

URS

Seabank 3

EIA Scoping Report

12th February 2013

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Prepared for:
SSE Seabank Land
Investments Ltd

UNITED
KINGDOM &
IRELAND



Rev	Date	Details	Prepared by	Checked by	Approved by
1	13 th November 2012	Draft for Client Review	Natalie Williams Environmental Consultant	Neil Tittle Principal Consultant	Richard Lowe Associate Director
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3	12 th February 2013	Final report for submission to NID	Natalie Williams Environmental Consultant	Neil Tittle Principal Consultant	Richard Lowe Associate Director

URS Infrastructure & Environment UK Ltd
 The Crescent Centre,
 Temple Back,
 Bristol
 BS1 6EZ
 United Kingdom

Telephone: +44(0)117 917 1200
 Fax: +44(0)117 930 0342

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TABLE OF CONTENTS	1.	INTRODUCTION.....	1
		Background.....	1
		Consenting Regime	1
		Objectives of Scoping	2
		The Need for the Proposed Development.....	4
	2.	DESCRIPTION OF THE EXISTING ENVIRONMENT.....	5
		Description of the Site	5
		Historic and Existing Site Use	10
		Sensitive Environmental Receptors.....	10
		Previous Environmental Studies.....	13
	3.	PROJECT DESCRIPTION.....	13
		The Proposed Development.....	13
		Combined Cycle Gas Turbines.....	17
		Electricity Substation and Grid Connection	20
		Gas Connection	20
		Access	21
		Carbon Capture Readiness (CCR).....	21
		Preparation of the Site.....	22
		Construction Programme and Management	23
	4.	PROJECT ALTERNATIVES	24
		Alternative Sites.....	24
		Alternative Developments.....	25
		Alternative Technologies	25
	5.	PLANNING POLICY.....	25
		Primary Policy Framework.....	25
		Secondary Policy Framework.....	26
	6.	POTENTIALLY SIGNIFICANT ENVIRONMENTAL ISSUES	29
		Air Quality	29
		Noise and Vibration	31
		Ecology	35
		Habitats Regulations Assessment.....	37
		Flood Risk	38
		Geology, Hydrogeology and Land Contamination.....	39
		Archaeology and Cultural Heritage.....	40
		Traffic and Transport	43
		Landuse, Recreation and Socio-Economics	45
		Landscape and Visual Impact Assessment.....	46
		Sustainability and Climate Change.....	51
		CHP Assessment.....	51

7. NON-SIGNIFICANT EIA ISSUES 52

Waste 52

Electronic Interference..... 52

Aviation 52

Accidental Events / Health & Safety 53

8. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS 53

EIA Methodology and Reporting..... 53

Structure of the Environmental Statement 53

Structure of Technical Chapters 55

Scoping and Consultation..... 62

9. CONCLUSIONS 63

10. REFERENCES..... 64

TABLE OF FIGURES

FIGURE 1: APPROXIMATE SITE LOCATION 2

FIGURE 2: POTENTIAL DCO BOUNDARY 3

FIGURE 3: PHOTOGRAPH FACING WEST TOWARDS SEABANK 1 & 2 FROM THE CENTRE OF THE SITE [DATE TAKEN, 30/08/2012, 3.15 MP, 2048X1536 PIXELS]..... 7

FIGURE 4: PHOTOGRAPH FACING SOUTH EAST FROM THE CENTRE OF THE SITE [DATE TAKEN, 30/08/2012, 3.15 MP, 2048X1536 PIXELS] 7

FIGURE 5: PHOTOGRAPH OF THE RED RHINE FACING SOUTH FROM THE CENTRE OF THE SITE [DATE TAKEN, 30/08/2012, 3.15 MP, 2048X1536 PIXELS]..... 8

FIGURE 6: PHOTOGRAPH FACING NORTH FROM THE CENTRE OF THE SITE [DATE TAKEN, 30/08/2012, 3.15 MP, 2048X1536 PIXELS] 8

FIGURE 7: LOCATION AND DIRECTION OF THE PHOTOGRAPHS SHOWN IN FIGURES 3-6..... 9

FIGURE 8: ENVIRONMENTAL CONSIDERATIONS ONSITE AND IN THE SURROUNDING AREA 12

FIGURE 9: CONCEPTUAL LAYOUT FOR THE PROPOSED DEVELOPMENT 15

FIGURE 10: INDICATIVE ACCESS POINTS AND ROUTE OF THE RED RHINE AND NEW SPINE ROAD 16

FIGURE 11: POWER GENERATION PROCESS (FOR A SINGLE SHAFT GENERATING MODULE)..... 18

FIGURE 12: POTENTIAL NOISE MONITORING LOCATIONS 33

FIGURE 13: COUNTY AND UNITARY AUTHORITIES WITHIN 10KM OF THE SITE 50

FIGURE 14: CUMULATIVE DEVELOPMENT LOCATION PLAN 61

TABLE OF TABLES

TABLE 1: INFORMATION PROVIDED IN THE SCOPING REPORT (BASED ON ADVICE NOTE 7)..... 4

TABLE 2: HISTORICAL MAP DESCRIPTIONS 10

TABLE 3: LOCAL AIR QUALITY MONITORING DATA, 2010 29

TABLE 4: ARCHAEOLOGICAL ASSETS WITHIN THE SITE BOUNDARY 40

TABLE 5: SCHEDULED MONUMENTS WITHIN 5KM 41

1. INTRODUCTION

Background

- 1.1 URS has been commissioned by SSE Seabank Land Investments Ltd, which is a wholly owned subsidiary of SSE Generation Ltd (hereinafter referred to as 'the Applicant') to prepare this Scoping Report to inform the scope and content of an Environmental Impact Assessment (EIA) for a proposed Combined Cycle Gas Turbine (CCGT) power station in Severnside, near Bristol.
- 1.2 The proposed new CCGT power station, which is named 'Seabank 3' will provide up to 1,400 megawatts (MW) electrical generation capacity on a site immediately adjacent to the existing Seabank Power Station ('Seabank 1 & 2'). Figure 1 presents the approximate site location.
- 1.3 This Scoping Report considers the environmental context of the site and the potential environmental impacts of the proposals. Where environmental impacts are considered to have the potential to be significant, these have been identified and this report outlines the proposed approach to be used in assessments undertaken for the EIA to characterise and understand the significance of these impacts. This report also outlines issues perceived to be non-significant which it is proposed do not require formal assessment as part of the EIA.
- 1.4 The EIA is an iterative process that feeds into the engineering design process to mitigate significant environmental effects where they are predicted to occur. The final design iteration, along with the findings of the EIA will be reported in an Environmental Statement (ES), in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) ('EIA Regulations') [Ref. 1] and will be submitted with the Development Consent Order (DCO) Application in accordance with Regulation 5 (2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('APFP Regulations') [Ref. 2].

Consenting Regime

- 1.5 The proposals fall within the definition of a 'nationally significant infrastructure project' (NSIP) under Section 15(2)(c) of the Planning Act 2008 [Ref. 3], as a 'generating station exceeding 50 MW'. It is also a 'Schedule 1' development under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) ('EIA Regulations') as it constitutes "Thermal power stations and other combustion installations with a heat output of 300 megawatts or more". As such an EIA is required for Seabank 3 and an ES needs to be prepared in accordance with these Regulations.
- 1.6 As a NISP project, the Applicant is required to seek a DCO to build the power station, under Section 31 of the Planning Act 2008. The DCO application will be prepared in accordance with Section 37 of this Act and secondary legislation including the EIA Regulations and the APFP Regulations (detailed above). The DCO application will be submitted to the Planning Inspectorate's (PINS) National Infrastructure Directorate (NID) who will examine the application and make recommendations to the Secretary of State, who will subsequently determine whether or not a DCO should be granted for Seabank 3.
- 1.7 Figure 2 illustrates the potential DCO site boundary. This comprises the Potential NSIP Site (or 'Site'), which constitutes the proposed generating station ('the Proposed Development'), as well as the Potential Associated Development Boundary, within which any new infrastructure associated with the NSIP such as water pipelines and electrical connection will be constructed (a decision has not been made at this stage as to whether this infrastructure will be included under this DCO application).

1.8 A description of the Site and NSIP Development is presented in Sections 2 and 3 of this report.

Objectives of Scoping

1.9 Having determined that the development requires an EIA ('screening'), scoping forms the next key stage of the EIA process, providing a framework for identifying likely significant environmental impacts arising from the development and distinguishing the priority issues needing to be addressed within the ES. Scoping also allows stakeholders an early opportunity to comment on the proposed structure, methodology and content of the EIA.

1.10 This Scoping Report has been prepared as part of a request to the NID for a formal Scoping Opinion on the information to be provided in the ES, pursuant to Regulation 8 of the EIA Regulations.

1.11 **Table 1** presents a list of information which should be included in a Scoping Report, as highlighted in The Planning Inspectorate Advice Note Seven 'Environmental Impact Assessment: screening and scoping' [Ref. 4], and the location where in this report the information is presented.

Figure 1: Approximate Site Location

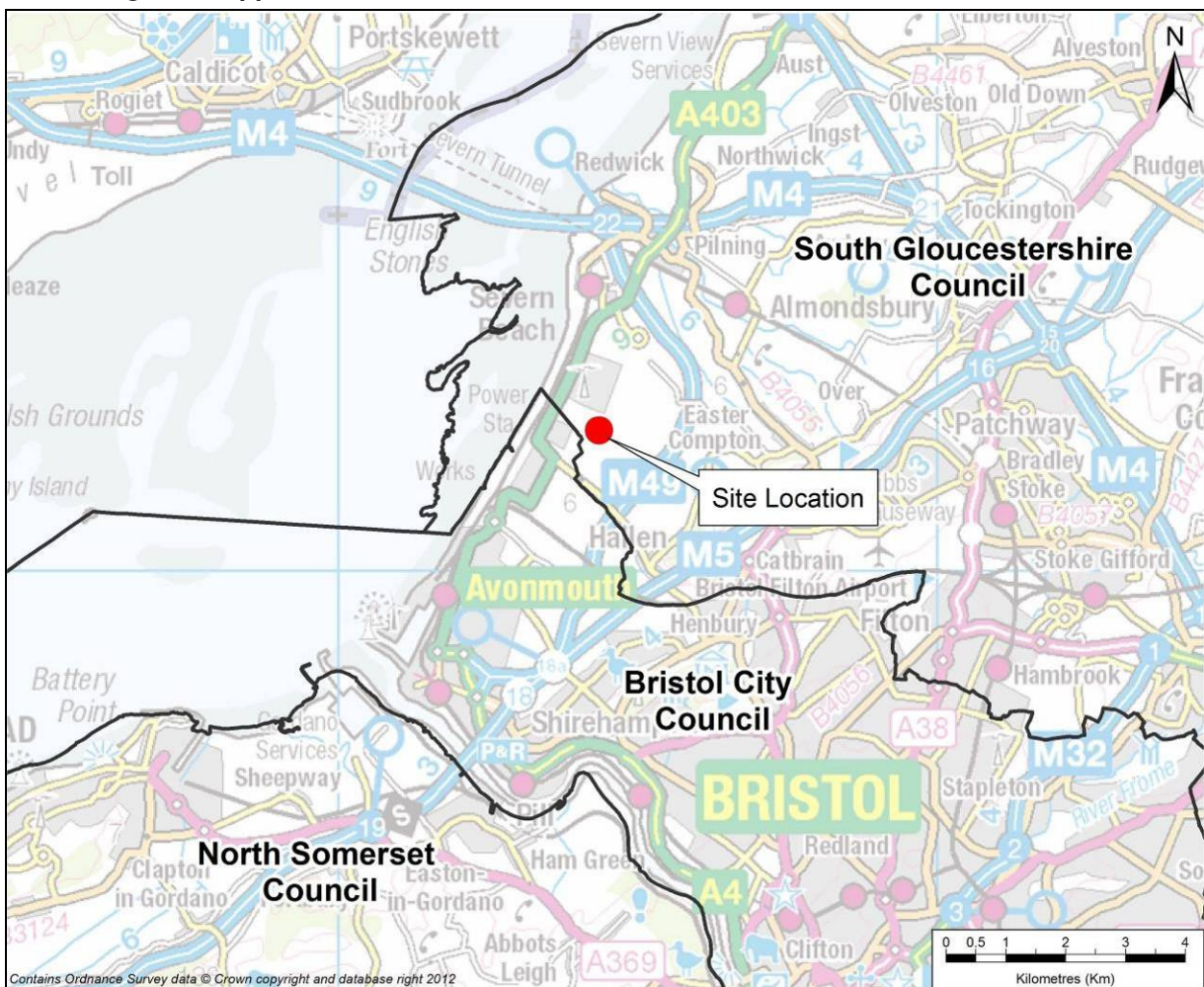


Figure 2: Potential DCO Boundary

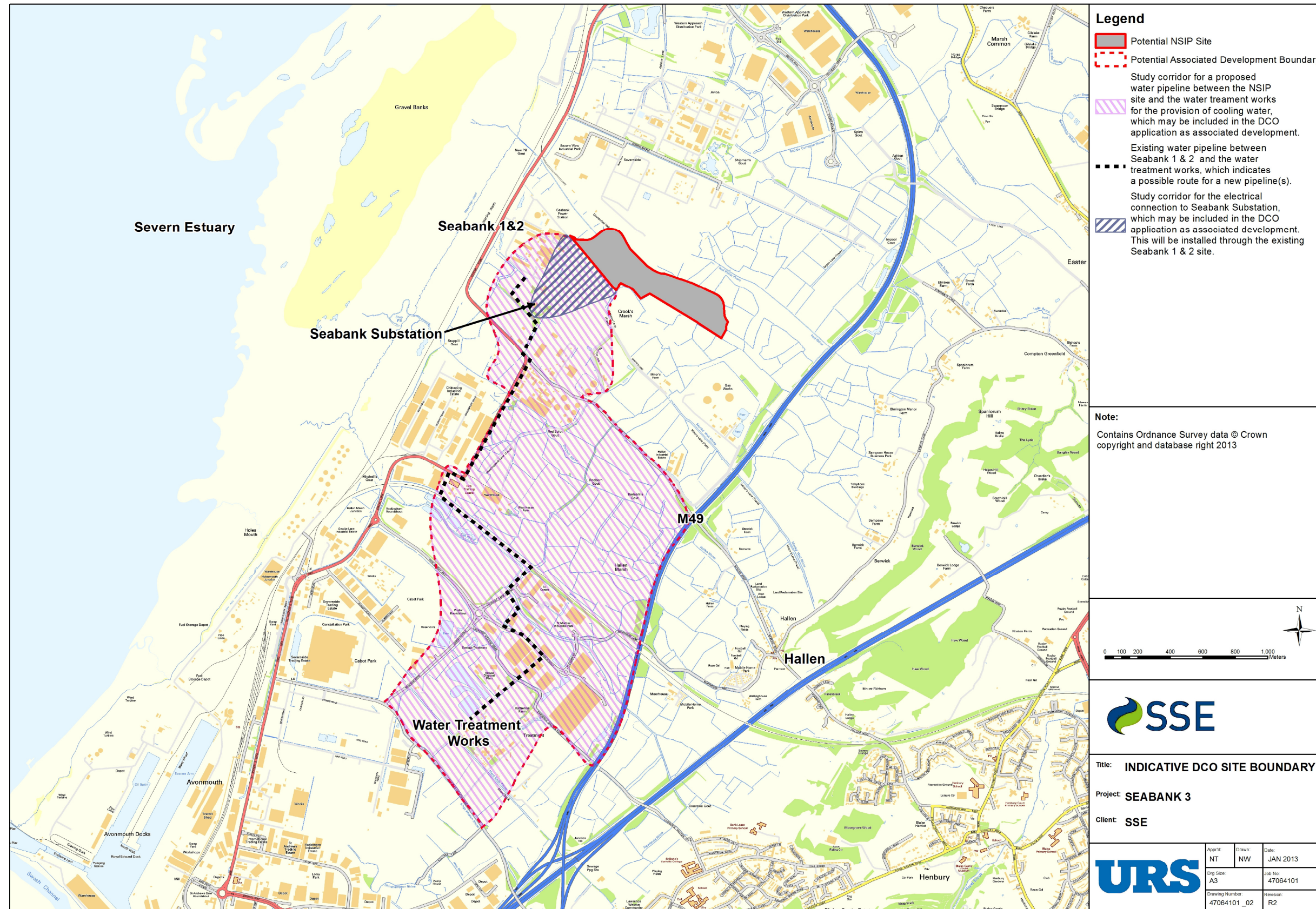


Table 1: Information provided in the Scoping Report (based on Advice Note 7)

Description of Information required	Section in Scoping Report where the Information is Presented
A plan showing: <ul style="list-style-type: none"> • the DCO site boundary and associated development; • permanent land take required for the NSIP; • temporary land take required for construction, including off-site construction compounds; • existing infrastructure which would be retained or upgraded for use as part of the NSIP; • existing infrastructure which would be removed; and • features including planning constraints and designated areas on and around the site, such as national parks or historic landscapes 	Figure 2. Figure 8 illustrates the environmental constraints and considerations
A description of: <ul style="list-style-type: none"> • the NSIP Site; • the NSIP development; and • its possible effects on the environment. 	<ul style="list-style-type: none"> • Section 2 • Section 3 • Section 6
An outline of the main alternatives considered and the reasons for selecting a preferred option	Section 4
Results of desktop and baseline studies where available	Section 2.4 and Section 6
Guidance and best practice to be relied upon	Section 6
Methods used or proposed to be used to predict impacts and the significance criteria framework used	Section 8.3.2
Where cumulative development has been identified, how the developer intends to assess these impacts in the ES	Section 8.3.6 and Figure 14
An indication of any European designated nature conservation sites that are likely to be significantly affected by the proposed development and the nature of the likely significant impacts on these sites	Figure 8 , Section 2.3 and Section 6
Where a developer seeks to scope out matters, a full justification for scoping out such matters	Section 7
Key topics covered as part of the developer’s scoping exercise	Section 6
An outline of the structure of the proposed ES	Section 8.2

The Need for the Proposed Development

1.12 The Energy White Paper ‘Meeting the Energy Challenge’ published in 2007 by the Department for Trade and Industry, which formed the basis of the Energy Act 2008 [Ref. 5], sets out the Government’s plans for tackling climate change by reducing carbon emissions whilst ensuring the availability of secure, clean, affordable energy.

- 1.13 The White Paper and the Overarching National Policy Statement (NPS) for Energy (EN-1) [Ref. 6] both emphasise the importance of a diverse mix of energy generating technologies, including renewables, nuclear and fossil fuels, to avoid over-dependence on a single fuel type and thereby ensure security of supply.
- 1.14 Changes to the current mix of energy generating plant will occur as a large number of existing oil, coal and nuclear power stations close over the next 10-15 years due to the requirements of the European Large Combustion Plant Directive and/or as plants reach the end of their operational lives. Projections quoted in the Energy NPS indicate 22 gigawatts (GW) of electricity generating capacity will close over this period. This creates a significant need for new major energy infrastructure.
- 1.15 The long lead-in for new nuclear power stations means that new fossil fuel and renewable generating capacity will also need to be progressed to meet demand.
- 1.16 Renewable energy is important to achieve the UK's targets for reductions in carbon emissions, but the Energy NPS also emphasises the ongoing requirement for fossil fuel power stations as they offer more flexibility in response to changes in energy demand compared to many renewable energy technologies (Ref. 6)
- 1.17 Gas generation contributes to the objective of reducing carbon dioxide (CO₂) emissions as generating electricity from gas is more efficient than other fossil fuels such as coal, resulting in significantly lower CO₂ emissions per MW from gas-fired power stations compared to coal-fired power stations.

2. DESCRIPTION OF THE EXISTING ENVIRONMENT

Description of the Site

- 2.1 The Seabank 3 Site (hereinafter referred to interchangeably as “the Potential NSIP Development Area” or “Site”) is located on land immediately adjacent to the existing Seabank 1 & 2 CCGT Power Station, approximately 5 kilometres (km) northeast of Avonmouth and 10km from Bristol in an area called Crooks Marsh in Severnside.
- 2.2 The main development Site is currently located entirely within South Gloucestershire Council (SGC) although it is bound immediately to the south by the Bristol City Council (BCC) administrative boundary. Dependant on the final design and layout, the Site may include land within BCC, as indicated in **Figure 2**.
- 2.3 The Site comprises an area of approximately 20 hectares (ha), although this may be extended if the connection routes for the electrical connection to the Seabank substation and/ or water pipeline to/ from the nearby water treatment plant for cooling (see Paragraphs 3.20 to 3.24) are included in the DCO application. This will be decided prior to submitting the DCO application. Where this affects the scope of the work to be carried out for the EIA, it is noted in this report, along with a description of the extra work that will be undertaken should either of these connection routes be progressed as part of the DCO application.
- 2.4 The Site is located approximately 400 metres (m) to the east of the Severn Estuary in a predominantly industrial area just over 1km west of the M49 motorway. The Severn Estuary is an internationally designated Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar Site and Site of Special Scientific Interest (SSSI) due to both habitat and species assemblages.

- 2.5 The northern Site boundary is bound by the former Terra Nitrogen and ICI site, which was most recently used as a fertiliser manufacturing plant. The site ceased to operate in 2008, and the majority of the buildings associated with the former use of the site have now been demolished and it is now predominantly a cleared and level site of hardstanding and crushed rubble. The former Terra Nitrogen and ICI site is currently subject to proposals for a separate CCGT power station, which is discussed further in Paragraphs 8.24 to 8.32 of this report in terms of the potential for cumulative impacts when considered with this Proposed Development.
- 2.6 The land to the east and northeast of the Site currently remains undeveloped open fields, however this area is subject to a separate development by Severnside Development Ltd. Beyond this lies the M49 motorway, with the Seabank Gas Works and Hallen Industrial Estate situated to the south east, and Crooks Marsh to the south.
- 2.7 The existing Seabank 1 & 2 power station is located immediately southwest of the Site boundary, with the site of the consented (but not yet built) SITA waste recycling facility to the west (Local Planning Authority reference PT12/1303/MW) of the Site, beyond which is the Severn Estuary.
- 2.8 Nearby residential communities include Severn Beach, Hallen, Pilning and Easter Compton, approximately 1.5km north, 2km south east, 2.2km north east and 3km east of the Site respectively. In addition, there are a small number of farms in the surrounding area, including several within 1.1km to 2km of the Site.
- 2.9 The Site itself constitutes a relatively flat area of open grassland criss-crossed with rhines (drainage channels) and ditches that flow into the Severn Estuary. The Red Rhine is the largest drainage channel within the Site and one of the main rhines in this area, currently running in an east to west direction through the middle of the Site. There are proposals separate to this application to relocate this rhine along the north of the development Site boundary (within the Site) under the extant 1957/58 consent (as discussed further in Paragraphs 8.24 to 8.32) and illustrated in **Figure 10**.
- 2.10 Shrub vegetation on the Site is limited and mainly concentrated along the rhines. There are currently no buildings/structures and only three trees on site, in the centre of the Site just north of the Red Rhine.
- 2.11 **Figure 3** and **Figure 4** show photographs of the Site facing north west and south east respectively when standing in the centre of the Site.
- 2.12 **Figure 5** is a photograph of the Red Rhine within the Site facing south towards the nearby Gas Works.
- 2.13 There are currently 11kV, 132kV and 400kV overhead electrical lines (OHL) crossing the south east area of the Site in a north to south direction, with five pylons located within the Site. **Figure 6** shows these OHL's, facing north in the eastern centre of the Site. Two underground gas mains and a water pipeline run along the southerly edge of the Site.
- 2.14 The electrical connection to the Site is discussed further in Paragraphs 3.31 to 3.34, and if included within the DCO application for Seabank 3, would connect to the Seabank Substation via either an overhead line or underground cable routed within the eastern part of the existing Seabank 1 & 2 site.
- 2.15 The locations and direction at which the photographs were taken provided are illustrated in **Figure 7**.

Figure 3: Photograph facing West Towards Seabank 1 & 2 from the Centre of the Site [Date taken, 30/08/2012, 3.15 MP, 2048x1536 pixels]



Figure 4: Photograph facing South East from the Centre of the Site [Date taken, 30/08/2012, 3.15 MP, 2048x1536 pixels]



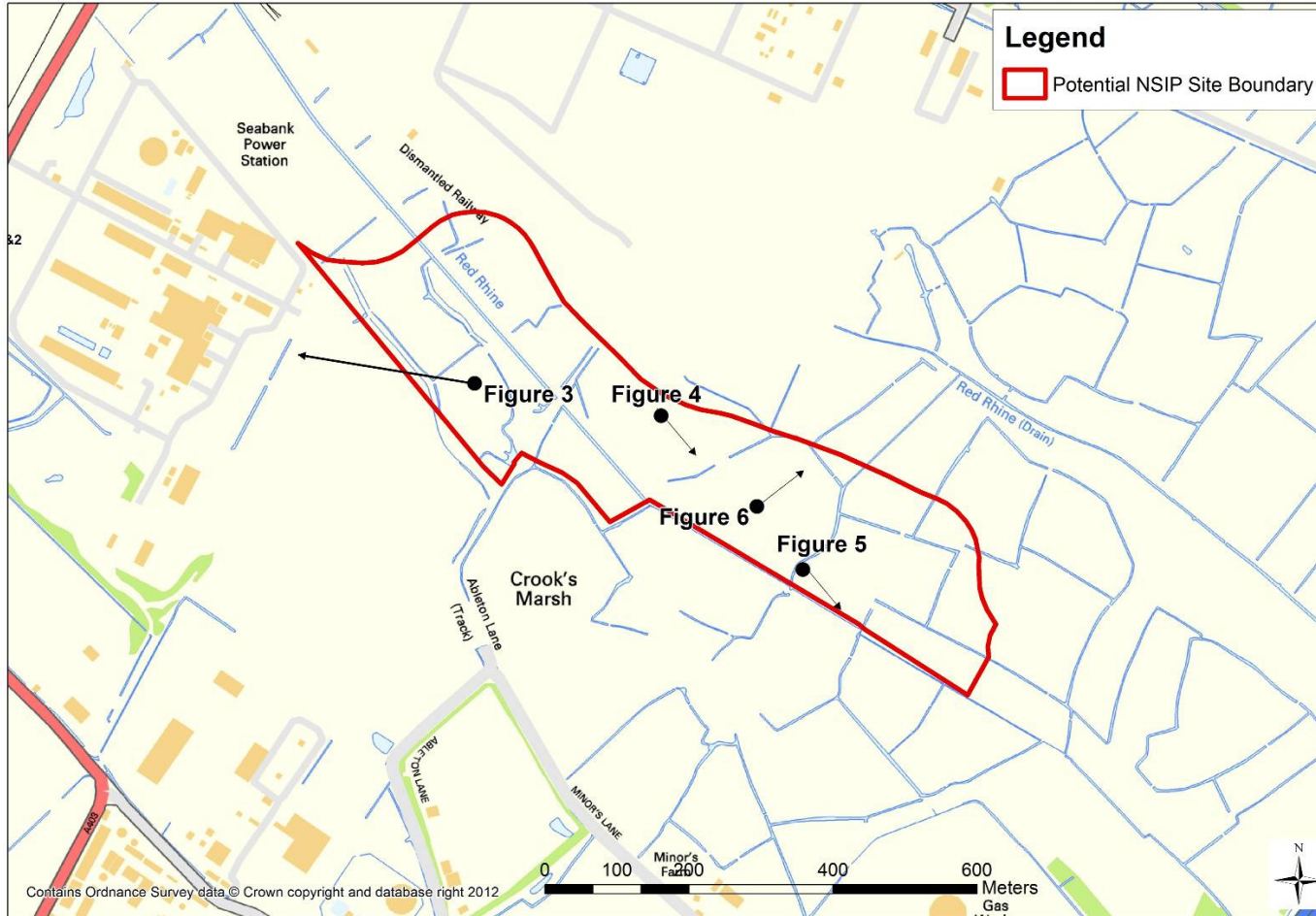
Figure 5: Photograph of the Red Rhine facing South from the Centre of the Site [Date taken, 30/08/2012, 3.15 MP, 2048x1536 pixels]



Figure 6: Photograph facing North from the Centre of the Site [Date taken, 30/08/2012, 3.15 MP, 2048x1536 pixels]



Figure 7: Location and Direction of the Photographs shown in Figures 3-6



Historic and Existing Site Use

- 2.16 The Site itself has generally remained grassland since the first published map in 1886, with the exception being field boundaries, hedges, the Red Rhine, railway track and more recently, electrical pylons.
- 2.17 Post 1955, 'Works' surround the Site and continue to develop until the present-day. A more detailed description is found in **Table 2**.

Table 2: Historical Map Descriptions

Published Date	Map Scale	Description
1886 - 1887	1:10,560	The Site made up of several field boundaries with hedgerows. A footpath is present from east to west with a footbridge named in the centre of the Site. Stowick Farm is approximately 50m north of the Site boundary.
1903 - 1904	1:10,560	The field patterns remain similar, with a few hedges removed. Crooks marsh farm is now named 50m north of the Site boundary.
1916 - 1938	1:10,560	Site unchanged.
1920 - 1921	1:10,560	
1955	1:10,560	
1965	1:10,560	Stowick and Crooks Marsh Farm have been replaced with Works to the North and West of the Site boundary. There is now railway tracks running north to east within the centre of the Site.
1972	1: 10,000	The Works become more developed around the Site with the Red Rhine diversion running through the Site.
1975	1: 10,000	In addition to the Red Rhine, a number of drains are present scatted throughout the Site.
2006	1: 10,000	Four pylons are now present in the southern area of the Site. Although not shown on OS Maps, a number of gas and water pipelines were installed beneath the site during the construction of Seabank 1, in approximately 2000 (as shown in Figure 8)
2012	1: 10,000	A number of buildings adjacent the north east boundary of the Site have been cleared.

Sensitive Environmental Receptors

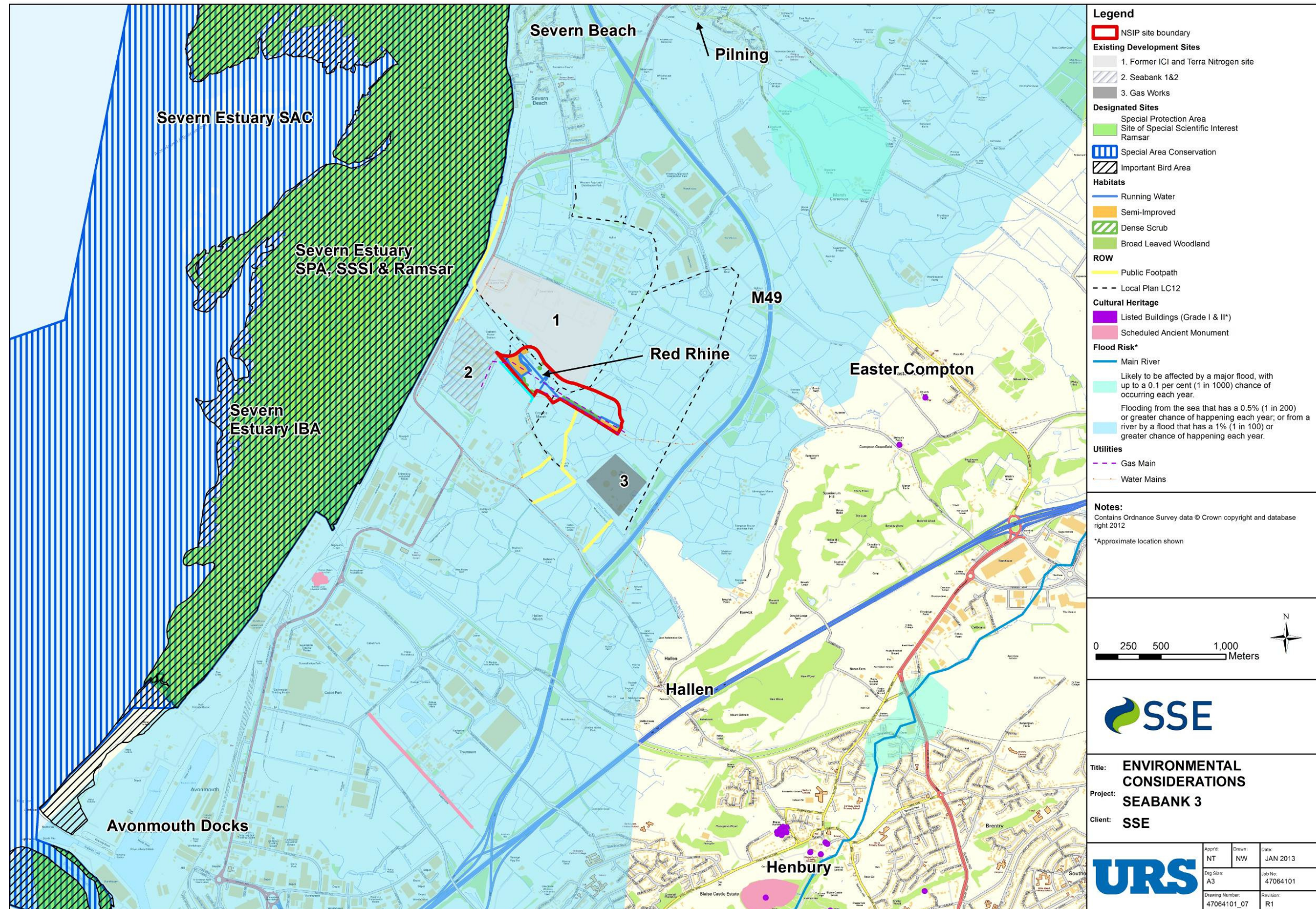
- 2.18 The following potentially sensitive receptors to the Proposed Development have been identified (note this may not be an exhaustive list at this stage):
 - Residential Receptors
 - Nearby residential communities in Severn Beach, Hallen, Pilning and Easter Compton all within 1.5km to 3km of the Site;

- A number of farm holdings in the surrounding area (within 1.1km to 2km of the Site);
- Ecological Receptors
 - A number of conservation designations within 2km of the Site of both European and UK significance, in particular the Severn Estuary SAC/SPA/Ramsar and SSSI;
 - The Site is within / immediately adjacent to an area designated as Coastal and Floodplain Grazing Marsh (a Biodiversity Action Plan (BAP) priority habitat);
 - Interconnecting rhines / drainage ditches on the Site and immediately adjacent have been identified by the Local Wildlife Trust as Sites of Nature Conservation Interest (SNCI);
 - The majority of the Site comprises floodplain grassland and there are a limited number of areas of scrub and hedgerow, which are Biodiversity Action Plan (BAP) habitat;
- Hydrological / flood risk, geological and hydrogeological
 - The Site lies entirely within Flood Zone 3 as classified by the Environment Agency (EA), and is therefore at risk from coastal flooding in a 1 in 200 year event or from fluvial flooding during a 1 in 100 year event;
 - The Site and surrounding area are within an area defined as having a moderate chance of flooding (i.e. it is predicted to flood somewhere between a 1 in 75 year event and a 1 in 200 year event). There are existing flood defences west of the A403 but their extent needs to be clarified as part of the EIA;
- Cultural Heritage
 - 3 scheduled monuments, 15 Grade II* and 14 grade I listed buildings have been identified within 5km of the Site, as well as features of potential local heritage value. In addition, there are 13 Grade II listed buildings within 2km of the Site;
 - Underground archaeology that may be present onsite or in the vicinity of the Site.
- Traffic and Transport
 - Local public rights of way across the Site and in the vicinity, and the local transport network.

2.19 These sensitive receptors are discussed further within Section 6 of this report. There are also a number of other possible developments in the area that might be considered as potential future receptors, which are also discussed in Section 8.

2.20 **Figure 8** illustrates the environmental considerations known at this stage of the EIA within the immediate surrounding area.

Figure 8: Environmental Considerations onsite and in the Surrounding Area



Previous Environmental Studies

- 2.21 There are a number of environmental studies that have been carried out on or in the surrounding area to the Site. These include, but are not limited to:
- The ES and Environmental Permit application for Seabank 1 & 2 comprising a number of environmental technical studies;
 - Ecological survey reports including an Extended Phase 1 Habitat Survey [Ref. 7], Bat Surveys [Ref. 8], Badger Report [Ref. 9], Wintering Bird Survey [Ref. 10], and the Severnside Link Road Protected Species Survey [Ref. 11]. Additional wintering bird and bat surveys have since commenced in October 2012;
 - Documents associated with the re-alignment of part of the road access which will serve the proposed SITA Energy Recovery Centre approved under reference PT09/5982/FMW to create a road around the northern perimeter of the Site (application number PT12/1207/MW);
 - Environmental reports associated with the nearby cumulative EIA developments, such as The Severnside Energy Recovery Centre (SERC) Bottom Ash Facility & Railhead – SITA and Severnside Recovery Centre (SERCE) (APP/P0119/A/10/2140199).
- 2.22 The cumulative developments are described in more detail in Paragraphs 8.24 to 8.32 of this report.

3. PROJECT DESCRIPTION

The Proposed Development

- 3.1 The Proposed Development comprises the construction and operation of a CCGT power station with a capacity of up to 1,400 MW, which at this stage is anticipated to consist of two main gas turbines and associated steam turbine(s).
- 3.2 At this stage, there are several options for ancillary development being by the Applicant, which is discussed below.
- 3.3 The plant will be designed to operate continuously for an expected period of at least 25 years after which ongoing operation will be reviewed and if it is not appropriate to continue operation the site will be decommissioned.
- 3.4 The Proposed Development will be designed to operate independently of Seabank 1 & 2, however there will be a number of shared services including access roads, cooling water, gas supply and grid connection. Proposed main access points to the site during construction and operation are shown in **Figure 10**.
- 3.5 The Proposed Development is likely to be similar in form, massing and appearance to Seabank 1 & 2. The main buildings are expected to comprise two main structures with a footprint of 80m by 80m and a maximum height of up to approximately 40m, with exhaust stack heights of up to 80m. The number of stacks is currently under consideration, though at this stage it is expected that there would be two main stacks, with the potential for a third, smaller stack should supplementary firing or black start / fast response capability be built into the Proposed Development (see Paragraphs 3.25 to 3.30 for further details).
- 3.6 There will also be ancillary structures of lower height and smaller footprint than the main generator buildings to accommodate for example, cooling towers, workshops and offices.

- 3.7 **Figure 3** shows a photograph of the existing power station, the appearance and massing of which is likely to be replicated for Seabank 3, to deliver visual consistency.
- 3.8 Generally speaking, the CCGT power station is likely to be located in the western half of the Site, adjacent to the existing power station, as shown in **Figure 9**. The eastern half would be reserved for future use for the siting of carbon capture and compression equipment, should it be required, in order to meet the requirements set out in the EU Carbon Capture Storage (CCS) Directive for the Proposed Development to be Carbon Capture Ready. This concept is subject to change as the preliminary design progresses and through input from the EIA. It should also be noted that the CCS will not form part of the DCO application, but it is currently shown within the NSIP Site to allow some flexibility as the design evolves (for example, should the area shown for the generating station need to encroach further east, or if the land reserved for carbon capture is required for construction activities, which is expected).
- 3.9 **Figure 10** shows the planned route of the diverted Red Rhine and new Spine Road, which are progressing independently of the Proposed Development and do not form part of this DCO application, as well as the indicative access points in/out of the Site.
- 3.10 It is anticipated at this stage that there will be two temporary access points for vehicles during construction: the existing access road along Ableton Lane / Minor's Lane, which will be upgraded and levelled in advance of site works commencing; and an additional arm off the existing roundabout immediately east of the Site. It is anticipated that three permanent access points will be provided during operation: direct access through Seabank 1 & 2 from the west to allow vehicles to move between the two sites (which could be a primary access in the event the new Spine Road is not built); an entrance/exit on the western perimeter of the Site from the new Spine Road; and the main access point along the northern perimeter of the Site from the Spine Road.

Figure 9: Conceptual Layout for the Proposed Development

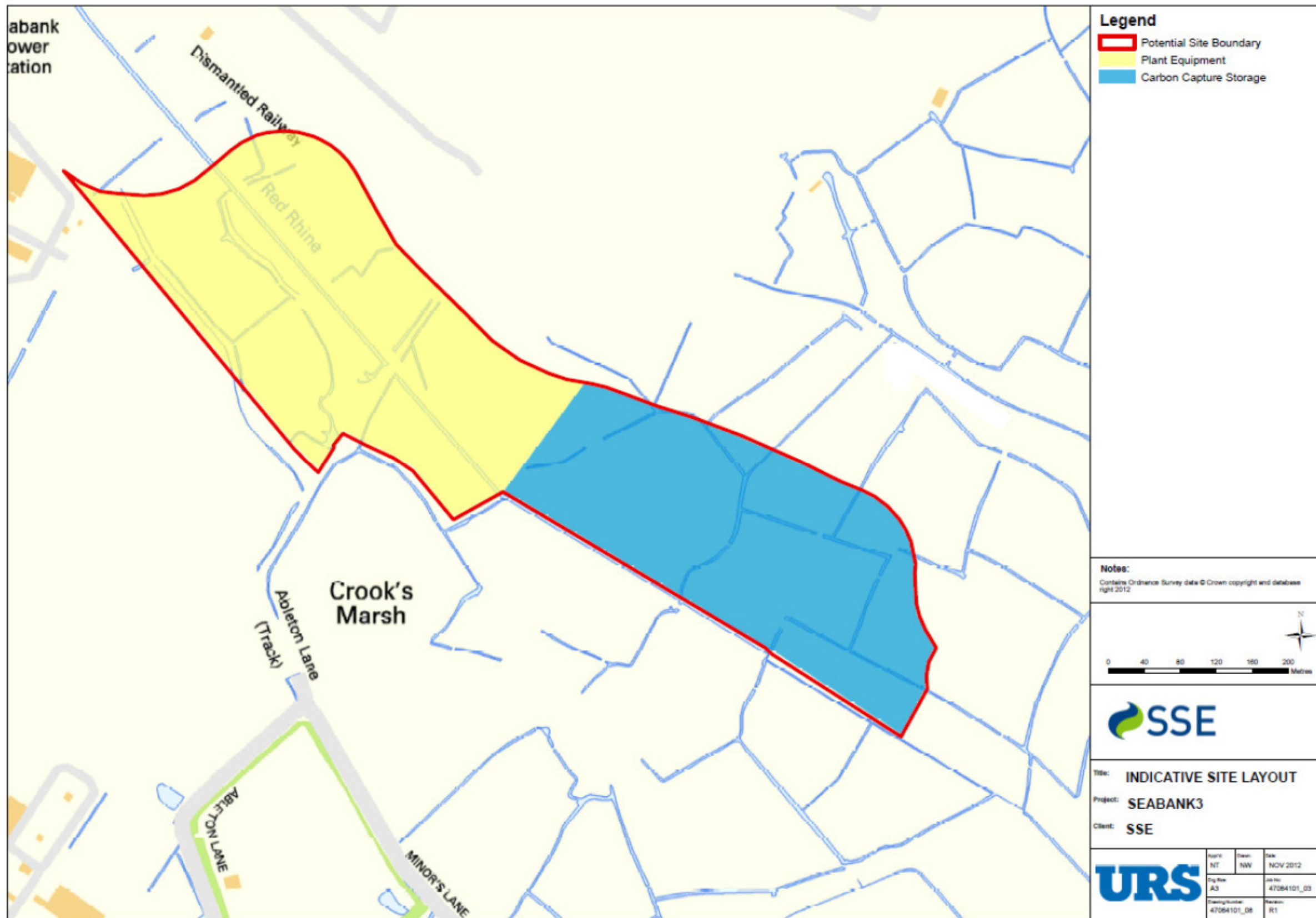
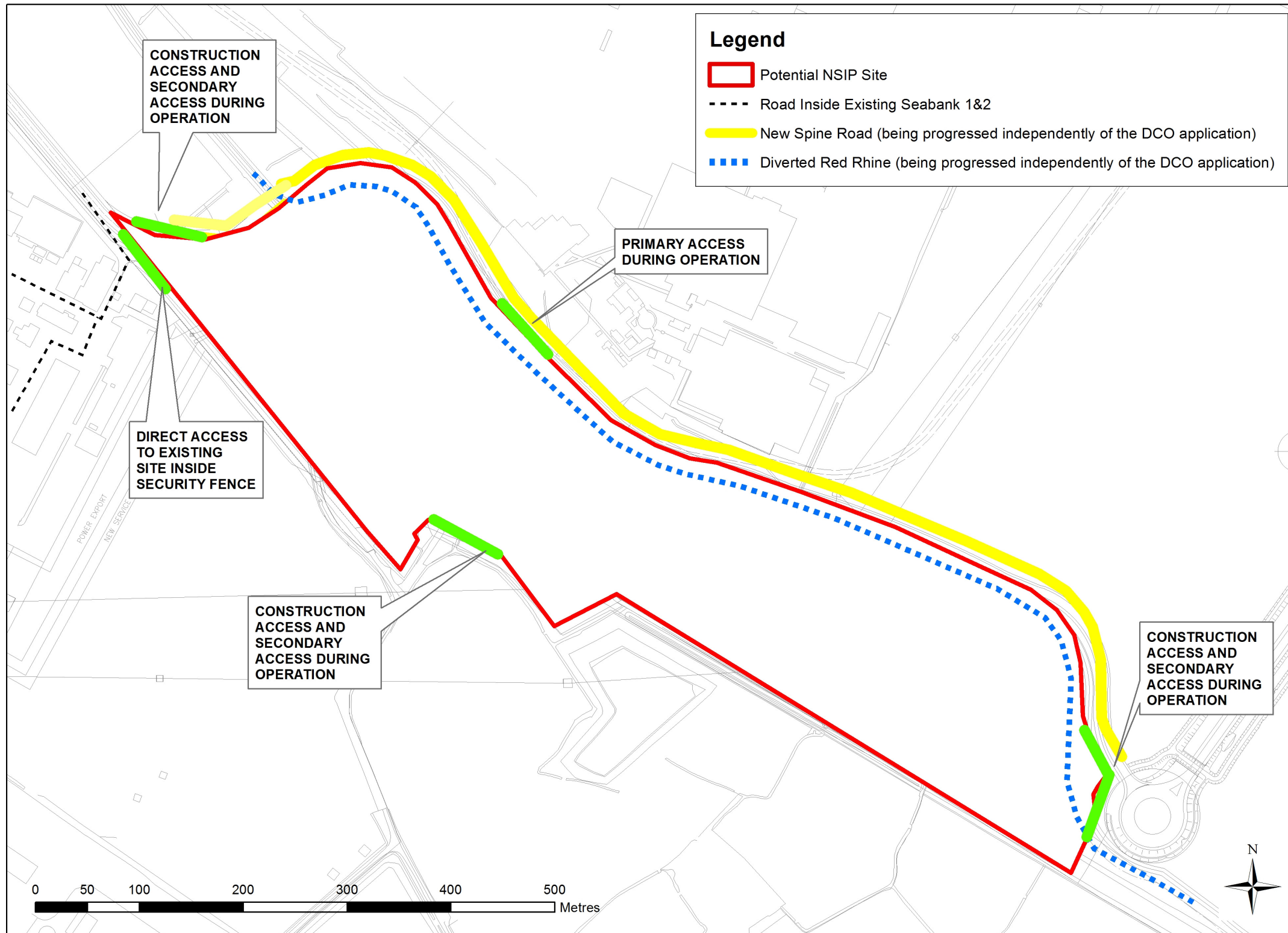


Figure 10: Indicative Access Points and Route of the Red Rhine and New Spine Road



Combined Cycle Gas Turbines

- 3.11 In a CCGT power station natural gas fuel is fired in the combustion system to drive the gas turbine, which is connected to a generator producing electricity. An amount of heat remains in the gas turbine exhaust, and this is passed into a Heat Recovery Steam Generator (HRSG), a type of boiler, to make steam to generate additional electricity via a steam turbine. The exhaust steam from the steam turbine is condensed back into water which is returned to the HRSG to continue the process.
- 3.12 The electrical efficiency of a modern CCGT power station is in the range of about 55-60%, which is considerably higher than that for an open cycle gas turbine or a conventional coal, oil or gas fired steam turbine generating plant.

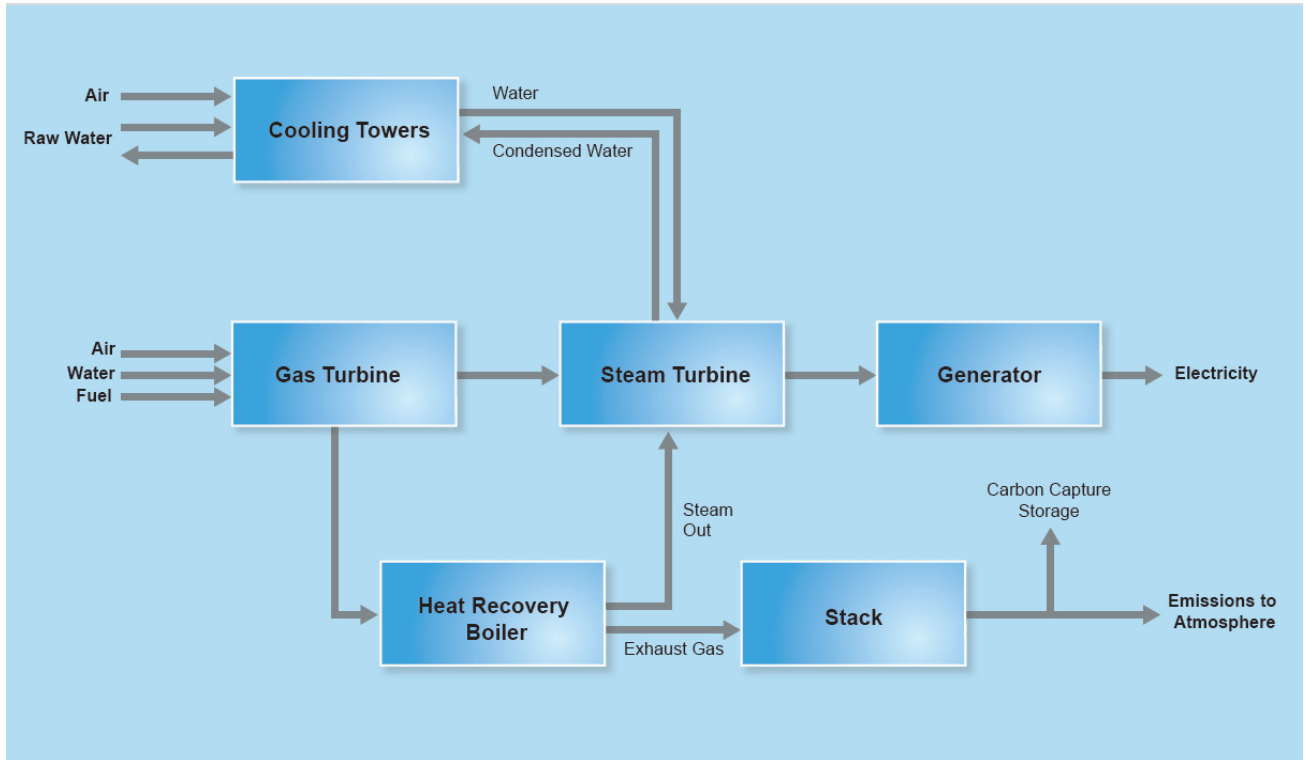
Fuel Type and Source

- 3.13 The fuel source for the turbines will be natural gas supplied from the National Grid Transmission network.
- 3.14 The current Seabank 1 & 2 power station is supplied from two high pressure natural gas feed from the north east corner of the site. These existing supply pipelines will be used to supply the gas to Seabank 3, though will need to be slightly diverted within the Site to accommodate the new plant and a connection taken from it.

Power Generation Process

- 3.15 The power plant will consist of two main gas generating modules and, depending on the steam turbine configuration (single shaft or multi-shaft design), two or three electrical generators with a total output of up to 1,400 MW, the final total being dependent on the selection of turbine manufacturer prior to construction of the plant.
- 3.16 In the gas turbine, gas will be mixed and combusted with compressed air, and the hot combustion gases will expand, rotating the turbine blades at high speed. This will drive the generators to produce electricity for export to the national transmission system.
- 3.17 The hot exhaust gases from the gas turbine will then be passed through a heat recovery boiler to produce high pressure steam. This will in turn be used to drive a steam turbine either connected to the same generator or to drive a separate steam turbine generating module; thereby maximising electricity generation from the fuel being combusted. The waste gases from the heat recovery boiler will be released into the atmosphere via an exhaust stack.
- 3.18 Each generating module may have an individual stack, or alternatively the flues from each unit may be grouped together in one multi-flue stack. This will be determined during the preliminary design and subject to the findings of the air quality assessment.
- 3.19 A schematic of the power generation process associated with the Proposed Development is provided below in Figure 11.

Figure 11: Power Generation Process (for a single shaft generating module)



The Cooling System and Aqueous Discharges

3.20 There is a requirement for a cooling system to condense the steam used in the power generation process once it has been exhausted through the steam turbine, and before it is returned to the boiler for re-use.

3.21 Three types of methods for cooling are available to this type of plant:

- **Direct wet-cooling technology.** This consists of high efficiency water-cooled condensers. It requires the abstraction of large quantities of water from an accessible water source and the discharge of warmer water back into the water source after it has been used for cooling. This method of cooling requires the construction of an intake and outfall structure within an appropriate controlled water body. The main advantage of this cooling method is that it uses a colder cooling medium (river water as opposed to air) and avoids the electrical consumption of the fans used in air cooled condensers thereby improving the thermal efficiency of the fuel used. However, the abstraction and discharge of water can only be undertaken in locations and in a way that would not give rise to significant impacts on the water body and the environment.
- **Hybrid-cooling technology.** This is essentially a combination of dry-cooling and wet-cooling. Water must still be abstracted from a controlled water source but by using a bank of low height cooling cells a smaller volume of water needs to be abstracted than for direct water cooling, and the temperature of the returned water is also lower. However, the use of cooling cells can give rise to visible water plume emissions to air under certain meteorological conditions and also results in a marginally lower plant thermal efficiency than direct water cooling.

- **Dry-cooling technology.** This consists of a system of air-cooled condenser fans situated in fan banks. The steam is condensed directly by air in a heat exchanger (the air cooled condenser) and the condensate is returned to the steam cycle in a closed loop. The air flow is induced solely by mechanical draft from the fans. This cooling method requires electrical energy to operate the fans, and therefore results in reduced electrical output to the national transmission system; in effect therefore this increases fuel consumption and the emission of exhausts gases for each megawatt of electricity produced, thereby reducing the thermal efficiency of the system. However, the advantages of air cooled condensers are that they require no cooling water abstraction, treatment or discharge and do not give rise to any visible plumes.
- 3.22 At this early stage in the project design, the final cooling technology selection for the Proposed Development has not been made, however a preliminary Best Available Technique (BAT) assessment has concluded that the option of direct cooling using water from the estuary should be discarded, due to a combination of technical and environmental challenges.
- 3.23 Seabank 1 & 2 already uses cooling water from the Wessex Water Sewage Treatment Works but the existing pipe infrastructure is not of sufficient capacity to accommodate Seabank 3 as well. The hybrid-cooling option could similarly utilise treated wastewater from this source. To do this, a new supply / return water pipeline would need to be installed between the Site and the water treatment works, which is shown in **Figure 2**.
- 3.24 A feasibility assessment is currently underway to determine the preferred route and diameter of this pipeline. This pipeline is likely to follow the route of the existing water pipeline shown on **Figure 2**. It is currently anticipated that a single pipeline would be constructed to deliver water to the Site and Seabank 1 & 2, using trenching techniques to install it underground, with the existing pipelines used for the return flow from both stations.
- Fast Response Generator / 'Black Start' Capability and Supplementary Firing*
- 3.25 The feasibility of including for supplementary firing and additional fast response generator and black start capability are currently being investigated and may form part of the Proposed Development.
- 3.26 A fast response generator (or 'peaking plant') is used to quickly increase or 'top up' the generating capacity of a generating station during periods of increased need by the National Grid. It is normally dormant and can be fired up at short notice to help cope with periods of high demand or low supply nationally (for example, when the wind is not blowing to provide adequate electricity from the increasing number of wind farms in the UK). If further feasibility studies and discussions with National Grid identify a need for fast response capacity it would be installed in addition to the CCGT plant, with the combined maximum output not exceeding 1,400 MW.
- 3.27 This fast response generator would also provide the Proposed Development with the capability of being able to start without any assistance from the grid in the event of a total or partial shutdown of the national transmission system (black-start). Thereby the Proposed Development could be used to help restart the national transmission system, whereas power stations without black start capability need to draw power from the transmission system to start operation.
- 3.28 This facility may require the Proposed Development to be able to run on diesel fuel in addition to natural gas, at start-up; on site diesel storage would therefore be required if this option is taken forward. This facility is subject to further ongoing investigation to determine if there is a need for including black start capability and what represents BAT for this Proposed Development.

- 3.29 In any event, should this additional ancillary peaking plant be installed at the Site, it would be contained within the Site boundary (**Figure 2**). The plant would be installed in a separate building with a smaller footprint and height than the main CCGT buildings. A separate stack would be needed for the emissions from the plant which again would be of lower height than the proposed main stacks. If on site diesel storage is to be undertaken, this would be in several above ground tanks, typically cylindrical and each of size around 15-20m diameter by approximately 10m height, depending on the volume of fuel stored onsite and number of tanks selected.
- 3.30 Supplementary firing is a way of producing additional steam to generate additional power for short periods by firing a dedicated gas burner located between the gas turbine and the heat recovery steam generator. The benefit of including this in the power station design is subject to further investigation.

Electricity Substation and Grid Connection

- 3.31 The Applicant already has a signed agreement with the National Grid to export electricity from the Proposed Development via the local transmission infrastructure, and the majority of the infrastructure is already in place at the Seabank substation which is located immediately south of the existing Seabank 1 & 2 power station and approximately 300m south west of the Site.
- 3.32 The Proposed Development will connect to the existing substation via a 400kV overhead line or underground cable. Five additional connection bays will be added to this substation by National Grid to accommodate the new connection
- 3.33 National Grid is also currently proposing the connection of an additional 400kV circuit into Seabank substation in relation to the network reinforcement required for Hinkley C, which will require additional connection bays to be added to the Seabank substation and is subject to separate independent plans. These plans are not considered 'associated development' to the Proposed Development.
- 3.34 Depending on the Applicant's preferred connection strategy, the Grid connection may either form part of the Proposed Development and DCO application or it may be consented separately by National Grid. If it is to be part of this application, it would be accommodated within the Site boundary (see **Figure 2**), and the Seabank 1 & 2 site. The potential cumulative impacts of the construction and operation of this infrastructure will be assessed as part of the EIA for this Proposed Development.

Gas Connection

- 3.35 There are two existing gas pipelines supplying the existing Station, one running through the centre of the Site, and another on the southern boundary. The pipeline running through the centre of the Site will have to be realigned as part of the Proposed Development, to follow the other pipeline route along the southern boundary to avoid obstructing the development site.
- 3.36 Subject to engineering confirmation being undertaken by National Grid (Gas), it is not expected that any upgrades will be required to deliver the necessary gas supply to the Proposed Development.

Access

- 3.37 The primary access point for the Proposed Development will be via a proposed new spine link access road which Severnside Developments Limited intends to construct under the extant 1957/58 consent¹.
- 3.38 The new road will connect to the consented new spine link access road linking the adjacent proposed SITA Energy Recovery Centre with the A403 (via a new roundabout to be constructed on the A403).
- 3.39 Secondary access to the road may also be available through the northern perimeter of the Site (also connecting to the new spine access road), the existing access from the south along Ableton Lane/Minor's Lane, and through the eastern perimeter of the Site from an existing roundabout that will connect to the new spine access road. These secondary access points will also be used during construction for the delivery of goods and equipment.
- 3.40 Once operational, direct access to the site will be available from the Seabank 1 & 2 site via an entrance in the northwest corner of the Site (which could alternatively be upgraded to being a primary access should the new Spine Road not get built in time).
- 3.41 **Figure 10** illustrates the anticipated access points in/out of the Site.

Carbon Capture Readiness (CCR)

- 3.42 The CCS technology and transport of CO₂ will not form part of the DCO application as the detailed implications of CCS are unquantifiable at this time. For the purposes of this DCO application and in accordance with UK requirements, CCS will be considered through preparation of a standalone supplementary report to the EIA that addresses the requirements of the DECC CCR Guidance [Ref. 12].
- 3.43 In accordance with UK CCR requirements, the Proposed Development will incorporate an area set aside for the potential future installation of Carbon Capture technology. It is recognised that technological progress and developments in the regulatory framework for the use of carbon capture technology are likely to occur within the lifetime of the Proposed Development. Therefore, the design of the new power station will be developed with consideration for the possible future retrofitting of carbon capture technology at some future date.
- 3.44 The CCR requirement means that applicants must demonstrate that CCS technology (of which there are 3 key types: pre-combustion capture, post-combustion capture and oxy-fuel combustion) has been considered as part of the application and that there is sufficient land available for the future retrofit of that technology in the event that it is commercially proven at some point in the future, i.e. that the Proposed Development is considered Carbon Capture Ready (CCR).
- 3.45 CCR needs to be demonstrable for all new combustion generating stations with a generating capacity at or over 300 MW (and of a type covered by the European Union Large Combustion Plant Directive as set out in Section 4.7 of the Overarching National Policy Statement for Energy (EN-1).

¹ See Paragraph 8.27 of this report for further details on the 1957/58 consent.

- 3.46 As such, an area of approximately 10ha has been reserved in the eastern part of the Site (see **Figure 2**) to allow for the provision of equipment for CCS technology. The EIA will evaluate the CCR requirements for each of the key stages of CCS, namely capture, transport and eventual storage of carbon, although any future installation of carbon capture technology would be subject to a separate formal consent application at the time, since the details associated with any such technology are not yet available. For the purposes of this DCO application therefore, only a high level evaluation of carbon capture readiness would be undertaken in accordance with the CCR requirements [Ref. 12].
- 3.47 An assessment will be undertaken to show the feasibility of future Carbon Capture on this site and will identify the options for transporting any captured CO₂ offshore to suitable geological storage sites. The key alternatives include a pipeline transporting the CO₂ offshore (either trenched or drilled underground using Horizontal Directional Drilling) or an onshore pipeline to Avonmouth where it can be loaded onto ships and transported offshore. The ability to tanker and transport the CO₂ by road and rail will also be considered in the CCS Report. The CCS Report will be submitted as a separate document along with the DCO application.

Preparation of the Site

Diversion of Existing Services

- 3.48 As part of the preliminary design and feasibility assessment, the Applicant has already considered the need to divert existing on-site services and utilities in order to realise the Proposed Development.
- 3.49 As discussed in earlier sections, there will be diversions required to gas and water mains supply services which broadly cross the Site in a south east to north west orientation. The nature of the required diversion of these services will become clearer as the design layout of the Proposed Development prevails. However, the ES will consider in full the implications of these service diversions in terms of their potential environmental impacts.
- 3.50 At this stage the diversion of any overhead lines to accommodate a CCS plant is not considered necessary and will not form part of this DCO application.

Diversion of the Red Rhine

- 3.51 The Red Rhine is a major drainage channel running from east to west through the centre of the Site. It, along with several minor rhines, is being diverted to the northern boundary of the Site by Severnside Developments Limited as part of their works to development the wider Severnside area.
- 3.52 Severnside Developments Ltd is currently engaging with the Lower Severn Internal Drainage Board in order to divert these channels under the extant 1957/58 planning consent for the site (as discussed in Paragraph 8.27) and will carry out this work in advance of construction work beginning for the Proposed Development. This work is independent of the DCO application and will be considered as part of the 'future baseline' [Ref. 13], as opposed to being 'associated development' to this Proposed Development.
- 3.53 The need to raise the site levels, to manage flood risk, will be determined following the outcome of hydraulic modelling, which in turn will depend on the new capacity of the diverted Red Rhine. This is discussed further in Paragraphs 6.51 to 6.59.

Diversion of Right of Ways

- 3.54 A footpath and a Local Plan LC12 recreational route (safeguarded under Policy LC12 of the South Gloucestershire Local Plan) runs directly through the centre of the Site (running in a south/north orientation). It is the Applicant's intention to divert both routes around the perimeter of the Site and connect these up with existing public access routes as part of this DCO application.

Earthworks

- 3.55 There are currently no buildings/structures located onsite, therefore there is not expected to be any demolition works as part of this Proposed Development. There are three trees on site, which will be removed following the appropriate permissions and ecological checks; the need for compensatory planting at another location will be assessed as part of the EIA.
- 3.56 Potentially there will be areas of the Site that may need to be raised by several metres or to have mitigation measures installed to protect the Site from flooding events, as mentioned above. Any such works will be assessed in the EIA and presented to stakeholders during the consultation process.

Construction Programme and Management

- 3.57 Subject to being granted planning permission and following a final investment decision, it is anticipated that the Proposed Development may be built in either one or two phases, each of which could last a minimum of 3 years.
- 3.58 The earliest construction would start in is 2015, with a planned commission date for the first unit being by the end of 2019.
- 3.59 The decision on the phasing of the development will be subject to a number of factors including: completion of grid connection reinforcements; electricity and gas market conditions; and equipment supplier's capabilities.
- 3.60 The ES will provide further details of the proposed construction activities, their anticipated duration, along with an indicative programme of each phase of the works.
- 3.61 The ES will also provide a framework for the Construction Method Statement (CMS) and Construction Environmental Management Plan (CEMP), which will describe the specific mitigation measures to be followed to reduce nuisance impacts from:
- Use of land for temporary laydown areas, accommodation, etc. It is currently anticipated that a portion of the eastern half of the Site reserved for CCS would be used for this purpose;
 - Construction traffic (including parking and access requirements) and changes to access and temporary road or footpath closure (if required);
 - Noise and vibration;
 - Utilities diversion;
 - Dust generation;
 - Soil removal; and

- Waste generation.

- 3.62 The CMS and CEMP will be produced following receipt of the DCO (for example, as part a condition attached to the DCO) and will identify all the procedures to be adhered to throughout construction.
- 3.63 Contracts with companies involved in the construction works will incorporate environmental control, health and safety regulations, and current guidance and will ensure that construction activities are sustainable and that all contractors involved with the construction stages are committed to agreed best practice and meet all relevant environmental legislation including: Control of Pollution Act 1974 (COPA), Environment Act 1995, Hazardous Waste Regulations 2005 and the Duty of Care Regulations 1991.
- 3.64 Records will be kept and updated regularly ensuring that all waste transferred or disposed of has been correctly processed with evidence of signed Waste Transfer Notes (WTNs) that will be kept on-site for inspection whenever requested. Furthermore all construction works will adhere to the Construction (Design and Management) Regulations 2007 (CDM).

4. PROJECT ALTERNATIVES

- 4.1 Alternatives to the Proposed Development that have or are being considered include:
- Similar development at an alternative site;
 - Alternative development within the Site; and
 - Alternative technologies.
- 4.2 A 'no development' alternative would not deliver the additional electricity generation capacity associated with this Nationally Significant Infrastructure Project and has therefore not been considered further.
- Alternative Sites**
- 4.3 The Applicant continuously considers potential sites for new power generation development. In addition to the Site at Severnside, a number of other sites in the UK have been considered recently for new power stations including CCGTs.
- 4.4 A range of factors are considered in the selection and prioritisation of power station development sites, many of which relate to the commercial viability of development. These include:
- Availability and suitability of sufficient land (including not only the power generation technology but also land available for potential future CCS technology and lay down areas for construction);
 - Site sensitivity in terms of proximity to sensitive receptors such as residential areas or designated ecological receptors;
 - Site constraints including topography and ground conditions;
 - Distance to electricity grid connection and gas supply connection and location on the grid network;
 - Cost associated with electricity grid connection and gas supply connection; and

- Accessibility.

4.5 The Site was selected because of its industrial setting and its proximity to Seabank 1 & 2, with the opportunity to utilise an already available gas, water and electricity infrastructure.

Alternative Developments

4.6 The majority of the Site is part of the Severnside area, which is allocated by the SGC Local Plan for employment uses based on extensive opportunities for storage and distribution development.

4.7 It is also within the boundary of a site covered by planning permission SG 4244, which was granted on 27th November 1957 and approves industrial uses on approximately 1,000 acres (405 hectares) of land.

4.8 Alternative layouts and technologies for the new CCGT power station will be considered during the design process. During the feasibility process a study was commissioned by the Applicant to investigate various options in terms of the design layout and installed capacity of the Proposed Development. The feasibility and design options study considered the following options:

- An 824 MW CCGT power station within three development layouts of between 14-18 ha;
- A 400 MW CCGT power station on a minimum plot area of 7 ha; and
- Up to a 1,400 MW CCGT power station on an area of around 18 ha.

4.9 A full detailed appraisal of the development options considered will be presented as part of the ES, discussing the rationale for the final site layout and design selection.

Alternative Technologies

4.10 A brief overview and justification for the chosen technology will be provided in the ES, including the evaluation of what constitutes BAT for this Proposed Development regarding the options currently under investigation mentioned above, for example black start, cooling technology, supplementary firing, and method of electrical connection for example.

5. PLANNING POLICY

5.1 This section sets out the planning policy documents that will be taken into account when defining the scope of the EIA. Paragraphs 5.2 to 5.5 set out the ‘Primary Policy Framework’ in accordance with which the DCO application must be examined and determined. Paragraphs 5.6 to 5.20 then set out the ‘Secondary Policy Framework’ which comprises other policy documents which may be taken into account in examining and determining the DCO application where those policies are important and relevant to the Secretary of State’s decision.

Primary Policy Framework

National Policy Statements

5.2 The Department for Energy and Climate Change published a number of National Policy Statements (NPSs) in relation to energy infrastructure, which were designated by the Secretary of State for Energy and Climate Change in July 2011.

- 5.3 Under Section 104(3) of the Planning Act 2008 (as amended) (2008 Act), DCO applications for NSIPs are required to be determined by the Secretary of State in accordance with policy set out in the relevant NPSs, except for where this would lead to the UK being in breach of any of its international obligations, lead to the Secretary of State being in breach of any duty imposed by or under any enactment, be unlawful by virtue of any enactment, the adverse impacts of the development would outweigh its benefits, or any condition prescribed for deciding an application otherwise than in accordance with a NPS is met.
- 5.4 The NPSs relevant to the Proposed Development are listed below.
- **Overarching National Policy Statement For Energy: E-N1 (NPS EN-1)** [Ref. 6]: This document sets out national policy for energy infrastructure as defined by the 2008 Act and provides an umbrella document under which all other energy NPSs sit. The policies within this NPS, in combination with policies set out in relevant technology specific energy NPSs, provide the primary basis for decisions by the Secretary of State and set out the need for new energy infrastructure.
 - **National Policy Statement for Fossil Fuel Generating Infrastructure: EN-2 (NPS EN-2)** [Ref. 14]: This NPS sets out policies specific to the determination of applications for fossil fuel electricity generating infrastructure.
- 5.5 The scope of the EIA will be designed to meet the requirements set out in NPS EN-1 and NPS EN-2, NPS EN-4 and NPS EN-5. In particular, the scope of the EIA will take account of Section 5, 'Generic Impacts' of NPS EN-1, which sets out generic impacts of NSIP energy projects on an EIA topic-by-topic basis, including specifying what is required in terms of both 'applicant's assessment' and 'IPC² decision making' and 'Mitigation'. The scope of the EIA will also consider the relevant 'Applicant's Assessment', 'IPC Decision Making' and 'Mitigation' sections of NPS EN-2, EN-4 and EN-5. The results of the EIA, presented in the ES, will provide information and evidence that will enable the PINS NID and Secretary of State to determine whether the Proposed Development is compliant with the relevant NPS policies.

Secondary Policy Framework

The Development Plan

- 5.6 NPS EN-1 states that consideration may be given to planning policy outside the NPSs where it is important and relevant to the Secretary of State's decision. The Site is located within SGC (though may extend into BCC depending on the final design, as discussed earlier). The Development Plan for SGC currently comprises the documents listed below:
- SGC Local Plan, adopted 2006 [Ref. 15];
 - West of England Partnership Joint Waste Core Strategy, adopted March 2011 [Ref. 16];
 - SGC Minerals and Waste Local Plan, adopted 2002 (saved policies) [Ref. 17];
 - Regional Planning Guidance Note 10 for the South West, September 2001 [Ref. 18];
- 5.7 The Site may also extend into the administrative area of BCC. The Development Plan for BCC comprises the documents listed below:

² On 1st April 2012, the IPC (Infrastructure Planning Commission) ceased to exist and its examination role was taken over by the PINS NID and its decision making role was taken over by the Secretary of State

- BCC Core Strategy, adopted June 2011 [Ref. 19];
 - BCC Local Plan, adopted 1997 (saved policies) [Ref. 20];
 - West of England Partnership Joint Waste Core Strategy, March 2011 [Ref. 16];
 - Regional Planning Guidance Note 10 for the South West, September 2001 [Ref. 18].
- 5.8 The Localism Act 2011 [Ref. 21] makes provision for the abolition of Regional Spatial Strategies (RSSs) and their predecessors Regional Planning Guidance Notes (RPGs), including RPG 10 for the South West. The government has also expressed its intention to revoke RSSs (and any remaining RPGs). However, until such a revocation has been made, adopted RSSs/RPGs remain part of the Development Plan.
- 5.9 The scope of the EIA will take account of relevant Development Plan policies.
- The Emerging Development Plan*
- 5.10 SGC is in the process of preparing the following document:
- SGC Core Strategy [Ref. 22].
- 5.11 The Draft SGC Core Strategy was subject to examination by an independent Inspector between 19 June and 18 July 2012. The Inspector's preliminary findings conclude that the March 2011 Submission Core Strategy, as amended by the December 2011 Core Strategy incorporating Post-Submission Changes, is capable of being made sound provided a number of Main Modifications are made.
- 5.12 The Draft SGC Core Strategy incorporating Post-Submission Changes, December 2011, will be considered when defining the scope of the EIA. In particular, Chapter 18 of the Core Strategy deals with Major Infrastructure Projects.
- 5.13 BCC is in the process of preparing the following document:
- Bristol Site Allocations and Development Management DPD [Ref. 23].
- 5.14 The Draft Bristol Site Allocations and Development Management, Preferred Approach Document, March 2012, underwent consultation between 23rd March and 18th May 2012. This draft document, in particular the Draft Development Management Policies will be taken into account in defining the scope of the EIA.
- Other Relevant Local Policy*
- 5.15 SGC has prepared the Supplementary Planning Documents (SPDs) and Supplementary Planning Guidance (SPGs) listed below, which are potentially relevant to the EIA:
- SGC Planning Guidance: Biodiversity in the Planning Process (SPG), adopted November 2005 [Ref. 24];
 - SGC Design Guide: Sustainable Drainage Systems (SPG) [Ref. 25];
 - SGC Planning Guidance: Trees on Development Sites (SPG), adopted November 2005 [Ref. 26];
 - SGC Design Guide: Waste Audits (SPG) [Ref. 27];

- SGC Landscape Character Assessment (SPD) Adopted July 2005 [Ref. 28].
- 5.16 Where relevant, the above document will be taken into account in designing the scope of the EIA.
- 5.17 SPDs and SPGs adopted by BCC, which may be relevant to the EIA include the documents listed below:
- Waste and Recycling: Collection and Storage Facilities – Guidance for developers, owners and occupiers, January 2010 [Ref. 29];
 - Supplementary Planning Document 1: Tall Buildings, adopted January 2005 [Ref. 30];
 - Supplementary Planning Document 5: Sustainable Building Design and Construction, adopted February 2006 [Ref. 31];
 - Supplementary Planning Document 7: Archaeology and Development, adopted March 2006 [Ref. 32];
 - BCC Local Plan Policy Advice Note 2: Conservation Area Enhancement Statements; November 1993 [Ref. 33];
 - BCC Local Plan Policy Advice Note 14: Safety and Security, June 1997 [Ref. 34];
 - BCC Local Plan Policy Advice Note 15: Responding to Local Character, March 1998 [Ref. 35].
- 5.18 Where relevant, the above documents will be taken into account in designing the scope of the EIA.
- National Planning Policy Framework*
- 5.19 National Planning Policy Framework (NPPF) [Ref. 36] sets out national planning policy and how this should be applied. It is accompanied by the National Planning Policy Framework Technical Guidance (NPPF TG) which seeks to ensure the effective implementation of the NPPF in areas at risk of flooding and in relation to minerals extraction. The NPPF will be taken into account in defining the scope of the EIA.
- Other Relevant National Policy*
- 5.20 Although Planning Policy Statement 25: Development and Flood Risk has been cancelled by the NPPF, its Practice Guide [Ref. 37] remains in force and provides guidelines on how to implement development and flood risk policies. This document will also be given consideration when defining the scope of the EIA.

6. POTENTIALLY SIGNIFICANT ENVIRONMENTAL ISSUES

6.1 The following sections present a discussion of the potential environmental impacts associated with the Proposed Development that it is proposed will be considered as part of the EIA. The methodology and assessment criteria that will be used to assess the potential significance of the identified impacts are also outlined alongside the potential mitigation measures for implementation following assessment.

Air Quality

Baseline Conditions

6.2 SGC has declared three Air Quality Management Areas (AQMAs) within its borough, the nearest of which is ‘Cribbs Causeway’ located over 3km east of the Site, which was designated due primarily to traffic emissions.

6.3 Baseline, or existing, background air quality at the Site will be determined using data from a nearby representative automatic monitoring station, supplemented by Local Authority diffusion tube sampling and Defra background air quality maps, where appropriate. A summary of the available local monitoring data is presented in **Table 3** for the latest year of ratified data which is currently 2010.

Table 3: Local Air Quality Monitoring Data, 2010

Station Name/ID	Site Type	Location	Distance from Site	Concentrations (µg/m ³)			
				NO _x	NO ₂	PM ₁₀	PM _{2.5}
Filton – Conygre House, Conygre Road (360768, 179407)	Automatic	Urban Background	6.5km east	-	20.4	16.7	-
Bristol St Pauls (359501, 173935)	Automatic	Urban Background	9km southeast	27.1	11.4	23.6	14.7
Chepstow A48 (353126,193473)	Automatic	Traffic Urban	10km north	40.1	35.3	22.1	17.4
Severn Beach Primary School (38) (354282, 184653)	Diffusion Tube	Urban Background	2km north	-	17.8	-	-
Defra Background Maps	Estimated	Background	220m north	22.8	15.8	13.9	9.7

6.4 Given the presence of local monitoring data, it is not proposed to conduct specific ambient air monitoring as part of this proposal, either as part of the baseline data collection or in order to validate the model findings, particularly given the inherent 25-30% margin of error associated with diffusion tube monitoring.

6.5 The existing air quality concentrations at the designated habitat sites will be obtained from UK AIR [Ref. 38] and the UK Pollutant Deposition website. The existing acid and nutrient nitrogen deposition rates will be obtained from the UK Air Pollution Information System (UK APIS) [Ref. 39].

Scope of the Assessment

- 6.6 The Proposed Development, when operational, will emit known pollutants to air, via a stack(s). These will include the combustion products nitrogen oxides, carbon monoxide and (if diesel firing is used) particulate matter and sulphur dioxide, for which Air Quality Objectives have been set as part of the National Air Quality Strategy, as well as CO₂ and potentially additional trace pollutants. The plant will be designed to comply with the requirements of the Industrial Emissions Directive (IED) [Ref. 40] (which now consolidates the requirements of the former Large Combustion Plant Directive) and in accordance with the EA Horizontal Guidance Note H1 – Environmental Risk Assessments for Permits [Ref. 41].
- 6.7 An atmospheric impact assessment will be undertaken for the main point source emissions, utilising air dispersion modelling to assess the impact to air quality potentially brought about through the generation and dispersion of emissions from the proposed plant. The study will be desk-based and shall assess the predicted concentrations of combustion pollutants specifically detailed in the IED, which are potentially hazardous to human health and Habitats sites, at a number of identified receptors (such as, residential homes, schools, nature sites etc) within the local area, as well as the potential effect on the nearby AQMAs.
- 6.8 The modelling will be based on Emission Limit Values set by the IED and at full operating load, thereby presenting a worst-case scenario in the ES. Should it be deemed appropriate to model lower loads, justification for this will be provided and the load clearly stated in the assessment. Modelling will be undertaken in accordance with the guidance outlined in the EA documents Horizontal Guidance Note H1 – Annex (f) and “Air dispersion modelling report requirements for detailed air dispersion modelling” [Ref. 41].
- 6.9 The atmospheric dispersion modelling study of operational emissions will be undertaken using the Atmospheric Dispersion Modelling System (ADMS) model, currently version 5.0. ADMS is widely used by industry and the regulatory authorities.
- 6.10 The dispersion modelling study will be used to determine the most appropriate height for the chimney stacks based on the resultant maximum short term and long term ground level concentrations predicted.
- 6.11 Impacts will be assessed with respect to ecology for the statutorily designated habitat sites within 10km of the Site. Non-statutory habitat sites within 2km of the Site will also be considered, in accordance with the EA Horizontal Guidance Note H1 – Environmental Risk Assessments for Permits [Ref. 41]
- 6.12 An air quality impact assessment will also be undertaken on the effects of road traffic on the local road network associated with the construction and operation of the Proposed Development, in accordance with the methods outlined in the guidance for local authorities (LAQM.TG09). Either the Highways Agency’s (HA’s) Design Manual for Roads and Bridges (DMRB) screening model or detailed ADMS-Roads dispersion model may be used, depending on background concentrations and predicted percentage traffic increase as a result of the Proposed Development. Both modelling tools have been specifically designed to assess the impact of road traffic emissions in urban areas in the UK (taking into account the recent changes to nitrogen oxide factors).
- 6.13 Should modelling be required, the assessment would utilise local traffic data attained during the proposed traffic and transport assessment (see Paragraphs 6.77 to 6.87 of this Scoping Report), including traffic numbers, fleet composition, and average vehicle speeds, to calculate emission fluxes for the above listed pollutants from each road source. A number of traffic scenarios would be modelled using designated HGV routes, including present-day, and a

given future date both with and without the Proposed Development and with specific reference to the AQMAs.

- 6.14 In addition, potential impacts and nuisance from site clearance, construction dust and mobile plant exhaust emissions generated during the construction phase of the plant and any associated pipeline will be considered using a basic screening assessment and supplemented by case studies where appropriate. Where necessary, mitigation measures will be recommended for the control of dust and site plant emissions during demolition or construction works to minimise or remove the potential impacts.
- 6.15 It is not considered necessary to prepare a separate Human Health Risk Assessment (HHRA) for this type of development, but which is sometimes required for waste to energy plants and other facilities not firing on 'clean' fossil fuels.
- 6.16 Given the subjectivity that can occur when attempting to assign a level of significance to a given air quality impact, URS has produced a set of quantitative significance criteria for air quality matters. These are based on:
- The Environment Agency EPR Horizontal Guidance Note H1: Environmental Risk Assessment, Annex (f) Air Emissions December 2011;
 - The Environmental Protection UK "Development Control: Planning for Air Quality" 2010 update; and
 - The HA's DMRB, which outlines numerical criteria for determining significant and non-significant impacts of vehicular emission sources.

Noise and Vibration

Baseline Conditions

- 6.17 The surrounding area is predominantly industrial, home to numerous chemical works, industrial parks and distribution centres. There are a small number of farm holdings within 1.1km to 2km of the Site, with the nearest residential communities approximately 1.5km north of the Site.
- 6.18 Ecological receptors include designated coastal and floodplain grazing marsh (a biodiversity action plan priority habitat) and a number of conservation designations within 2km of the Site of both UK and European significance.

Scope of the Assessment

- 6.19 The following potential impacts are likely to be associated with the Proposed Development:
- Construction noise and vibration impacts (including construction traffic on public roads);
 - Operational noise impacts from the new plant; and
 - Operational noise impacts from road traffic on public roads.
- 6.20 Based on the distance between the Site and the nearest residential receptors, significant vibration impacts associated with Site operational activities are considered unlikely, although they will still be considered as part of the EIA.
- 6.21 The scope of the noise and vibration assessment will be:

- Identification of nearest noise sensitive receptors.
- Liaison with Local Authorities' Environmental Health Officer(s) to agree scope and methodology of noise assessment, including baseline noise monitoring locations and measurement protocol.
- Establishment of baseline noise levels in the locality.
- Assessment of the impact of predicted noise levels at the nearest noise sensitive receptors from the construction and operation of the proposed power station and any associated pipelines / electrical connection. This will include:
 1. Construction noise and vibration (including construction traffic on public roads).
 2. Operational noise and vibration (including site traffic on public roads).

6.22 The noise and vibration assessment will be carried out in accordance with the following guidance:

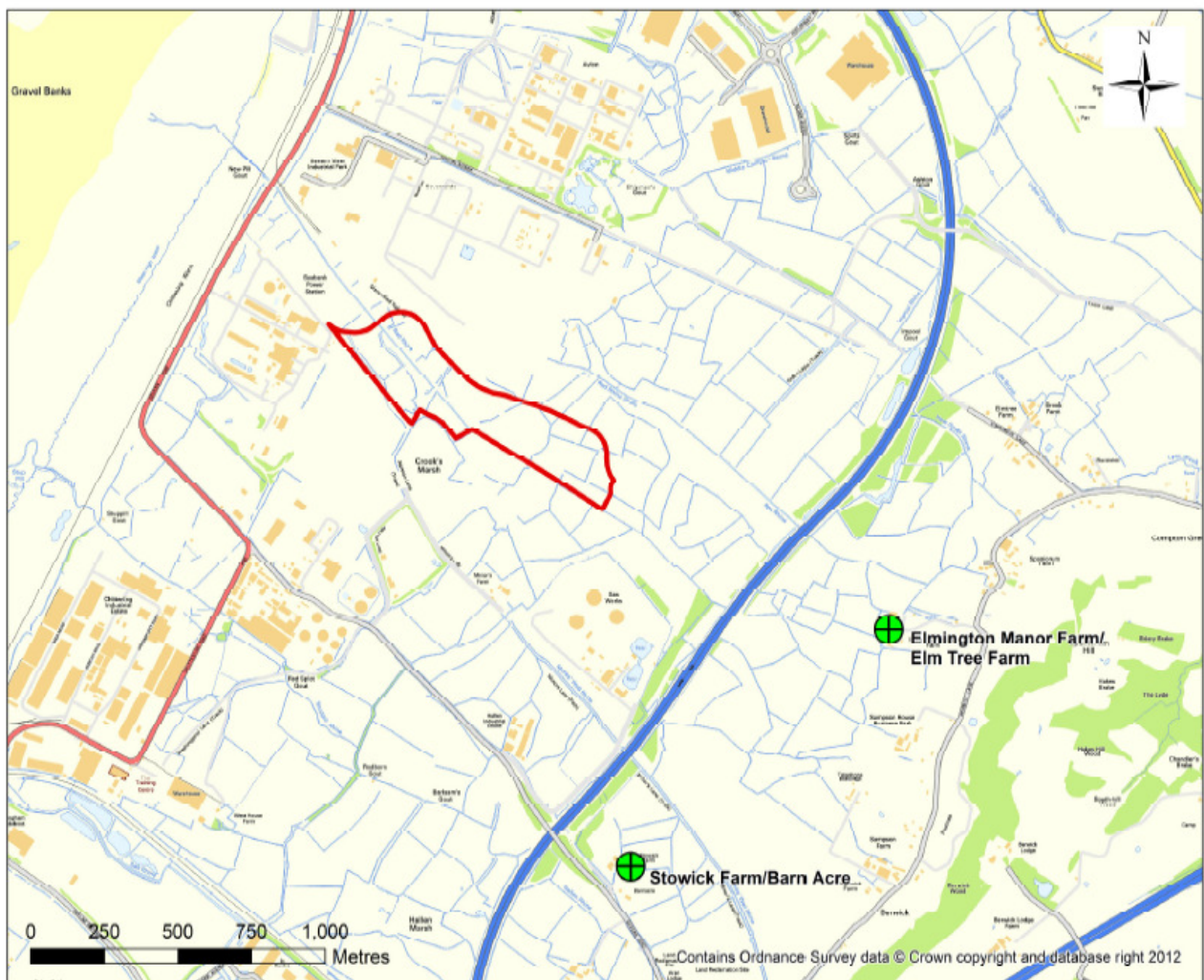
- Overarching National Policy Statement for Energy (EN-1), July 2011 (NPS EN-1);
- National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2), July 2011 (NPS EN-2);
- SGC Local Plan, adopted 2006; and
- National Planning Policy Framework, 2012;

6.23 Additionally, reference will be made, but not be limited, to the following:

- British Standard 5228:1 2009 'Code of practice for noise and vibration control on open sites' Noise;
- British Standard 5228:2 2009 'Code of practice for noise and vibration control on open sites' Vibration;
- ISO 9613-2: 1996 'Attenuation of sound during propagation outdoors. Part 2: General method of calculation';
- BS 4142: 1997 'Method for rating noise affecting mixed residential and industrial areas';
- British Standard 7385: 1993 'Evaluation and measurement for vibration in buildings';
- British Standard 6472: 2008 'Guide to evaluation of human exposure to vibration in buildings';
- Control of Pollution Act 1974;
- SI 2001/1701: The Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001 (EC Directive 2000/14/EC);
- Calculation of Road Traffic Noise, DoT, 1988.

- 6.24 Baseline noise monitoring locations and the monitoring regime to be employed will be agreed in advance with the Environmental Health Officers at SGC and BCC. The monitoring procedures will conform to BS 7445: 1991 'Description and Measurement of Environmental Noise'. It is proposed to undertake medium term baseline monitoring in close proximity to local sensitive receptors to include weekend and weekday times. Ideally, and subject to adequate security, a minimum five day unmanned monitoring period will be undertaken (Thursday to Monday suggested) but if sites are not secure this may not be possible and a shortened, manned monitoring regime may be required.
- 6.25 Suggested monitoring locations include Stowick Farm/Barn Acre located on Severn Road to the south east, and Elmington Manor Farm and Elm Tree Farm both located to the east, as illustrated in **Figure 12**. However, the suitability of these locations will be discussed with the EHO at both councils before monitoring commences.

Figure 12: Potential Noise Monitoring Locations



- 6.26 Noise and vibration levels associated with any enabling and construction works will be calculated (at chosen sensitive receptors) using the data and procedures given in BS 5228: 2009 'Code of practice for noise and vibration control from construction and open sites'. Additionally, noise increases at sensitive receptors due to any construction traffic on public roads will be calculated according to the methods given in Calculation of Road Traffic Noise by the Department of Transport [Ref. 42].
- 6.27 As necessary, the assessment of construction works will include the electrical connection to the Seabank substation and any pipeline to the nearby water treatment works, if these components are to be included in the scope.
- 6.28 The operational noise impact of the Proposed Development will be predicted using sophisticated computer noise modelling software (SoundPLAN), based on information on plant layout, the operating conditions and the levels of noise generated by plant items and vehicles, as provided by the client. The modelling software enables a detailed implementation of the proposed equipment and buildings, existing surrounding buildings and ground features. The software implements the methodology in ISO 9613-2: 1996 'Attenuation of sound during propagation outdoors, Part 2: General method of calculation' for the calculation of noise levels from industrial sources'.
- 6.29 The significance of the noise impact of the proposed new power station will be assessed using the method given in British Standard BS 4142: 1997 'Method for rating noise affecting mixed residential and industrial areas'. This standard provides a method for rating the acceptability of increases in existing noise levels at noise-sensitive receptors affected by noise from fixed plant at proposed developments. BS 4142 is considered the best practice guidance, though can be interpreted differently by different Local Authorities; therefore the assessment methodology will be discussed with the relevant Environmental Health Officer(s) to determine any local requirements.
- 6.30 Additionally, the tonal, impulsive and low frequency characteristics of the noise emissions from the new power station will be quantified and assessed against the prevailing noise climate to the sensitive receptors.
- 6.31 As part of the assessment of the potential impacts of construction and operational noise on local wildlife, representative L_{Amax} noise levels will be determined at the habitat sites of importance to bird life. Should noise levels be shown to be acceptable at the nearest habitat sites, it will not be considered necessary to assess those further from the Site.
- 6.32 The operational assessment will include the electrical connection to the Seabank substation and the pipeline to the nearby water treatment works, if these components are to be included in the DCO application.
- 6.33 The operation of the new power station may have a potentially significant impact on traffic flows on local roads around the site. The change in road traffic noise levels, at a selection of relevant receptors, will be predicted using the standard methodology outlined in the 'Calculation of Road Traffic Noise'. The predictions will be based on baseline and with-development traffic data provided as part of the proposed traffic and transport assessment (see Paragraph 6.77 onward of this Scoping Report).
- 6.34 The significance of changes in road traffic noise levels will be assessed based on a range of relevant guidance including the Design Manual for Roads and Bridges [Ref. 43].

Ecology

Baseline Conditions

- 6.35 An extended Phase 1 Habitat Survey was undertaken for the Site in April 2012. In addition, records of statutory and non-statutory sites, UK Biodiversity Action Plan Priority Habitats and records of protected and notable species were reviewed for the Site and surrounding area to a 10km and a 1.5km radius respectively.
- 6.36 Sixteen statutory designated sites were found within 10km of the centre of the site; eleven national and international (European) sites and five Local Nature Reserves (LNRs). The Severn Estuary SAC/SPA/Ramsar Site and SSSI lies approximately 400m to the west of the Site. This habitat site has been designated for the marine and intertidal habitats present, and because it supports important populations of a number of bird species of international and national conservation importance. The SAC/SPA/Ramsar Site and SSSI have been designated on the basis of the populations of wildfowl and waders present, particularly over-wintering species. No other statutorily designated sites are present within 5km of the Site.
- 6.37 A number of ecological surveys have previously been undertaken to inform proposals for adjacent developments to the Site. The previously reported results of these surveys were included in the desk study.
- 6.38 There are records of badger and water vole within 1.5km of the Site. Several records of bat roosts exist within 10km, the closest of these located approximately 4.5km south of the Site. Roosting bat species recorded within 10km of the centre of the Site include greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*Rhinolophus hipposideros*), which are rare species listed on Annex II of the Habitats Directive and for which the former Avon area is considered a national stronghold. Lesser horseshoe bats are Priority Species on the SGC BAP. Other bat species recording roosting within 10km include; noctule (*Nyctalus noctula*), leisler's (*Nyctalus leisleri*), serotine (*Eptesicus serotinus*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared (*Plecotus auritus*), daubenton's (*Myotis daubentonii*) and an unidentified myotis species (*Myotis* spp.). In addition, barbastelle (*Barbastella barbastellus*) activity has also been recorded.
- 6.39 There are many records of protected and notable bird species within 1.5km of the centre of the Site, as expected from the proximity of the Site to the Severn Estuary SAC/SPA/Ramsar Site and SSSI. Bird species recorded within the search area, which are specially protected under Schedule 1 of the Wildlife and Countryside Act 1981 (WCA) include; kingfisher (*Alcedo atthis*), peregrine (*Falco peregrinus*), mediterranean gull (*Larus melanocephalus*), whimbrel (*Numerius phaeopus*), green sandpiper (*Tringa ochropus*), pintail (*Anas acuta*), little tern (*Sternula albifrons*), black redstart (*Phoenicurus ochruros*), redwing (*Turdus iliacus*), fieldfare (*Turdus pilaris*), bewick's swan (*Cygnus columbianus*) and, merlin (*Falco columbarius*). Furthermore, surveys previously undertaken in 2007, which included the footprint of the Site, identified the presence of small numbers of wintering birds, and concluded that the Site was of local importance for wintering birds, with evidence of wintering sandpiper. There are records of smooth newt (*Lissotriton vulgaris*), great crested newt (*Triturus cristatus*), grass snake (*Natrix natrix*) and slow-worm (*Anguis fragilis*) within 1.5km of the centre of the Site and records of adder (*Vipera berus*) 3km from the Site. Eels (*Anguilla anguilla*), a UK BAP priority species, have also been recorded in Red Rhine. Several UK BAP Priority Species of moth and butterfly, alongside other notable invertebrate species, have been recorded within the search area; including several species of water beetle.

- 6.40 The Site largely consists of grazing land interspersed with rhines and patches of scrub. There are also three trees and a species-poor hedgerow. The habitats recorded during the extended Phase 1 habitat survey and the target notes associated with this figure are described in a separate Extended Phase 1 Habitat Survey Report, which will form part of the ES.
- 6.41 Two of the three trees on the Site were considered to offer potential roosting habitat for bats. Emergence surveys of these trees were undertaken in 2009. No bats were recorded, despite the presence of suitable roost features within each tree. This was followed up by inspections of these trees on 25 September 2012 using torches and an endoscope to inspect the crevices for any evidence of bats in order to formally assess the potential of these trees to support bats. No evidence of bats was noted during the tree inspection.
- 6.42 A dusk and dawn bat emergence/activity survey was also undertaken to survey for the presence/absence of bats onsite. Two surveyors were used to cover all vantage points, beginning half an hour before sunset and continuing two hours after sunset. No bats were seen entering or exiting the trees, however a blue tit was recorded roosting in one of the trees and was seen entering the roost during the dusk survey, and exiting during the dawn survey.
- 6.43 During the bat activity survey, a noctule (*Nyctalus noctula*) bat was recorded foraging near to the trees before it flew away from the Site. A number of common pipistrelle (*Pipistrellus pipistrellus*) bats were also recorded foraging and feeding around the Site. These records were all noted from the dusk survey, no bats were recorded during the dawn survey. The full results will be mapped and tabulated in the ES.

Scope of Assessment

- 6.44 Potential impacts on ecological receptors will be assessed using the Institute for Ecology and Environmental Management (IEEM) Ecological Impact Assessment Guidelines (2006). Any potentially adverse significant impacts will be mitigated or compensated for and a number of ecological enhancements will also be recommended where appropriate. Following the implementation of mitigation and compensation, the Ecology Chapter will identify the residual impacts on ecological receptors.
- 6.45 In summary the following ecological, species specific surveys (with timescales) are likely to be undertaken to facilitate an adequate assessment of the likely effects of the Proposed Development on designated sites and protected/notable species and to adequately inform the DCO application:
- Badger survey (survey in early spring);
 - Water vole survey (survey in spring);
 - Otter survey (Survey in spring);
 - Bat tree roost emergence/re-entry survey (informed by Bat Conservation Trust 2012 Guidance);
 - Bat activity survey (April to August, informed by Bat Conservation Trust 2012 Guidance);
 - Breeding bird survey (three visits in April to June);
 - Wintering bird survey (diurnal and nocturnal visits during different tides in each month between October - March);

- Amphibian survey (great crested newts) (minimum 4 survey visits in mid-March to mid-June); and
- Aquatic and terrestrial invertebrate survey (terrestrial survey over 4 visits from spring to late summer; aquatic Survey in late summer).

- 6.46 Data on the status of reptiles already exists for the Site and surrounding land, and these data have informed other development in the locality. The Site and surrounding habitats will be surveyed and assessed to determine whether this information remains valid and sufficient to allow likely significant impacts to be identified without further additional survey work. Surveys will be undertaken if deemed necessary to inform the impact assessment or the mitigation requirements. These surveys will include a full ornithological assessment.
- 6.47 The results of these surveys, the desk study, consultation responses and the 'extended' Phase 1 habitat survey will be used to undertake an Ecological Impact Assessment to be included in the Ecology Chapter of the ES. Once the ecological baseline for the Site has been fully described, any ecological receptors that are likely to be significantly impacted by the Proposed Development will be identified and appropriate and proportionate mitigation will be described. Mitigation design will consider wider strategic aims and options for mitigation of development in the Severnside and Avonmouth area, particularly in relation to the European and other statutory nature conservation designations. Consideration will be given to the SGC, BCC and NE report "Severnside and Avonmouth Wetland Habitat Project" ('the Cresswell Report') [Ref. 44] when designing mitigation.
- 6.48 As outlined in the Air Quality section (see Paragraph 6.2 onward) of this report, it is expected that the Proposed Development will emit a range of pollutants into the air, including nitrogen oxides and some trace species. As such, based on modelling presented in the Air Quality Chapter, the Ecology Chapter will consider whether there is a potential for these pollutants to significantly impact any designated sites in the surrounding area, including any European Protected Sites, specifically SACs (the nearest of which is The Severn Estuary SAC/SPA/Ramsar Site and SSSI which lies approximately 400m to the west of the Site). Potential pollutant impacts will be assessed both alone and in combination with other plans or projects, so as to conform to Conservation of Habitats and Species Regulations 2010 (as amended); if required, mitigation will be proposed and agreed, in consultation with the County Ecologist and Natural England, to ensure that there are no likely significant effects to the SAC (alone and in combination with other plans and projects).

Habitats Regulations Assessment

- 6.49 The Severn Estuary SAC/SPA/Ramsar Site and SSSI is located approximately 400m west of the Site. In order to assess likely significant effects on qualifying features and determine effects on the integrity of the Site, a Habitats Regulations Assessment (HRA) screening exercise will be required to determine the potential, or otherwise, for the project to impact the Severn Estuary and other European Sites.
- 6.50 The Screening Exercise will be used to identify whether there is a requirement for further consideration of impacts on European Sites, i.e. the need for Appropriate Assessment as the next stage of HRA.

Flood Risk

Baseline Conditions

- 6.51 A site visit has been undertaken to establish the existing local drainage and hydrology of the site and local area. Consultation will be undertaken throughout the EIA process with the EA, the local Councils (SGC and BCC), the Lower Severn Internal Drainage Board, Wessex Water and Bristol Water in order to obtain all relevant flood risk, drainage, water resource quality and water use related information.
- 6.52 The Red Rhine flows directly through the Site in a westerly direction to the Severn Estuary, at which point it discharges through a tide flap valve. A Flood Risk Assessment (FRA) report in 2010 [Ref. 45] into the potential flood extents due to the existing rhine configuration confirmed that flooding would be predicted to occur on the Site from the Red Rhine during a 100 year return period event, inclusive for the effects of climate change. The 2010 FRA indicates that the principal flood risk is fluvial, from the Red Rhine, solely or in conjunction with tidal locking of the downstream boundary outfall into the Severn Estuary.
- 6.53 The Environment Agency Flood Map identifies that land located within the area of interest is within Flood Zone 3. The definition of Flood Zone 3 according to the National Planning Policy Framework (NPPF) is, land assessed as having a 1 in 100 year or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. South Gloucestershire Council, Bristol City Council, along with the Lower Severn Internal Drainage Board, have also prepared the Avonmouth/Severnside Strategic Flood Risk Assessment Level 2 Report, which has been endorsed by the Environment Agency. This document will be taken into consideration in the determination of baseline conditions in the FRA.

Scope of Assessment

- 6.54 The former land owner, Severnside Developments Ltd, is currently engaging with the Lower Severn Internal Drainage Board to divert the Red Rhine to run along the northern perimeter of the Site as shown in **Figure 10**, which is being undertaken under the extant 1957/58 planning consent for the site. Preliminary modelling by Severnside Developments Ltd in conjunction with the Lower Severn Internal Drainage Board Report suggests that the proposed rhine diversion will reduce flood levels within the Site by approximately 0.5mm compared with the existing situation.
- 6.55 The proposed diversion of the Red Rhine will require further assessment to quantify the effects of fluvial flooding to the Site. Of particular note is the increase in downstream outfall sizing which will allow for an increased flow of water to the Severn Estuary and may reduce the effects of flooding during periods where tide locking does not occur. A 2D hydraulic model representation of the diversion will quantify any differences between the existing and proposed watercourse configuration and inform the study of suitable flood mitigation strategies which could be implemented.
- 6.56 Within the scope of the FRA for the Proposed Development an existing TUFLOW hydraulic model (2D) will be acquired and amendments made to represent the proposed diversion of the Red Rhine. Where no model existing model is available, a suitable hydraulic model will be developed for this study.
- 6.57 The findings of the above will be reported in an FRA and summarised within the ES chapter. The FRA reporting will have regard for the relevant statutory guidance on planning, development and flood risk (NPPF).

- 6.58 In terms of requirement for the FRA, which will supplement the ES, suitable design compensations will have to be considered as a result of any level raising or hard standing regions that are proposed in relation to the existing condition. The impact of reducing the area of permeable surface and subsequent increased surface water runoff will also have to be considered. The result of affecting greenfield runoff rates will be explored further within the EIA as well as providing further details of any proposed drainage infrastructure and pollution prevention where required.
- 6.59 An assessment of the potential impacts on groundwater during construction may also need to be undertaken, in particular to determine impacts of contamination during any excavation and installation of the Proposed Development. This is dealt with further in the following sub-section.

Geology, Hydrogeology and Land Contamination

Baseline Conditions

- 6.60 The Site is located within an industrial area positioned between the existing Seabank 1 & 2 power station and a former ICI fertilizer plant (including the associated railway terminal). The Site itself has remained undeveloped agricultural land.
- 6.61 The adjacent Seabank 1 & 2 site is reported to have operated as a gas-from-naphtha production facility between 1963 and the 1970s [Ref. 46]. Prior to development of the current Seabank 1 & 2 facility, site investigation works were completed which identified contaminated ground within the Seabank 1 & 2 development footprint. Remediation works were completed to remove soil and groundwater contaminated with metals, benzene, toluene, ethylbenzene and xylenes (BTEX) and sulphide from the Site. Areas of soil contaminated with tar / hydrocarbon were also reportedly removed from the Site. It is reported that risk assessment works completed following remediation demonstrated that the remediation was successful.
- 6.62 Investigation works have been completed on the land to the west of the Site that is currently proposed for the development of an energy recovery centre by SITA. Available information contained within the ES [Ref. 47] for a bottom ash recycling facility and railhead that is proposed to form part of this development describes that ground conditions at the Site may “pose potential risks to human health and the built and water environment”.
- 6.63 There is no site investigation data currently available for the Site; however a site walkover has been completed as part of the initial work for the EIA. During the walkover, it was noted that material had been fly tipped and burnt on the Site. The fly tipped materials contained suspected asbestos containing materials while the burnt material appeared to contain melted metal and glass.

Scope of the Assessment

- 6.64 A desk based assessment will be completed to identify potential contaminative uses of the Site and the surrounding area. A site specific Envirocheck® Report including historical maps will be commissioned and geological and hydrogeological maps reviewed. This desk based assessment will identify the potential for land contamination and potential pathways to sensitive receptors on and off the Site. The desk based assessment will consider the potential for current and historic land use surrounding the Site to have impacted upon the ground conditions at the Site.
- 6.65 Results of the desk based assessment will inform the requirements for intrusive investigation at the Site, which shall be discussed and agreed in advance with the EA, SGC and BCC if deemed to be required. It is also intended that environmental sampling will be carried out as

part of the preliminary geotechnical works, the scope of which will be discussed with the aforementioned organisations, and may negate the need for further sampling,

- 6.66 An assessment of impacts on existing ground conditions will be undertaken as part of the EIA, including the potential for the Proposed Development to lead to land contamination, as defined in the Environment Act 1995 Part 2A. Consideration will also be given to potential impacts associated with the construction and operation of the Proposed Development and how these will be prevented or minimised.
- 6.67 Based on the assessment of the baseline and the identification of any potential impacts, the ES will make recommendations for mitigation measures. This may include the recommendation for further intrusive investigation works post-consent, quantitative risk assessment, remediation and validation. It will also make recommendations for mitigation should any previously unidentified contamination be encountered during the construction phase which should be employed to minimise the risk of their mobilisation.

Archaeology and Cultural Heritage

Baseline Conditions

- 6.68 There is evidence that archaeological remains have the potential to exist at the Site. Previous desk studies and investigations upon and in close proximity to the site indicate activity of prehistoric, Roman, Medieval, post-medieval and modern date. However, given that there has been some limited previous development of modern date upon and in close proximity to the Site, there is also the potential for any remains to have already been disturbed. As a result, the preliminary data search suggests the potential for below-ground remains at the site is medium to high. **Table 4** presents a summary of the archaeological records within the Site boundary.

Table 4: Archaeological Assets within the Site boundary

Ref	Monument Type	Period	Comments
1278	Ditch	Roman	A watching brief carried out during the laying of a power cable onsite from Seabank 1 & 2 via Minors Lane to an industrial estate on Severn Road revealed a section of a ditch containing C2 Roman pottery. The work formed part of a watching brief on a series of pylons none of this work has been separately numbered.
14323	Field System	Roman	A series of ditches containing Roman material was noted initially during a watching brief which was followed by excavation
2994	Enclosure	Prehistoric-Roman-Medieval	Enclosure; underlying ridge and furrow. Possibly farmstead site can be seen on aerial photographs. A watching brief carried out on a cable trench exposed a ditch containing Roman pottery not far from this site, which may suggest a Roman date for the enclosure.
14322	Enclosure	Post medieval	A farm noted on the 1st edition OS map was avoided during the Pucklechurch to Seabank pipeline construction.
14321	Pit	Medieval	A pit, perhaps originally containing the remains of a sheep and a small quantity of medieval ceramics was recorded onsite during a watching brief.

Ref	Monument Type	Period	Comments
2955	Enclosure	Medieval	Earthwork enclosures, ditched, surrounded by ridge and furrow, possibly site of farmstead. Two contiguous sub-rectangular enclosures

6.69 Previous archaeological investigation on the Site includes a desk based survey which was conducted in this area in 1996 with basic background information on this area, a watching brief on a gas pipeline which extended through the Site from south east to north west, together with limited trial excavation which was carried out along the line of the Pucklechurch (approximately 8km north east of Bristol) to Seabank pipeline. A further desk based assessment (12766), covering an area just to the south of the Site was undertaken in 1997 in advance of construction on the M49 motorway.

6.70 There are five scheduled monuments within 5km of the Site, as presented in **Table 5**.

Table 5: Scheduled Monuments within 5km

NMR	Monument Type	Period	Comments
27988	Ditch and Bank	Medieval	Located 2.2km to the south of the Site is a scheduled monument comprising a 1.1km length of the Mere Bank, a linear flood defence of probable medieval date, and its flanking ditches. Although it may have Roman origins the present Mere Bank has been provisionally dated to the 12th-13 th century by partial excavation. Documentary sources would appear to support this date. Part of its length survives as a recognisable feature within the landscape, which is rare nationally and particularly within the Avon and North Somerset Levels.
2885	Heavy Anti-aircraft battery	Modern	Located 2.1km to the south west of the Site, this scheduled monument includes a Heavy Anti-aircraft battery at Rockingham farm, approximately 3km north of Avonmouth. The site lies a short distance from the coast and is bordered by a railway line on its west side and the A403 road on its east. To the south of the Site are modern industrial units, and to the north an area of marsh.
BS87	Villa	Romano British	Located 4.6km south west of the Site
BS183	Blaise Castle, Hillfort	Iron Age -med	Located 4km to the south east
BS53	Hill fort	Iron Age	Located 4km to the south

6.71 In addition, there are thirteen Grade II listed buildings and one Grade II* listed building within 2km of the Site. A further seventeen Grade II* and three Grade I Listed buildings exist between 2km and 5km from the Site.

Scope of the Assessment

- 6.72 A desk-based archaeological assessment will determine, as far as is reasonably possible from existing records, the nature of the archaeological resource within a study area of 1km and will be used to identify any impacts that the Proposed Development may have on the receptors.
- 6.73 An inventory of all heritage assets will be cross-referenced to drawings (base maps) and the report narrative. In accordance with the NPPF and national standards and guidelines (see below), the impact of the Proposed Development on the significance of the setting of all designated heritage assets within 5km of the Site will also be assessed.
- 6.74 Due to the scale of the Proposed Development there is the potential for the setting of these designated heritage assets to be impacted by the scheme; therefore potential setting impacts upon designated assets will be assessed in relation to the scheme ZTV (to be undertaken as part of the landscape and visual impact assessment as discussed in Paragraphs 6.94 to 6.113 of this Scoping Report). The assessment will follow current professional good practice and guidance including that produced by the Institute for Archaeologists (IfA) and English Heritage (EH):
- IfA (2011) - Standard and Guidance for archaeological desk-based assessment; and
 - IfA (2010) – Code of Conduct;
 - EH (2008) – Conservation Principles: Policies and Guidance for the sustainable Management of the Historic Environment;
 - EH (2011) - The Setting of Heritage Assets. It is understood this guidance is currently being updated by EH; the latest version at the time of submitting the ES will be taken into account in the EIA;
 - EH (2011) - Seeing History in the view; and
 - EH (2008) Severn Estuary Rapid Coastal Zone Survey, where applicable.
- 6.75 It is possible that sufficient archaeological information is presently available to provide an adequate baseline assessment for the EIA. However, should this prove not to be the case following the initial assessment, the need for further archaeological evaluation such as geophysical survey will be discussed and agreed with South Gloucestershire Council and Bristol City Council. It is also intended that an archaeologist will be present to undertake a watching brief during the preliminary geotechnical works that will be carried out as part of the EIA.
- 6.76 In addition, any potential mitigation strategies required will be considered and recommendations made. The significance of residual impacts remaining after mitigation will be assessed according to accepted criteria for assessing archaeological and historic sites.

Traffic and Transport

Baseline Conditions

- 6.77 Existing access to the Site is gained via a single track gravel road that runs eastwards from a priority junction on the A403 Severn Road (Ableton Lane / Minor's Lane). The A403 is a single lane carriageway that runs from Avonmouth in the South, to a junction with the M48 motorway in the north, located on the east side of the Severn Bridge. In the south, the A403 connects with the A4 Crowley Way which is in close proximity to junction 18 of the M5 and M49 motorways. The A403 runs southwards from the M48 junction in the north skirting the villages of Pilning and Severn Beach.
- 6.78 Planning approval has been granted by SGC for a new spine access road that will link the adjacent SITA Energy Recovery Centre with the A403. The link road will form a new three arm roundabout junction with the A403. Severnside Developments Ltd intends to extend this new spine access road around the northern perimeter of the Site, under the extant 1957/58 consent (which is discussed further in Paragraph 8.27). It is intended that the primary access/egress for the Proposed Development will be along this new spine access road, with direct access also between the Proposed Development and Seabank 1 & 2 in the northwest corner of the Site, as shown in **Figure 10**.
- 6.79 **Figure 10** also shows the location of three secondary access points, which will also be used during construction of the Proposed Development. The first is along Ableton Lane / Minor's Lane, from the south, which will be upgraded and levelled through a separate planning application to SGC (or under the extant 1957/58 permission) prior to construction commencing onsite. The other two secondary access points will be from the existing roundabout located immediately east of the Site and which will be connected to the new spine access road that will link the adjacent SITA Energy Recovery Centre with the A403, and direct from the new spine access road through the north western perimeter of the Site .
- 6.80 To understand the availability of highway capacity in the area, a desktop study has been undertaken that has reviewed numerous Transport Assessments for developments in the area. In general, it appears as though the current highway network has spare capacity, although the future baseline conditions could be very different given the amount of committed development in the area. Consultation with SGC and BCC will be undertaken to agree and determine which committed schemes, together with any further highway infrastructure enhancements, should be included in the future baseline scenario.

Scope of the Assessment

- 6.81 A preliminary assessment has been undertaken to establish the level of traffic that is likely to be associated with the Proposed Development. The principal vehicle movements are anticipated to be associated with the construction phase of the development. The volume of construction vehicles associated with the delivery of plant and the labour force has not been determined at this stage but based on other similar sized CCGT power station construction projects is likely to be between 600 and 800 vehicle movements per day during the peak construction period (assuming a single phased development; it would be less if the Proposed Development is phased).
- 6.82 During the operational phase of the development, it is anticipated that there will be a workforce of up to 40 people that will be required on a shift basis to be spread over a 24 hour period. Staff will travel to and from work in a variety of directions. Fuel will be delivered by pipeline and other operational and maintenance consumables are likely to be minimal. Therefore it is considered that the effects of operational traffic would be negligible and a detailed assessment of the operational phase of the development is not proposed for the ES.

- 6.83 To fully address the impacts of the construction phase on the transport network, it is likely that a Transport Assessment (TA) will be produced (though this will be confirmed following determination of the number of construction movements, in liaison with SGC and BCC). The scope for the TA will follow the guidelines set out in the Department for Transport's 'Guidance on Transport Assessment, March 2007. SGC, BCC and the Highways Agency will also be consulted so that their specific requirements can be accommodated within the TA scope.
- 6.84 The traffic and transport chapter in the ES will summarise the salient points from the Transport Assessment. It will also relate the magnitude and significance of potential impacts to criteria contained in the 'Guidelines for the Environmental Impact Assessment of Road Traffic' document, produced by the Institute of Environmental Management & Assessment.
- 6.85 The scope of the TA will cover the following key areas:
- A review of national, regional and local transport policy - including the Joint Local Transport Plan 3 (JLTP3) (issued by the four councils of Bath and North East Somerset, BCC, North Somerset and SGC), Bristol Development Framework Core Strategy (Adopted June 2011), the emerging SGC Core Strategy, the Avonmouth and Severnside Integrated Development, Infrastructure and Flood Risk report, (Feb 2012) and the Avonmouth/ Severnside Outline Development Strategy, (April 2012);
 - A description of baseline and future baseline conditions, including consideration of accessibility by all main transport modes and available traffic flow data (described further below);
 - Calculations of construction and development traffic flows;
 - Distribution and assignment of construction and operational traffic flows, including the identification of routes for abnormal loads such as the delivery of generators and transformers;
 - Local network impact analysis – the size of the study area is to be confirmed with the local authorities and the HA. Key junctions may be identified by these stakeholders that require detailed capacity analysis;
 - Consideration of the local public rights of way for commuting, and whether this would be affected by the Proposed Development;
 - Cumulative impact assessment – the Severnside/ Avonmouth area is forecast for significant employment growth. The phasing of the proposed development in relation to other committed developments will be reviewed and any potential cumulative impacts on transport infrastructure will be commented on;
 - A review of highway safety issues including examination of personal injury accident data; and
 - The formulation of mitigation measures, such as a travel plan to promote sustainable journeys during the operational phase of the development and where possible reduce single occupant car journeys. In addition, a Construction Traffic Management Plan will be developed to seek to minimise the impact of construction vehicles arriving and departing the development Site.

- 6.86 An initial review of local traffic data held by SGC and BCC has been undertaken. It is likely that additional traffic surveys will need to be undertaken to supplement some of the data held by the local authorities, though this will be determined in liaison with SGC and BCC. The data will be used to quantify baseline vehicular demand along key routes to and from the Site. The data will also form the basis of calculations to quantify the impact of construction traffic on the surrounding road network.
- 6.87 As described earlier, it is considered that traffic and transport impacts are more likely to occur during the construction phase of the development. A summary of any residual and cumulative impacts will be provided should the proposed mitigation not fully address the impact of the development on the transport network.

Landuse, Recreation and Socio-Economics

Baseline Conditions

- 6.88 The Proposed Development is located in an existing industrial employment area. The employment uses surrounding the Site include the Seabank 1 & 2 to the north west, open storage of vehicles to the south west, a large active industrial and logistics park to the north and a gas works to the south east. The area surrounding the Proposed Development which is outside of the industrial area and between the M49 is mainly agricultural land. There are no residential uses immediately adjacent. There are a series of rights of way passing through the area. A footpath and Local Plan LC12 recreational route pass directly through the centre of the Site.

Scope of the Assessment

- 6.89 For the purposes of the ES, due consideration will be given to the role of the Proposed Development in the generation of direct and indirect employment opportunities at the local and regional level, during the demolition, construction and operation phases. A full socio-economic assessment will be undertaken to assess the impact of the scheme on the baseline conditions within both the local and wider area. The assessment will also consider the impact of the Proposed Development on landuse and recreation on the site and surrounds.
- 6.90 The methodology for assessing landuse, recreation and socio-economic impacts will follow standard EIA guidance and will involve:
- Review of relevant baseline conditions at the Site and locality;
 - Assessment of policy justification for the provision of additional employment space and the contribution of these activities to SGC's and BCC's policy objectives;
 - Estimate of employment generated during the construction and operational phase;
 - Consideration of local policy, plans and development constraints;
 - Assessment of the impact of the Proposed Development on Public Rights of Way and recreational uses that may be affected by the Proposed Development;
 - Consideration will also be given to whether there are any nuisance or health and safety implications that might affect recreational activities and land use in the immediate surrounds, in particular the status and viability of the Avonmouth Severnside Enterprise Area; and
 - Assessment of the likely scale, permanence and significance of impacts.

- 6.91 The social and economic policy context review will consider relevant policy at various levels including: local (SGC and BCC), regional (South West) and national (in terms of urban regeneration and neighbourhood renewal). The assessment will be carried out using a number of recognised data sources including, but not limited to the following:
- Office of National Statistics Labour Force and Neighbourhood Statistics;
 - Annual Business Inquiry;
 - Annual Population Survey;
 - Census 2011; and
 - Travel to Work Data.
- 6.92 Wherever possible the impacts of the socio-economic assessment will be appraised against relevant national standards such as those provided by HM Treasury and Homes and Communities Agency (HCA). Where no standards exist, professional experience and judgement will be applied and justified.
- 6.93 A summary will be provided of key residual impacts of the Proposed Development and how the Proposed Development fits into local and regional planning and development objectives, as well as its overall impact on the contribution to the local economy and community.

Landscape and Visual Impact Assessment

- 6.94 This section provides information on the likely effects of the Proposed Development upon landscape character and visual amenity of the Site and the surrounding area.
- Baseline Conditions*
- 6.95 An initial site visit and review of planning policy context relevant to landscape character and visual amenity has been undertaken to assess the potential landscape and visual impacts of the Proposed Development to inform this scoping exercise and recommend a study area for the landscape and visual impact assessment. A more detailed assessment will be undertaken once a preferred scheme layout has emerged.
- 6.96 No designated landscapes have been identified within a 10km radius of the Site. To the south and south east of the Site, however, are several historic landscapes listed in the English Heritage Register of Historic Parks and Gardens. Within 4 to 5km of the Site are Blaise Castle and Hamlet (Grade II*), Kings Weston House (Grade II) and Royal Victoria Park, formerly Bentry House (Grade II). Within 7 to 10km of the Site are Leigh Court (Grade II), Ashton Court (Grade II*), Bristol University Botanic Gardens and Rayne Thatch (Grade II) and Stoke Park (Grade II).
- 6.97 The Site is adjacent to the existing Seabank 1 & 2 CCGT Power Stations, approximately 5km north east of Avonmouth beyond the western outskirts of Bristol. The Site is an area of open grassland criss-crossed with rhines and ditches that discharge into the Severn Estuary.
- 6.98 Within the coastal belt west of the M49 motorway link, served by the A4043 coast road, the Site is surrounded by industrial development including the remnants of the former buildings and structures of the Terra Nitrogen and ICI site to the north, Seabank 1 & 2 to the south west, Chittening Industrial Estate and Cabot Park to south and the Seabank Gas Works and Hallen Industrial Estate to the south east. Two overhead electricity power lines on pylons cross the Site connecting to a network of overhead power lines on pylons that criss-cross the

surrounding area. The nearest residential communities are approximately 1.5km north of the Site, with a number of farm holdings in the surrounding area (within 1.1km to 2km of the Site).

- 6.99 The floodplain is contained to the east by a wooded ridge that extends from Olveston (approximately 7.5km to the north east to Kings Weston approximately 5km to the south east). The River Avon forms a valley through the ridge before it continues south westwards from Easton in Gordano approximately 7.5km to the south. Using the stacks of the existing Seabank 1 & 2 Power Stations for reference, it is clear that potential views of the Proposed Development from the east would be unlikely to extend beyond the wooded ridge.
- 6.100 To the west, the floodplain is contained by the flood wall with the open water of the Severn Estuary stretching beyond towards the South Wales coast. Potential views of the Proposed Development from the west and north west would be possible from the South Wales coast, approximately 7km to the north west at its closest point. The distance of the views and potential for interruption by low-lying intervening structures such as buildings, vegetation and landform would, however, limit these views resulting in only the upper parts of the Proposed Development being visible amongst the extensive industrial built-up area of Avonmouth.
- 6.101 To the north, north east and south west the screening effect of vegetation, mounding, buildings and structures would restrict potential views of the Proposed Development across the flat floodplain, although, where the visual receptor is raised above these low lying-elements, potential views would be possible. For example, drivers/passengers on the Severn Estuary crossings approximately 3.3km and 8.3km to the north, and ramblers on East Wood Hill in Portishead or on Portishead Pier (approximately 8.5km to the south west), could potentially experience distant views of the Proposed Development.

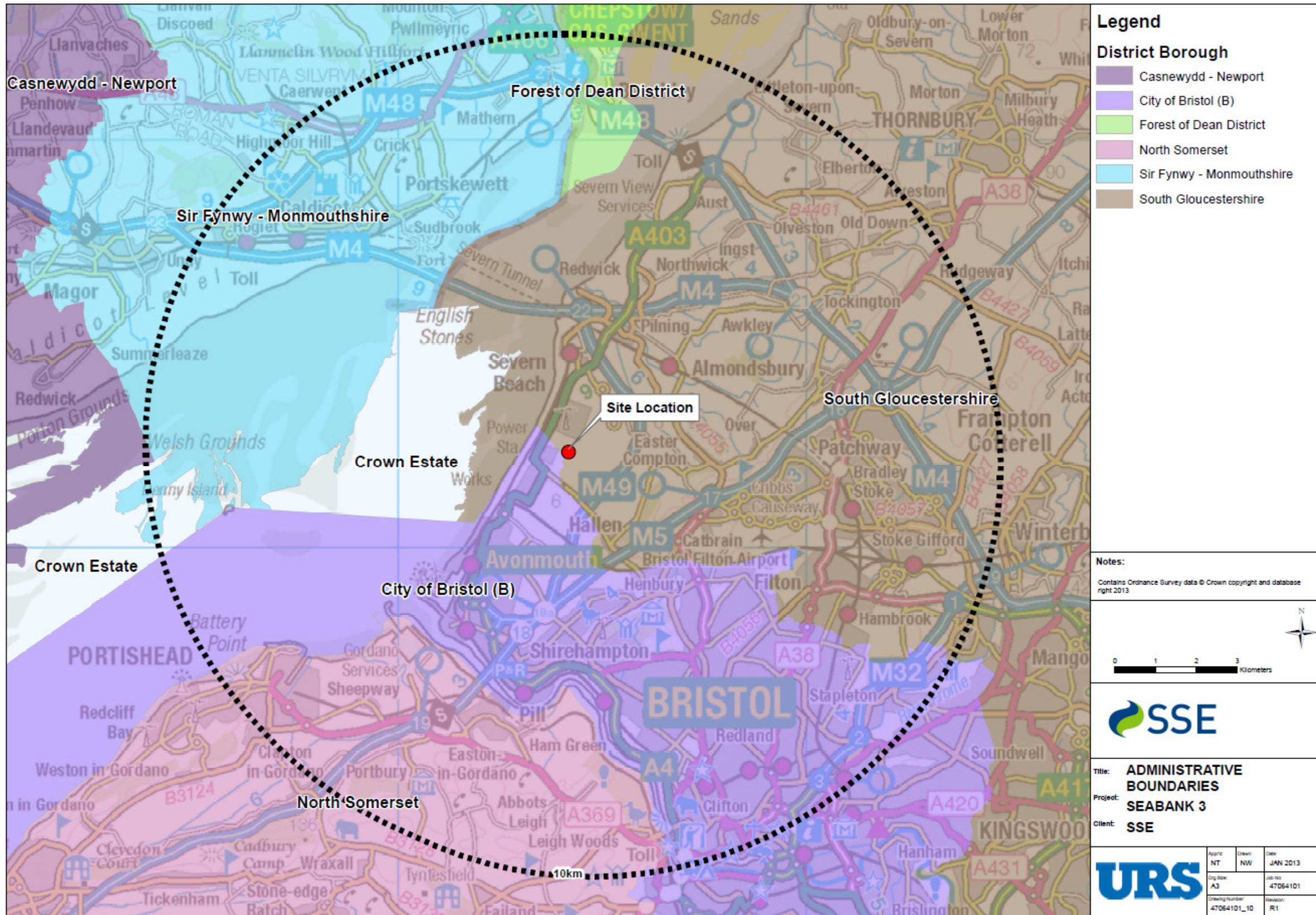
Scope of the Assessment

- 6.102 The method of landscape and visual impact assessment which is proposed has been devised to address the specific impacts likely to result from a development of its scale and nature. The methodology draws upon the following established best practice guidance:
- Guidelines for Landscape and Visual Impact Assessment (Landscape Institute and Institute of Environmental Management and Assessment, 2002);
 - Landscape Character Assessment: Guidance for England and Scotland (Countryside Agency and Scottish Natural Heritage, 2002); and
 - Landscape Institute Advice Note 01/11: Photography and photomontage in landscape and visual impact assessment (Landscape Institute, 2011).
- 6.103 The assessment will also take account of SGC's Landscape Character Assessment (SPD) Adopted July 2005 [Ref. 28].
- 6.104 The EIA process requires that a clear distinction is drawn between landscape and visual impacts, as follows:
- Landscape impacts relate to the degree of change to physical characteristics or components of the landscape, which together form the character of that landscape, e.g. landform, vegetation and buildings; and
 - Visual impacts relate to the degree of change to an individual receptor's view of that landscape, e.g. local residents, users of public footpaths or motorists passing through the area.

- 6.105 The assessment of impacts on built heritage, including impacts on the setting of listed buildings and structures, will be addressed under the Cultural Heritage and Archaeology section of the EIA – see Paragraphs 6.68 to 6.76 of this scoping report.
- 6.106 A detailed study of the existing landscape components, character and views of the Site and an identified study area will be carried out in consideration of the following:
- Site context;
 - Topography;
 - Vegetation;
 - Roads, public rights of way and access;
 - Settlement and land-use;
 - Landscape character; and
 - Representative views.
- 6.107 This will be supported by tables, drawings and photographs as appropriate. The planning context with respect to landscape character and visual amenity will also be assessed, taking into account relevant European, national, regional and local planning policies. The baseline study will form the basis of the assessment of the predicted impacts of the Proposed Development.
- 6.108 Representative views will be identified within the Zone of Theoretical Visibility (ZTV) for the main building envelope and the potential stack. A ZTV is a graphical representation of places within the Study Area from where the Proposed Development could potentially be visible and is generated by computer by analysing a model of the Proposed Development and a bare ground Digital Terrain Model (DTM). The resulting ZTV is reviewed with fieldwork against the following criteria in order to determine the selection of representative views which form the basis of the visual assessment:
- Receptor function / activity;
 - Distance from the Site;
 - Topography and elevation;
 - Degree and period of exposure;
 - Designation of the viewing place; and,
 - Distribution of receptors.
- 6.109 From the initial site visit and planning policy context review, a 10km radius study area is proposed for the landscape and visual impact assessment of the Proposed Development. This would enable any potential distant views from the South Wales coast in the north west, from Olveston in the north east and from Portishead in the south west to be included in the visual impact assessment. It is not considered that any significant landscape or visual impacts would occur beyond 10km.

- 6.110 **Figure 13** shows the County and Unitary Authorities within 10km of the Site that might be affected by the Proposed Development, which will be consulted during the EIA process.
- 6.111 Accurate Visual Representations of the Proposed Development for agreed representative views (visual receptors) will be produced in line with the guidance within the Landscape Institute Advice Note 01/11: Photography and photomontage in landscape and visual impact assessment.
- 6.112 The location and number of representative views and photomontages will be agreed in consultation with SGC and BCC.
- 6.113 A landscaping approach that enhances or mitigates the site will be discussed in the ES, with the expectation that a detailed landscaping strategy will be prepared in liaison with SGC and BCC following receipt of the DCO.

Figure 13: County and Unitary Authorities within 10km of the Site



Sustainability and Climate Change

- 6.114 National, regional and local policy guidance promotes sustainability principles, particularly with regard to the reuse of land and buildings, air quality and land contamination issues, energy conservation, materials and water usage. The ES will incorporate an assessment of the design against established sustainability criteria to take into account the following:
- Land, materials and natural resource use;
 - Energy consumption and energy efficiency;
 - Waste minimisation and implementation of the waste hierarchy, including a waste management plan covering the construction and operational phases of the Proposed Development;
 - Materials specification and usage in relation to CO₂ emissions and ozone depletion;
 - Sustainability of the generation and sourcing of the proposed fuel stock; and
 - The aims of the SGC and BCC Action Plan.
- 6.115 The carbon emissions/ carbon footprint from the combustion and proposed mitigation measures will be assessed in a standalone Climate Change Impact Report, considering proposed plant efficiency and performance against UK data including the average carbon emissions associated with the current electricity fuel mix in the UK.

CHP Assessment

- 6.116 Although not formally part of the EIA, it is a National Infrastructure Directorate requirement for all new power stations to explore and develop feasible CHP opportunities, as required by Section 36 of the Electricity Act 1989. This is in order to maximise the use of waste heat and in turn the thermal efficiency of the proposed combustion plant.
- 6.117 A CHP investigation will be undertaken as part of the DCO application which will involve identifying and contacting potential CHP users in the local area in accordance with the EA Guidance UKTWG17: CHP Ready and BAT for UK CCGT Power Stations, 2011 [Ref. 48]. This will initially be based on examining a map around the Site based on a predetermined economic radius for heat transportation. Should any potential uses be identified, a 'heat map' of the local area would be produced incorporating community, commercial and industrial heat uses and opportunities. Within this 'heat map' area the identified users would then be classified into user sectors. Community opportunities would mainly consider industrial, residential and housing opportunities, though would also include any hotels, leisure centres, large corporate buildings, hospitals, universities, prisons, defence installations and accommodation complexes. Industrial opportunities would be readily identified by the industrial sector of those industries inside the 'heat map' radius.
- 6.118 The CHP feasibility review will consider the heat availability from the proposed CCGT together with future CCR implications and the heat demand opportunities in the locality to justify the approach that will be taken for maximising CHP opportunities for the plant.

7. NON-SIGNIFICANT EIA ISSUES

- 7.1 The aim of the Scoping Stage is to focus the EIA on those environmental aspects that may be significantly affected by the Proposed Development. In so doing, the significance of impacts associated with each environmental aspect becomes more clearly defined, resulting in certain aspects being considered 'non-significant'. The following section provides a summary of those issues, which have been considered during the preparation of this Scoping Report, but are not considered key to the EIA and it is proposed will therefore not be considered in detail in the ES.

Waste

- 7.2 A description of the potential streams of construction waste and estimated volumes will be described within the Project Description chapter of the ES, along with a description of the requirements under the Site Waste Management Plan (SWMP) Regulations. In addition to this, the Construction Environmental Management Plan (CEMP), which would be produced following receipt of a DCO, will set out how waste will be managed on site, and opportunities to recycle waste will be explored.
- 7.3 For the operational Proposed Development, an analysis of the main waste streams will be provided. This Waste Management Strategy will be produced in accordance with the current local standards and policies.
- 7.4 There will be relatively little waste produced from the operation of the Proposed Development. It is not intended to remove significant quantities of material from site during construction (there is no demolition works for example) and there is relatively little waste associated with gas CCGT power stations, except for general waste associated with office/administrative activities. There may however be a need to remove some soils from the Site for treatment or disposal, if found to be contaminated and it is not practical to treat this onsite.
- 7.5 Taking the above into account, it is considered unnecessary that a separate waste chapter should be produced as part of the ES.

Electronic Interference

- 7.6 The proposed maximum building heights and expected temporary construction crainage will be no higher than the existing stacks associated with Seabank 1 & 2. Therefore an assessment of the Proposed Development's effect on electronic interference is unlikely to be required.
- 7.7 Further to this, analogue signals have ceased to be transmitted and have been replaced by digital signals. As such, the Proposed Development's potential to interfere with television, radio (both analogue and digital) and mobile phone reception is considered negligible. Nonetheless, a screening assessment will be undertaken to determine the existing effect of the current buildings onsite, and likely extent and severity of any impacts arising from the Proposed Development. Based on this, and the fact that the nearest residential dwellings are 1.5km north of the Site, and farm holdings 1.1km south, it is not envisaged at this stage that this will be necessary and therefore has not been scoped for at this stage.

Aviation

- 7.8 The Civil Aviation Association (CAA) has a general interest in charting all known structures of 91.4 m (300 feet) or more above ground level. The existing Seabank 1 & 2 stacks are a maximum 80m in height, and Seabank 3 stacks are not expected to exceed this height.

- 7.9 The proposed buildings and the Site's location should not warrant the inclusion of an assessment of the potential impacts of the development on the operating procedures at the nearest airfield. Bristol Filton is (located 4km east of the site) is due for closure at the end of 2012, and Bristol International Airport is located over 15km south of the site. Therefore, it is proposed that aviation is scoped out of the EIA.

Accidental Events / Health & Safety

- 7.10 The description of the Proposed Development in the ES will be written to provide sufficient information to allow the key environmental issues identified to be adequately assessed. Accidental events such as the potential for fuel spillages and abnormal air emissions, and how the risk of these events will be minimised, will be discussed in the relevant chapter of the ES.
- 7.11 Accidental events will be covered by a brief risk assessment in the ES, which will include reference to SSE's overarching principles of emergency management. The majority of emergency response plans and contingency measures will be dealt with in the Environmental Permit, which is regulated by the Environment Agency.

8. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

EIA Methodology and Reporting

- 8.1 The ES will set out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts. Any assumptions made will be clearly identified.
- 8.2 The EIA process is designed to be capable of, and sensitive to, changes that occur as a result of changes to the design, including any mitigation measures that are incorporated during the EIA. This will be particularly important for this scheme as the design and layout of the power station is still being refined, and minor changes are likely to be made following submission of this EIA Scoping Report.
- 8.3 Impacts will be considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies (major, moderate, minor and not significant).
- 8.4 Where potentially significant environmental effects are identified in the assessment process, measures to mitigate these effects will be put forward in the form of recommendations to be undertaken as part of the project development.

Structure of the Environmental Statement

- 8.5 The ES is based on a number of related activities, as follows:
- Establishing existing baseline conditions;
 - Consultation with statutory and non-statutory consultees throughout the DCO application process;
 - Consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
 - Consideration of technical standards for the development of significance criteria;

- Review of secondary information, previous environmental studies and publicly-available information and databases;
- Physical surveys and monitoring;
- Desk-top studies;
- Computer modelling;
- Reference to current legislation and guidance; and
- Expert opinion.

8.6 The ES will address the direct effects of the Proposed Development in addition to the likely indirect, cumulative, short, medium and long term, permanent, temporary, beneficial and adverse effects. The mitigation measures envisaged in order to avoid, reduce or remedy significant adverse effects will also be described. The concluding chapters will provide a summary of the cumulative and residual impacts.

8.7 The ES will comprise the following set of documents:

- Non-Technical Summary (NTS): this document will provide a summary of the key issues and findings of the EIA in non-technical language.
- Volume I: Environmental Statement: This will contain the full text of the EIA with the proposed chapter headings as follows:
 1. Introduction;
 2. Assessment Methodology;
 3. Description of the Site
 4. The Proposed Development;
 5. Construction Programme and Management;
 6. Design Evolution and Alternatives Assessment;
 7. Planning Policy Context;
 8. Air Quality;
 9. Noise and Vibration;
 10. Ecology and Habitats
 11. Flood Risk, Hydrology and Water Resources
 12. Geology, Hydrogeology and Land Contamination
 13. Archaeology and Cultural Heritage
 14. Traffic and Transportation
 15. Landuse, Recreation and Socio-economics

16. Sustainability and Climate Change
17. Cumulative Impacts; and
18. Residual Impacts.

- *Volume II: Landscape and Visual Assessment*
- *Volume III: Technical Appendices:* these will provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs. This will include the CHP Assessment, FRA and CCR feasibility study.

Structure of Technical Chapters

8.8 Chapters 8-16 (and Volume II) will be structured based on the following sub-headings:

Introduction

8.9 This section describes the format of the assessment presented within the chapter and identifies the author.

Legislation and Planning Policy Context

8.10 This section of the technical chapters provides an overview of the relevant legislation, planning policy and technical guidance application to the assessment.

Assessment Methodology and Significance Criteria

8.11 The methods used in undertaking the technical study are outlined in this section with references to published standards (e.g. British Standards, Building Research Establishment), guidelines (e.g. Design Manual for Roads and Bridges and Institute of Environmental Management & Assessment guidelines) and relevant significance criteria.

8.12 The significance of residual impacts will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it is not been possible to quantify impacts, qualitative assessments will be carried out, based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant technical assessment chapter.

8.13 Specific criteria for each technical assessment will be developed, giving due regard to the following:

- Extent and magnitude of the impact;
- Impact duration (whether short, medium or long term);
- Impact nature (whether direct or indirect, reversible or irreversible);
- Whether the impact occurs in isolation, is cumulative or interactive;
- Performance against environmental quality standards;
- Sensitivity of the receptor; and
- Compatibility with environmental policies and standards.

- 8.14 For issues where definitive quality standards do not exist, significance has been based on the:
- Local, district, regional or national scale or value of the resource affected;
 - Number of receptors affected;
 - Sensitivity of these receptors; and
 - Duration of the impact.

8.15 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between impacts upon different environmental components, the following terminology has been used in the ES to define residual impacts:

Adverse Detrimental or negative impacts to an environmental resource or receptor; and

Beneficial Advantageous or positive impact to an environmental resource or receptor.

8.16 Where adverse or beneficial impacts have been identified, these have been assessed against the following scale:

Negligible Imperceptible impacts to an environmental resource or receptor;

Minor Slight, very short or highly localised impact of no significant consequence;

Moderate More than a slight, very short or localised impact (by extent, duration or magnitude) which may be considered significant; and

Major Considerable impact (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

8.17 As indicated above, for the purpose of this EIA moderate and major impacts will be deemed 'significant'.

8.18 Each of the technical chapters provides the criteria, including sources and justifications, for quantifying the different levels of residual impact. Where possible, this has been based upon quantitative and accepted criteria (for example, the National Air Quality Strategy objectives or noise assessment guidelines), together with the use of value judgement and expert interpretation to establish to what extent an impact is environmentally significant.

Baseline Conditions

8.19 In order to assess the potential impacts of the Proposed Development, it is necessary to determine the environmental conditions that currently exist on site and in the surrounding area. These are known as 'baseline conditions'. Baseline conditions have been determined using the results of onsite surveys and investigations or desk based data searches, or a combination of these, as appropriate.

8.20 Since the Proposed Development assumes the diversion of the Red Rhine, which is being progressed independently and will take place in advance of Seabank 3, it is necessary to consider the future baseline conditions onsite, taking into account the intended route of the Red Rhine as currently being discussed between Severnside Development Ltd and the Lower Severn Internal Drainage Board.

8.21 The future baseline conditions will also consider the consented new spine access road linking the adjacent proposed SITA Energy Recovery Centre with the A403 (via a new roundabout to be constructed on the A403). It is anticipated that this will be built prior to Seabank 3 allowing access directly from this road into the Site from the north. It should be noted that Seabank 3 is not reliant on this spine road however, and access can be achieved through Seabank 1 & 2 if required.

Potential Impacts and Mitigation Measures

8.22 This section identifies the potential impacts resulting from the Proposed Development. This section also describes the mitigation measures that the Applicant will implement to reduce adverse impacts and enhance beneficial impacts and the mitigation measures that relate to construction and operational phases.

Residual Impacts and Conclusions

8.23 Impacts of the Proposed Development remaining following the implementation of available mitigation measures are known as ‘residual impacts’. These will be discussed for each of the potential impacts, and their significance level identified.

Cumulative Impact Assessment

8.24 In accordance with the EIA Regulations, consideration will also be given to the potential for ‘cumulative impacts’ to arise. These are impacts that result from incremental changes caused by other reasonably foreseeable developments.

8.25 For the cumulative impact assessment, two types of impact will be considered:

- The combined *impacts* of several development schemes which may, on an individual basis be insignificant but, cumulatively, have a significant impact; and
- The combined *effect* of individual impacts, for example noise or pollutants on a single receptor.

8.26 Cumulative impacts are those that accrue over time and space from a number of development activities. The impact of the Proposed Development will be considered in conjunction with the potential impacts from other projects or activities which are both reasonably foreseeable in terms of delivery (e.g. have planning consent) and are located within a realistic geographical scope where environmental impacts could act together to create a more significant overall effect.

8.27 Based on an initial search of the planning register, **Figure 14** presents the known cumulative developments within 6km to the site where the application has been submitted or beyond, or which has been specifically requested for consideration by a key stakeholder. These are described below:

1. **‘Avonmouth Power Station’, Scottish Power: Pre-application.** A new Combined Cycle Gas Turbine (CCGT) power station on the former Terra Nitrogen/Growthow site in Severnside.

2. **'Sevenside Energy Recovery' (SITA) – PT09/5982/FMW: Granted.** Development of an Energy Recovery Centre. The 2009 application was refused by SGC, although the decision was granted an appeal in 2011.
3. **'Spine Access Road' – PT12/1207/MW: Granted.** A road linking the adjacent SITA Energy Recovery Centre with the A403 (via a new 3-arm roundabout to be constructed on the A403). Permission was granted by SGC for the access road under reference PT09/5982/FMW, and a further application was granted planning permission for the re-alignment of the original planned and approved road under reference. Sevenside Developments Ltd intends to extend this new spine access road around the northern perimeter of the Site, under the extant 1957/58 consent (which is discussed further in bullet point 16).
4. **'Bottom Ash Facility' (SITA) – APP/P0119/A/10/2140199: Granted.** Bottom Ash Facility and associated Railhead which will serve the consented Sevenside Energy Recovery Centre (SERC), at Severn Road, Sevenside, South Gloucestershire (SITA).
5. **'Helius Energy', Avonmouth Docks – 09/00506/K: Deemed Planning Permission** granted 26 March 2010 - Construction of Biomass fuel store and biomass fired electricity generating plant, capable of generating approximately 100 megawatts of electricity. (Notification by Department of Energy & Climate Change).
6. **'Deep-sea Container Terminal' - 08/03387/K: Granted.** Construction of a deep-sea container terminal on the site of a former oil terminal at Avonmouth to accommodate the existing large container ships and future generations of Ultra Large Container Ships (ULCS). (Notification by Department for Transport.)
7. **'Sita/Cyclamax', Plot M2, Merebank Estate, Kingsweston Lane - 11/01773/F: Granted.** Proposed Bristol Resource Recovery Centre to consist of A) a 100,000 tonnes per annum batch oxidation gasification facility; B) a 80,000 tonnes per annum materials recycling facility to process source segregated recyclable materials; C) an end of life plastics to fuel conversion facility; D) a vehicle depot for waste collection vehicles; and E) a temporary refuse derived fuel production facility to be located within the proposed gasification building.
8. **'W4B', Former Columbian Chemicals (Sevalco), Severn Road - 09/03235/F: Granted.** Appeal allowed 10 February 2011 - Redevelopment of part of existing industrial site for a Bio-fuel, renewable energy plant together with ancillary access roads, parking facilities and landscaping.
9. **'Asda/Walmart', Former Rhodia Works, St. Andrews Road - 12/03149/F: Granted.** Redevelopment of the former Rhodia chemical works to provide a chilled distribution unit (Use Class B8) and an ancillary service centre (Use Class B2).
10. **'Rockingham Park' – 11/05157/P: Granted.** Outline planning application for industrial redevelopment, comprising B1(b), B1(c) and B8 uses.
11. **'Honda Site' – 10/05469/F: Granted.** Erection of new building, 40,041m², (within Class B8) for use as storage and distribution depot, new access off Poplar Way West, lorry, car and cycle parking and landscaping.
12. **'Resource Recovery Centre' (VIRIDOR) – 09/04470/F: Granted.** The construction and operation of a Resource Recovery Centre including a materials recycling facility, associated office, visitor centre and energy from waste and bottom ash facility, with

new access road and weighbridge facilities, associated landscaping and surface water attenuation features.

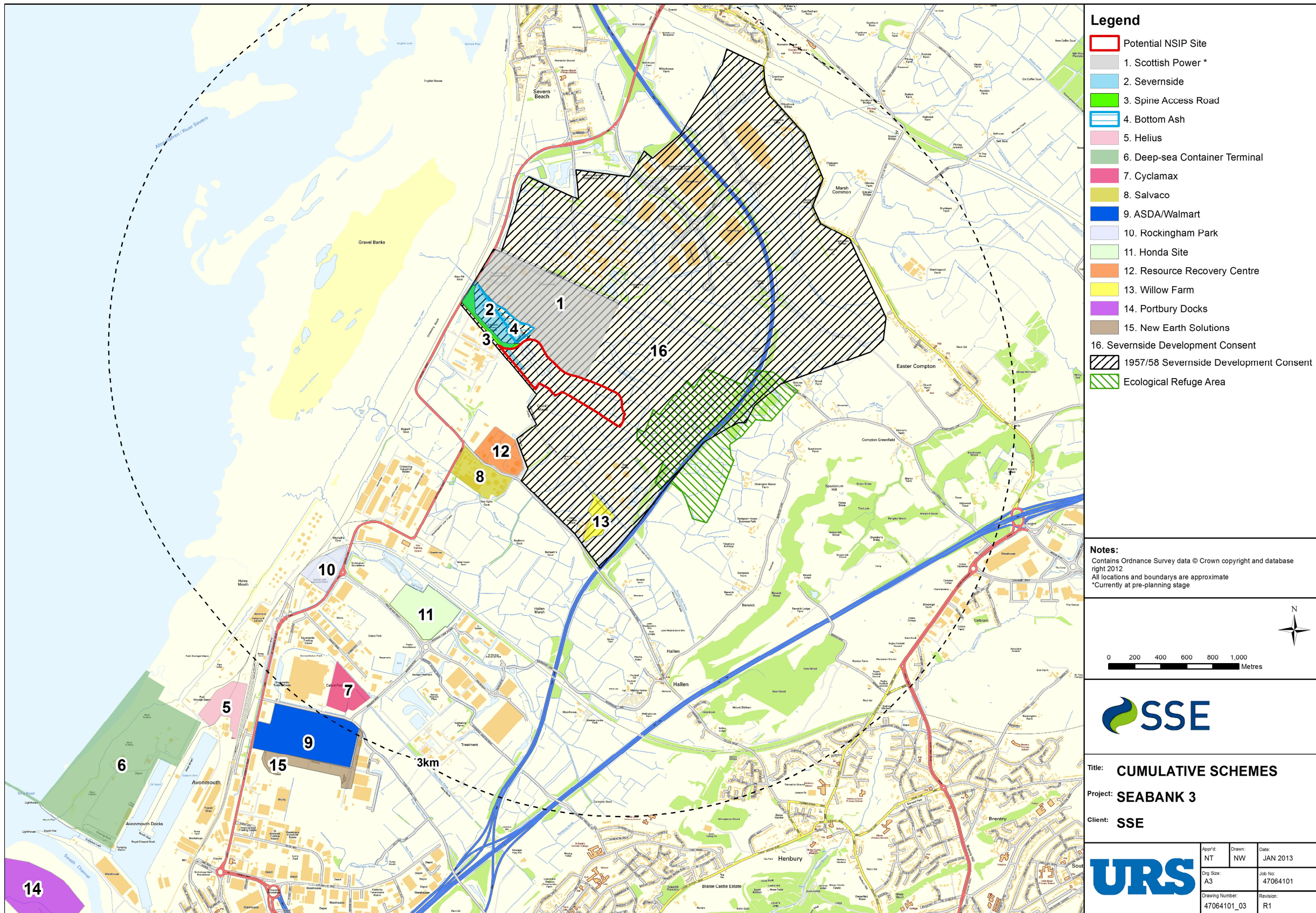
13. **‘Willow Farm’ – PT12/1015/MW: Granted.** Change of use of agricultural land to anaerobic digestion facility including weighbridges, reception building, biofilter, digestion and storage tanks and associated plant and infrastructure (New Earth).
14. **‘Portbury Docks’ – 09/00506/K: Granted.** An application to build a biomass-fired renewable energy plant as a means of increasing electricity generation derived from non-fossil fuels. The proposed plant would be located at the Royal Portbury Dock, within the Port of Bristol and would be developed on a plot of land approximately 5ha in size, leased to E.ON by The Bristol Port Company.
15. **‘New Earth Solutions’ - 10/02837/F: Granted** and currently under construction. Permission for a gasification plant adjacent to an existing Mechanical Biological Treatment Facility (MBT).
16. **‘The 1957 Consent’ – SG 4244: Granted.** Planning permission was granted on 27th November 1957 for a variety of uses on approximately 1,060ha of land, with an additional 10ha added by a 1958 consent, which remains extant for future development. The majority of this area, approximately 405ha is approved for industrial use – for the construction and operation of factories for the production of chemical and allied products (including non-ferrous metals) and for the development of offices, warehouses, canteens, clubs, hostels, training establishments, sports pavilions and playing fields etc. This includes the Site. The peripheral 220ha, mainly in the eastern portion of the consented area, allows for the development of offices, warehouses, canteens, clubs, hostels, training establishments, sports pavilions and playing fields etc. A further 445ha of land extending from the coastline into the Severn Estuary was originally approved for the construction and operation of any buildings structures or engineering works expedient to the construction and operation of the factories, though this was later rescinded through a Section 106 agreement with ICI accompanying the granting of planning permission for the development of the first phase of the Western Approaches Business Park, (P94/400/8) (hereafter referred to as WAP1). This agreement included the setting aside of 38ha of land for ecology enhancements and the creation of a number of green corridors within the 1957-58 consented land, as shown in **Figure 14**. It is worth noting that Severnside Developments Ltd intends to extend the new spine access road mentioned in bullet point 3 around the northern perimeter of the Site, under the extant 1957/58 consent (as shown in **Figure 10**).

8.28 Information on other developments that have the potential for cumulative effects with the Proposed Development will be identified in consultation with the local planning authorities.

8.29 In particular, it may be appropriate to include the Hinckley C reinforcement works and National Grid (Gas) connection reinforcement work, though the extent and location of these projects has not yet been identified. As mentioned earlier, National Grid is in the early stages of designing and applying for connecting an additional 400kV circuit into Seabank substation in relation to the network reinforcement required for Hinckley C. At the time of writing this Scoping Report a study corridor has been released showing the area within which the connection will be located, but a specific route or DCO application has not been submitted to the National Infrastructure Directorate.

- 8.30 Again, depending on the Applicant's preferred way forward, the 132 kV connection and water pipeline may or may not form part of the Proposed Development and DCO application and could therefore be deemed to be cumulative development (or 'associated development' as it "*is associated with the development*" according to the Planning Act 2008).
- 8.31 The impact of the Proposed Development on the Avonmouth Severnside Enterprise Area will be considered within the technical assessments, where relevant. It is not considered appropriate however to treat this enterprise area as a cumulative development, which has the potential to give rise to environmental impacts. The list of cumulative developments will evolve during the EIA process and, should the enterprise area lead to planning permission being sought or granted for specific projects, these would be considered as part of the cumulative impact assessment.
- 8.32 The combination of predicted environmental impacts resulting from a single development on any one receptor that may collectively cause a greater effect, are referred to as combined effects. Potential combined effects that will be considered include the combined effects of noise and air quality/ dust impacts during construction on local residents.

Figure 14: Cumulative Development Location Plan



Scoping and Consultation

- 8.33 The process of consultation is critical to the development of a comprehensive and balanced ES. The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation. Consultation is an ongoing process, which enables mitigation measures to be incorporated into the project design thereby limiting adverse effects and enhancing environmental benefits.
- 8.34 In accordance with Section 47(6) of the Planning Act 2008 (as amended), for a nationally significant infrastructure project (NSIP) such as Seabank 3, the Applicant will prepare a Statement of Community Consultation (SOCC) for publication in early 2013. This will outline how the Applicant intends to consult with the local community about the Proposed Development. The Applicant is required to consult the relevant local authorities on the draft SOCC and they will have a period of at least 28 days following receipt of the request to comment on a draft SOCC prior to its publication for inspection by the public.
- 8.35 At this stage, a two stage approach to public consultation is planned, as follows:
- A first round of events in Quarter 1 or 2 of 2013 to introduce the proposals and present a preliminary design and the options currently under consideration;
 - A second round of events in Summer/Autumn of 2013, which would be when the submission of the Preliminary Environmental Information (PEI), required by the Infrastructure and Planning (Environmental Impact Assessment Regulations) 2009 and the Planning Act 2008 is expected to be available. The PEI will comprise an early draft of the ES, to allow consultees to develop an informed view of the Proposed Development, but without certain surveys and assessments that are not possible at that time of year, such as protected species surveys that are summer dependent. A 'chosen' design will be presented based on a consideration of the BAT and feedback from the first round of events. Members of the public will be given an opportunity to comment on the chosen technology and design before proposals are 'fixed' for the DCO application and the ES is finalised.
- 8.36 A number of stakeholder meetings have already taken place to provide an introduction to the proposals, including:
- The Planning Inspectorate (PINS);
 - The EA;
 - Natural England;
 - BCC Planning Department; and
 - SGC Planning Department.
- 8.37 A project website will be hosted for Seabank 3 to provide up to date information on the project. All the information displayed at the aforementioned exhibitions for example will be made available via the website: www.sse.com/seabank3.

- 8.38 All responses received during consultation will be carefully considered and taken into account in the development of the project in accordance with Section 49 of the Planning Act 2008. Details of any responses received during consultation and the account taken of those responses will be included in a Consultation Report. This Consultation Report will be submitted with the application for a DCO to the NID and will therefore be available for public review.
- 8.39 The Consultation Report will demonstrate how SSE has complied with the consultation requirements of the Planning Act 2008 and will be considered by the National Infrastructure Directorate, both when determining whether to accept the application, and then in examining the application.

9. CONCLUSIONS

- 9.1 This Scoping Report requests the Scoping Opinion of the NID pursuant to Regulation 8 of the Infrastructure Planning (Environmental Impact Assessment Regulations 2009). It has outlined what we believe to be a comprehensive scope of work proposed for the EIA based on previous experience of the assembled team of specialists and existing baseline studies of the Site. The NID and other consultees are invited to consider the contents of this Report and comment accordingly within the statutory 42 day time period.

10. REFERENCES

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- Ref. 2 HMSO (2009) Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('APFP Regulations')
- Ref. 3 HMSO (2008) The Planning Act
- Ref. 4 Planning Inspectorate. 2012. Screening and Scoping under the EIA Regulations. Advice note seven: Environmental Impact Assessment: screening and scoping
- Ref. 5 HMSO (2008) Energy Act
- Ref. 6 Department of Energy and Climate Change (DECC) (2011) Overarching National Policy Statement (NPS) for Energy: EN-1
- Ref. 7 ENVIRON (2006) Ecological Report and Extended Phase I Habitat Survey, Severnside
- Ref. 8 ENVIRON (2007) Bat Surveys of Land Adjacent to the Western Approach
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- Ref. 10 ENVIRON (2007) Wintering Bird Survey, Severnside
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- Ref. 12 Department of Energy and Climate Change (DECC) (2009) Carbon Capture Readiness (CCR), A guidance note for Section 36 Electricity Act 1989 consent applications
- Ref. 13 European Commission (EC) (1999) Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions
- Ref. 14 Department of Energy and Climate Change (DECC) (2011) National Policy Statement for Fossil Fuel Generating Infrastructure: EN-2
- Ref. 15 South Gloucester Council (SGC) (2006) Local Plan
- Ref. 16 West of England Partnership (2011) West of England Joint Waste Core Strategy
- Ref. 17 SGC (2002) SGC Minerals and Waste Local Plan
- Ref. 18 SWRDA (2001) Regional Planning Guidance Note 10 for the South West
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- Ref. 20 BCC (1997) BCC Local Plan
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- Ref. 29 BCC (2010) Waste and Recycling: Collection and Storage Facilities - Guidance for developers, owners and occupiers
- Ref. 30 BCC (2005) Supplementary Planning Document 1: Tall Buildings
- Ref. 31 BCC (2006) Supplementary Planning Document 5: Sustainable Building Design and Construction
- Ref. 32 BCC (2006) Supplementary Planning Document 7: Archaeology and Development

- Ref. 33 BCC (1993) BCC Local Plan Policy Advice Note 2: Conservation Area Enhancement Statements
- Ref. 34 BCC (1997) BCC Local Plan Policy Advice Note 14: Safety and Security
- Ref. 35 BCC (1998) BCC Local Plan Policy Advice Note 15: Responding to Local Character
- Ref. 36 Department for Communities and Local Government, (2012), 'National Planning Policy Framework', The National Archives
- Ref. 37 Department for Communities and Local Government, (2009), Planning Policy Statement 25 Development and Flood Risk Practice Guide
- Ref. 38 Department for Environment Food and Rural Affairs, UK AIR: Air Information Resource (online) Available at: <http://uk-air.defra.gov.uk/>
- Ref. 39 Air Pollution Information System (APIS) (online) Available at: http://www.apis.ac.uk/habitat_table.html
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- Ref. 41 Environment Agency (EA) (2011) H1 Guidance: Annex F
- Ref. 42 Department of Transport (1988) Calculation of Road Traffic Noise
- Ref. 43 Highways Agency (HA) (2011) Design Manual for Roads and Bridges
- Ref. 44 South Gloucestershire Council, Bristol City Council & Natural England (2010) Severnside/Avonmouth Wetland Habitat Project Stage 1: Distribution of Wetland Birds within the Study Area. Report no:WX71453/C1453/Final/V1
- Ref. 45 Potamos Consulting (2010) Flood Risk Assessment, Avonmouth
- Ref. 46 Seabank Power Station, Avonmouth Site Remediation Works Completion Report, December 1996, 01.6417/COMREP
- Ref. 47 Bottom Ash Recycling Facility & Railhead, Land adjacent to Severnside Energy Recovery Centre Environmental Statement, April 2012
- Ref. 48 EA (2011) Guidance UKTWG17: CHP Ready and BAT for UK CCGT Power Stations