2000-3000 terns including Roseate Terns, a species listed on Annex I of the E.U. Birds Directive. South Dublin Bay is largely protected as a Special Protection Area.

At low tide the inner parts of the south bay are used for amenity purposes. Bait-digging is a regular activity on the sandy flats. At high tide some areas have wind-surfing and jet-skiing.

This site is a fine example of a coastal system, with extensive sand and mudflats, and incipient dune formations. South Dublin Bay is also an internationally important bird site.

Site Name: North Dublin Bay SAC

Site Code: 000206

This site covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. The North Bull Island is the focal point of this site.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats

[1210] Annual Vegetation of Drift Lines

[1310] *Salicornia* Mud

[1330] Atlantic Salt Meadows

[1410] Mediterranean Salt Meadows

[2110] Embryonic Shifting Dunes

[2120] Marram Dunes (White Dunes)

[2130] Fixed Dunes (Grey Dunes)*

[2190] Humid Dune Slacks

[1395] Petalwort (*Petalophyllum ralfsii*)

North Bull Island is a sandy spit which formed after the building of the South Wall and Bull Wall in the 18th and 19th centuries. It now extends for about 5 km in length and is up to 1 km wide in places. A well-developed and dynamic dune system stretches along the seaward side of the island. Various types of dunes occur, from fixed dune grassland to pioneer communities on foredunes. Marram Grass (*Ammophila arenaria*) is dominant on the outer dune ridges, with Lyme-grass (*Leymus arenarius*) and Sand Couch (*Elymus farctus*) on the foredunes. Behind the first dune ridge, plant diversity increases with the appearance of such species as Wild Pansy (*Viola tricolor*), Kidney Vetch (*Anthyllis vulneraria*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Restharrow (*Ononis repens*), Yellow-rattle (*Rhinanthus minor*) and Pyramidal Orchid (*Anacamptis pyramidalis*). In these grassy areas and slacks, the scarce Bee Orchid (*Ophrys apifera*) occurs.

About 1 km from the tip of the island, a large dune slack with a rich flora occurs, usually referred to as the 'Alder Marsh' because of the presence of Alder trees (*Alnus glutinosa*). The water table is very near the surface and is only slightly brackish. Saltmarsh Rush (*Juncus maritimus*) is the dominant species, with Meadowsweet (*Filipendula ulmaria*) and Devil's-bit Scabious (*Succisa pratensis*) being frequent. The orchid flora is notable and includes Marsh Helleborine (*Epipactis palustris*), Common Twayblade (*Listera ovata*), Autumn Lady's-tresses (*Spiranthes spiralis*) and Marsh Orchids (*Dactylorhiza* spp.).

Saltmarsh extends along the length of the landward side of the island. The edge of the marsh is marked by an eroding edge which varies from 20 cm to 60 cm high. The marsh can be zoned into different levels according to the vegetation types present. On the lower marsh, Glasswort (*Salicornia europaea*), Common Saltmarsh-grass (*Puccinellia maritima*), Annual Sea-blite (*Suaeda maritima*) and Greater Sea-spurrey (*Spergularia media*) are the main species. Higher up in the middle marsh Sea Plantain (*Plantago maritima*), Sea Aster (*Aster tripolium*), Sea Arrowgrass (*Triglochin maritima*) and Thrift (*Armeria maritima*) appear. Above the mark of the normal high tide, species such as Common Scurvygrass (*Cochlearia officinalis*) and Sea Milkwort (*Glaux maritima*) are found, while on the extreme upper marsh, the rushes *Juncus maritimus* and *J. gerardi* are dominant. Towards the tip of the island, the saltmarsh grades naturally into fixed dune vegetation.

The habitat 'annual vegetation of drift lines' is found in places, along the length of Dollymount Strand, with species such as Sea Rocket (*Cakile maritima*), Oraches (*Atriplex* spp.) and Prickly Saltwort (*Salsola kali*).

The island shelters two intertidal lagoons which are divided by a solid causeway. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. The north lagoon has an area known as the "Salicornia flat", which is dominated by *Salicornia dolichostachya*, a pioneer glasswort species, and covers about 25 ha. Beaked Tasselweed (*Ruppia maritima*) occurs in this area, along with some Narrow-leaved Eelgrass (*Zostera angustifolia*). Dwarf Eelgrass (*Z. noltii*) also occurs in Sutton Creek. Common Cordgrass (*Spartina anglica*) occurs in places but

its growth is controlled by management. Green algal mats (*Enteromorpha* spp., *Ulva lactuca*) cover large areas of the flats during summer. These sediments have a rich macrofauna, with high densities of Lugworms (*Arenicola marina*) in parts of the north lagoon. Mussels (*Mytilus edulis*) occur in places, along with bivalves such as *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*. The small gastropod *Hydrobia ulvae* occurs in high densities in places, while the crustaceans *Corophium volutator* and *Carcinus maenas* are common. The sediments on the seaward side of North Bull Island are mostly sands. The site extends below the low spring tide mark to include an area of the sublittoral zone.

Three rare plant species which are legally protected under the Flora (Protection) Order, 1999 have been recorded on the North Bull Island. These are Lesser Centaury (*Centaureum pulchellum*), Red Hemp-nettle (*Galeopsis angustifolia*) and Meadow Saxifrage (*Saxifraga granulata*). Two further species listed as threatened in the Red Data Book, Wild Clary/Sage (*Salvia verbenaca*) and Spring Vetch (*Vicia lathyroides*), have also been recorded. A rare liverwort, *Petalophyllum ralfsii*, was first recorded from the North Bull Island in 1874 and has recently been confirmed as still present. This species is of high conservation value as it is listed on Annex II of the E.U. Habitats Directive. The North Bull is the only known extant site for the species in Ireland away from the western seaboard.

North Dublin Bay is of international importance for waterfowl. During the 1994/95 to 1996/97 period the following species occurred in internationally important numbers (figures are average maxima): Brent Goose 2,333; Knot 4,423; Bar-tailed Godwit 1,586. A further 14 species occurred in nationally important concentrations - Shelduck 1505; Wigeon 1,166; Teal 1,512; Pintail 334; Shoveler 239; Oystercatcher 2,190; Ringed Plover 346; Grey Plover 816; Sanderling 357; Dunlin 6,238; Black-tailed Godwit 156; Curlew 1,193; Turnstone 197 and Redshank 1,175. Some of these species frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes (mostly Brent Goose, Oystercatcher, Ringed Plover, Sanderling and Dunlin).

The tip of the North Bull Island is a traditional nesting site for Little Tern. A high total of 88 pairs nested in 1987. However, nesting attempts have not been successful since the early 1990s. Ringed Plover, Shelduck, Mallard, Skylark, Meadow Pipit and Stonechat also nest. A well-known population of Irish Hare is resident on the island

The invertebrates of the North Bull Island have been studied and the island has been shown to contain at least seven species of regional or national importance in Ireland (from the Orders Diptera, Hymenoptera and Hemiptera).

The main land uses of this site are amenity activities and nature conservation. The North Bull Island is the main recreational beach in Co. Dublin and is used throughout the year. Much of the land surface of the island is taken up by two golf courses. Two separate Statutory Nature Reserves cover much of the island east of the Bull Wall and the surrounding intertidal flats. The site is used regularly for educational purposes. North Bull Island has been designated a Special Protection Area under the E.U. Birds Directive and it is also a statutory Wildfowl Sanctuary, a Ramsar Convention site, a Biogenetic Reserve, a Biosphere Reserve and a Special Area Amenity Order site.

This site is an excellent example of a coastal site with all the main habitats represented. The site holds good examples of nine habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a numbers of rare and scarce plants including some which are legally protected. Its proximity to the capital city makes North Dublin Bay an excellent site for educational studies and research.

Site Name: Malahide Estuary SAC**Site Code: 000205**

Malahide Estuary is situated immediately north of Malahide and east of Swords in Co. Dublin. It is the estuary of the River Broadmeadow. The site is divided by a railway viaduct which was built in the 1800s.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats

[1310] *Salicornia* Mud

[1330] Atlantic Salt Meadows

[1410] Mediterranean Salt Meadows

[2120] Marram Dunes (White Dunes)

[2130] Fixed Dunes (Grey Dunes)*

The outer part of the estuary is mostly cut off from the sea by a large sand spit, known as 'the island'. The outer estuary drains almost completely at low tide, exposing sand and mud flats. There is a large bed of Eelgrass (Dwarf Eelgrass, *Zostera noltii*, and Narrow-leaved Eelgrass, *Z. angustifolia*) in the north section of the outer estuary, along with Beaked Tasselweed (*Ruppia maritima*) and extensive mats of green algae (*Enteromorpha* spp., *Ulva lactuca*). Common Cord-grass (*Spartina anglica*) is also widespread in this sheltered part of the estuary.

The dune spit has a well developed outer dune ridge dominated by Marram Grass (*Ammophila arenaria*). The dry areas of the stabilised dunes have a dense covering of Burnet Rose (*Rosa pimpinellifolia*), Red Fescue (*Festuca rubra*) and species such as Yellow-wort (*Blackstonia perfoliata*), Autumn Gentian (*Gentianella amarella*), Hound's-tongue (*Cynoglossum officinale*), Carline Thistle (*Carlina vulgaris*) and Pyramidal Orchid (*Anacamptis pyramidalis*). Much of the interior of the spit is taken up by a golf course. The inner stony shore has frequent Sea-holly (*Eryngium maritimum*). Well-developed saltmarshes occur at the tip of the spit. Atlantic salt meadow is the principle type and is characterised by species such as Sea-purslane (*Halimolobos portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Arrowgrass (*Triglochin maritima*) and Common Saltmarsh-grass (*Puccinellia*

maritima). Elsewhere in the outer estuary, a small area of Mediterranean salt meadow occurs which is characterised by the presence of Sea Rush (*Juncus maritimus*). Below the salt marshes there are good examples of pioneering glasswort (*Salicornia* spp.) swards and other annual species, typified by *S. dolichostachya* and Annual Sea-blite (*Suaeda maritima*).

The inner estuary does not drain at low tide apart from the extreme inner part. Here, patches of saltmarsh and salt meadows occur, with Sea Aster, Sea Plantain (*Plantago maritima*) and Sea Club-rush (*Scirpus maritimus*). Beaked Tasselweed occurs in one of the channels.

The site includes a fine area of rocky shore south-east of Malahide and extending towards Portmarnock. This represents the only continuous section through the fossiliferous Lower Carboniferous rocks in the Dublin Basin, and is the type locality for several species of fossil coral.

The estuary is an important wintering bird site and holds an internationally important population of Brent Goose and nationally important populations of a further 15 species. Average maximum counts during the 1995/96-1997/98 period were: Brent Goose 1217; Great Crested Grebe 52; Mute Swan 106; Shelduck 471; Pochard 200; Goldeneye 333; Red-breasted Merganser 116; Oystercatcher 1228; Golden Plover 2123; Grey Plover 190; Redshank 454; Wigeon 50; Teal 78; Ringed Plover 106; Knot 858; Dunlin 1474; Greenshank 38; Pintail 53; Black-tailed Godwit 345; Bar-tailed Godwit 99. The high numbers of diving birds reflects the lagoon-type nature of the inner estuary.

The estuary also attracts migrant species such as Ruff, Curlew Sandpiper, Spotted Redshank and Little Stint. Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of the island and the habitat remains suitable for these birds.

The inner part of the estuary is heavily used for water sports. A section of the outer estuary has recently been infilled for a marina and housing development.

This site is a fine example of an estuarine system with all the main habitats represented. The site is important ornithologically, with a population of Brent Goose of international significance.

Site Name: Rye Water Valley/Carton SAC

Site Code: 001398

Rye Water Valley/Carton SAC is located between Leixlip and Maynooth, in Counties Meath and Kildare, and extends along the Rye Water, a tributary of the River Liffey.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[7220] Petrifying Springs*

[1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*)

[1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)

The Rye Water in Carton Estate is dammed at intervals, creating a series of lakes. Reed Sweet-grass (*Glyceria maxima*) is frequent around the lakes, along with Yellow Iris (*Iris pseudacorus*), Reed Canary-grass (*Phalaris arundinacea*), Bulrush (*Typha latifolia*), Water Forget-me-not (*Myosotis scorpioides*), Marsh-marigold (*Caltha palustris*) and starworts (*Callitriche* spp.). Along the remainder of the site the river has been dredged and much of the reed fringe removed.

To the north-west of Carton Bridge a small clump of willows (*Salix* spp.), with dogwood (*Cornus* sp.), Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*) and Elder (*Sambucus nigra*) occurs. The ground flora found here includes Golden Saxifrage (*Chrysosplenium oppositifolium*), Meadowsweet (*Filipendula ulmaria*), Common Valerian (*Valeriana officinalis*), Wavy Bitter-cress (*Cardamine flexuosa*) and Bittersweet (*Solanum dulcamara*).

The woods on Carton Estate are mostly old demesne woods with both deciduous and coniferous species. Conifers, including some Yew (*Taxus baccata*) – a native species, are dominant, with Beech (*Fagus sylvatica*), oak (*Quercus* sp.), Sycamore (*Acer pseudoplatanus*), Ash and Hazel (*Corylus avellana*) also occurring. The ground flora is dominated by Ivy (*Hedera helix*), with such species as Hedge Woundwort (*Stachys sylvatica*), Wood Speedwell (*Veronica montana*), Woodruff (*Galium odoratum*), Wood Avens (*Geum urbanum*), Common Dog-violet (*Viola riviniana*), Wild Angelica (*Angelica sylvestris*), Ramsons (*Allium ursinum*), Ground-ivy (*Glechoma hederacea*) and Ivy Broomrape (*Orobanche hederae*) also found.

Hairy St. John's-wort (*Hypericum hirsutum*), a species legally protected under the Flora (Protection) Order, 1999, occurs in Carton Estate and there is an old record from the estate for the similarly protected Hairy Violet (*Viola hirta*). However, this latter species has not been recorded from the site in recent years. Another species listed in the Red Data Book, Green Figwort (*Scrophularia umbrosa*), occurs on the site in several locations by the Rye Water. The woods at Carton Demesne are the site of a rare Myxomycete fungus, *Diderma deplanatum*.

The marsh, mineral spring and seepage area found at Louisa Bridge supports a good diversity of plant species, including stoneworts, Marsh Arrowgrass (*Triglochin palustris*), Purple Moor-grass (*Molinea caerulea*), sedges (*Carex* spp.), Common Butterwort (*Pinguicula vulgaris*), Marsh Lousewort (*Pedicularis palustris*), Grass-of-parnassus (*Parnassia palustris*) and Cuckooflower (*Cardamine pratensis*). The mineral spring found at the site is of a type considered to be rare in Europe and is a habitat listed on Annex I of the E.U. Habitats Directive. The Red Data Book species Blue Fleabane (*Erigeron acer*) is found growing on a wall at Louisa Bridge.

Within the woods, Blackcap, Woodcock and Long-eared Owl have been recorded. Little Grebe, Coot, Moorhen, Tufted Duck, Teal and Kingfisher, the latter a species listed on Annex I of the E.U. Birds Directive, occur on and about the lake.

The Rye Water is also a spawning ground for Trout and Salmon, and the rare, White-clawed Crayfish (*Austropotamobius pallipes*) has been recorded at Leixlip. The latter two species are listed on Annex II of the E.U. Habitats Directive. The rare Narrow-mouthed Whorl Snail and Desmoulin's Whorl Snail occur in marsh vegetation near

Louisa Bridge. Both are rare in Ireland and in Europe, and are listed on Annex II of the E.U. Habitats Directive. The scarce dragonfly, *Orthetrum coerulescens*, has also been recorded at Louisa Bridge.

The conservation importance of the site lies in the presence of several rare and threatened plant and animal species, and the presence of petrifying springs, a habitat type listed on Annex I of the E.U. Habitats Directive. The woods found on Carton Estate and their birdlife are of additional interest.

SITE NAME: MALAHIDE ESTUARY SPA

SITE CODE: 004025

Malahide Estuary is situated in north Co. Dublin, between the towns of Malahide and Swords. The site encompasses the estuary, saltmarsh habitats and shallow subtidal areas at the mouth of the estuary. A railway viaduct, built in the 1800s, crosses the site and has led to the inner estuary becoming lagoonal in character and only partly tidal. Much of the outer part of the estuary is well-sheltered from the sea by a large sand spit, known as "The Island". This spit is now mostly converted to golf-course. The outer part empties almost completely at low tide and there are extensive intertidal flats exposed. Substantial stands of eelgrass (both *Zostera noltii* and *Z. angustifolia*) occur in the sheltered part of the outer estuary, along with Tasselweed (*Ruppia maritima*). Green algae, mostly *Ulva* spp., are frequent on the sheltered flats. Common Cord-grass (*Spartina anglica*) is well established in the outer estuary and also in the innermost part of the site. The intertidal flats support a typical macro-invertebrate fauna, with polychaete worms (*Arenicola marina* and *Hediste diversicolor*), bivalves such as *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*, the small gastropod *Hydrobia ulvae* and the crustacean *Corophium volutator*. Salt marshes, which provide important roosts during high tide, occur in parts of the outer estuary and in the extreme inner part of the inner estuary. These are characterised by such species as Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Arrowgrass (*Triglochin maritima*) and Common Saltmarsh-grass (*Puccinellia maritima*).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Great Crested Grebe, Light-bellied Brent Goose, Shelduck, Pintail, Goldeneye, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit and Redshank. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

This site is of high importance for wintering waterfowl and supports a particularly good diversity of species. It has internationally important populations of Light-

bellied Brent Goose (1,104 individuals or 5% of the all-Ireland total) and Black-tailed Godwit (409 individuals or 2.9% of the all-Ireland total) - figures given here and below are mean peaks for the five winters 1995/96-1999/2000. Furthermore, the site supports nationally important populations of an additional 12 species: Great Crested Grebe (63), Shelduck (439), Pintail (58), Goldeneye (215), Red-breasted Merganser (99), Oystercatcher (1,360), Golden Plover (1,843), Grey Plover (201), Knot (915), Dunlin (1,594), Bar-tailed Godwit (156) and Redshank (581). The high numbers of diving ducks reflects the lagoon-type nature of the inner estuary, and this is one of the few sites in eastern Ireland where substantial numbers of Goldeneye can be found. A range of other species occurs, including Mute Swan (37), Pochard (36), Ringed Plover (86), Lapwing (1,542), Curlew (548), Greenshank (38) and Turnstone (112).

The estuary also attracts other migrant wader species such as Ruff, Curlew Sandpiper, Spotted Redshank and Little Stint. These occur mainly in autumn, though occasionally in spring and winter.

Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of Malahide Island. Grey Herons breed nearby and feed regularly within the site.

Malahide Estuary SPA is a fine example of an estuarine system, providing both feeding and roosting areas for a range of wintering waterfowl. The lagoonal nature of the inner estuary is of particular value as it increases the diversity of birds which occur. The site is of high conservation importance, with internationally important populations of Light-bellied Brent Goose and Black-tailed Godwit, and nationally important populations of a further 12 species. Two of the species which occur regularly (Golden Plover and Bar-tailed Godwit) are listed on Annex I of the E.U. Birds Directive. Malahide Estuary (also known as Broadmeadow Estuary) is a Ramsar Convention site.

23.8.2013

SITE NAME: NORTH BULL ISLAND SPA

SITE CODE: 004006

This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5 km long and 1 km wide and runs parallel to the coast between Clontarf and Sutton. Part of the interior of the island has been converted to golf courses.

Saltmarsh extends along the length of the landward side of the island and provides the main roost site for wintering birds in Dublin Bay. The island shelters

two intertidal lagoons which are divided by a solid causeway. These lagoons provide the main feeding grounds for the wintering waterfowl. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. Green algal mats (*Ulva* spp.) are a feature of the flats during summer. These sediments have a rich macro-invertebrate fauna, with high densities of Lugworm (*Arenicola marina*) and Ragworm (*Hediste diversicolor*).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone and Black-headed Gull. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The North Bull Island SPA is of international importance for waterfowl on the basis that it regularly supports in excess of 20,000 waterfowl. The site supports internationally important populations of three species, Light-bellied Brent Goose (1,548), Black-tailed Godwit (367) and Bar-tailed Godwit (1,529) - all figures are mean peaks for the five winters between 1995/96 and 1999/2000. The site is one of the most important in the country for Light-bellied Brent Goose. A further 14 species have populations of national importance – Shelduck (1,259), Teal (953), Pintail (233), Shoveler (141), Oystercatcher (1,784), Grey Plover (517), Golden Plover (2,033), Knot (2,837), Sanderling (141), Dunlin (4,146), Curlew (937), Redshank (1,431), Turnstone (157) and Black-headed Gull (2,196). The populations of Pintail and Knot are of particular note as they comprise 14% and 10% respectively of the all-Ireland population totals. Other species that occur regularly in winter include Grey Heron, Little Egret, Cormorant, Wigeon, Goldeneye, Red-breasted Merganser, Ringed Plover and Greenshank. Gulls are a feature of the site during winter and, along with the nationally important population of Black-headed Gull (2,196), other species that occur include Common Gull (332) and Herring Gull (331). While some of the birds also frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes, the majority remain within the site for much of the winter. The wintering bird populations have been monitored more or less continuously since the late 1960s and the site is now surveyed each winter as part of the larger Dublin Bay complex.

The North Bull Island SPA is a regular site for passage waders, especially Ruff, Curlew Sandpiper and Spotted Redshank. These are mostly observed in single figures in autumn but occasionally in spring or winter.

The site formerly had an important colony of Little Tern but breeding has not occurred in recent years. Several pairs of Ringed Plover breed, along with Shelduck in some years. Breeding passerines include Skylark, Meadow Pipit,

Stonechat and Reed Bunting. The island is a regular wintering site for Short-eared Owl, with up to 5 present in some winters.

The North Bull Island SPA is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Light-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit that use it. Also of significance is the regular presence of several species that are listed on Annex I of the E.U. Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl. North Bull Island is a Ramsar Convention site, and part of the North Bull Island SPA is a Statutory Nature Reserve and a Wildfowl Sanctuary.

25.3.2014

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Appendix 2 – Site Photos



Site Photo 1: Eastern periphery of site and access road (Compartment 1)



Site Photo 2: Planted willow woodland with negligible ground cover (Compartment 2)



Site Photo 3: Southwestern periphery of site (mature treeline to be retained) (Compartment 2)



Site Photo 4: Open area comprising ruderal vegetation (Compartment 3)

Appendix 3 – Electricity and gas grid connection routes

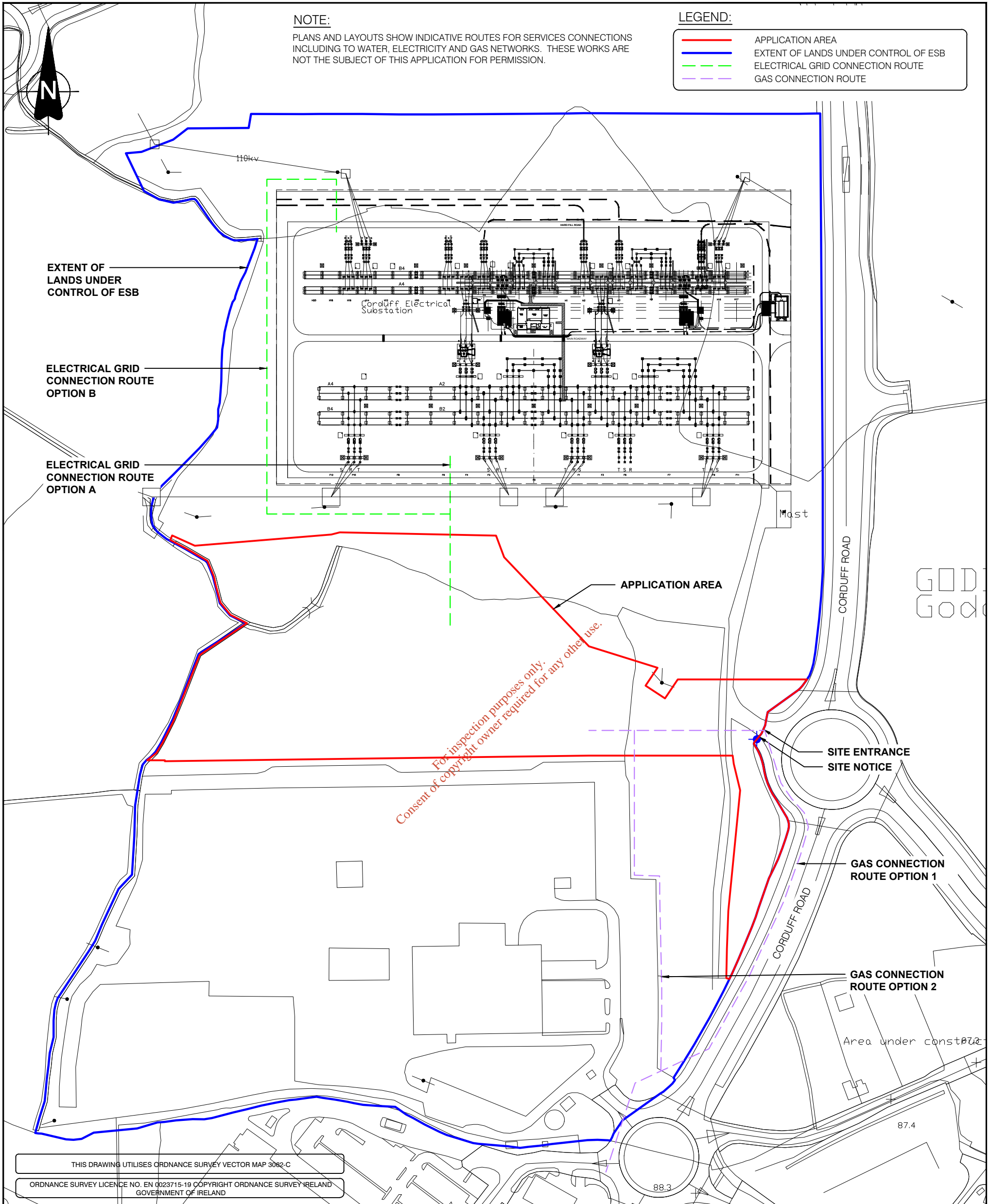
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NOTE:

PLANS AND LAYOUTS SHOW INDICATIVE ROUTES FOR SERVICES CONNECTIONS INCLUDING TO WATER, ELECTRICITY AND GAS NETWORKS. THESE WORKS ARE NOT THE SUBJECT OF THIS APPLICATION FOR PERMISSION.

LEGEND:

- APPLICATION AREA
- EXTENT OF LANDS UNDER CONTROL OF ESB
- - - ELECTRICAL GRID CONNECTION ROUTE
- - - GAS CONNECTION ROUTE



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Rev	Date	Revision description	Drn.	Prod.	Ver.	App.
1	20.03.20	UPDATED, RE-ISSUED FOR PLANNING	SB	SB	AM	JMcL
0	25.06.19	ISSUED FOR PLANNING	SB	SB	MH	HOK

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Client ref.		No. of sheets 1	Size A3	Scale 1:2500

Drawing title
**SITE LOCATION MAP
 (1:2500)**

Client
GENERATION AND TRADING

Project
CORDUFF FLEXGEN PROJECT

Contract

Production unit
Civil & Environmental Engineering

Drawing Number
QP000032-01-D460-003-001-001