PARSONS BRINCKERHOFF

November 2013

SUTTON BRIDGE B
Non-Technical Summary

EDF Energy

Final

CONTENTS

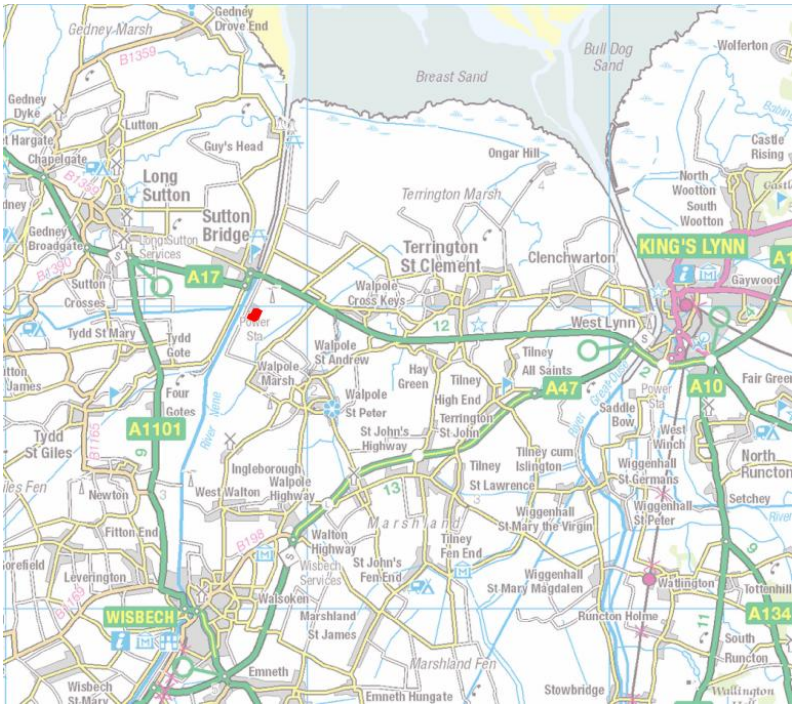
INTRODUCTION

Overview

1.0.1 EDF Energy proposes to construct and operate a Combined Cycle Gas Turbine (CCGT) power plant to be known as Sutton Bridge B (SBB) on land adjacent to the existing Sutton Bridge A CCGT power plant, nears King's Lynn, Lincolnshire. The proposed SBB power station (the proposed development) will be completely standalone from Sutton Bridge A, and there are not anticipated to be any common or shared facilities.

1.0.2 The location of the proposed SBB site is shown in Insert 1.

INSERT 1: LOCATION OF THE PROPOSED SBB SITE



1.0.3 The proposed development would produce up to 1800 MW of electrical generation capacity. Whilst the ultimate configuration of SBB is still being investigated, it is likely that the CCGT power plant would comprise up to three gas turbines, fuelled by natural gas, complete with associated HRSGs and steam turbine plant in single shaft configuration.

The Developer

1.1.1 The Developer is EDF Energy. They are one of the UK's largest energy companies and the largest producer of low-carbon electricity, producing around one-fifth of the UK's electricity from their nuclear power stations, wind farms, coal and gas power stations and Combined Heat and Power (CHP) plants. Furthermore, the company supplies gas and electricity to more than 5.8 million businesses and residential customers and is the biggest supplier of electricity by volume in Great Britain.

The Purpose of this Document

Consent under Section 36 of the Electricity Act 1989

1.2.1 Section 36 of the Electricity Act 1989 requires that those seeking to construct, extend or operate an electricity generating station with an output of over 50 MW located

within England and Wales must apply for consent to the Secretary of State for Energy and Climate Change. Section 90 of the Town and Country Planning Act 1990 provides that on granting any consent under Section 36 of the Electricity Act 1989, the Secretary of State for Energy and Climate Change may direct that planning permission for the development shall be deemed to be granted.

1.2.2 An application for consent under Section 36 of the Electricity Act 1989 was originally made to the Department of Energy and Climate Change (DECC) in December 2005. This application is still live (has not yet been determined) and, since December 2005, there have been a number of proposed changes to the proposed SBB development.

1.2.3 Discussion with DECC (regarding the application for consent and the proposed changes) has resulted in the requirement for the updating and revision of the application documentation. The updating and re-submission is intended to:

- Describe the proposed changes to the proposed development;
- Update the Environmental Impact Assessment (EIA) undertaken for SBB (which was reported in the December 2005 Environmental Statement (ES));
- Update the supporting studies, including the Combined Heat and Power (CHP) Assessment and the Flood Risk Assessment (FRA); and
- Provide the required additional supporting studies, including a Carbon Capture Readiness (CCR) Feasibility Study.

1.2.4 Accordingly, an ES has been prepared as part of an addendum to the existing application for consent, which has been made under Section 36 of the Electricity Act 1989. This document is a Non-Technical Summary of the Addendum to the ES.

Viewing the Consent Application

1.3.1 Copies of the updated application documentation (with a plan showing the land to which it relates), may be inspected during office hours at the following addresses:

- **South Holland District Council**:
  Council Offices, Priory Road, Spalding, Lincolnshire, PE11 2XE
- **Sutton Bridge Community Library**:
  Curlew Centre, Bridge Road, Sutton Bridge, Spalding, Lincolnshire, PE12 9SA
- **Long Sutton Library**:
  Trafalgar Square, Long Sutton, Spalding, Lincolnshire, PE12 9HB

1.3.2 Alternatively, copies of the Environmental Statement (£250 paper, £50 electronic) and the Non Technical Summary (free of charge while stocks last) can be obtained from: Dan Hulbert, Contracts and Origination Manager, EDF Energy, Cardinal Place, London, SW1E 5JL. Copies of the Non-Technical Summary are also available from EDF Energy's website:

http://www.edfenergy.com/about-us/energy-generation/thermal-power-generation/gas/sutton-bridge-b.shtml

Commenting on the Application

1.4.1 Should you wish to make a representation regarding the application, then it should be forwarded to the Electricity Supply Consents team at DECC, to: Secretary of State for Energy and Climate Change, c/o National Infrastructure Consents Team, Markets and Infrastructure, 3 Whitehall Place, London SW1A 2HD or by email to:

deccnic@decc.gsi.gov.uk

RATIONALE FOR DEVELOPMENT

The Need to Replace Closing Electricity Generating Capacity

2.0.1 Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (commonly known as the Large Combustion Plant Directive (LCPD)) requires power plants to adhere to stringent emissions limits. Several power plants throughout the UK, totalling 12 GW of generating capacity, have 'opted-out' of this obligation and, as such, are required to close by the end of 2015 or after 20,000 hours of operation after 1 January 2008, whichever is sooner.

2.0.2 Of these plant, only Ironbridge remains open, having converted to fire on 100 per cent sustainable biomass and is expected to close in 2015. RWE npower's made a similar conversion to its Tilbury B plant, but ceased operations in July 2013.

2.0.3 There are a further 20GW of coal plant which have "*opted-in*" to the LCPD, but which will be subject to more stringent emissions controls under the Industrial Emissions Directive (IED) from 2016 onwards. These plant face a significant number of options, including:

- Opting-out of the IED (with a similar 17,500 limit on hours ahead of ultimate closure in 2023);
- Deferral of opting-in by complying with a transitional emissions limit (the Transitional National Plan) until 2020, with limited additional emissions control investment;
- Full compliance with the IED's Emissions Limit Values (ELV) (to "opt-in") by installing emissions control equipment – allowing unconstrained running;
- Conversion to an alternative fuel source (e.g. biomass);or
- Closure.

2.0.4 The power plants which have *'opted-in'* to the LCPD are shown in Table 2.1.

TABLE 2.1: COAL POWER PLANTS WHICH HAVE 'OPTED-IN' TO THE LCPD

Name	*Capacity (to nearest 10MW)*
Drax Units 1-3	1940
Drax Units 4-6	1940
Ratcliffe-on-Soar	1990
Longannet	2280
Cottam	1990
West Burton A	1970
Rugeley B	980
Eggborough	1940
Lynemouth	420
Aberthaw	1500
Ferrybridge Units 3&4	980
Fiddlers Ferry	1960
Uskmouth	240
Total	**20120 MW**

2.0.5 Drax Power has already completed full conversion of its unit 2 to biomass fuel, and conversion work is ongoing on its units 1 and 3, while E.On's Ratcliffe station is retrofitting selective catalytic reduction technology to achieve full compliance with the IED ELV. However, potential decisions at other plant are diverse and uncertain and the outlook for coal economics is relatively poor given the rise of the carbon price floor.

2.0.6 The picture is made even more complex by the introduction of a capacity mechanism in the GB market, for first delivery in 2018, upon which most of the plant will rely to support any investment decisions.

2.0.7 Therefore, as the operating regimes and future plans of these *'opted-in'* power plant will become a commercial decision to be taken by the power plant operators, it is currently impossible to fully predict the timing and impact of the IED and capacity market on the UK generation capacity. However, it is ultimately expected that there would be a significant loss of generation capacity as full compliance with the ELV is unlikely to be economically viable for all plant in the fleet.

2.0.8 In addition, based on published figures, around 4.5 GW of generating capacity will be lost by 2020 due to the planned closure of some nuclear power plants that are reaching the end of their useful life, with an additional loss of 4.9 GW by 2035.

2.0.9 The remaining fleet of nuclear power plant and their estimated closure dates is shown in Table 2.2.

TABLE 2.2: REMAINING FLEET OF NUCLEAR POWER PLANT AND THEIR ESTIMATED CLOSURE DATES[1]

Name	*Reactor Type*	*Capacity (MW)*	*Start of Operation*	*Closure / Estimated Closure*
Wylfa	Magnox	980	1972	2014
Dungeness B	AGR	1080	1985	2018
Hartlepool	AGR	1210	1989	2019
Heysham 1	AGR	1200	1989	2019
Hinkley Point B	AGR	1260	1976	2023
Hunterston B	AGR	1210	1976	2023
Heysham 2	AGR	1200	1989	2023
Torness	AGR	1200	1988	2023
Sizewell B	PWR	1190	1995	2035

2.0.10 Therefore, based on published figures, 58 per cent of the current nuclear power plant generating capacity is expected to exist beyond 2020 decreasing to 11 per cent beyond 2023. We note that EDF Energy expects further plant life extensions will be possible[2], but no figures exist at plant level in the public domain.

The Likely Future Increases in Electricity Demand

2.1.1 In addition to the above closures of existing electricity generating capacity, a further challenge is presented through the projected future increases in electricity demand.

2.1.2 Forecasts from National Grid's 2013 Future Energy Scenarios indicate that between 3.9 GW (Slow Progression Scenario) and 4.2 GW (Gone Green Scenario) of new thermal generation capacity will be required by 2020.

2.1.3 Further to this, analysis by the UK Government of different pathways to 2050 indicates that it will be vital to make energy efficiency improvements to meet the

[1] Table of past and present nuclear reactors (DECC). Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48353/2027-past-and-present-uk-nuclear-reactors.pdf
http://webarchive.nationalarchives.gov.uk/+/http:/www.berr.gov.uk/files/file49437.pdf

[2] See http://www.edfenergy.com/media-centre/press-news/EDF-Energy-announces-seven-year-life-extension-to-Hinkley-Point-B-and-Hunterston-B-nuclear-power-stations.shtml

target of reducing emissions by at least 80 per cent by 2050. However, set against the energy efficiency improvements, is that the demand for electricity is likely to increase. This is due to significant sectors switching from being powered by fossil fuels to using electricity (i.e. industry, heating and transport). Therefore, the analysis by the UK Government predicts that total electricity consumption could double (or triple) by 2050.

Summary of the Urgency of Need for New Electricity Capacity

2.2.1 Based on the above information in Section 2.3 (The Need to Replace Closing Electricity Generating Capacity), the UK faces a significant need to replace generating capacity in the next decade as a result of environmental costs/emissions restrictions.

2.2.2 Coupled with the information in Section 2.4 (The Likely Future Increases in Electricity Demand) there will be a clear need for new generating capacity in the next decade. This will be required to:

- Aid the maintenance of a diverse, reliable, secure and strategically robust energy mix;
- Replace the electricity generation capacity loss due to ageing plant closures; and
- Cover the expected increase in electricity demand.

Summary of Rationale for Development

2.3.1 Therefore, it is clear that fossil fuelled power plants are required in order to play a key role in providing reliable and flexible capacity to provide back-up and maintain the safety margin. In this regard, the development of the proposed SBB power station is considered an appropriate candidate.

SUMMARY OF SUTTON BRIDGE B

Alternatives

3.0.1 The Electricity Works EIA Regulations require that the ES should include an outline of the main alternatives that have been studied by the applicant and an indication of the main reasons for their choice, taking into account environmental impacts.

3.0.2 In the case of SBB, the main alternatives that have been considered are:

- Alternative development sites;
- Alternative technologies for electricity generation;
- Alternative technologies for cooling; and
- Alternative layouts.

3.0.3 In considering alternatives it was concluded that:

- The proposed SBB site is the preferred development site;
- A gas-fired CCGT power plant (designed to be Carbon Capture Ready) is the preferred technology for electricity generation at SBB; and
- There is currently the potential for hybrid cooling towers to be employed. However, at this time, there remains an ongoing technical, commercial and regulatory evaluation such that ACCs may be utilised at the SBB power station. For this reason, wherever possible and relevant, the impact assessment has considered both hybrid cooling towers and ACCs.

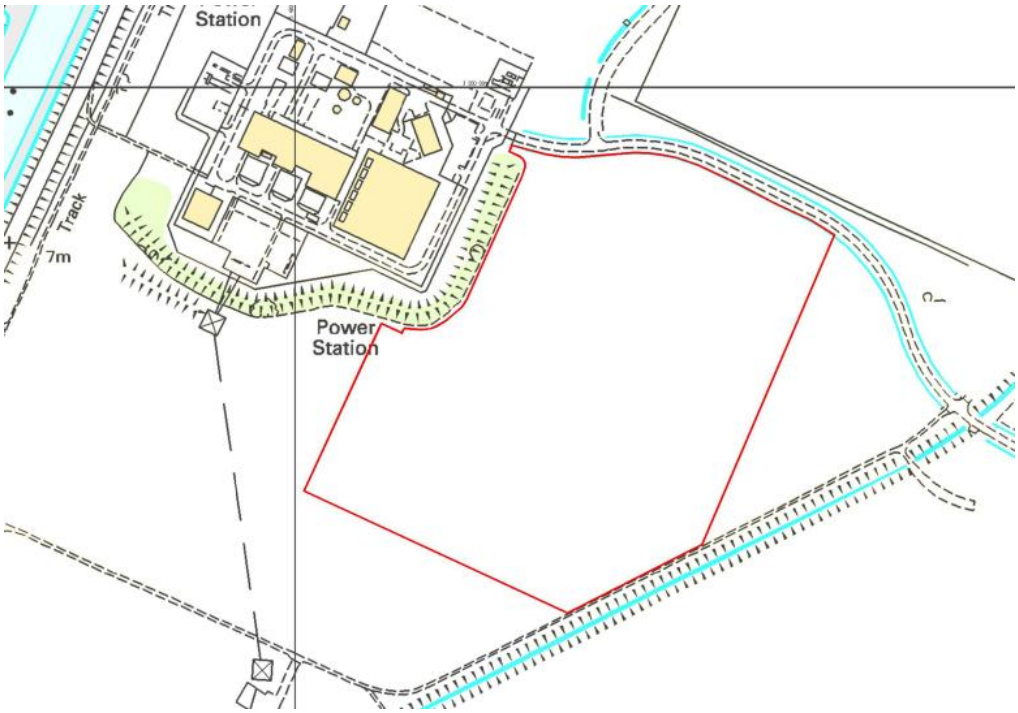
Proposed Site

3.1.1 The proposed SBB site is located approximately 2km south/south east of Sutton Bridge in Lincolnshire, close to the east bank of the River Nene. The Wingland Enterprise Park/Industrial Estate and Bakkavor Meals lie to the north of the site. To the south and east of the site lies open farmland. To the west, the proposed SBB site is bounded by a boundary with the existing Sutton Bridge A CCGT power plant. To the south and east, the proposed SBB site is surrounded by open farmland. To the north, the proposed SBB site is bounded by Centenary Way. This is shown in Insert 2.

3.1.2 Towns and villages in the surrounding area include (but are not limited to):

- Port of Sutton Bridge – approximately 2.5km north;
- Long Sutton – approximately 5km west;
- Holbeach – approximately 13km west;
- Tydd St. Giles – approximately 7.4km west;
- Walpole Marsh – approximately 1.5km south east;
- Walpole St. Andrew – approximately 2km south east;
- Walpole St. Peter – approximately 3.8km south east;
- Walpole Cross Keys – approximately 3km east; and
- Terrington St. Clement – approximately 5.7km east.

INSERT 2: THE PROPOSED SBB SITE



3.1.3 The site lies within the administrative boundary of South Holland District Council. However, the site also lies close to the administrative boundaries of the Borough of King's Lynn and West Norfolk (to the east) and Fenland District Council (to the south).

Designations

3.1.4 The nearest Area of Outstanding Natural Beauty (AONB) is the Norfolk Coast AONB, which is approximately 15km from the proposed SBB site. Refer to Section 11 (Landscape and Visual) of the ES for further details.

3.1.5 There are no Scheduled Ancient Monuments (SAMs) within a 5km radius of the proposed SBB site. The nearest SAM is a moated site and medieval field system in Church Field, north of St John's Church, some 7km to the south east of the proposed SBB site. Refer to Section 16 (Historic Environment) of the ES for further details.

3.1.6 There are no public footpaths crossing the proposed SBB site or in the immediate vicinity of the site. However, the Nene Way Recreational Path passes the site on the opposing bank of the River Nene running north to south. This Recreational Path follows the course of the River Nene for approximately 70 miles. Refer to Section 11 (Landscape and Visual) of the ES for further details.

Access to Site

3.1.7 Road access to the proposed SBB site is provided via Centenary Way. This is an existing road which also provides road access to the existing Sutton Bridge A CCGT power plant.

3.1.8 Centenary Way joins the A17 approximately 0.7km to the north east. The A17 travels east to west, linking Newark-on-Trent in Nottinghamshire to King's Lynn in Norfolk. To the north, at Newark-on-Trent, the A17 joins the A1, which provides links to the wider motorway network.

3.1.9 The A1101 passes to the west of Sutton Bridge, and the River Nene and runs from Bury St Edmunds to Littleport in the north. As it crosses the Fens it is predominantly below sea level.

3.1.10 Wisbech Port and the River Nene Navigation connects the town of Wisbech (south of the proposed SBB site) to the North Sea via the tidal river, which forms the boundary between Norfolk and Cambridgeshire. The route lies to the west of the existing Sutton Bridge A power station.

Operational Details

3.2.1 The SBB power station would provide up to 1800 MW of electrical generation capacity. Whilst the ultimate configuration of SBB is still being investigated, it is likely that the CCGT power plant would comprise up to three gas turbines, fuelled by natural gas, complete with associated HRSGs and steam turbine plant in single shaft configuration.

3.2.2 SBB would be capable of operating continuously throughout the year; for up to 35 years.

3.2.3 The electricity generated by the SBB power station would be delivered to the National Grid. It is currently anticipated that this would be via a connection into the nearest suitable connection point, which is the National Grid Walpole Sub-station approximately 3.5km from the proposed SBB site. A separate consent application will subsequently be submitted for the electrical connection either under the Town and Country Planning Act 1990 and/or the Planning Act 2008.

3.2.4 The SBB power station would require a gas connection for the provision of natural gas. It is currently anticipated that this would be via a connection to the nearby National Grid Gas National Transmission System. The quality of natural gas would be the same as that used in domestic properties and would be supplied to a Gas Receiving Facility (GRF) on the SBB site at a pressure in the range of approximately 30 to 75 bar g. With the exception of filtration, pressure and temperature regulation within the GRF, the natural gas would not be treated on site, and accordingly it would not be stored on site. A separate consent application would subsequently be submitted for the gas connection either under the Town and Country Planning Act 1990 and/or the Planning Act 2008.

The CCGT Power Plant Principle

3.2.5 In the electricity generation process, natural gas would be burnt in the combustion chamber of each gas turbine from where the hot gases would expand through the turbine section of the gas turbine. This would drive an electrical generator to generate electricity. Each gas turbine is likely to comprise: an inlet air filter house; an air compressor; combustion chambers; a power turbine; and exhaust ductwork and silencer.

3.2.6 Following this, the hot gas turbine exhaust gases would contain recoverable energy and would therefore be used in a HRSG to generate high pressure steam. In a large CCGT power plant of this type, the steam would usually be generated at three pressures to the steam turbine plant to generate additional electricity. The steam turbine is connected to the gas turbine in single shaft configuration.

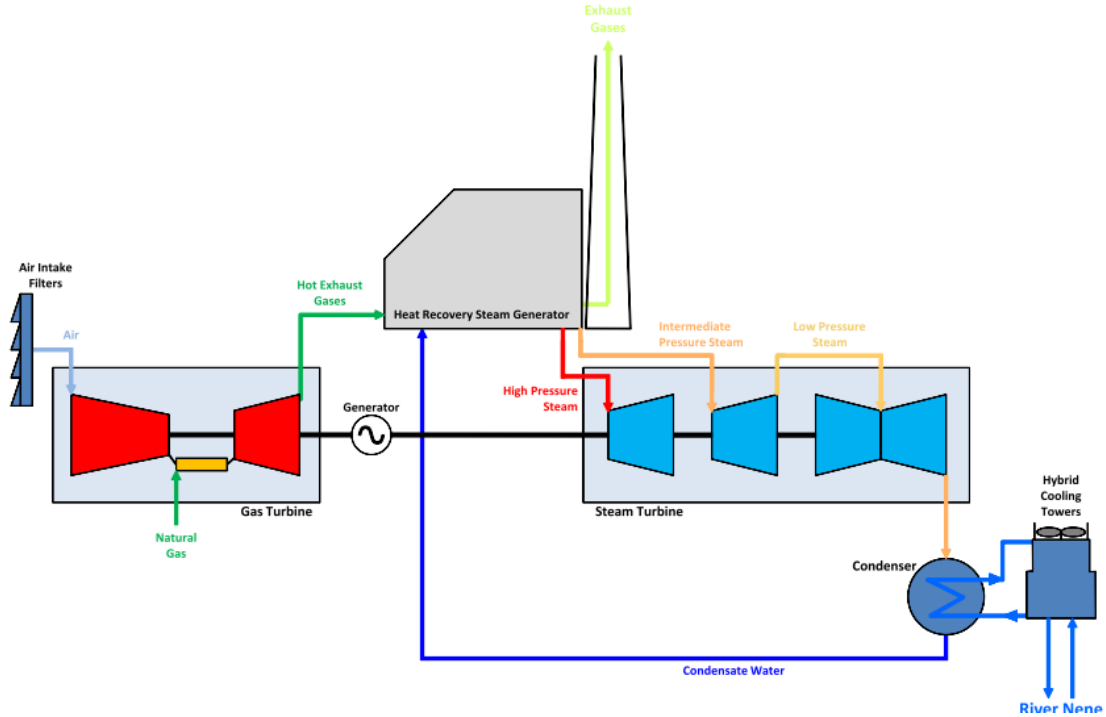
3.2.7 The use of a combined gas turbine and steam turbine cycle increases the overall efficiency of the power plant. Accordingly, SBB would be capable of generation in combined cycle mode with an overall electrical generation efficiency of approximately 60 per cent. Furthermore, if it becomes technically and economically feasible to provide heat and/or power to surrounding users, additional fuel utilisation gains may be achieved. Refer to the CHP Assessment for further details.

3.2.8 After expanding through the steam turbine plant, most of the steam's useful heat would have been extracted, and the Low Pressure (LP) turbine exhaust steam would be condensed prior to its re-use in the HRSG as feedwater. At present there are two different options being considered for the cooling technology. These are hybrid cooling towers and ACCs. In the event that hybrid cooling towers are preferred, then it is proposed that water from the River Nene would be used as make-up water. In the event that ACCs are preferred, then water from the towns water supply would be used as make-up water.

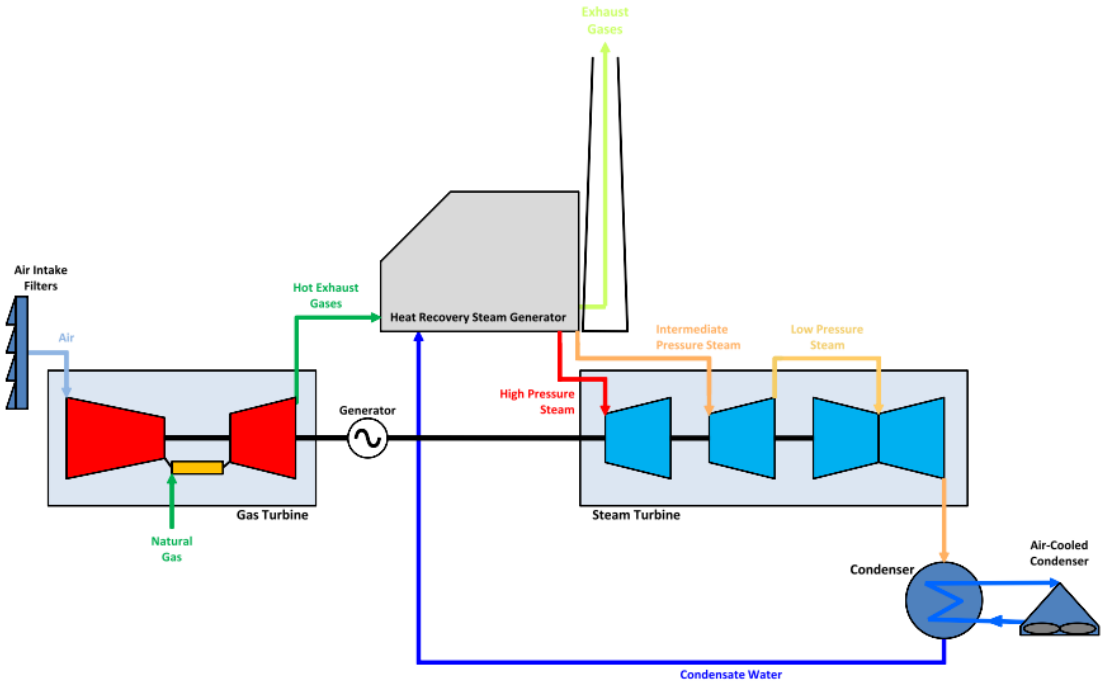
3.2.9 The flue gases would be discharged via up to three 80m high stacks (one per HRSG).

3.2.10 A schematic showing the CCGT power plant principle is provided in Insert 3 (using hybrid cooling towers) and Insert 4 (using ACCs).

INSERT 3: CCGT POWER PLANT PRINCIPLE USING HYBRID COOLING TOWERS



INSERT 4: CCGT POWER PLANT PRINCIPLE USING AIR COOLED CONDENSERS



NON-TECHNICAL SUMMARY OF THE ENVIRONMENTAL STATEMENT

Introduction

4.0.1 The siting and design of the proposed SBB power station has been carefully considered to avoid, where possible, environmental sensitivities and minimise any potential impacts.

4.0.2 An assessment has been undertaken to consider potential environmental impacts of the proposed SBB power station on the following:

- Air Quality;
- Noise and Vibration;
- Landscape and Visual;
- Ecology;
- Water Resources;
- Geology and Soils;
- Traffic, Transport and Access;
- Historic Environment; and
- Socio-Economics.

4.0.3 The following sections set out the key findings of the assessments undertaken, identifying any potentially significant environmental impacts and mitigation measures proposed.

Air Quality

Approach to Assessment

4.1.1 An assessment of potential impacts during the construction phase on air quality was undertaken in accordance with the Institute of Air Quality Management's '*Guidance on the Assessment of Construction on Air Quality and the Determination of their Significance'*. The assessment considers the potential impacts with regards to:

- Nuisance and loss of amenity (i.e. annoyance/disturbance due to dust deposition/soiling);
- Harm to human health (i.e. due to increased exposure to PM_{10}); and
- Harm to ecological receptors.

4.1.2 The assessment of the potential impacts during the operational phase examined both the use of hybrid cooling towers as well as ACCs. The assessment was undertaken using industry standard air dispersion modelling techniques in accordance with the latest Environment Agency Guidance, particularly guidance provided by their Air Quality Modelling and Assessment Unit. It included an assessment of:

- Short-term increments to ground level concentrations of nitrogen dioxide (NO_2) and carbon monoxide (CO); and
- Long-term increments to ground level concentrations of NO_2.

Construction

4.1.3 During the construction phase, there is potential that the proposed development would have a Moderate impact on the Sutton Bridge A Power Station and a Minor impact on the Wingland Enterprise Park in terms of dust emissions prior to mitigation. However, the potential impact would reduce to Minor for all sensitive receptors once

control measures, secured through compliance with a Construction Environmental Management Plan (CEMP), have been implemented.

Operation

4.1.4 During the operational phase, the proposed development would have a potentially Negligible impact from short term increments to ground level concentrations of nitrogen dioxide (NO_2) and carbon monoxide (CO) and a Minor impact from long term increments to ground level concentrations of NO_2. The following measures and controls would be in place during the operational phase:

- Compliance with the Environmental Permit which will be issued under the Environmental Permitting England and Wales Regulations 2010 (as amended);
- Use of an abatement technology;
- Implementation of a stack of sufficient height; and
- Emitting flue gases at a temperature and velocity which would ensure adequate dispersion.

Decommissioning/Demolition

4.1.5 The works associated with the decommissioning/demolition phase would be similar to those experienced during the construction phase. During this phase activities would be controlled via a Decommissioning Environmental Management Plan. Therefore, the potential impacts experienced during the decommissioning/demolition phase would be similar to those experienced during construction.

Summary

4.1.6 The assessment concludes that potential air quality impacts experienced during all phases of the project would be Not Significant following compliance with the commitments and controls set out, in the ES, for each phase of SBB.

Noise and Vibration

Approach to Assessment

4.2.1 The assessment of potential noise and vibration impacts was undertaken via the following steps:

Step 1) Identification of Noise Sensitive Receptor (NSR) locations;

Step 2) Quantification of existing ambient baseline noise climate at the NSR locations;

Step 3) Predicting noise and vibration levels from each phase of the project; and

Step 4) Assessment of likely significant noise and vibration impacts by reference to relevant policy, guidance and best practice.

4.2.2 In consultation with South Holland District Council, the following NSR locations were selected for monitoring[3]:

[3] It should be noted that these NSR locations are the same as those used in the December 2005 ES.

- ***Location 1: Gibbons Farm -*** The Farm is approximately 930m south east of the proposed SBB site, and is screened from the Sutton Bridge A power station by a large barn. The monitoring location was in front of the dwelling.
- ***Location 2: Herons Path Bungalow -*** This property is approximately 660m north west of the proposed SBB site. The monitoring location was just outside the boundary of the property, in line with the façade nearest the existing Sutton Bridge A power station.
- ***Location 3: Peterspoint Lane Cottages -*** These properties are approximately 975m north west of the proposed SBB site. The monitoring location was in front of a cluster of three houses on Peterspoint Lane, with clear line of site to the existing Sutton Bridge A power station.
- ***Location 4: Agricultural Experimental Units -*** These units are approximately 800m north north west of the proposed SBB site. The monitoring location was in the driveway in front of the units.
- ***Location 5: Marigold Cottage, Chalk Lane -*** The property is approximately 1300m north east of the proposed SBB site. The monitoring location was in line with the rear façade of this cottage, with clear line of site to the existing Sutton Bridge A power station.
- ***Location 6: King John Bank -*** The bank is approximately 790m south south east of the proposed SBB site. The monitoring location was on the edge of the road, close to the existing houses. There is clear line of site to the existing Sutton Bridge A power station.

4.2.3 A baseline noise survey was undertaken to determine existing noise levels at the six NSR locations. Noise from the existing Sutton Bridge A Power Station contributes to the baseline noise climate.

Construction

4.2.4 Construction activities would inevitably lead to some degree of noise disturbance at locations in close proximity although this would only be temporary. Noise levels would also vary, depending upon variables which include:

- noise generated by plant/equipment used on site, generally expressed as sound power levels;
- distance between the noise source and the receptor;
- periods of time that plant/equipment is operational; and
- the level of attenuation (i.e. ground absorption/air absorption/barrier effects).

4.2.5 The potential noise levels during construction were estimated using calculation methods from the British Standards Institute (BSI). In addition, the Construction Environmental Management Plan (CEMP) will include measures to control noise emissions to ensure that noise thresholds would not be breached. Therefore, compliance with the noise thresholds would ensure that the proposed development would have no greater than a Negligible impact on the receptors identified above in terms of noise.

4.2.6 In terms of vibration, there would be no piling activities within 20m of surrounding properties. Therefore, the proposed development would have no greater than a Negligible impact in terms of vibration.

Operation

4.2.7 Best practice noise control measures would be adopted to minimise any potential noise impact. Measures would include, as appropriate: housing equipment within

acoustic enclosures; fitting silencers; and/or selecting 'low-noise' generating equipment. The noise levels would be below 'marginal significance' and therefore the potential impact would be Minor.

4.2.8 In terms of vibration, it is not anticipated that the level of induced vibration would be of a level that could be recorded at receptor locations. Therefore, it has not been assessed.

Decommissioning

4.2.9 The works associated with the decommissioning/demolition phase would be similar to those experienced during the construction phase. During this phase activities would be controlled via a Decommissioning Environmental Management Plan. Therefore, the potential impacts experienced during the decommissioning/demolition phase would be similar to those experienced during construction.

Summary

4.2.10 The assessment concludes that potential noise and vibration impacts experienced during all phases of the project would be Not Significant following compliance with the commitments and controls set out, in the ES, for each phase of SBB.

Landscape and Visual

Approach to Assessment

4.3.1 During all phases of the project some features of the SBB power station would have the potential to produce direct and indirect effects on the landscape (i.e. landscape elements and character) and on visual receptors.

4.3.2 Consideration has been given to the potential impacts of the proposed development of SBB (with mitigation) on landscape character and visual receptors/amenity.

Construction

4.3.3 Throughout construction, the proposed SBB site would have the appearance of a typical construction site.

4.3.4 Measures would be included within the Construction Environmental Management Plan (CEMP) to mitigate any potential impacts. Measures would include: the use of topsoil storage to screen views into the site; the creation of a screen around the perimeter of the site; and, the removal of any buildings or structures (e.g. lighting and fencing) once they are no longer needed to support the construction.

4.3.5 Assuming the adoption of the above mitigation measures, the potential impacts from most viewpoints would be Neutral or Slight. However, the impact on residents from Walpole St Andrews looking north west, King John Bank looking west and River Nene, north of Gibbons Farm looking north east has a potential Moderate impact, albeit only for a temporary period.

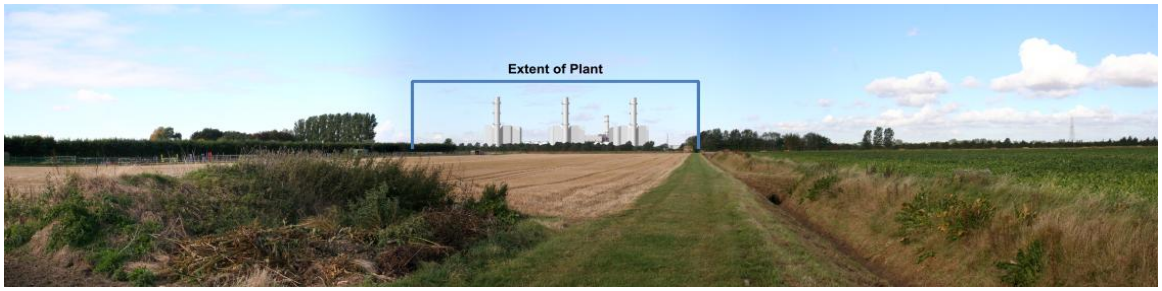
Operation

4.3.6 The power station would be of a modern and functional design, industrial in character and appearance. The structure would have a relatively simple clear outline, with the use of cladding and materials with finishes in recessive colours to help minimise any potential visual impacts.

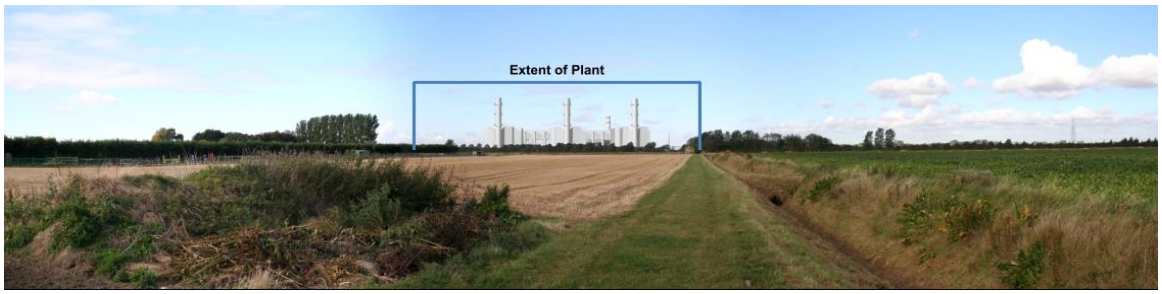
4.3.7 To aid with the assessment, ten photomontages were produced from key locations in the vicinity of the proposed SBB site. Insert 7 shows the existing view and proposed SBB views (with hybrid cooling towers and ACCs respectively) from King John Bank, and Insert 8 shows the existing view and proposed SBB views (with hybrid cooling towers and ACCs respectively) from Railway Lane.

INSERT 7: VIEWS FROM KING JOHN BANK

Existing View



Proposed SBB View (with Hybrid Cooling Towers)



Proposed SBB View (with ACCs)

INSERT 8: VIEWS FROM RAILWAY LANE

Existing View

Proposed SBB View (with Hybrid Cooling Towers)

Proposed SBB View (with ACCs)

4.3.8 The potential impacts relate to:

- The loss of existing landscape features associated with the proposed SBB site;
- The introduction of new buildings and structures to the locality, including any impacts arising during the night time as a result of lighting associated with the development;
- Change of land use.

4.3.9 All viewpoints would potentially experience a Slight impact once the landscaping scheme has established itself, with the exception of the viewpoint by residents from King John Bank near A17 looking west, King John Bank looking west and the River Nene, north of Gibbons Farm, looking north east which would be Moderate.

Decommissioning

4.3.10 The works associated with the decommissioning/demolition phase would be similar to those experienced during the construction phase. During this phase activities would be controlled via a Decommissioning Environmental Management Plan. Therefore, the potential impacts experienced during the decommissioning/demolition phase would be similar to those experienced during construction.

Summary

4.3.11 The assessment concludes that potential landscape and visual impacts experienced during all phases of the project would be Not Significant in the long-term following compliance with the commitments and controls set out, in the ES, for each phase of SBB.

Ecology

Approach to Assessment

4.4.1 The methodology for the impact assessment is based on Guidelines for Ecological Impact Assessment in the UK issued by the Institute of Ecology and Environmental Management. The methodology involved five key stages:

- ***Stage 1***: Consultation;
- ***Stage 2***: Baseline Studies and Evaluation of Ecological Receptors;
- ***Stage 3***: Identification of Valued Ecological Receptors;
- ***Stage 4***: Identification and Characterisation of Potential Impacts; and
- ***Stage 5***: Assessment of Impact Significance (including estimation of confidence).

4.4.2 There are two Statutory Designated Sites within the Ecological Study Area, which are:

- The Wash (and The Wash and North Norfolk Coast) Special Areas of Conservation (SAC), Special Protection Area (SPA), Ramsar, Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR). This is the largest estuarine system in the UK, and is located approximately 6.5km to the north of the proposed SBB site; and
- The Shrubberies Local Nature Reserve (LNR), which is parkland/pasture. It is located approximately 6.6km north west of the proposed SBB site.

4.4.3 There are four Non-Statutory Designated Sites within the ecological study area. These are:

- Cross Keys Pool and Field Local Wildlife Site (LWS), approximately 750m north of the proposed SBB site footprint;

- Nene Bank Verges Roadside Nature Reserve (RNR), approximately 500m south west of the proposed SBB site footprint;
- South Holland Main Drain Banks LWS, approximately 500m west of the proposed SBB site footprint; and
- Sutton Bridge Disused Railway Line Site of Nature Conservation Interest (SNCI), approximately 1km north west of the proposed SBB site footprint.

4.4.4 In addition, within the ecological survey area, there are two Biodiversity Action Plan (BAP) Habitats listed on the UK and Lincolnshire BAPs: coastal and floodplain grazing marsh; and, ponds.

4.4.5 Various ecology surveys have been undertaken to assemble a detailed list of the habitats present, including: badgers, bats, breeding birds, Great Crested Newts (and other amphibian species), otters, reptiles, water voles and wintering birds. In addition, any invasive species were also noted.

Construction

4.4.6 The potential impacts of the construction phase on ecological receptors are:

- Damage and disturbance to designated sites;
- Habitat loss, fragmentation, degradation, damage and disturbance;
- Mortality and/or injury of and/or disturbance of protected and notable species.

4.4.7 The potential impacts to identified valuable ecological receptors are, in some instances considered to be significant at a local/site level prior to the implementation of mitigation. However, the potential impacts would be managed through compliance with the Construction Environmental Management Plan (CEMP). Measures included within the CEMP will include:

- briefings and instruction to be given with regards to the ecological and biodiversity issues associated with the proposed development;
- environmental awareness training plans;
- ensuring that work compounds and access tracks are not located in, or adjacent to, areas that maintain habitat value or are within areas supporting protected/notable species.

4.4.8 Following the implementation of such measures detailed in the CEMP, the potential impacts will be Not Significant during construction.

Operation

4.4.9 The potential impacts of the operational phase on ecological receptors are:

- Potential degradation/disturbance of designated sites;
- Potential degradation/disturbance of existing/retained habitats;
- Potential mortality and/or injury to protected and notable species; and
- Disturbance to protected and notable species.

4.4.10 The Environmental Impact Assessment has noted that there would be some potential Slight Adverse impacts at the Cross Keys Pool and Field Local Wildlife Site before the implementation of mitigation.

4.4.11 The operation of the power station would be controlled, principally, through the Environmental Permit that will regulate the maximum emissions from operation of SBB to within levels acceptable to the receiving environment. Controls imposed by

the Permit would ensure that the potential impacts during operation of SBB will be Not Significant.

Decommissioning

4.4.12 The works associated with the decommissioning/demolition phase would be similar to those experienced during the construction phase. During this phase activities would be controlled via a Decommissioning Environmental Management Plan. Therefore, the potential impacts experienced during the decommissioning/demolition phase would be similar to those experienced during construction.

Summary

4.4.13 The assessment concludes that potential ecological impacts experienced during all phases of the project would be Not Significant following compliance with the commitments and controls set out, in the ES, for each phase of SBB.

Water Quality and Resources

Approach to Assessment

4.5.1 The anticipated sources of the raw water are identified and the appropriate processing and storage methods are defined, based on the intended uses (such as make-up to the HRSG/cooling). The reason for use and the amounts of water required is outlined and, where appropriate, the anticipated effluent compositions established. The final destination and impact of all effluents will be assessed.

4.5.2 The assessment methodologies adopted have also allowed for an estimate of the dilution capacity of the River Nene (should hybrid cooling be implemented), to be made. With regard to the cooling water discharge, a calculation of the residual process contribution to concentrations of pollutants at the edge of the cooling water discharge plume mixing zone has been undertaken and an assessment made of how this could impact on achieving the objectives of the Water Framework Directive for the River Nene based on its chemical status and the supporting elements of the ecological status.

Construction

4.5.3 The potential impacts on water resources during construction would be associated with the use of water for (inter alia):

- General construction activities;
- Dust suppression;
- Wheel-washing facilities; and
- Welfare facilities.

4.5.4 However, various measures would be adopted in the Construction Environmental Management Plan to manage works and to avoid, minimise and mitigate any potential impacts.

4.5.5 Following the implementation of, and compliance with, the CEMP, the potential impacts on water quality and resources are considered to be Not Significant.

Operation

4.5.6 During operation, the potential impacts would depend on whether hybrid cooling towers or ACCs were employed. As such, the description of potential impacts considers impacts based on the use of hybrid cooling towers only, and also potential impacts based on the use of either hybrid cooling towers or ACCs.

4.5.7 During operation with hybrid cooling towers only, the potential impacts on water resources would be associated with the use of water for:

- Raw water treatment (make-up to hybrid cooling towers);
- The effluent/purge from the hybrid cooling towers; and
- The thermal plume from the hybrid cooling towers.

4.5.8 During operation with either hybrid cooling towers or ACCs, the potential impacts on water resources would be associated with the use of water for:

- Raw water treatment (make-up to steam/water cycle);
- Effluent from steam/water cycle;
- The Waste Water Treatment Plant; and
- Miscellaneous uses.

4.5.9 In addition, during operation there are expected to be four new drainage/water systems on the proposed SBB site. These are expected to include:

- The surface water drainage system;
- The oily water drainage system;
- The contaminated (process effluent) waste water system; and
- The sewerage system.

4.5.10 The following measures would be implemented, and complied with, in order to manage works and mitigate potential impacts:

- The Environmental Permit which will be issued under the Environmental Permitting England and Wales) Regulations 2010 (as amended);
- Appropriate oil and chemical storage tank areas would be utilised; and
- The site drainage system would be appropriately designed and maintained.

4.5.11 Following the implementation of these measures, the impact assessment has indicated that the residual impacts on water quality and resources are considered to be Not Significant.

Decommissioning

4.5.12 The works associated with the decommissioning/demolition phase would be similar to those experienced during the construction phase. During this phase activities would be controlled via a Decommissioning Environmental Management Plan. Therefore, the potential impacts experienced during the decommissioning/demolition phase would be similar to those experienced during construction.

Summary

4.5.13 The assessment concludes that potential impacts on water quality and resources experienced during all phases of the project would be Not Significant following compliance with the commitments and controls set out, in the ES, for each phase of SBB.

Geology and Soils

Approach to Assessment

4.6.1 The assessment undertaken considered both an Inner Study Area (i.e. the proposed SBB site) and an Outer Study Area (i.e. a 500m buffer zone around the proposed SBB site).

4.6.2 The assessment has been undertaken with an understanding of:

- previous land uses of the proposed SBB site;
- existing physical and underlying ground conditions at the SBB site;
- the importance of receptors and their sensitivity to change, as well as the magnitude of change; and
- measures to mitigate potential impacts arising from the proposed development.

Construction

4.6.3 In terms of geology, there would be no potential impacts. Indeed, construction activities will be carried out at depths which would interfere with either the superficial or the bedrock geology.

4.6.4 In terms of soils, the construction works would result in disturbance to the underlying geology and soils (e.g. through site clearance, excavations for foundations, construction of structures for plant/equipment). During construction, there would be a temporary loss of land used as temporary storage/lay down areas. However, this land would be restored following construction. Therefore, there would be a potential Moderate temporary impact.

4.6.5 In terms of contamination, there would be a potential impact on the health of construction workers (arising from direct contact with potential contaminants). In addition, although a landfill site is noted approximately 275m away from the proposed SBB site, the risk of leaching of contaminants is low due to the local geology. There would be a potential Moderate temporary impact, prior to mitigation. The potential impact would be reduced through compliance with a Construction Environmental Management Plan, which would impose best working practices to manage any potential impacts.

Operation

4.6.6 During operation of SBB it is unlikely that significant ground works which have the potential to disturb geology in and around the proposed SBB site will be undertaken. Therefore, in respect of geology, there would be no impacts during the operational phase.

4.6.7 In terms of soils, the potential impact would be in relation to the change in land use (i.e. a loss of farmland). However, the proposed SBB site is very small compared with the available land in the area, and would not impact on the integrity or value of this resource (similar to the impacts as a results of the development of the existing Sutton Bridge A Power Station), equating to a Moderate impact.

4.6.8 In terms of contamination, there is the potential for accidental spills/leakages of materials which could be potentially harmful to health. However, the majority of the proposed SBB site would be hardstanding which would block pollutants from contacting the underlying land (i.e. there will be no pathway between the source and the receptor). Furthermore, adherence to Best Practice means that accidental spills/leakages are unlikely and, where they do occur, will be retained on-site for treatment and disposal by suitably licensed contractors. The potential impact is assessed as Moderate.

Decommissioning

4.6.9 The works associated with the decommissioning/demolition phase would be similar to those experienced during the construction phase. During this phase activities would be controlled via a Decommissioning Environmental Management Plan. Therefore, the potential impacts experienced during the decommissioning/demolition phase would be similar to those experienced during construction (Moderate).

Summary

4.6.10 The assessment concludes that potential impacts on geology and soils experienced during all phases of the project would be Not Significant following compliance with the commitments and controls set out, in the ES, for each phase of SBB.

Traffic, Transport and Access

Approach to Assessment

4.7.1 The impact assessment considered the potential impacts of the proposed SBB development on local traffic, the local transport network and associated infrastructure, particularly during the morning (AM) and afternoon (PM) peak hours, consistent with conditions on the A17 and the junction with Centenary Way/King John Bank.

4.7.2 The main access to the proposed SBB site would be via Centenary Way. Centenary Way links to the A17 via a staggered priority junction with Sutton Road and the A17, approximately 2km east of the proposed SBB site entrance.

4.7.3 Construction of SBB remains subject to an investment decision, which would be made by EDF Energy at a later date still to be determined, after securing all necessary consents for the construction and operation of SBB and when suitable commercial and regulatory conditions exist. Since the timing of commencement of construction is therefore not currently known, for the purposes of this assessment the earliest possible date has been estimated. This is important to the assessment as the earlier that construction of SBB would start, the greater the potential for an overlap with the construction phase of the Sutton Bridge Energy Park and therefore the greater the cumulative impact that may result due to the traffic from the two developments.

4.7.4 Based upon this estimate of the earliest possible construction date, the peak of construction activities has been assumed to occur in 2017 to provide a worst case assessment.

Construction

4.7.5 During the peak of construction, it is estimated that up to approximately 1,500 construction personnel per day would travel to and from the proposed SBB site. Typically, during construction, the bulk of the construction workforce traffic to and from the proposed SBB site would occur outside of the AM and PM peak hours.

4.7.6 During construction, there would be no exceedances of the threshold for satisfactory operation of the A17 following the addition of the traffic associated with SBB, a potentially Minor impact for general construction traffic and a potentially Moderate impact for the movement of abnormal indivisible loads (AILs). In addition, there would be no exceedances of the threshold for satisfactory operation of Centenary Way.

4.7.7 EDF Energy will work with Sutton Bridge Power (operators of the existing Sutton Bridge A Power Station), the developer/operator of Sutton Bridge Energy Park and users of the Wingland Enterprise Park to ensure that any on-site traffic associated with SBB is managed and the potential for impacts on Centenary Way traffic minimised.

Operation

4.7.8 During operation, it is anticipated that there will only be low levels of additional traffic to the local road network, including the intermittent delivery of various process chemicals. Therefore, the potential impact from operational traffic associated with SBB would be Minor.

Decommissioning

4.7.9 The works associated with the decommissioning/demolition phase would be similar to those experienced during the construction phase. During this phase activities would be controlled via a Decommissioning Environmental Management Plan. Therefore, the potential impacts experienced during the decommissioning/demolition phase would be similar to those experienced during construction.

Summary

4.7.10 The assessment concludes that potential impacts on traffic, transport and access experienced during all phases of SBB would be Not Significant following compliance with the commitments and controls set out, in the ES, for each phase of SBB. Notwithstanding, a Construction Traffic Management Plan would be developed to manage the movement of goods and workforce during the construction phase.

Historic Environment

Approach to Assessment

4.8.1 The historic environment/archaeological assets considered in the impact assessment include:

- Conservation Areas;
- Designated features (including Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and Registered Battlefields);
- Built historic environment assets;
- Earthwork features; and
- Buried archaeological assets.

4.8.2 There are no Conservation Areas within the proposed SBB site footprint. However, there are a number of Conservation Areas within the study area. These are at Long Sutton and Sutton Bridge, and have been designated as conservation areas for their unique and important Post-Medieval and Modern historical buildings and development.

4.8.3 There are no designated Scheduled Ancient Monuments, World Heritage Sites, Registered Parks and Gardens, or Registered Battlefields within the study area. The nearest Scheduled Ancient Monuments are approximately 6-7km from the proposed SBB site. The nearest Registered Park and Garden is approximately 10km away, in the centre of Wisbech. This is Peckover House which is an early to mid 19th Century walled town garden, with late 20th Century additions. Peckover House is under the ownership of the National Trust.

4.8.4 Grade I Listed Buildings are those which are considered to be of exceptional national architectural or historic importance. Grade II* Listed Buildings are particularly important buildings of more than special interest. There are ten Listed Buildings/Monuments within the Study Area. These include:

- 2 Grade II* Listed Buildings/Monuments (a K6 Telephone Kiosk and the Cross Keys Bridge/Engine house for the Cross Keys Bridge); and
- 8 Grade II Listed Buildings/Monuments (a milestone, a footbridge, a public house, a church and 4 residential properties).

4.8.5 The built historic environment assets, earthwork features and buried archaeological assets are detailed in Table 4.1.

TABLE 4.1: SUMMARY OF HISTORIC ENVIRONMENT / ARCHAEOLOGICAL POTENTIAL

Period	*Summary*	*Likelihood of Further Discovery*
Pre-Historic	Absent/Limited/None Recorded There are no known pre-historic sites or finds within the Study Area. The proposed SBB site footprint was located in a wide river estuary within a tidal plain. This would have been attractive for hunting and gathering. Settlement is likely to have been found on higher ground away from the tidal plain, and may not have been located within the proposed SBB site footprint. In addition, environmental changes since this period have seen the general area inundated with flood waters many times, as well as erosion and alluvial accumulation events.	Medium
Roman	Present/Limited/Minor Recordings	Low
Medieval	Absent/Limited/None Recorded	Low
Post-Medieval/Industrial	Present/Frequent/Multiple Recordings	Low
Modern	Present/Frequent/Multiple Recordings	High

4.8.6 The assessment was divided into consideration of temporary impacts and permanent impacts.

4.8.7 Temporary impacts are those associated with construction and decommissioning activities, and relate to:

- Visual impacts on the setting of historic environment/archaeological assets during construction/decommissioning; and
- Visual impacts on the historic landscape during construction/decommissioning.

4.8.8 Permanent impacts are those associated with construction, operation and decommissioning, and relate to:

- Physical impacts on historic environment/archaeological assets during construction/operation/decommissioning;
- Loss of upstanding historic environment/archaeological assets;
- Visual impacts on the setting of historic environment/archaeological assets during operation; and
- Visual impacts on the historic landscape during operation.

4.8.9 The most significant impacts on heritage assets would occur during the construction phase. Therefore measures would be agreed with the relevant consultee and adopted to ensure that where there are heritage assets these are all treated in an appropriate manner based on an approach that either leaves the heritage asset in-situ after being recorded, or that the heritage asset is recorded and removed following a controlled procedure from the site. Details of the measures to be adopted will be detailed in the Construction Environmental Management Plan. Following compliance with the CEMP, the potential impacts on the historic environment would be Not Significant.

Socio-Economics

Approach to Assessment

4.9.1 Social impacts are those which relate to the ways in which people live, work, play, relate to one another, organise to meet their needs and generally cope as members of society. Economic impacts relate to employment, and direct and indirect spending.

4.9.2 This impact assessment considers the potential impact of the proposed development on:

- Population characteristics;
- Community and institutional structures;
- Individual and family changes; and
- Community resources.

4.9.3 There is currently no established methodology for the assessment of socio-economic impacts. Therefore, to assess the socio-economic impacts the '*Guidelines and Principles for Social Impact Assessment*' (updated 2003) were used as an initial guide. In addition, guidance contained within the '*Social Impacts and Wellbeing: multi-criteria analysis techniques for integrating nonmonetary evidence in valuation and appraisa*l', written by the Social Impacts Taskforce and published by Defra in December 2011 has been used. This was supplemented by professional knowledge and experience. There assessment was undertaken using the following steps:

Stage 1. Describe the Human Environment and Area of Influence

Stage 2. Identify Potential Stakeholders

Stage 3. Identify Probable Impacts

Stage 4. Identify Likely Socio-Economic Impacts

Stage 5. Clarify with Enhancement Measures

Stage 6. Assess Socio-Economic Impacts

Stage 7. Recommend Further Opportunities for Benefits Associated with the Development

Stage 8. Conclusions

4.9.4 The construction workforce is anticipated to peak at approximately 1,500 workers. During operation, the power station is anticipated to employ a workforce of approximately 50 workers. Local recruitment and supply chain use would be encouraged throughout the facility's life. There would be a potential Minor (positive) benefit during construction. This would have associated benefits for the local supply chain, shops and services and population.

4.9.5 The works associated with the decommissioning/demolition phase would be similar to those experienced during the construction phase.

Summary

The assessment concludes that potential socio-economics impacts experienced during all phases of the project would be Not Significant.