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GATEWAY ENERGY CENTRE

NON-TECHNICAL SUMMARY OF THE 2019 ENVIRONMENTAL STATEMENT

FURTHER INFORMATION DOCUMENT

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GATEWAY ENERGY CENTRE

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CONTENTS

LIST OF ABBREVIATIONS

AGI	Above Ground Installation
BEIS	Department for Business, Energy and Industrial Strategy
BESS	Battery Energy Storage System
CCGT	Combined Cycle Gas Turbine
CCR	Carbon Capture Readiness
CCS	Carbon Capture and Storage
CEMP	Construction Environmental Management Plan
DCLG	Department for Communities and Local Government
DEMP	Decommissioning Environmental Management Plan
EIA	Environmental Impact Assessment
ES	Environmental Statement
ES FID	Environmental Statement Further Information Document
GEC	Gateway Energy Centre
GECL	Gateway Energy Centre Limited
ha	hectares
HRSG	Heat Recovery Steam Generator
LCV	Lower Calorific Value
LPA	Local Planning Authority
NO_x	nitrogen oxides
OCGT	Open Cycle Gas Turbine
OS	Ordnance Survey
TTGDC	Thurrock Thames Gateway Development Corporation

1. INTRODUCTION

1.1 Overview

1.1.1 In August 2011, the Original Consent was granted for the Gateway Energy Centre (GEC) under Section 36 of the Electricity Act 1989. Subsequently, in November 2014 and August 2016, the consent was varied (the 2014 Varied Consent and the 2016 Varied Consent, respectively) under Section 36C of the Electricity Act 1989. The 2016 Varied Consent is the existing consent for GEC.

1.1.2 Gateway Energy Centre Limited (GECL) is submitting the 2019 Variation Application under Section 36C of the Electricity Act 1989, to the Secretary of State for Business, Energy and Industrial Strategy (the Secretary of State) via the Department for Business, Energy and Industrial Strategy (BEIS), to vary the existing consent for GEC (the Development or the Proposed Development).

1.1.3 This Section provides a summary of the consenting history for GEC, a description of the 2019 Variation Application and the associated purpose of this document.

1.2 Summary of the Consenting History for Gateway Energy Centre

1.2.1 Condition 2 of the existing consent provides that: "*the Development shall be up to 1250 MW capacity and comprise:*

(a) either:

(i) Up to two Combined Cycle Gas Turbine (CCGT) units (including for each CCGT unit: a gas turbine; a heat recovery steam generator; steam turbine plant; and, associated equipment); or,

(ii) (1) One CCGT unit (including: a gas turbine; a heat recovery steam generator; steam turbine plant; and, associated equipment), and

(2) One or more Open Cycle Gas Turbine (OCGT) units with the OCGT units having a combined rated electrical output of less than 300 MW[1] (including for each OCGT unit: a gas turbine; and, associated equipment).

(d) air cooled condensers and auxiliary cooling;

(e) gas receiving facility;

(f) one or more electrical switchyards;

(g) ancillary plant and equipment; and,

(h) the necessary buildings (including administration offices) and civil engineering works".

1.2.2 To ensure enforceability, Condition 4(1A) of the existing consent provides that: "*the Company shall notify the Secretary of State and Thurrock Council (as the relevant planning authority) which one of the gas turbine technology options in paragraph 2(a) of this consent has been selected prior to the commencement of the Development and provide details of the capacity of each gas turbine technology to be used*".

1.2.3 In addition, Condition 4(2) of the existing consent provides that: "*the commencement of the Development shall not be later than five years from 3 August 2016".*

1.2.4 With regards to Carbon Capture Readiness (CCR), Condition 4(3)(d) provides that: "'*designated site' means the land hatched yellow on FIGURE 3-B* ['Illustrative Site Plan with Carbon Capture Areas' dated 16/02/2010] *as the area where the Company proposes to locate the capture equipment"*.

1.3 The 2019 Variation Application.

1.3.1 Based on a number of influencing factors, including electricity market changes and technological advancements, GECL is submitting an application under Section 36C of the

[1] 300 MW refers to the OCGT(s) and not the CCGT and the OCGT(s).

Electricity Act 1989, to the Secretary of State via BEIS, to vary the 2016 Varied Consent to:

- Provide that GEC shall remain up to 1250 MW, but shall comprise either (*green italic text added to highlight proposed variation*):

  (i) *Development Option (i)*, comprising:

  Up to two CCGT units (including for each CCGT unit: a gas turbine; a HRSG; steam turbine plant; and, associated equipment); or,

  (ii) *Development Option (ii)*, comprising:

  (1) One CCGT unit with a rated electrical output of up to 630 MW (including: a gas turbine, a HRSG; steam turbine plant; and, associated equipment);

  (2) One or more OCGT units, with the OCGT units having a combined rated electrical output of less than 300 MW (including for each OCGT unit: a gas turbine; and, associated equipment); and,

  (3) A Battery Energy Storage System (BESS) with a rated electrical output of up to 320 MW (including: batteries; associated enclosures; control and protection systems; temperature control systems; and, power conversion systems).

- Provide that the commencement of GEC shall take place not later than 31 December 2023.
- Better allow for a phased development of GEC by varying conditions and including a new condition to specify and require, where relevant, that:
  - Certain conditions only apply to a specific phase of the Proposed Development, and not to other phases;
  - A scheme for the phasing of the works comprised in the Proposed Development be submitted and approved; and,
  - Under certain conditions, the approval of details may be applied for and granted on a phase-by-phase basis.
- With regards to CCR and designated sites, provide that:
  - 'CCS site for Development Option (i)' and 'CCS site for Development Option (ii)' mean the areas of land hatched green on FIGURE 1620002349-018-00004 (P02) and FIGURE 1620002349-018-00005 (P02) respectively allocated to the Development Options; and,
  - 'designated site' means, following notification to the Secretary of State and Thurrock Borough Council which one of the Development Options has been selected, the area of land allocated to that Development Option as the area where GECL proposes to locate the capture equipment.

The application also seeks a direction to vary the conditions subject to which the 2016 Deemed Planning Permission was deemed to be granted under Section 90(2ZA) of the Town and Country Planning Act 1990.

Together, the 2019 Variation Application.

1.4 The Purpose of this Document

1.4.1 To accompany the 2019 Variation Application, GECL is providing the following information to BEIS:

- The 2019 Environmental Statement Further Information Document (ES FID); and,
- The 2019 Updated CCR Feasibility Study.

1.4.2 This document is the Non-Technical Summary of the 2019 ES FID.

2. SUMMARY OF RATIONALE FOR THE 2019 VARIATION APPLICATION

2.1 Rationale for Varying the Technology Options for GEC

2.1.1 The 2019 Variation Application seeks to:

- Provide that GEC shall remain up to 1250 MW, but shall include in Development Option (ii) a BESS with a rated electrical output of up to 320 MW (alongside the CCGT unit and the OCGT unit(s)).

2.1.2 BESS technologies offer great potential to support the UK's electricity transmission and distribution network system, and have been named by the UK Government as one of the "*eight great technologies … in which the UK is set to be a global leader*"[2].

2.1.3 In addition, the UK Government notes that UK researchers are developing next generation batteries which could "*reduce our electricity consumption by one fifth*", and with the increased integration of intermittent renewable energy technologies (such as solar photovoltaics (PV) and wind) "*will keep the lights on*". The UK Government also notes that "*innovation in energy storage could create £12bn of new business revenue in the UK*"[3].

2.1.4 Furthermore, the Renewable Energy Association states that the use of energy storage technologies is "*a key missing piece for the UK's energy policy*" and can "*help deliver the low carbon energy the country needs*"[4].

2.1.5 The Renewable Energy Association also notes a number of key benefits which energy storage technologies can offer. When compared to the UK's 'Energy Trilemma'[5], these key benefits include:

- In terms of ensuring security of supply:
  - Helping to optimise overall supply and demand, and thereby reducing the reliance on supplies through interconnectors;
  - Reducing transmission and distribution losses[6];
  - Addressing the increasing requirements for flexibility; and,
  - Providing network system stability.
- In terms of decarbonising:
  - Supporting the integration of zero-carbon renewable energy technologies (such as solar PV and wind); and,
  - Reducing the use of fossil fuels (and hence reducing emissions), creating a greener mix.
- In terms of containing costs:
  - Reducing businesses and consumer bills as energy can be stored when prices are low, and discharged when prices are high; and,
  - Reducing the amount of transmission and distribution network upgrades required.

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[2] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249255/eight_great_technologies_overall_infographic.pdf
[3] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249262/energy_storage_infographic.pdf
[4] 'Energy Storage in the UK: An Overview', Renewable Energy Association (Winter 2015 / 2016).
[5] The UK's 'Energy Trilemma' is widely accepted to represent the key challenges of: ensuring security of supply; decarbonising; and, containing costs.
[6] The Renewable Energy Association note that "*transmission losses typically run at just below 10% of the total energy produced in the UK*".

2.1.6 Furthermore, the UK Government and OFGEM state that "*storage can open up many possibilities, helping to integrate low carbon generation, reduce the costs of operating the system, and help avoid or defer costly reinforcements to the network*"[7].

Summary

2.1.7 Under Development Option (ii), a BESS will complement the proposed CCGT unit and OCGT unit(s) at the GEC site and will be able to provide essential support to the electricity system by storing and discharging energy, delivering significant benefits in meeting the UK's 'Energy Trilemma'.

2.1.8 In particular, in decarbonising and supporting the UK's commitment to net zero-carbon emissions by 2050, the BESS will support the further integration of zero-carbon renewable energy technologies (such as solar PV and wind). The BESS will enable energy produced from renewable technologies during times of low demand and / or during favourable generation conditions to be stored and subsequently discharged during times of peak demand. The use of an energy storage system for this is essential because favourable generation conditions for renewable sources frequently do not coincide with periods of peak demand. Using solar PV as an example, the BESS will enable energy produced during the day to be storage and 'time-shifted', such that energy can be available during the period of peak evening demand.

2.1.9 To highlight the scale and ambition of the 2019 Variation Application, a 320 MW BESS with a 4-hour discharge capability (1.3 GWh) would be one of the largest in the world at the current time. In a UK context, recent statistics indicate that the UK currently has 3300 MW of operational storage capacity (including hydro projects)[8], with 450 MW being operational large-scale (>1 MW) battery storage[9]. Within this context, a BESS with a rated electrical output of up to 320 MW represents approximately 10% of total operational storage capacity and just over approximately 70% of operational large-scale battery storage capacity, and would be enough capacity to fully charge 32000 electric vehicles[10].

2.1.10 Furthermore, whilst the average size of applications for large-scale battery storage continues to rise (from a 2016 average of 10 MW to a 2018 average of 27 MW), the scale of the 2019 Variation Application is such that it is over 10-times the average for such projects.

2.2 Rationale for Commencement Deadline Extension and Phased Development

2.2.1 The 2019 Variation Application seeks to:

- Provide that the commencement of GEC shall take place not later than 31 December 2023.
- Better allow for a phased development of GEC by varying conditions and including a new condition to specify and require, where relevant, that:
  - Certain conditions only apply to a specific phase of the Proposed Development, and not to other phases;
  - A scheme for the phasing of the works comprised in the Proposed Development be submitted and approved; and,
  - Under certain conditions, the approval of details may be applied for and granted on a phase-by-phase basis.

2.2.2 Recognising that the technology, design and (in particular) financing of generating stations can take a great deal of time to finalise, and that it is also necessary to put in

[7] 'Upgrading Our Energy System: Smart Systems and Flexibility Plan', HM Government and OFGEM (July 2017).
[8] Renewable Energy Association. Available at: https://www.renewableuk.com/news/425522/Energy-storage-capacity-set-to-soar-300-UK-based-companies-involved-in-new-sector.htm
[9] Solar Power Portal. Available at: https://www.solarpowerportal.co.uk/blogs/a_leap_forward_for_large_scale_storage_uks_new_capacity_to_top_500mw_in_201
[10] Based on Renewable Energy Association figures. Available at: https://www.renewableuk.com/news/425522/Energy-storage-capacity-set-to-soar-300-UK-based-companies-involved-in-new-sector.htm

place infrastructure and agreements for the import of fuel and the export of electricity, developers of generating stations have a variety of factors to address. These factors include (but are by no means limited to): changing technologies and designs; and, uncertain markets for both fuel and electricity.

2.2.3 Indeed, the Variation Guidance[11] issued by the Department of Energy and Climate Change (DECC, now BEIS) states (at paragraph 12) that: "*generating station* […] *consents are often not implemented until some years after they are granted. Each consent reflects technology and industry practice at the time it was applied for, but such practices do not stand still, even in relatively mature sectors. This means that when a developer comes to construct a generating station, it will sometimes be uneconomic or have more detrimental effects on the environment to do so according to all the details specified in the consent. In practice, this means changes to the original proposals to make the project feasible".*

2.2.4 As a result, a generating station cannot sensibly be compared to other simpler projects where shorter commencement deadlines, with no phasing of works, can often be an effective incentive to bring forward much needed development. Indeed, a generating station represents a complex project where longer commencement deadlines, with phasing of works, can be justified.

2.2.5 Furthermore, whilst the rationale for the commencement deadline extension and phased development are not limited to issues relating to the UK Government's Capacity Market, these have undoubtedly added to the variety of factors to be addressed.

Summary

2.2.6 The rationale for the commencement deadline extension and phased development is to maximise the potential for GEC to secure a 15-year contract(s) in future Capacity Market Auctions and, in recognition of their differing economics, be able to participate as separate Capacity Market Units within the Capacity Market Auction, thereby maximising the potential to successfully secure a 15-year Capacity Market Award, and consequently secure financing of the relevant project(s).

2.2.7 At the time of writing the Capacity Market is suspended as a result of a recent judgement by the European Union Court of Justice. The European Commission is currently addressing the requirements of the judgement, which include whether the Capacity Market is compatible with State Aid rules. If the European Commission considers that the Capacity Market is compatible with the rules, it is possible with the Capacity Market may be reinstated in Q4 2019. On this basis, the current understanding is that the Capacity Market Auctions (or a similar mechanism) could be held early next year (2020) with both three year ahead (T-3) and four year ahead (T-4) auctions held. Subsequently, annual T-4 auctions would be held.

2.2.8 GEC has participated in four Capacity Market Auctions, under Development Option (i) as CCGT Capacity Market Units, and to date has not been successful in securing a Capacity Market Award.

2.2.9 Based on the current understanding, the commencement deadline extension would allow five opportunities for participation in the Capacity Market Auction (i.e. the 2020 T-3 (first delivery year 2022 – 2023), the 2020 T-4 (first delivery year 2023 – 2024), the 2021 T-4 (first delivery year 2024 – 2025), the 2022 T-4 (first delivery year 2025 – 2026) and the 2023 T-4 (first delivery year 2026 – 2027)).

2.2.10 By means of a comparison with similar developments, InterGen's Spalding Energy Expansion project has participated in three Capacity Market Auctions with both CCGT Capacity Market Unit and OCGT Capacity Market Unit configurations. To date, only the OCGT Capacity Market Unit has been successful in securing a 15-year Capacity Market Award (in the 2016 T-4 (first delivery year 2020 – 2021)).

2.3 Rationale for Variations regarding CCR and Designated Sites

2.3.1 The rationale for the variations regarding CCR and designated site is to allow GECL, at the time of notification to the Secretary of State and Thurrock Borough Council which one of

[11] 'Varying Consents granted under Section 36 of the Electricity Act 1989 for Generating Stations in England and Wales: A Guidance Note on the New Process', Department of Energy and Climate Change (July 2013).

the Development Options has been selected, to dispose of the CCS site associated with the Development Option not selected.

2.3.2 Further information is provided in the Updated CCR Feasibility Study.

3. REQUIRED CONTENT OF AN EIA REPORT / EIA METHODOLOGY USED IN THE 2019 ES FID

3.1 Required Content of an EIA Report / Further Environmental Information: The Electricity Works (Environmental Impact Assessment) Regulations 2017

3.1.1 When submitting an application for a consent under Section 36 of the Electricity Act 1989, or an application to vary a consent under Section 36C of the Electricity Act 1989, for EIA Development, Regulation 6 of the EIA Regulations requires that: "*Where an application is made for a Section 36* […] *Consent, or a Section 36 Variation, for EIA Development, the relevant authority must not grant the application unless an environmental impact assessment has been undertaken in respect of the development*".

3.1.2 Regulation 5(1)(a) of the EIA Regulations defines 'EIA Development' as including development of a description set out in Schedule 1. Schedule 1 of the EIA Regulations provides that 'EIA Development' includes: "*a thermal generating station with a heat output of 300 megawatts or more*". GEC exceeds this threshold.

3.1.3 Regulation 7(1) of the EIA Regulations provides that the EIA process includes the preparation, by the developer, of an EIA Report (in accordance with Regulation 17) and the provision, by the developer to the relevant authority, of the EIA Report and any further environmental information.

3.1.4 Regulation 17(1) and Schedule 4 of the EIA Regulations set out the required content of an EIA Report and any further environmental information. This 2019 ES FID in combination with the February 2010 ES, December 2010 ES FID, August 2014 ES FID and the February 2016 ES FID comprise the EIA Report and further environmental information for the Proposed Development (being the generating station GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as requested in the 2019 Variation Application).

3.1.5 Accordingly, the 2019 ES FID in combination with the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID provide:

- A description of the reasonable alternatives studied by GECL that are relevant to the Proposed Development (being the generating station which GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as per the 2019 Variation Application) and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment;
- A description of the parameters of the Proposed Development;
- A description of the relevant aspects of the current state of the environment (baseline scenario);
- A description of the likely significant effects of the Proposed Development on the environment;
- In the case of this 2019 ES FID, the August 2014 ES FID and the February 2016 ES FID, a description of the main respects in which the likely significant effects of the Proposed Development will differ from those previously described; and,
- A description of the features of the Proposed Development, and any measures envisaged, in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.

3.2 EIA Methodology used in the 2019 ES FID

3.2.1 In order provide the required content of an EIA Report and further environmental information (and comply with the requirements of Regulation 17(1) and Schedule 4 of the EIA Regulations), the EIA methodology used in this 2019 ES FID comprises:

- Discussion with consultees on the key issues to be considered;
- Identification of reasonable alternatives;
- Establishment of the parameters of the Proposed Development;

- Establishment of the relevant aspects of the current state of the environment (baseline scenario);
- Establishment of the likely significant effects of the Proposed Development on the environment;
- Determination of the main respects in which the likely significant effects of the Proposed Development on the environment will differ from those previously described; and,
- Establishment of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on the environment.

4. THE PROPOSED DEVELOPMENT

4.1 The Proposed Development: Gateway Energy Centre

4.1.1 Regulation 2(1) of the Variation Regulations defines the term 'Proposed Development' as meaning: "*The generating station, or extension of a generating station, which the applicant would be authorised to construct under a relevant Section 36 Consent if that consent were varied as requested by the variation application".*

4.1.2 Accordingly, this Section provides a description of the Proposed Development (i.e. GEC, being the generating station GECL would be authorised to construct if the 2016 Varied Consent is varied as requested in the 2019 Variation Application), comprising information on its location, design, size and other relevant features, alongside additional information on the construction, operational and decommissioning characteristics of the Proposed Development.

4.1.3 Wherever appropriate, the parameters presented provide an 'envelope' for assessing the likely effects of the Proposed Development on the environment. Accordingly, in order to ensure that the likely significant effects of the Proposed Development on the environment are described and assessed, parameters have been set which are broad enough to take account of all reasonable options available for the Proposed Development. Such an approach is considered good practice, as reflected in case law as the 'Rochdale Envelope' principle. Suitably applied within EIA methodology, it can ensure there is a comprehensive assessment of the likely significant effects of a Proposed Development on the environment.

Indicative Programme / Phasing

4.1.4 The 2019 Variation Application seeks to better allow for a phased development of GEC in recognition that a generating station represents a complex project where longer commencement deadlines, with phasing of works, can be justified. Accordingly, in order to better allow for a phased development of GEC, the 2019 Variation Application seeks to, under the 2016 Deemed Planning:

- Vary a number of existing certain conditions to only apply to a specific phase of the Proposed Development, and not to other phases;
- Include a new condition (Condition (3A)) to require that commencement of the Proposed Development not take place until a scheme for the phasing of the works comprised in the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council; and,
- Vary a number of the existing certain conditions to require that the approval of details may be applied for and granted on a phase-by-phase basis, with commencement of a specified phase of the Proposed Development not taking phase until the details associated with the specified phase being submitted and approved in writing by Thurrock Borough Council.

4.1.5 Therefore, the 'phasing envelope' for assessing the likely significant effects of the Proposed Development on the environment comprises:

- Construction and operation of the Proposed Development in one phase, for example:
  - For Development Option (i), construction of two CCGT units; or,
  - For Development Option (ii), construction of one CCGT unit along with the OCGT unit(s) along with the BESS.
- Construction and operation of the Proposed Development over a number of phases, for example:
  - For Development Option (ii), likely including:
    - A 'CCGT Unit Phase': construction of the CCGT unit;
    - An 'OCGT Unit(s) Phase': construction of the OCGT unit(s); and,

- A 'BESS Phase': construction of the BESS.

For Development Option (ii), it should also be noted that some of these sub-phases may also be phased, for example construction of part of the BESS followed by construction of the remaining part of the BESS.

4.1.6 In the event that the construction and operation of the Proposed Development occurs over a number of phases, this will ultimately be determined by external influencing factors including developments and changes in the energy market, in particular the UK Government's Capacity Market. Indeed, as noted previously, the rationale for phased development is to maximise the potential for GEC to secure a 15-year contract(s) in future Capacity Market Auctions and, in recognition of their differing economics, be able to participate as separate Capacity Market Units within the Capacity Market Auction, thereby maximising the potential to successfully secure a 15-year Capacity Market Award, and consequently secure financing of the relevant project(s).

4.2 Proposed Development Location

4.2.1 The Proposed Development will be located within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent).

4.2.2 The Ordnance Survey (OS) Grid Reference of the centre of the Proposed Development site is approximately 573209, 182165.

4.2.3 The overall red-line boundary covers a total area of approximately 29.1 hectares (ha) (71.9 acres). This includes:

- The GEC site, which covers an area of approximately 11.3 ha (27.9 acres) and includes the land to be set aside for the purposes of CCR; and,
- Land to the north and west which is intended to be used during construction for temporary laydown and storage.

4.2.4 The overall red-line boundary, and the GEC site, is located on the north bank of the Thames Estuary on land within the DP World® London Gateway Logistics Park, to the north of the DP World® London Gateway Port

State of the Environment

4.2.5 The GEC site is located on land within the DP World® London Gateway Logistics Park.

4.2.6 As part of the agreement between GECL and the team behind the DP World® London Gateway Logistics Park, the GEC site will be cleared, remediated and levelled, and provided in a condition that would allow for the construction of GEC. The likely significant effects of the clearance, remediation and levelling works have previously been assessed as part of the historical applications for the DP World® London Gateway sites.

4.2.7 As such, the current state of the environment (i.e. assumed baseline scenario) at the GEC site comprises a cleared, remediated and levelled site post-works undertaken for the DP World® London Gateway Logistics Park.

4.2.8 Clearance, remediation and levelling works have commenced within the DP World® London Gateway Logistics Park, and a substantial part of the DP World® London Gateway Logistics Park has been successfully cleared, remediated and levelled[12].

4.2.9 At the time of writing this 2019 ES FID, it is noted that construction and build-out of the DP World® London Gateway sites continues, with approximately 113099 m^2 of Logistics Park 'B'-Class floor space and three Port berths currently operational. A further 41575 m^2 of Logistics Park 'B'-Class floor space and remaining three Port berths remain authorised, and will be delivered subject to commercial demand. Additional clearance, levelling and remediation continues in a manner to support this on-going development.

4.2.10 As noted in the August 2014 ES FID, it is also understood from DP World® that, within the Logistics Park and Port, development of an individual plot would only commence once it had been successfully cleared and remediated.

[12] At the time of writing the August 2014 ES FID, it was noted that approximately 80% of the locations across the DP World® London Gateway Logistics Park site which were known to require remediation had been remediated.

Site Surroundings

4.2.11 The Proposed Development site is located on the north bank of the Thames Estuary, approximately 6 km east of the A13. The A1014 dual carriageway (The Manorway) lies approximately 0.5 km to the north of the site and runs east to west to provide a link with the A13, which in turn connects with the M25 at Junction 30.

4.2.12 Within the immediate surrounding area, the predominant land use is industrial, with some residential settlements located further afield. In brief, the immediate surrounding land uses comprise:

- To the north, the A1014 dual carriageway (The Manorway);
- To the east, the Shell Haven Terminal (approximately 100 m), the Coryton CCGT generating station (approximately 700 m) and the former Petroplus Coryton Oil Refinery site[13] (approximately 950 m);
- To the south, the DP World® London Gateway Port and the Thames Estuary; and,
- To the west, the DP World® London Gateway Logistics Park.

4.2.13 Therefore, the Proposed Development site will be viewed within the context of the immediate surrounding area, where the predominant land use is industrial.

4.2.14 The nearest residential settlements are:

- To the north, Basildon (approximately 7 km);
- To the east, Canvey Island (approximately 5 km); and,
- To the west, Corringham and Fobbing (approximately 4 km).

4.2.15 Within the wider surrounding rural area, the predominant land use is agricultural.

Summary

4.2.16 Condition (2) of the 2016 Deemed Planning Permission requires the Proposed Development to be located within the overall red-line boundary. The 2019 Variation Application does not seek to vary this Condition. As such, there will be no change to the Proposed Development location (i.e. the overall red-line boundary) and, as such, the future land uses of the Proposed Development site comprise those relating to energy / electricity generation.

4.3 Design of the Proposed Development

4.3.1 The Construction Contractor(s) who will complete the final layout and design of the Proposed Development will not be appointed until after the 2019 Variation Application. Therefore, it is not until this time that the final precise layouts and designs of the Proposed Development will be completed.

4.3.2 For this reason, it is not possible to provide the precise final layouts and designs for the Proposed Development. However, preliminary engineering studies have been undertaken to establish the parameters of the Proposed Development. These parameters have formed the basis for the establishment of the likely significant effects of the Proposed Development on the environment.

4.3.3 Condition (8) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme of provisions for the layout and design has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme of provisions for the layout and design associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

4.3.4 The design of equipment / buildings / enclosures will minimise regular and long-term maintenance requirements. Materials and finishes will be selected to meet this objective

[13] The former Petroplus Coryton Oil Refinery ceased production in June 2012. Following its sale, the site is being used for new developments, including the Thames Enterprise Park.

and to ensure that the appearance of the Proposed Development does not deteriorate materially over its operating lifetime (approximately 35 years). Materials and finishes will be similar to those used on existing generating stations, and will be selected to align with the appearance of the surrounding land uses, including the DP World® London Gateway Logistics Park.

4.3.5 Condition (9) of the 2016 Deemed Planning Permission requires the Proposed Development to adhere to the design principles within the December 2010 Revised Design and Access Statement. Whilst there will be no change to these overarching design principles, the 2019 Variation Application seeks to vary this Condition to require that each phase of the Proposed Development adhere to these design principles.

4.3.6 For safety and security, a perimeter security fence will be installed around the Proposed Development site. Motion sensor CCTV cameras will also be installed.

Landscaping

4.3.7 An overall landscaping strategy will be developed which aims to enhance the ecological resource of the Proposed Development site, and maintain connectivity to ecological resources in the wider area.

4.3.8 Condition (50) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme of landscaping (in accordance with the February 2010 ES) has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme of landscaping associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

4.4 Size of the Proposed Development

Dimensions

4.4.1 The February 2010 ES included a Parameter Block Model Layout[14]. Insert 4.1 provides the Parameter Block Model Layout. The December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID subsequently referenced this Parameter Block Model Layout.

4.4.2 Within the February 2010 ES (and the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID), the basis for the assessment of likely significant effects of the Proposed Development on the environment is that the Proposed Development is located wholly within the limits of the Parameter Block Model Layout. This provided an 'envelope' for assessing the likely effects of the Proposed Development on the environment.

4.4.3 For the Parameter Block Model Layout, Table 4.1 identifies the plant / equipment expected to be located within the various areas.

[14] Included in: 'Environmental Statement Volume 3 (Figures)' (Parsons Brinckerhoff, February 2010). Figure 4.3 'Proposed Indicative Layout / Parameter Block Model Layout'.

INSERT 4.1: PARAMETER BLOCK MODEL LAYOUT

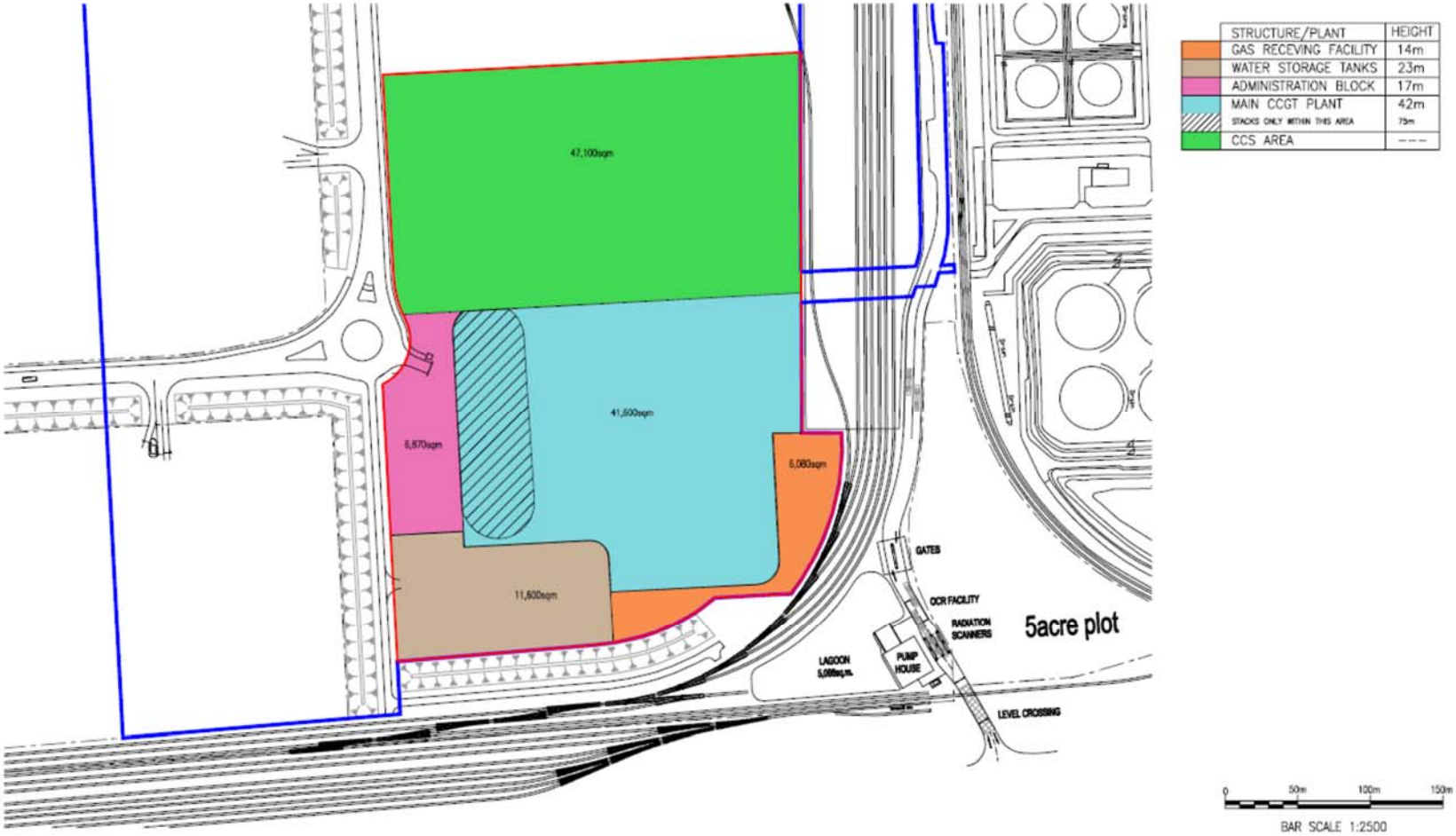

TABLE 4.1: PLANT / EQUIPMENT EXPECTED TO BE LOCATED WITHIN THE VARIOUS PARAMETER BLOCK MODEL LAYOUT AREAS

Area	***Maximum Height (m)***	***Approx. Area* (m^2)***	***Previously Described in February 2010 ES***	***Development Option (i)***	***Development Option (ii)***
Blue	42	41,600	Main plant / equipment area, including: • For the CCGT unit(s): - Air inlets; gas turbines; HRSGs; steam turbines; ACC; fin-fan coolers; transformers; and, other associated equipment.	Main plant / equipment area, including: • For the CCGT unit(s): - Air inlets; gas turbines; HRSGs; steam turbines; ACC; fin-fan coolers; transformers; and, other associated equipment.	Main plant / equipment area, including: • For the CCGT unit: - Air inlet; gas turbine; HRSG; steam turbine; ACC; fin-fan coolers; transformers; and, other associated equipment. • For the OCGT unit(s): - Air inlet(s); gas turbine(s); stack(s); fin-fan coolers; transformers; and, other associated equipment. • For the BESS: - BESS enclosures; and, other associated equipment. Would include some of the proposed 'CCS Site for Development Option (ii)'.
Blue Hatch	75	Within the Blue Area	Including: • For the CCGT unit(s): - Stacks.	Including: • For the CCGT unit(s): - Stacks.	Including: • For the CCGT unit: - Stack.

Area	***Maximum Height (m)***	***Approx. Area* (m^2)***	***Previously Described in February 2010 ES***	***Development Option (i)***	***Development Option (ii)***
Pink	17	6,870	Administration area, including: • Administration and control building; • Warehouse and maintenance building; and, • Car parking.	Administration area, including: • Administration and control building; • Warehouse and maintenance building; and, • Car parking.	Administration and water treatment area, including: • For administration: - Administration and control building; - Warehouse and maintenance building; and, - Car parking. • For water treatment: - Water treatment plant; - Demineralised water storage tank; and, - Firewater storage tank.
Brown	23	11,600	Water treatment area, including: • Water treatment plant; • Demineralised water storage tank; and, • Firewater storage tank.	Rainwater retention area.	Would include some of the proposed 'CCS Site for Development Option (ii)'.
Orange	14	6,080	Gas reception area.	Gas reception area.	Would include some of the proposed 'CCS Site for Development Option (ii)'.
Green	N / A	47,100	Covers the 'CCS Site for Development Option (i)'.	Covers the 'CCS Site for Development Option (i)'.	N / A. Would not be required for Development Option (ii).

4.4.4 In terms of the main respects in which the plant / equipment items expected to be located within the various area differ from those previously described, whilst there may be some additional structures and some re-location of items of plant / equipment, both Development Option (i) and Development Option (ii) remain wholly located within the limits of the original Parameter Block Model Layout.

4.4.5 Condition (8) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme of provisions for the layout and design has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme of provisions for the layout and design associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

4.5 Further Variations to the Phasing, Location, Design and / or Size of the Proposed Development

4.5.1 Should further variations to the phasing, location, design and / or size of the Proposed Development be required, consideration will be given to the provisions of Condition (60) and Condition (61) of the 2016 Deemed Planning Permission.

4.5.2 Condition (60) of the 2016 Deemed Planning Permission requires that: "*where the words 'unless otherwise agreed in writing by the Council' or 'with the prior written approval of the Council' or similar appear, such agreement or approval may only be given in relation to immaterial changes where is has been demonstrated to the satisfaction of* [Thurrock Borough Council] *that the agreement or approval is unlikely to give rise to any materially new or materially different environmental effects from those assessed in the Environmental Statement*". The 2019 Variation Application does not seek to vary the provisions of this Condition.

4.5.3 Condition (61) of the 2016 Deemed Planning Permission requires that: "*the environmental effects of the Development must not exceed those assessed in the Environmental Statement*". The 2019 Variation Application does not seek to vary the provisions of this Condition.

4.5.4 Therefore, if an application(s) were to be made under the relevant conditions for agreement in writing or written approval, for further variations to the location, design and / or size of the Proposed Development, the documents to support such applications will include assessments to demonstrate:

- (For Condition (60) of the 2016 Deemed Planning Permission), that the further variations are: "*unlikely to give rise to any materially new or materially different environmental effects from those assessed in the Environmental Statement*"; and,
- (For Condition (61) of the 2016 Deemed Planning Permission), that the further variations do: "*not exceed those assessed in the Environmental Statement"*.

4.6 Associated Development / Infrastructure Connections

Gas Connection

4.6.1 Both Development Option (i) and Development Option (ii) include the construction of a CCGT unit(s). Development Option (ii) additionally includes the construction of an OCGT unit(s). During operation, both the CCGT unit(s) and OCGT unit(s) will burn natural gas only, which will be required to be supplied to the GEC site via an underground gas pipeline.

4.6.2 On 8 March 2012, planning permission (Reference: 11/50286/TTGFUL) was granted to GECL by Thurrock Thames Gateway Development Corporation (TTGDC) to: "*develop an underground gas pipeline, an above ground installation (AGI) and ancillary development (including pipeline route markers, cathodic protection posts, M4 marker posts (for special crossings) and landscaping / biodiversity provision)*".

4.6.3 Following discharge of the relevant conditions, this planning permission was implemented on 7 March 2017 by the construction of a new access road to the associated AGI. The

implementation was in accordance with approved drawings and documents, thereby the planning permission is preserved in perpetuity.

4.6.4 Under both Development Options, this approximately 8 km long underground gas pipeline is required for the CCGT unit(s) as there is not sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station. The proposed route of this pipeline parallels the route of the existing pipeline for the majority of its length.

4.6.5 However, under Development Option (ii), should there be phasing of GEC with the OCGT unit(s) constructed and operated in advance of the CCGT unit, there is sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station for the OCGT unit(s). As it is technical feasible to 'tap-in' to the existing underground gas pipeline, under Development Option (ii), a phase with only OCGT unit(s) would be more cost-competitive in comparison to a phase which also includes the CCGT unit, as the OCGT unit(s) would not be financially overburdened by the cost of the 8 km long underground gas pipeline for the CCGT unit. This would allow the OCGT unit(s) to participate as a separate Capacity Market Unit within the Capacity Market Auction, thereby maximising the potential to successfully secure a Capacity Market Award.

4.6.6 Therefore, GECL are currently investigating the potential for a shorter length of underground gas pipeline based on a 'tap-in' to the existing underground gas pipeline serving the existing Coryton CCGT generating station. As part of this 'tap-in', a smaller AGI would also be required. In progressing this investigation, GECL has commissioned some initial gas feasibility work to identify possible new route options and AGI locations. It is currently anticipated that the initial gas feasibility work will be further developed into an application for the shorter length of underground gas pipeline and smaller AGI, most likely an application for planning permission under the Town and Country Planning Act 1990.

4.6.7 The quality of the natural gas will be the same as that used in domestic properties and will be supplied to a flanged terminal point at a pressure in the range of approximately 30 to 75 bar(g). There will be gas pressure reduction / and potential for compression facilities on the Proposed Development site to regulate the pressure of the incoming gas supply to that required by the gas turbines.

4.6.8 With the exception of temperature and pressure regulation, the natural gas will not be treated on site and no natural gas will be stored on the Proposed Development site.

Electrical Connection

4.6.9 For both Development Options, during operation, the electricity generated will be dispatched to the National Grid Electricity National Transmission System via a new HV electrical connection from the GEC site into the existing National Grid Coryton South Substation.

4.6.10 On 27 February 2013, planning permission (12/01085/FUL) was granted to GECL by Thurrock Borough Council: "*for the development of a high voltage electrical connection comprising an underground and possible part culverted double circuit 400 kV cable system linking the approved Gateway Energy Centre electrical switchyard/s to the existing National Grid Coryton South Substation, together with an extension to the substation, installation of electrical equipment (including a 400 kV rotating centre post disconnector, 400 kV surge arrestors, 400 kV air insulated switchgears / gas insulated switchgear buildings, 400 kV gas insulated switchgear circuit breaker, 400 kV gas insulated switchgear cable sealing ends), associated development (including transitional bay, marker posts / plates) and access track works*".

4.6.11 However, this development was not commenced, and the planning permission has since expired. Accordingly, GECL has commissioned some initial electrical feasibility work to identify possible new route options for the HV electrical connection and it is currently anticipated that the initial electricity feasibility work will be developed into an application for the new HV electrical connection, most likely an application for a replacement planning permission under the Town and Country Planning Act 1990.

5. CONSTRUCTION / OPERATION / DECOMMISSIONING

5.1 Construction

Main Construction Characteristics

5.1.1 Based on similar experience on the construction of generating stations, a high-level programme of construction activities comprises:

- Provision of temporary construction facilities;
- Undertaking site preparation;
- Installation of foundations;
- Equipment / buildings construction;
- Completion of construction; and,
- Commissioning and handover.

5.1.2 The 2019 Variation Application seeks to allow for a phased development of GEC. For construction of the Proposed Development in as either single-phase or multi-phase, this programme of construction activities would occur for each phase.

Construction Working Hours

5.1.3 Regarding general construction works, Condition (26) of the 2016 Deemed Planning Permission provides normal construction working hours. The 2019 Variation Application does not seek to vary this Condition. Table 5.1 presents these normal construction working hours.

TABLE 5.1: NORMAL CONSTRUCTION WORKING HOURS

Day	***Working Hours***
Monday to Saturday	07:00 – 19:00
Sunday or Bank Holiday	N / A

5.1.4 Pursuant to Condition (26) of the 2016 Deemed Planning Permission, no construction works will take place outside these hours, unless such work:

- Is associated with an emergency; or,
- Is carried out with the prior written approval of Thurrock Borough Council; or,
- Does not cause existing ambient background noise levels to be exceeded.

Construction Environmental Management

5.1.5 The Construction Contractor(s) will be required to prepare and implement a Construction Environmental Management Plan(s) (CEMP(s)).

5.1.6 The objective of the CEMP(s) will be to:

- Identify legal, environmental and other obligations and requirements appropriate to the construction of the Proposed Development (or relevant phase of the Proposed Development);
- Provide a framework to comply with the identified legal, environmental and other obligations and requirements through appropriate mitigation and monitoring;
- (Based on the identified mitigation and monitoring measures), provide the basis for setting objectives and targets for construction of the Proposed Development (or relevant phase of the Proposed Development); and,
- Demonstrate a professional approach to environmental management.

5.1.7 Condition (25) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a CEMP has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks

to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a CEMP associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

Construction Site Access

5.1.8 During construction, site access will be via the DP World® London Gateway Site Access Road, which is a two-lane dual carriageway, from the A1014 (The Manorway) / Sorrell Roundabout into the DP World® London Gateway sites. This Site Access Road was completed in 2013.

Construction Personnel

5.1.9 For construction of the Proposed Development in one phase, approximately 600 construction personnel will be employed. GECL is expecting that a number of construction employment opportunities will be created in the local area.

5.1.10 For construction of the Proposed Development over a number of phases, there will be no material changes to the types of construction skills required. However, for construction of the Proposed Development over a number of phases, the short-term employment opportunities and associated increase in the use of local services per phase would be reduced, but would be experienced over a longer overall period.

5.2 Operation

Main Operational Characteristics / Process Description

5.2.1 The Proposed Development will have an operational lifetime of approximately 35 years.

Development Options

5.2.2 The 2019 Variation Application seeks to vary Condition 2(a) of the 2016 Varied Consent to provide that GEC shall remain up to 1250 MW, but shall comprise either:

- Development Option (i):

  Up to two CCGT units with a rated electrical output of up to 1250 MW; or,

- Development Option (ii):

  (1) One CCGT unit with a rated electrical output of up to 630 MW;

  (2) One of more OCGT units having a combined rated electrical output of less than 300 MW; and,

  (3) A BESS with a rated electrical output of up to 320 MW.

5.2.3 The CCGT unit(s) and the OCGT unit(s) will burn natural gas only, which is an inherently clean fuel and does not produce the sulphur dioxide (SO_2) or particulate matter (PM) emissions associated with burning coal. As a result, all atmospheric emissions from the Proposed Development will be controlled at source and no flue gas cleaning equipment is required. Back-up firing on Distillate Fuel Oil (DFO), or any other fuel, is not proposed.

Development Options Technologies

CCGT Unit(s)

5.2.4 Under the varied Condition 2(a):

- For Development Option (i), there would be up to two CCGT units with a rated electrical output of up to 1250 MW; or,
- For Development Option (ii), there would be one CCGT unit with a rated electrical output of up to 630 MW.

5.2.5 Each CCGT unit will comprise: a gas turbine; a HRSG; steam turbine plant; and, associated equipment.

5.2.6 Within each CCGT unit, the natural gas will be burnt in the combustion chamber of the gas turbine from where the resulting hot gases will expand through the turbine section to generate sufficient power to drive the air compressor section and generator to produce

electrical power. The hot exhaust gases still contain recoverable energy and will therefore be used in a HRSG to generate steam, which will be expanded in steam turbine plant to produce additional electrical power.

5.2.7 The steam exhausting the steam turbine plant will pass to an air cooled condenser (ACC) where it will be condensed. The resulting condensate will be returned to the HRSG to continue the steam cycle.

5.2.8 The flue gases will be discharged via a dedicated stack.

5.2.9 The use of a combined gas and steam cycle increases the overall fuel efficiency of the generating station. As such, the CCGT unit(s) will be capable of generation in combined cycle mode with an overall electrical generation efficiency of approximately 57 to 60.5% based on the Lower Calorific Value (LCV) of the fuel.

OCGT Unit(s)

5.2.10 Under the varied Condition 2(a):

- For Development Option (ii), there would be one or more OCGT(s) unit having a combined rated electrical output of less than 300 MW.

5.2.11 Each OCGT unit will comprise: a gas turbine; and, associated equipment. Indeed, in essence, an OCGT unit comprises the prime driver of a CCGT unit, which is the gas turbine.

5.2.12 Within each OCGT unit (and as with a CCGT unit), the natural gas will be burnt in the combustion chamber of the gas turbine from where the resulting hot gases will expand through the turbine section to generate sufficient power to drive the air compressor section and generator to produce electrical power.

5.2.13 As there is no steam cycle, there is no condensing of steam and associated cooling requirement. Whilst auxiliary cooling is still required, this is significantly lower for an OCGT unit than for a CCGT unit.

5.2.14 The flue gases will be discharged via a dedicated stack. The stack normally contains a silencer to reduce noise emissions. Due to the higher stack exit temperature, the stacks for OCGT units are generally shorter than those for CCGT units.

5.2.15 The OCGT unit(s) will have an electrical generation efficiency between approximately 36 to 41.5% based on the LCV of the fuel.

Comparison of CCGT Units and OCGT Units

5.2.16 Table 5.2 provides a high-level comparison of a number of the key differences between CCGT units and OCGT units.

TABLE 5.2: COMPARISON BETWEEN CCGT UNITS AND OCGT UNITS

Parameter	***CCGT***	***OCGT***
Efficiency	Between approximately 57 to 60.5% based on the LCV of the fuel	Between approximately 36 to 41.5% based on the LCV of the fuel
Start Up Time	Between 30 to 180 minutes	Between 20 to 30 minutes
Cooling	Required for steam condensing and auxiliaries (larger requirement)	Required for auxiliaries only (smaller requirement)
Stack Height	Typically larger, on the Proposed Development will be up to approximately 75 m	Typically smaller, on the Proposed Development will be up to approximately 42 m

The Battery Energy Storage System

5.2.17 Under the varied Condition 2(a):

- For Development Option (ii), there would be a BESS with a rated electrical output of up to 320 MW.

5.2.18 The BESS will comprise:

- Batteries, housed in enclosures, also including:
- Control and protection systems;
- Chillers / cooling systems (to ensure temperature control); and,
- A power conversion system (to convert Alternating Current (AC) into Direct Current (DC) during energy charging, or to convert DC into AC during energy discharging).
- Transformers and switchgear.

5.2.19 Although the battery types may be varied throughout the Proposed Development's operational lifetime, it is currently envisaged that lithium-ion batteries will be used during the initial operational phase[15].

Performance

5.2.20 It is expected that for the majority of their operational lifetime, the CCGT unit(s) and the OCGT unit(s) will operate in various running modes including (but not limited to) baseload and cycling. The BESS will operate in either 'energy charge', 'energy storage' or 'energy discharge' modes.

5.2.21 The performance of the CCGT unit(s) and the OCGT unit(s) will be continuously recorded to ensure correct and efficient operation. Any significant deviations will be alarmed, and corrections will be applied. Records will be maintained of performance, including any deviations.

5.2.22 The CCGT unit(s) and the OCGT unit(s) will be occasionally shut down for period of essential maintenance and inspection. For both the CCGT unit(s) and the OCGT unit(s), minor outages (of the order of 4 days) are expected to occur every year. For the CCGT unit(s), major outages (of the order of 4 weeks) are expected to occur every three years, and will be planned on a long-term basis.

5.2.23 The Proposed Development will be designed with a view to a high degree of automatic operation. However, operator intervention will be necessary from time to time. Full facilities for interfacing information and control / protection / alarm systems will be installed so that the Proposed Development can eb operated efficiently and safely from a Central Control Room via a Distributed Control System (DCS).

Operational Environmental Management

5.2.24 During operation, activities on the GEC site will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016. GECL already holds an Environmental Permit for the development permitted by the 2014 Varied Consent (EPR/EP3536EN) issued in July 2016. Based on the Development Option selected, an application to vary this Environmental Permit will be made in due course.

5.2.25 In addition, regarding emissions of CO_2, the Proposed Development will be required to apply for an EU Emissions Trading Scheme (ETS) Permit. The scheme is currently operating in Phase III, which runs from 1 January 2013 to 31 December 2020. Phase IV will run from 1 January 2021 to 31 December 2030.

Operational Site Access

5.2.26 During operation, site access will be via the DP World® London Gateway Site Access Road, which is a two-lane dual carriageway, from the A1014 (The Manorway) / Sorrell Roundabout into the DP World® London Gateway sites. This Site Access Road was completed in 2013.

Operational Employment

5.2.27 Should the Proposed Development be operated in conjunction with the existing Coryton CCGT generating station, approximately 15 to 25 operational personnel would be

[15] Regarding other battery types, it is understood that lithium-ion batteries will continue to be the battery chemistry of choice for the foreseeable future, largely due to the upfront investment in this battery chemistry from the automotive industry in large-scale manufacturing capacity for the electric vehicle market.

employed. Of these, approximately 10 personnel would work 'standard' hours (08:00 to 16:15). The balance would then either work 'day-shift' hours (07:00 to 19:00) or 'night-shift' hours (19:00 to 07:00). Furthermore, in this instance, it may be that the Proposed Development is operated remotely from the existing Coryton CCGT generating station site.

5.2.28 Should the Proposed Development be operated 'stand-along', approximately 40 operational personnel would be employed. Similarly, of these, approximately 10 personnel would work 'standard' hours (08:00 to 16:15). The balance would then either work 'day-shift' hours (07:00 to 19:00) or 'night-shift' hours (19:00 to 07:00).

5.3 Decommissioning

Main Decommissioning Characteristics

5.3.1 Following operation for up to approximately 35 years, the Proposed Development will be decommissioned.

5.3.2 Decommissioning will take account of the prevailing environmental legislation and guidance in place at the time. Notice will be given to the relevant statutory authorities (including BEIS, the Environment Agency and Thurrock Borough Council), and any necessary permissions will be obtained.

5.3.3 Alternatively, if market conditions and / or electricity supply constraints at the time of decommissioning indicate that it would be appropriate to extend the lifetime of the Proposed Development, then decommissioning may be deferred. In order to ensure continuing plant / equipment conditions and environmental performance, the Proposed Development will be re-engineered and re-permitted as required, in accordance with the prevailing environmental legislation and guidance in place at the time.

Decommissioning Environmental Management

5.3.4 The Decommissioning Contractor(s) will be required to prepare and implement a Decommissioning Environmental Management Plan(s) (DEMP(s)).

5.3.5 The objectives of the DEMP will be to:

- Identify legal, environmental and other obligations and requirements appropriate to decommissioning of the Proposed Development (or relevant phase of the Proposed Development);
- Provide a framework to comply with the identified legal, environmental and other obligations and requirements through appropriate environmental management measures;
- (Based on the identified environmental management measures), provide the basis for setting objectives and targets for decommissioning of the Proposed Development (or relevant phase of the Proposed Development); and,
- Demonstrate a professional approach to environmental management.

5.3.6 Condition (56) of the 2016 Deemed Planning Permission requires that within 6 months of the Proposed Development ceasing to be used for the purposes of electricity generation, a DEMP be submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that within 6 months of a specified phased of the Proposed Development ceasing to be used for the purposes of electricity generation, a DEMP associated with the specified phase of the Proposed Development be submitted to and approved in writing by Thurrock Borough Council.

6. SUMMARY OF IMPACT ASSESSMENT SECTIONS

6.1.1 Table 6.1 provides a summary of the impact assessment sections of the 2019 ES FID.

TABLE 6.1: SUMMARY OF THE IMPACT ASSESSMENT SECTIONS OF THE 2019 ES FID

	Construction / Decommissioning	***Operation***
Air Quality	The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described. Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on air quality will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.	The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described. Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on air quality will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.
Noise and Vibration	The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not cause noise and vibration that materially differs from that previously described. Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary noise and vibration effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.	The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not cause noise and vibration that materially differs from that previously described. Therefore, during operation, the likely significant direct and indirect / secondary noise and vibration effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.
Landscape and Visual	The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary landscape and visual effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.	The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during operation, the likely significant direct and indirect / secondary landscape and visual effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.
Ecology	The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on ecology will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.	The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on ecology will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

	Construction / Decommissioning	***Operation***
Ground Conditions	The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on ground conditions (geology and land contamination) will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remains valid and appropriate.	The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on ground conditions (geology and land contamination) will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remains valid and appropriate.
Water Resources	The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on water resources will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.	The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on water resources will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.
Flood Risk:	With regards to flood risk, the 2019 Updated Flood Risk Assessment did not identify a requirement to alter the proposed finished floor levels from the current minimum level of 3.7 m AOD. Nevertheless, to reflect that there may be differing requirements for Development Option (i) and Development Option (i), the 2019 Variation Application proposes to include a new condition (Condition (41A)) to require that the commencement of each phase of the Proposed Development not take place until details of the flood resilience and flood evacuation measures associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council. The flood resilience and flood evacuation measures should ensure that the specified phase of the Proposed Development is able to remain operational in times of a residual flood event, and that operational personnel / visitors can be safely evacuated in times of a residual flood event.	
Traffic and Transport Infrastructure	For construction / operation / decommissioning, the level and characteristics of the traffic generated by the Proposed Development will not materially differ from that previously described. However, with regard to the current state of the environment (baseline scenario) there has been: (a) Predicted growth in baseline flows (due to the revision of the assessment year from 2014 /2019 to 2023); (b) Growth in baseline flows (with associated influence on the level and characteristics of the baseline flows) as due to further third-party development proposals which have become committed in the vicinity of the Proposed Development; (c) Changes to the layout and / or characteristics of the links and junctions within the study area (due to a number of scheme having been committed, commenced and / or completed); and, (d) Changes to the sustainable transport facilities and services serving to provide access to the Proposed Development site. Therefore, an updated impact assessment was undertaken in order to describe the main respects in which the likely significant traffic and transportation effects of the Proposed Development will differ from those previously described.	

	Construction / Decommissioning	***Operation***
	Based on the updated impact assessment, it was demonstrated that the 2019 effects of the changes in circumstance range from minor beneficial to minor adverse (albeit not directly attributable to the Proposed Development). Overall, a number of likely direct and indirect / secondary effects have changed from negligible (from the February 2010 ES) to minor adverse (this 2019 ES FID), but are anticipated to remain Not Significant.	For operation, the levels and characteristics of the traffic generated will be significantly lower than for construction. Therefore, the likely direct and indirect / secondary effects are anticipated to be negligible, and remain Not Significant.
Historic Environment	The current state of the environment (baseline scenario) is materially the same as that previously described, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on the historic environment will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.	The current state of the environment (baseline scenario) is materially the same as that previously described, and the likely effects of the Proposed Development are materially the same as those previously described. Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on the historic environment will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.
Socio-Economics	The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not result in social or economic changes which materially differ from those previously described. Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary socio-economic effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.	The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not result in social or economic changes which materially differ from those previously described. Therefore, during operation, the likely significant direct and indirect / secondary socio-economic effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

7. CONSOLIDATED SUMMARY OF MITIGATION AND MONITORING

7.1 Construction

7.1.1 For construction, Table 7.1 provides the consolidated summary of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects. With regards to implementation of these features and measures, wherever relevant, Table 7.1 also provides the associated Conditions of the 2016 Deemed Planning Permission (alongside a description of the proposed 2019 Variation Application variations of these Conditions).

7.2 Operation

7.2.1 For operation, Table 7.2 provides the consolidated summary of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects. With regards to implementation of these features and measures, wherever relevant, Table 7.2 also provides the associated Conditions of the 2016 Deemed Planning Permission (alongside a description of the proposed 2019 Variation Application variations of these Conditions).

7.3 Decommissioning

7.3.1 As far as possible, for decommissioning, Table 7.3 provides the consolidated summary of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects. With regards to implementation of these features and measures, wherever relevant, Table 7.3 also provides the associated Conditions of the 2016 Deemed Planning Permission (alongside a description of the proposed 2019 Variation Application variations of these Conditions).

TABLE 7.1: CONSTRUCTION MITIGATION AND MANAGEMENT FEATURES / MEASURES

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
General Features / Measures	General construction works / activities.	Prepare and implement a CEMP. The objective of the CEMP will be to: • Identify legal, environmental and other obligations and requirements appropriate to the construction of the Proposed Development; • Provide a framework to comply with the identified legal, environmental and other obligations and requirements through appropriate mitigation and monitoring; • (Based on the identified mitigation and monitoring measures), provide the basis for setting objectives and targets for construction of the Proposed Development; and, • Demonstrate a professional approach to environmental management.	Condition (25) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a CEMP has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a CEMP associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Comply with the 'normal construction working hours'.	Condition (26) of the 2016 Deemed Planning Permission requires compliance with these working hours. The 2019 Variation Application does not seek to vary this Condition.
		Comply with the 'piling construction working hours'.	Condition (27) of the 2016 Deemed Planning Permission requires compliance with these working hours. The 2019 Variation Application does not seek to vary this Condition.
		Comply with the 'construction working hours where no vehicle movements are permitted'.	Condition (22) of the 2016 Deemed Planning Permission requires compliance with these working hours. The 2019 Variation Application does not seek to vary this Condition.

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
		Comply with the 'heavy commercial vehicle movements construction working hours'.	Condition (21) of the 2016 Deemed Planning Permission requires compliance with these working hours. The 2019 Variation Application does not seek to vary this Condition.
Air Quality	General construction works / activities.	Prepare and implement a CEMP. With regards to air quality, the CEMP should include the following measures: This will include the following measures: • Assessment of materials for moisture content; • If material is dry, application of water spray onto the working area to suppress dust or treatment with a suitable dust suppressant; • Where excavation faces / trenches are not being worked, if required, sheeting or treating with a suitable dust suppressant; and, • Where finely ground materials are delivered, requiring that these are in bag form or stockpiled in specified locations where the material can be suitably covered; • Monitoring of areas utilised by traffic, and if they are dry, application of water by water bowsers; • Provision of paper-type face masks for all operatives working in areas of dust-generating construction works; and, • Employment of a road sweeping vehicles when required to remove dust and dirt from public roads.	See Condition (25) of the Deemed Planning Permission.

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
	Dust-generating construction works, including: earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow Earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow.	Development of and compliance with a scheme employing all reasonable measures for the suppression of dust during the period of construction.	Condition (6) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
	Dust-generating construction works, including: vehicle movements.	Development of and compliance with a scheme for the provision of wheel cleansing facilities for heavy commercial vehicles and any mobile plant which has an operating weight exceeding three tonnes.	Condition (4) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Sheeting of all open bodied heavy commercial vehicles carrying dry loose, aggregate, cement or soil into and / out of the Site.	Condition (7) of the 2016 Deemed Planning Permission requires that all open bodied heavy commercial vehicles carrying dry loose, aggregate, cement or soil into and / out of the Site be sheeted. The 2019 Variation Application does not seek to vary this Condition.

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
Noise and Vibration	General construction works / activities.	Prepare and implement a CEMP. With regards to noise and vibration, the CEMP should include the following measures: • All construction plant / equipment to be with customary exhaust silencers, and regularly maintained; • All construction plant / equipment to be used where appropriate. All major compressors to be sound-reduced models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers; • All ancillary construction plant / equipment (such as generators, compressors and pumps) to be positioned so as to cause minimum noise disturbance. If necessary, temporary acoustic barriers or enclosures to be provided; and, • To the extent required by Thurrock Borough Council, specific method statements and risk assessments to be produced for night working.	See Condition (25) of the Deemed Planning Permission.
	Noise and vibration-generating construction works; and, noise and vibration-generating construction plant / equipment / vehicles.	Compliance with BS 5228:2009 + A1 2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: Noise and Part 2: Vibration).	Condition (29) of the 2016 Deemed Planning Permission requires compliance with BS 5228:2009 + A1 2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: Noise and Part 2: Vibration). The 2019 Variation Application does not seek to vary this Condition.

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
		Development and implementation of a 'Noise Complaints Procedure'.	Condition (33) of the 2016 Deemed Planning Permission requires the development and implementation of a 'Noise Complaints Procedure'. The 2019 Variation Application does not seek to vary this Condition.
Landscape and Visual	General construction works / activities, including: • Construction works; • The presence of construction plant / equipment / vehicles; and, • The use of lighting.	Prepare and implement a CEMP. With regards to landscape and visual, the CEMP should include the following measures: • Careful placement of the temporary storage of topsoil and any other material considered of value for retention; and, • Careful design and layout of site construction areas including the location and type of temporary security fencing and lighting.	See Condition (25) of the Deemed Planning Permission.
Ecology	General construction works / activities.	Prepare and implement a CEMP.	See Condition (25) of the Deemed Planning Permission.
Ground Conditions (Geology and Land Contamination)	Release of contaminants due to construction activities across the Proposed Development site; and, discharges of pollutants to land.	Development of and compliance with a scheme to deal with the risks associated with the contamination of the site, including: • A Preliminary Risk Assessment; • If required, a Site Investigation Scheme; • If required, a Method Statement for any additional remediation; and, • If required, a Verification Plan.	Condition (45) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
		For any additional remediation, preparation of Verifications Report(s).	Condition (47) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a Verification Report has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a Verification Report associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Development of and compliance with a scheme in the event of unexpected contamination.	Condition (33) of the 2016 Deemed Planning Permission requires the development and implementation of a scheme in the event of unexpected contamination. The 2019 Variation Application does not seek to vary this Condition.
Water Resources and Flood Risk	Discharges of pollutants to water.	Development of and compliance with a scheme detailing the method and working of drainage facilities.	Condition (35) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Use of oil / grit interceptors for any surface waters contaminated by hydrocarbons.	Condition (37) of the 2016 Deemed Planning Permission requires the use of oil / grit interceptors. The 2019 Variation Application does not seek to vary this Condition.

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
		Storage of hydrocarbon / process chemicals / similar liquids on impervious bases, or surrounded by impervious bunds, with the size at least equipment to the capacity of the largest tank plus 10%.	Condition (37) of the 2016 Deemed Planning Permission requires the storage of hydrocarbon / process chemicals / similar liquids on impervious bases, or surrounded by impervious bunds, with the size at least equipment to the capacity of the largest tank plus 10%. The 2019 Variation Application does not seek to vary this Condition.
Transport and Transport Infrastructure	Short-term additional vehicular traffic on the public highway network (links and junctions within the study area).	Development of and compliance with a Transport Management Plan.	Condition (23) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a Transport Management Plan has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a Transport Management Plan associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Development of and compliance with a scheme for the monitoring of traffic movements.	Condition (14) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
		Development of and compliance with a scheme detailing the route(s) which traffic would take to and from the Site.	Condition (24) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Investigation into the use of water for the delivery of construction plant / equipment / materials.	Condition (15) of the 2016 Deemed Planning Permission requires that the construction of the Proposed Development not take place until the results of the investigation have been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that construction of a specified phase of the Proposed Development not take place until the results of the investigation associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council.

Aspect	***Likely Significant Effect on the Environment***	***Feature / Measure***	***Implementation***
		Investigation into the use of rail for the delivery of construction plant / equipment / materials.	Condition (17) of the 2016 Deemed Planning Permission requires that the construction of the Proposed Development not take place until the results of the investigation have been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that construction of a specified phase of the Proposed Development not take place until the results of the investigation associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council.
Historic Environment	Potential for construction works / activities to damage and / or disturb unknown buried archaeological features.	Development of and compliance with a scheme of archaeological investigation and associated implementation programme.	Condition (42) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
Socio-Economics	Direct positive effects due to short-term employment opportunities; and, indirect / secondary positive effects due to increases in the use of local services and businesses.	N / A	N / A

TABLE 7.2: OPERATION MITIGATION AND MANAGEMENT FEATURES / MEASURES

	Likely Significant Effect on the Environment	***Feature / Measure***	***Implementation***
General Features / Measures	General operational works / activities.	During operation, activities on the GEC site will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016. GECL already holds an Environmental Permit for the development permitted by the 2014 Varied Consent (EPR/EP3536EN) issued in July 2016. Based on the Development Option selected, an application to vary this Environmental Permit will be made in due course. In addition, regarding emissions of CO_2, the Proposed Development will be required to apply for an EU Emissions Trading Scheme (ETS) Permit. The scheme is currently operating in Phase III, which runs from 1 January 2013 to 31 December 2020. Phase IV will run from 1 January 2021 to 31 December 2030.	
Air Quality	NO_x emissions from the Proposed Development (the CCGT unit(s) or the CCGT unit and OCGT unit(s)).	The following features / measures will be included in the design of the CCGT unit(s) or the CCGT unit and the OCGT unit(s): • Dry Low NOx Combustion Technology; and, • A use of a stack of sufficient height and flue gases of sufficient temperature and velocity to ensure good dispersion.	Design of the Proposed Development.
		Development of and compliance with a scheme for the monitoring of NO_x in the area.	Condition (55) of the 2016 Deemed Planning Permission requires that commissioning of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commissioning of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

	Likely Significant Effect on the Environment	***Feature / Measure***	***Implementation***
Noise and Vibration	The use of noise and vibration-generating plant within the Proposed Development (the CCGT unit(s) or the CCGT unit and OCGT unit(s)).	The following features / measures will be included in the design of the CCGT unit(s) or the CCGT unit(s) and the OCGT unit(s): • Silencers to be fitted to achieve noise attenuation on specific plant / equipment items, including gas turbine and HRSG inlets and ductwork; • Acoustic lagging and low noise trims to be fitted to specific pipework and noise generating steam valves where required; • Acoustic enclosures to be considered, and provided where required, for all plant / equipment items where practicable, including for smaller plant items such as compressors and pumps; • Where required, internal surfaces within the turbine hall to be treated to control internal reverberant noise levels. An appropriate treatment would consist of dense mineral wool panel behind perforated sheet steel, or a spray on cellulose fibre treatment; • Although 'normally-off' plant / equipment items have not been included in the modelling of normal operation, these to be afforded the same level of noise control as all other plant / equipment items as appropriate; and, • As tonal or impulsive noises are considered more annoying than continuous noise sources, plant / equipment items to be silenced or otherwise controlled through regular maintenance.	Design of the Proposed Development.

	Likely Significant Effect on the Environment	***Feature / Measure***	***Implementation***
		Development of and compliance with a scheme for the monitoring and control of noise generated by the normal commercial operation.	Condition (30) of the 2016 Deemed Planning Permission requires that commissioning of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commissioning of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Development and implementation of a 'Noise Complaints Procedure'.	Condition (33) of the 2016 Deemed Planning Permission requires the development and implementation of a 'Noise Complaints Procedure'. The 2019 Variation Application does not seek to vary this Condition.
Landscape and Visual	The presence of the Proposed Development.	Development of and compliance with a scheme including provisions for the layout and design. In particular:	Conditions (8) to (11) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

	Likely Significant Effect on the Environment	***Feature / Measure***	***Implementation***
		Development of and compliance with a scheme of landscaping. The landscaping scheme for GEC shall consider: • The provision of additional ponds on site. These could be designed in particular for amphibians and aquatic invertebrates but would also provide value for a variety of bird species. • The use of a locally appropriate species-rich grass seed mix for the grassland surrounding the GEC. • The provision of landscape planting, in particular any screen planting, which would provide new habitat for nesting birds and terrestrial invertebrate species as well as providing new features of value to foraging and commuting bats. • The provision of bird nesting boxes on buildings within the area to immediately increase the availability of nesting habitat on site. The associated landscaping management plan shall also consider: • Low frequency, ecologically sensitive grass cutting to allow grass and flora species to flower and set seed. • Recommendations for the drainage features and any ponds provided on site.	Condition (50) of the 2016 Deemed Planning Permission requires that commissioning of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commissioning of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

	Likely Significant Effect on the Environment	***Feature / Measure***	***Implementation***
Ecology	General operational works / activities.	Development of and compliance with a scheme of Environmental Enhancement Measures (incorporating a management plan).	Condition (54) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme (incorporating a management plan) has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
			In addition, following discussion with Natural England, InterGen / GECL has agreed to: • Provide an ecologist for 1 – 2 days per year over a 5 year term to monitor mitigation works to regenerate acid grassland at Thundersley Great Common SSSI; and, • Participate in a new Project to increase the population of Least Lettuce (*Lactuca saligna*) species at Vange and Fobbing Marshes SSSI.
Ground Conditions (Geology and Land Contamination)	General operational works / activities.	The following features / measures will be included in the design of GEC: • All foundations will be appropriately specified to resist chemical attack from soils or groundwater; and, • All foundations will be designed so as not to present a preferential pathway for contamination migration.	Design of the Proposed Development.

	Likely Significant Effect on the Environment	***Feature / Measure***	***Implementation***
Water Resources and Flood Risk	Discharges of pollutants to water.	Development and implementation of a scheme for sustainable drainage.	Condition (34) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
Transport and Transport Infrastructure	Long-term additional vehicular traffic on the public highway network (links and junctions within the study area).	Development of and compliance with a Travel Plan.	Condition (13) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a Travel Plan has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Development of and compliance with a scheme for the monitoring of traffic movements.	Condition (14) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

	Likely Significant Effect on the Environment	***Feature / Measure***	***Implementation***
Historic Environment	N / A	N / A	N / A
Socio-Economics	Direct positive effects due to long-term employment opportunities; and, indirect / secondary positive effects due to increases in the use of local services and businesses.	N / A	N / A

TABLE 7.3: DECOMMISSIONING MITIGATION AND MANAGEMENT FEATURES / MEASURES

	Likely Significant Effect on the Environment	***Feature / Measure***	***Implementation***
General Features / Measures	General construction works / activities.	Prepare and implement a DEMP. The objective of the DEMP will be to: • Identify legal, environmental and other obligations and requirements appropriate to the decommissioning of the Proposed Development; • Provide a framework to comply with the identified legal, environmental and other obligations and requirements through appropriate mitigation and monitoring; • (Based on the identified mitigation and monitoring measures), provide the basis for setting objectives and targets for decommissioning of the Proposed Development; and, • Demonstrate a professional approach to environmental management.	Condition (56) of the 2016 Deemed Planning Permission requires that within 6 months of the Proposed Development ceasing to be used for the purposes of electricity generation, a DEMP be submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that within 6 months of a specified phased of the Proposed Development ceasing to be used for the purposes of electricity generation, a DEMP associated with the specified phase of the Proposed Development be submitted to and approved in writing by Thurrock Borough Council.