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Sizewell C Project

Site Condition Report

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1. Introduction and Site Details

1.1 Purpose of this report

1.1.1 This document represents the Site Condition Report (SCR) for the back-up diesel generators for the proposed Sizewell C (SZC) power station development located near Sizewell to be owned and operated by NNB Generation Company (SZC) Limited (SZC Co.). SZC will consist of two European Pressurised Water Reactor (EPR) units referenced in this SCR as Unit 1 and Unit 2.

1.1.2 The development (hereafter referred to as the installation) is not yet constructed, however the information presented in this report is broadly consistent with that detailed in the Generic Design Assessment Pollution Prevention and Control Application, produced by EDF with deviations clearly stated. The only parts of the site identified as being an installation subject to permitting as part of the Environmental Permitting (England and Wales) Regulations 2016, as amended (known as the “EP Regulations”) are the diesel generators comprising of 4 No. essential diesel generators (EDGs) and 2 No. ultimate diesel generators (UDGs) for each UK EPR unit, as the total thermal input of these combustion plants will exceed 50MW. An application for a permit to operate is being made under the Environmental Permitting (EP) Regulations (2016, as amended). The activities undertaken at the installation constitute a regulated activity, as defined in Section 1.1, Part A(1), Paragraph (a) of Schedule 1 to the EP Regulations as “Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more”.

1.1.3 The overall purpose of the SCR is to describe and record the condition of the land and groundwater at the location of the proposed installation at the point of application for an environmental permit. The SCR is designed to be a live document which is maintained throughout the lifetime of operation of an installation, from permit application to permit surrender. It provides a centralised source for relevant data and site records; such as ongoing environmental and/or infrastructure monitoring/testing carried out during the lifetime of the installation. Any remedial works required following the accidental release of potentially polluting substances to the land during the permitted operations will also be documented and referenced in the SCR. Future updates of the SCR will include information from various complementary studies.

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- 1.1.4** At the point of permit surrender, a surrender SCR must be produced to demonstrate that the site is in a satisfactory state so that the Environment Agency can allow the permit to be surrendered. This allows a comparison to be made with the condition of the land prior to and during the permitted operations and post operation at the point of permit surrender. It should be noted that the scope of this SCR is limited to non-radiological contamination.
- 1.1.5** The report is structured as per Section 2.0 of the SCR template provided in Environment Agency horizontal guidance note H5: “site condition report (guidance and templates) v3.0 April 2013”. In accordance with the H5 guidance, Sections 1 to 3 have been completed for the permit application stage; Sections 4 to 7 are required to be maintained by SZC Co. during the lifetime of the installation; and Sections 8 to 10 are required to be completed as part of an application to surrender an environmental permit. The sections of the report are summarised below.

Environmental Permit Site Condition Report		
Permit Application Stage (Current Stage)	Section 1	Introduction and Site Details
	Section 2	Condition of the Land at Permit Issue
	Section 3	Permitted Activities
Operational Phase (To follow issue of an Environmental Permit)	Section 4	Changes to the Activity
	Section 5	Measures taken to Protect the Land
	Section 6	Pollution Incidents that may have had an impact on the Land, and their Remediation
	Section 7	Soil Gas and Water Quality Monitoring
Permit Surrender Application Stage	Section 8	Decommissioning and Removal of Pollution Risk
	Section 9	Reference Data and Remediation
	Section 10	Statement of the Site Condition

1.2 Installation Details

Details of the Installation	
Name of Applicant	NNB Generation Company (SZC) Limited (SZC Co.).
Activity Address	Sizewell C Power Station Leiston IP16 4UR
National Grid Reference	TM 47270, 64145
Document References for Installation Plans	Figure 1: Site Location Plan Figure 2: Proposed Installation Boundary Figure 3: Diesel Generator Building Layout Figure 4: Human Receptors Figure 5: International Designated Habitat Receptors Figure 6: National Designated Habitat Receptors

1.3 Installation Overview

1.3.1 The installation is located in Sizewell, approximately 3 km west of the town of Leiston. The surrounding land use is a mixture of industrial and agricultural land. The site location plan is shown in Figure 1 in Appendix 1. The immediate neighbouring land includes:

- The installation is bound to the north by agricultural land;
- The installation is bound to the **south** by Sizewell B (SZB) power station;
- The installation is bound to the **west** by a car park and agricultural land; and
- The installation is bound to the **east** by Greater Sizewell Bay (beyond the North Sea).

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1.3.2 The nearest residential properties are approximately 1km south (village of Sizewell) and 3km to the west (town of Leiston). The human receptors are shown in Figure 4 in Appendix 1.

1.3.3 The installation is located on the Suffolk Heritage Coast within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty. Greater Sizewell Bay is located immediately to the east. The Sizewell Marshes, a Site of Special Scientific Interest (SSSI) is located adjacent to the west and north west of the installation comprising ponds and drainage ditches. Leiston Beck is located adjacent to the west of the installation, which then joins the Minsmere, approximately 2km north. The Minsmere-Walberswick Heaths and Marshes SSSI, a Special Area of Conservation (SAC), Special Protected Area (SPA) and Ramsar site is located adjacent to the north of the wider SZC power station site boundary. The ecological receptors are shown in Figures 5 and Figures 6 in Appendix 1.

1.4 Installation Activities

1.4.1 The SZC Co. facility at Sizewell is a proposed facility for a new nuclear power station to be situated directly to the north of the existing SZB power station.

1.4.2 The back-up diesel generators associated with the proposed SZC power station development fall within the EP Regulations. The installation to which the environmental permit will apply therefore comprises the twelve diesel generators, their associated fuel storage tanks and interconnecting pipework, all of which will be housed within four purpose-built concrete buildings within the SZC power station site. The diesel generators would be routinely operated for maintenance purposes and during periodic nuclear safety tests.

1.4.3 Consequently, there are a total of four installation areas and the proposed installation boundaries are provided as Figure 2 in Appendix 1. The layout of the diesel generator buildings is shown in Figure 3 in Appendix 1. The four installation areas are located within the SZC power station site. The site as discussed in this report refers to the wider SZC power station site boundary.

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2. Conditions of the Land at Permit Issue

Condition of the Land at Permit Issue	
Environmental Setting	
Geology	<p>Geological mapping indicates various superficial deposits located beneath the installation. Peat is recorded to be present underlying the two central installations, Tidal Flat Deposits (clay and silt) are recorded present underlying the most northern installation and superficial deposits are recorded as absent from the most southern installations.</p> <p>The solid geology mapping indicates that the installations are located upon the Crag Group (Sand), which is further underlain by White Chalk.</p> <p>Intrusive investigations have been undertaken as part of the design process for SZC. Ground investigations were undertaken in 2009 by Structural Soils Ltd (Ref: 722201 dated March 2009) and in 2011 by Environmental Services Group Limited (ESG) (Ref: A0012-10/1 dated August 2011). The Atkins Phase 2 Geo-Environmental Interpretive Report 2018 (Ref: 5166065/7.1/001/001/00/A dated June 2018) summaries the investigations carried out across the wider SZC site and in the vicinity of the four installations and is provided in Appendix 2.</p> <p>The findings are summarised below:</p> <p>Topsoil</p> <p>Topsoil including ploughed soil in the southern section of the wider site was encountered in exploratory holes and comprised either brown orange silty or clayey sand or fine to medium grained sand. The layer generally included rootlets, with a low content of gravels or anthropogenic material. The thickness of this stratum ranged from 0.1m up to 0.8m in the southern section of the zone.</p> <p>Made Ground</p> <p>Made Ground was encountered in the majority of exploratory hole locations. Reportedly, the ground surface was raised with surplus spoil from the construction of Sizewell A (SZA) between 1964 and 1971.</p> <p>Reworked natural deposits were encountered within a number of exploratory holes from ground surface to between 3.6m and 7.0m below ground level (bgl) which comprised either brown silty sand/sandy loam, brown to orange brown sand with occasional to frequent rootlets or brown/orange slightly gravelly sand with roots. Reworked sands were also encountered described as grey gravelly</p>

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Condition of the Land at Permit Issue	
	<p>sand with organic and hydrogen sulphide odours and sub-angular to angular gravel and grey sand.</p> <p>Marine Deposits</p> <p>Marine Deposits were encountered from 6.0m bgl up to depths of 12.7m bgl across the northern and central sections of the site and in one location within the southern section of the site. The Marine Deposits generally comprised rounded to sub-angular orange gravel with a varying content of medium to coarse-grained sands.</p> <p>Alluvium and Peat</p> <p>Alluvium was encountered at depths of between 3.6m and 7.0m bgl within a number of locations across the site, overlain by Made Ground or Marine Deposits. The Alluvium contained varying amounts of brown or dark yellow fibrous, slightly silty peat, interbedded with a grey sandy clay or clayey silt.</p> <p>Crag Group (Sand)</p> <p>The solid strata of the Crag Group (Sand) was encountered at depths of between 6.0m and 9.9m bgl in the central and northern sections of the site and at a shallow depth of 0.15m bgl in the southern section of the site underlying the superficial deposits. The Crag Group (Sand) generally consisted of either orange or grey silty sand with occasional subangular to rounded flint gravel. Clasts of grey clayey sand were encountered in several boreholes, in addition to shell fragments. The base of the Crag Group (Sand) was not proven (maximum depth proven was 23m bgl during installation of groundwater monitoring standpipes).</p> <p>As part of the construction of the proposed SZC power station development, a cut off wall will be installed, and a cut and fill exercise will be undertaken whereby the superficial material listed above (Topsoil, Made Ground, Marine Deposits and Alluvium and Peat) will be excavated down to the Crag Group (Sand). The deficit will then be filled with Crag Group (Sand) sourced from borrow pits in an area primarily located within the north-west of the site, known as the Temporary Construction Area (TCA). The TCA is bounded by the Sizewell Marshes SSSI to the south, the Minsmere Levels to the north, the B1122 to the west and the Suffolk coast to the east.</p> <p>As such, the SCR will only be based upon the Crag Group (Sand) and the condition of the fill material from the TCA. This material will be validated before being placed, as detailed in the following sections.</p>

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Condition of the Land at Permit Issue	
Hydrogeology	<p>Groundwater vulnerability mapping indicates that the site and installations are underlain by a Secondary A Aquifer associated with the Superficial Deposits. Secondary A Aquifers are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.</p> <p>The Crag Group (Sand) is classified as a Principal Aquifer which is defined as layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. The Crag Group (Sand) is underlain by the Chalk which is classified as a Principal Aquifer.</p> <p>The soils underlying the majority of the site are identified as having high permeability, with the exception of the peat deposits, which are identified as having intermediate leaching potential. As identified above a cut off wall will be installed, and the superficial material will be removed down to the Crag Group.</p> <p>Groundwater was encountered underlying the installations within the Made Ground, Peat, Lowestoft Formation (sand and gravel), Crag and Chalk with levels varying between 0.9m and 7.8m bgl. However, this may alter with the installation of the cut off wall.</p> <p>Currently, the Made Ground is considered to be in partial hydraulic continuity with the underlying natural strata. No tidal variation was observed in the Peat. There is a hydraulic separation of the low vertical hydraulic conductivity deposits including Peat, Alluvium and Tidal Flats with the Crag Sand. The Crag Sand Formation is influenced by tidal variation of sea level. The Crag Sand Formation and Chalk are currently in hydraulic continuity.</p> <p>Groundwater flow within the Crag Group (Sand) was found to be primarily towards the coast, with localised groundwater flow occurring to the north and south. During periods when high water levels were recorded across the monitoring network, groundwater levels were noted to be significantly elevated relative to the surrounding area. The higher water levels may be a result of the SZB cut-off wall to the south causing water levels to rise locally, or it may be a result of Made Ground causing delayed recharge to the underlying Crag Group (Sand) aquifer.</p> <p>During lower water levels, a slight dip in groundwater levels was noted, suggesting that the main Leiston Beck / Sizewell Drain may be receiving groundwater baseflow.</p>

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Condition of the Land at Permit Issue	
	<p>The site and installations are not located within a listed groundwater Source Protection Zone (SPZ).</p> <p>There are seven permitted active groundwater abstractions located within 2km of the installations, with the closest being a groundwater abstraction point at the existing Sizewell power station located 450m south of the installation for make up or top up water from the Marine Deposits. The abstraction licence/permit is operated by British Energy Generation Ltd. with a start date of 31 December 1998 (the permit end date is not supplied and it is assumed to be active). The remaining permitted active groundwater abstractions are located between 900m and 1990m from the installations and are for make-up or top up water, spray irrigation and water transfer.</p> <p>Further hydrogeological information is present within Atkins Sizewell Site C Conceptual Site Model of the Hydrogeological Regime (Ref. 5129919/TR/001 dated June 2015).</p>
Surface Waters	<p>The main surface water feature within 1km of the site is the coastal water of Greater Sizewell Bay located adjacent to the east and a series of surface features located to the west and north west of the site. These include an extensive network of ponds and drainage ditches, referred to as the Sizewell Belts located adjacent to the west and north - west of the site.</p> <p>Leiston Beck, located adjacent to the west of the site, receives drainage from the Sizewell Belts and runs north, parallel with the coast, before joining the Minsmere New Cut, a large watercourse flowing west to east discharging to the sea via a sluice gate known as 'The Sluice', approximately 2km north.</p> <p>The site and installations are located within an area at risk of flooding (Flood Risk 3) as a result of rivers or seas without defences. The site will be protected against flooding from the sea by its elevation. This elevation of the platform on which the plant is to be constructed, will be created at 7.3 AOD. Although it will not ensure a dry site under all conditions, the elevation was determined as a solution that is as low as reasonably possible (ALARP). A Flood Risk Assessment has been undertaken, which took into consideration changes in extreme high water levels due to reasonably foreseeable climate change through to the end of the station operational lifetime assessed using UK Climate Projections (UK CP09) 10,000 year return period at 95% confidence level. The site also benefits from drainage arrangements and buildings are designed so that standing water does not enter buildings.</p> <p>There are 10 discharge consents to surface water within 1km of the installation, the closest of these being 220m south of the installation. All of the discharge consents relate to processes being undertaken at Sizewell A and B including</p>

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Condition of the Land at Permit Issue	
	<p>cooling water, process water, trade effluent, sewage and surface water discharges to Greater Sizewell Bay and a tributary of Leiston Beck.</p> <p>Surface water samples were collected by AMEC between 2011 and 2013 and Atkins from 2013 to present. Over 500 surface water samples were collected from a series of interconnecting drainage ditches located on-site and, in the area, upstream and downstream of the site including Leiston Drain, SSSI drains, unnamed watercourses and Sizewell Drain were collected and tested. Further information on surface water sampling is presented in Atkins Phase 2 Geo-Environmental Interpretive Report 2018 (Ref: 5166065/7.1/001/001/00/A dated June 2018).</p>
Sensitive Land Uses	<p>The site is located within a Nitrate Vulnerable Zone.</p> <p>The installation is located on the Suffolk Heritage Coast within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty.</p> <p>Sizewell Marshes are a SSSI located adjacent to the west and north west of the installation comprising ponds and drainage ditches.</p> <p>The southern North Sea located 335m east is a SAC.</p> <p>The Outer Thames Estuary located 320m east is an SPA.</p> <p>The Minsmere-Walberswick Heaths and Marshes located 2km north of the installation are a SSSI, a SAC, SPA and Ramsar site.</p> <p>The nearest residential property is located 1km south of the installation (village of Sizewell).</p>
Pollution History	
Pollution incidents that may have affected the land	<p>The Landmark Envirocheck Report dated 2021 indicates that there have been 14 recorded pollution incidents within 1km of the site including incidents relating to unknown substances, sewage, oils and chemicals. Several of the incidents relate to impacts to Greater Sizewell Bay from activities associated with the existing power station. The remaining incidents involve Leiston Beck and its tributaries. The closest pollution incident was located approximately 130m north of the installations and was recorded in 1993 relating to entry of an unknown pollutant into Leiston Beck, listed as a Category 3 (minor) incident. All of the incidents were classified as minor incidents with the exception of one severe</p>

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Condition of the Land at Permit Issue	
	<p>incident in relation to a diesel spill to the North Sea in 1994 located 580m from the installations.</p> <p>The Envirocheck report includes an enforcement and prohibition notice for Sizewell B (date not provided). This was in relation to a review of potential sources of iodine in the discharge to water. Activity improvements were required including the means by which discharges are reduced, investigation of reasons for the fuel pin failures and the need to set out a forward strategy to ensure that the annual iodine limit is not exceeded.</p>
Permits and Consents	<p>The Envirocheck report indicates there are no Explosive Sites or Notification of Installations Handling Hazardous Substances on or within 1km of the site.</p> <p>There is one Integrated Pollution Prevention & Control Permit identified within 1km of the site, which is for the Sizewell B power station combustion activities. There are three revoked Integrated Pollution Prevention & Control Permits for Sizewell B (for two incinerators (dated 1994 & 2008) and for respraying (dated 1995).</p> <p>There are five Registered Radioactive Substances authorisations at Sizewell B and five authorised and seven (waiting for authorisation) Registered Radioactive Substances authorisations at Sizewell A.</p> <p>Sizewell B power station is a Lower Tier Control of Major Accident Hazard (COMAH) site and holds a Planning Hazardous Substances Consent for the dangerous substances stored at the power station.</p> <p>Two registered landfills and three historical landfill sites are present within 2km of the site. The nearest of these is a registered landfill site located 200m south of the installations. There are no identified restrictions on the source of waste received by the landfill. The dates of operation of the landfill are not provided and the status of the licence is listed as lapsed. The other registered landfill is located approximately 2km to the south of the installations. The landfill was operational from June 1977 and there is no identified restriction on the source of waste received by the landfill. The status of the licence is listed as lapsed/cancelled or surrendered. The historical landfills are located approximately 2km from the installations.</p>
Historical land-uses and	<p>The Atkins Phase 2 Geo-Environmental Interpretive Report 2018 (Ref: 5166065/7.1/001/001/00/A dated June 2018) summaries the history of the site,</p>

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Condition of the Land at Permit Issue	
associated contaminates	<p>referring to Envirocheck Reports, in which the site and installations are located and is provided in Appendix 2.</p> <p>From 1883, the installation locations are recorded as open fields with drains running across the wider site area. An old drainage pump is also located in the north and centre of the site in close proximity to the installation locations. Sand pits are located in the approximate vicinity of the most southern installation. The TCA comprises open fields, farmland, marshland and woodland in 1883. Several roads and tracks are present transecting this area Lover's Lane and Abbey Road. Drains and a Sand Pit are present in the east of the TCA around Goose Hill. Several other areas which appear to be pits are present in the centre of the TCA around Upper Abbey.</p> <p>By publication of the 1905 map, a wind pump is recorded present in the north-east of the site and to the east of the most northern installation. Between 1928 and 1958 a rifle range is labelled in the area of the central installation. A wind pump is present adjacent to Upper Abbey in the west of the TCA.</p> <p>Mapping from 1976 reveals earthworks in the south of the site suggesting that the site has been raised with SZB now present. There are also a number of tracks on a grid crossing the site and the area to the immediate south of the site. The rifle range is no longer shown. There is a sewage works (Leiston Sewage Treatment Works) to the west of the site. The Sand Pit and other unnamed pits in the TCA are now labelled as 'Pit (disused)'.</p> <p>By the publication of the 2006 map, SZB power station has been developed further north and has encroached onto the southern section of the site.</p> <p>An aerial photo from 1999 shows the northern area as undeveloped and the southern area developed as part of SZB, including various buildings and a storage area.</p> <p>The 2021 aerial photo shows additional development including a car park adjacent to the storage area, whilst the northern area of the site remains undeveloped.</p> <p>Potential On-Site Sources of Contaminants</p> <ul style="list-style-type: none"> • Former rifle range located in the centre of the site and central installation (potential inorganic and organic contamination including metals and hydrocarbons). • Possible Made Ground across the site including beneath the installations (associated with construction of SZB, former contactors compound, soil disposal and construction waste)

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	<p>(potential inorganic and organic contamination including metals, hydrocarbons, PCBs, asbestos, etc.).</p> <ul style="list-style-type: none"> • Buildings, storage area and car park beneath the southern area (a range of inorganic and organic contaminants, including potential fuels and oils attributed to possible spills from vehicles, plus exhaust particulates). • Drainage channels (potentially infilled) and wind pumps (potential inorganic and organic contamination including metals and hydrocarbons). • Discharge Consents for sewage discharges associated with the existing power station activities. Activities relating to the former contractors' compound on the site for SZB including possible storage areas, fabrication areas, lagoons, stone washing / concrete batching area, etc. • Former infilled sand pits and unnamed pits (risk of inorganic and organic contamination including metals, hydrocarbons, etc.). • Made Ground associated with the construction of roads crossing the site as well as activities associated with their operation (potential inorganic and organic contamination including metals and hydrocarbons). <p>Potential Off-Site Sources of contaminants</p> <ul style="list-style-type: none"> • Leiston sewage treatment works located on the western boundary of the site, approximately 50m from the installations (potential metals, organic contaminants including biological contaminants). • Discharge Consents for cooling water, process water, site drainage and treated effluent discharges to Greater Sizewell Bay and Leiston Beck. • Car park located on western edge of the site and approximately 50m from the installations (potential fuels and oils attributed to spills from vehicles, plus exhaust particulates. A range of inorganic and organic contaminants). • Activities associated with the operation of SZA and SZB power stations including the use of associated infilled materials, and

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	<p>migration of contaminated groundwater onto the site (risk of contamination from fuel oil contamination and PCBs).</p> <ul style="list-style-type: none"> • Infilled sand pits between 95m and 800m of the installations and site (risk of inorganic and organic contamination including metals, hydrocarbons, PCBs, ground gas, etc.). • Potential military land along the coast, 210m and 280m from the installations (potential metals and munitions).
Visual/olfactory evidence of existing contamination	<p>The site, at the time of writing, is largely open field with some building and hardstanding associated with SZB, which are due to be relocated. There was no visual or olfactory evidence of contamination noted in the areas accessed during the walkover in 2015. However, an area of Made Ground was noted in the field in the north-east of the site and areas of fly-tipping comprising plastic, rubber, wood and metal were noted in the north-west corner of the site. This Made Ground will be removed when the material above the Crag Group (Sand) is excavated and additional Crag Sand is filled in its place.</p> <p>No other visual or olfactory evidence of contamination was recorded during the ground investigations with the site.</p>
Evidence of damage to pollution prevention measures	<p>The installation is not yet constructed, and detailed design is still to be confirmed. The outline design of pollution prevention measures for the installation is discussed in Section 3 under permitted activities and in the SZC combustion activities environmental permit application.</p>
Evidence of historical contamination (e.g. historical site investigation assessment, remediation and verification reports if available)	<p>The site has been subjected to previous intrusive soil and groundwater investigations and no contamination requiring remediation has been identified during these ground investigations. The Atkins Phase 2 Geo-Environmental Interpretive Report 2018 (Ref: 5166065/7.1/001/001/00/A dated June 2018) summaries the investigations carried out across the SZC site and in the vicinity of the four installations and TCA and is provided in Appendix 2.</p> <p>It should be noted that the soil and ground water investigations have not specifically covered the area underneath the installations. In addition, the ground investigations were mainly undertaken to provide geotechnical information and limited contamination test data are available for the site.</p> <p>In addition, as part of the construction of the proposed SZC power station development, a cut off wall will be constructed, and a cut and fill exercise will be</p>

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Condition of the Land at Permit Issue	
	<p>undertaken whereby the superficial material will be excavated down to the Crag Sand and replaced with Crag Sand sourced from another area of the site.</p> <p>The following exploratory holes in close proximity to the installations could provide an initial baseline for the installation areas, prior to more appropriate exploratory holes being completed. However, groundwater data is unavailable for the majority of these exploratory holes (in addition these materials will be excavated, and the groundwater regime will be altered by the cut off wall):</p> <ul style="list-style-type: none"> • Unit 1 North: BH22 and BH17; • Unit 1 South: BH32A and BH33; • Unit 2 North: GW7 and BH37; and • Unit 2 South: BH14. <p>The additional Crag Sand that will be imported to the site from the TCA will be validated before it is placed to identify any contaminants within it. Leachate data has been obtained for this material in previous ground investigations, as outlined below.</p> <p>The Atkins Phase 2 Geo-Environmental Interpretive Report 2018 (Ref: 5166065/7.1/001/001/00/A dated June 2018) recommends further limited ground investigation across the site and within the installations.</p> <p>Recommendations include additional chemical testing of soil, leachate, surface water and groundwater samples and monitoring of new and existing boreholes (where present) to provide updated information in relation to groundwater.</p>
Baseline soil and groundwater reference data	<p>Baseline soil and groundwater condition data for the site of SZC power station is presented in Chapter 18, Volume 2 of the Environmental Statement and in the Atkins Phase 2 Geo-Environmental Interpretive Report 2018 (Ref: 5166065/7.1/001/001/00/A dated June 2018), which are included in Appendix 2.</p> <p>These soil and ground water investigations have not specifically covered the area underneath the installations and were mainly undertaken to provide geotechnical information with limited contamination test data available for the site.</p> <p>In addition, as part of the construction of the proposed SZC power station development, a cut off wall will be installed, and a cut and fill exercise will be undertaken whereby the superficial material will be excavated down to the Crag</p>

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	<p>Sand and replaced with Crag Sand sourced from another area of the site. The Crag Sand has been tested for their leachability of contaminants, however no soil data is available for this material.</p> <p>Therefore, in areas of the installations where no baseline data has been collected to date, and where SZC Co. considers that baseline data is required, further investigation will be undertaken, predominantly to validate the Crag Sand at the site (verification testing of imported materials for the potential contamination sources that are present). This will form part of the FAP (Refer to Section 6 of the SZC combustion activity permit application – FAP Ref. 4i). The investigation will be carried out upon finalisation of the site layout and during excavations completed during the construction phase and closer to the start of the permitted operations. The results of this investigation will be incorporated into future versions of the SCR.</p> <p>A summary of the soil and groundwater investigations completed to date is provided below:</p> <ul style="list-style-type: none"> • Soil sampling and chemical analysis has been undertaken at the site during site investigations by Structural Soils Ltd, (Ref: 722201 dated March 2009), ESG (Ref: A0012-10/1 dated August 2011) and Structural Soils Ltd (ref, 734318, dated January 2020 including samples from the Crag Sand. The suite of chemical analysis included pH, sulphide, metals, cyanide, ammonium, Polycyclic Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons (TPH), phenol, benzene, toluene, ethylbenzene and xylene (BTEX), VOCs, Semi-volatile Organic Compounds (SVOCs), polychlorinated biphenyls (PCBs), Organochlorine Pesticides (OCP), Organochlorine Pesticides (OPP) and asbestos. • Monthly monitoring of groundwater has been undertaken by AMEC between 2011 and 2013 and Atkins from 2013 to present. Over 400 groundwater samples were collected from monitoring boreholes located within the site and wider area. Water samples were tested for a suite of pH, ammonia, ammonium, hardness, chloride, nitrate, cyanide, metals, PAHs, BTEX, TPHs, PCBs, VOCs, SVOCs and phenols. • Monthly monitoring of surface water has been undertaken by AMEC between 2011 and 2013 and Atkins from 2013 to present. Over 500 surface water samples were collected from a series of interconnected drainage ditches located within the site and in the area upstream and downstream of the site (note: there is no surface water within the installation). Water samples were tested for a suite

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Condition of the Land at Permit Issue	
	of pH, ammonia, ammonium, hardness, chloride, nitrate, cyanide, metals, PAHs, BTEX, TPHs, PCBs, VOCs, SVOCs and phenols.
Supporting Information	<p>The information provided in this section of the SCR is based on the following documents.</p> <ul style="list-style-type: none"> • Landmark, Envirocheck Report, April 2021. EDF Energy Ltd, Sizewell, Leiston, IP16 4UR. (Ref: 276958405_1_1). • Landmark, Envirocheck Report, July 2012. CN6 Lovers Lane (North) (Ref: 40136387_1_1, 40137381_1_1, 40138928_1_1, 40144528_1_1, 40144706_1_1, 40144960_1_1, 40146010_1_1). • Structural Soils Ltd, March 2009. Factual Report on Supplementary Ground Investigation at Proposed Nuclear Development at Sizewell 'C' (Ref: 722201). • Structural Soils Ltd, January 2020, Interim Factual Report on Ground Investigation for the period between 8 July to 12 January 2020 (Ref: 734318). • AMEC, February 2010. Desk Based Assessment for Sizewell EPR Site. • AMEC, July 2010. Radiological survey report for Sizewell C. • AMEC, 2011. Groundwater Level Monitoring for Period 5 April 2011 to 30 June 2011 (First Interim Factual Report). • AMEC, 2011. Groundwater Level Monitoring for Period 1 July 2011 to 21 December 2011 (Second and Third Interim Factual Report). • ESG, August 2011. Onshore Investigations Phase 1 for Sizewell Site. Factual Report on Ground Investigation. • AMEC, 2012. Sizewell EPR - Ground Gas Risk Assessment (Campaigns 1 - 7). • AMEC, 2012. UK EPR Sizewell C – Summary of Groundwater Quality (Campaigns 1 – 6). • AMEC, September 2014. Sizewell EPR – Preliminary Phase 2 Contamination Assessment.

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Condition of the Land at Permit Issue	
	<ul style="list-style-type: none"> Atkins, August 2018, Sizewell C – Phase 2 Geo-Environmental Interpretative Report (Ref: 5166065/7.1/001/001/00/A). Atkins, June 2015. Sizewell Site C – Site Model of the Hydrogeological Regime.

3. Permitted Activities

Permitted Activities	
Permitted Activities	<p>The two UK EPRs will be constructed to the same design specifications. The UK EPRs are referenced as Unit 1 and Unit 2, with Unit 1 located in the east of the site and Unit 2 in the west of the site. Each UK EPR is served by 4 No EDGs and 2 No UDGs located within two purpose-built buildings. A total of four discrete concrete buildings, each containing two EDGs and one UDG, form the installation and these are shown on Figure 2 as Areas 1 to 4. The installation boundary is currently limited to the extent of these four buildings, however this may be subject to amendment as the detailed design progresses, and in consultation with the Environment Agency.</p> <p>The eight EDGs are identical diesel generators which can provide sufficient generating capacity to restore power supply to the UK EPRs in the event of loss of off-site power. The four UDGs are identical and can provide sufficient power, in the event of a total loss of external electrical sources and of EDGs to supply all required equipment at a suitable voltage. As noted above there are four diesel generator buildings within the installation and each contains the following plant:</p> <ul style="list-style-type: none"> Two EDGs each with one bulk fuel storage tank of 226m³ capacity, one day tank of 5m³ capacity, and associated ancillary equipment including delivery pipes and fuel pumps; and One UDG with one bulk fuel tank of 137m³ capacity, one day tank of 3m³ capacity, and associated ancillary equipment including delivery pipes and fuel pumps. <p>This gives a total fuel oil holding capacity of 742m³ for each UK EPR and a total of 1,484m³ for the installation.</p> <p>During routine testing diesel will also be used with up to 240m³ of diesel per year per EDG and up to 56m³ of diesel per year per UDG, based on a 2 hour test of every</p>

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Permitted Activities	
	<p>engine every 2 months. If there is a loss of off-site power then the fuel consumption will be much higher.</p> <p>As noted above all of the fuel tanks will be located inside the same buildings as the generators. The detailed design of the tanks and their layout inside the buildings is not yet known (discussed further under bulk fuel storage and secondary containment). The proposed layout of the diesel generator buildings and fuel tanks are in Figure 3. Each diesel generator building will be constructed to form a bund and any spills would be captured in sumps and pumped out and disposed off-site at a licensed waste facility. There will be no direct connection to the site's surface water drainage system.</p> <p>Lubricating oil will be contained within the diesel generators; 10,560kg per EDG and 1,000kg per UDG (assuming that there is no loss of off-site power). No other storage of lubricating oil will take place within the installation other than during maintenance activities when used oil will be drained from the diesel generators and fresh oil added as required. The storage of these materials will take place outside the installation boundary within the wider SZC power station in a suitable oil storage area with secondary containment.</p> <p>The EDGs and UDGs will be cooled by demineralised water, containing anti-freeze in re-circulating systems. Storage of antifreeze will take place outside the installation boundary within the wider SZC power station in a suitable chemical storage area.</p> <p>The cooling systems will be initially filled with an approximate volume of 88m³ of monoethylene glycol for each of the UK EPR unit (14.2m³ per EDG and 15.8m³ per UDG of 50:50 water and glycol). After this, usage will be restricted to loss and/or replacement. The total system volume will be replaced every 3 or 4 years as antifreeze and anticorrosion chemicals decompose over time. Cooling mixture drained from the cooling circuits during maintenance will be collected in a suitable container and disposed of at a licensed waste facility.</p> <p>Batteries will be used for the start-up and to power the UDG regulators and air compressors. The demand for replacement batteries will be determined by the manufacturer's recommendations; as an estimate the batteries will be replaced annually (to ensure they continue to hold/provide power). On this basis, 4 batteries per UDG may be required per year.</p> <p>The drainage system will allow the capture and testing of any potentially contaminated run-off from the process. This could include traces of anti-freeze solution or fuel or oil from the generators or storage tanks within the concrete diesel generator buildings. The bunds and/or any associated sumps will be routinely</p>

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Permitted Activities	
	<p>checked for antifreeze, oil and fuel, and if any are found then these will be removed by pumping out to a suitable container and disposed of at a licensed waste facility.</p> <p>A summary of the measures to be employed at the site to prevent pollution is provided below by installation activity.</p> <p>Bulk Fuel Storage and Secondary Containment</p> <p>The detailed design of the fuel storage facilities is not yet known, however, it is planned that all tanks will be located within the diesel generator buildings in bunded rooms. The pollution prevention measures for fuels and oils stored and handled at the installation will be of a standard which complies with or exceeds the relevant standards applicable at the time of construction. The Control of Pollution (Oil Storage) (England) Regulations 2001 (the Oil Storage Regulations) currently set out the measures operators storing more than 200 litres of oil must take to prevent oil leaks and spills to the environment. These regulations apply to external tanks, however, tanks within a building are not currently covered by the regulations. The Construction Industry Research and Information Association (CIRIA) advice (C736 containment systems for the prevention of pollution - secondary, tertiary and other measures for industrial and commercial premises and C741 environmental good practice on site guide) will also be followed where relevant for pollution prevention measures. Current guidance for above ground oil storage in bulk tanks is published by the Environment Agency as oil storage regulations for businesses (updated 3 January 2018) 'How to store oil, design standards for tanks and containers, where to locate and how to protect them, and capacity of bunds and drip trays'. In accordance with these guidelines SZC Co. will make provision for the following in the design and construction of the installation:</p> <ul style="list-style-type: none"> • That safe access to the tanks is possible for maintenance; • Areas where oil storage is undertaken are surfaced with material which is impermeable to the substances stored and isolated from surface water drainage systems; • Tanks comply with BS 5410 and are of sufficient strength and structural integrity so that they are unlikely to leak during normal operations, are positioned on appropriately designed and constructed supports, and if possible, have a design life of twenty years; • Tanks are type tested to a recognised standard under a quality assurance system complying with BS EN ISO 9001:2000*, and steel tanks comply with BS 799-5:2010*;

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Permitted Activities	
	<ul style="list-style-type: none"> Installation of tanks is carried out by technicians registered with a professional scheme such as that operated by Oil Firing Technical Association (OFTEC); Tanks and their ancillary equipment (such as sight gauges, valves and vent pipes) are situated within an oil tight secondary containment system such as a bund; Shut-off valves will be installed at extended fill points, drip trays or other containment systems will be present at fill points, and remote fill points will be avoided where possible (if used they will comply with BS 799-5:2010*); and Fixed pipework will be above ground where possible and where this is supplying oil to fixed appliances will comply with BS 5410. <p><i>* The primary and secondary containment measures will be compliant with these standards or future amendments/standards valid at the time of construction.</i></p> <p>Use of devices such as high level alarms to prevent overfilling will be employed in bulk tanks as this is current best practice. An automatic overflow prevention device will be required if the tank and vent pipe cannot be seen from where the filling operation is controlled.</p> <p>Building Regulations will also stipulate requirements for the diesel tanks and generator buildings.</p> <p>It is not known whether the bulk fuel tanks will be standalone tanks or hydraulically linked, however a general rule for secondary containment is that it is adequate to contain 110% of the tank capacity or a minimum of 25% of the total capacity of several tanks within a bunded area. Secondary containment will be designed to meet or exceed this capacity requirement. Bulk tanks at the installation will benefit from being located within a building offering protection from weather and avoiding rainwater ingress. Secondary containment will comply with the Construction Industry Research and Information Association (CIRIA) advice where relevant.</p> <p>Fuel Pumps and Delivery Pipes</p> <p>Fuel pumps will either be located such that any leaks can be captured in the secondary containment serving the tanks or alternative secondary containment measures will be employed. Pumps will be fitted with a check valve in their feed line to prevent the tank contents emptying in the event of damage to the pump or feed line.</p>

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Permitted Activities	
	<p>Underground pipework will be avoided in the design if possible and if used will be double skinned and/or laid in accessible ducts where possible with leak detection.</p> <p>Testing and Inspection</p> <p>The EDGs and UDGs will be test run every other month to ensure reliability. The detailed test programme will depend on the SZC safety specification, manufacturers' recommendations and testing frequency.</p> <p>All tanks, pipes and pumps will be subject to regular inspections as part of the installation's Integrated Management System (IMS). High level alarms and other equipment will also be subject to regular testing.</p> <p>Underground pipework, if present, will be tested for leaks at least every five or ten years, depending on whether there are mechanical joints.</p> <p>Manufacturer's test instructions will be followed, alongside other relevant guidance, such as British Standard 5410 Parts 2 and 3 and BS 799-5, which has information about pipework pressure testing.</p> <p>SZC Co. will ensure that systems are in place during site operations to generate alerts when equipment tests are due and when equipment is likely to be reaching the end of its design life. Tests and inspections will be carried out by competent persons.</p> <p>Inspections and maintenance tasks will be logged in a central database upon completion.</p> <p>Fuel Delivery by Road Tanker</p> <p>Diesel delivery to the bulk tanks will be by road tanker via connection of the tanker's flexible delivery hose to a fill point either within the diesel generator building or within a designated bunded area outside the building. The offloading process will be compliant with the Oil Storage Regulations with regard to collection of drips during filling, general housekeeping, location of fill points and use of automatic shut-off valves. Drainage from the tanker offloading area will be controlled to prevent any fuel spills or leakages reaching ground or surface water drainage. Forecourt separators (Class 1 BS-EN-858) are to be provided at all locations where fuel handling takes place. Penstocks are provided at the point of discharge to all forebays which discharge with the cooling water via the outfall. Full details of the drainage strategy for the installation will be developed at the detailed design phase.</p> <p>Adequate measures will be taken by SZC Co. to ensure that the risk of tanker collision on site is managed; with due consideration given to traffic route design, on-</p>

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Permitted Activities	
	<p>site signage, speed limits, barriers, driver and/or banksman training and site housekeeping.</p> <p>Procedures</p> <p>Procedures will be in place in relation to onsite activities to prevent and mitigate potential releases of materials to the environment. All personnel on site will be trained and competent for the activities, which they carry out.</p> <p>Integrated Management System (IMS)</p> <p>A single IMS will be adopted for both the SZC and HPC projects, which will be developed in compliance with the requirements of BS EN ISO 14001, BS EN ISO 9001 and BS OHSAS 18001.</p> <p>The system will encompass procedures and management tools (e.g. maintenance plans) to ensure continued improvement with regards to environmental performance.</p> <p>A rolling internal audit programme for the installation will be developed against the requirements set out in the IMS.</p> <p>The site will develop and implement a program for the notification, recording, investigation and reporting of incidents that will include leaks and spills.</p> <p>Section 5.1 of the SZC combustion activities environmental permit application describes the IMS.</p>
Non-Permitted Activities Undertaken	<p>Drummed storage of lubricating oil, waste oil, antifreeze and waste cooling mixture used or produced at the installation will take place on site but outside the diesel generators. The handling and storage of these materials will be compliant with best practice (e.g. the Environment Agency’s guidance on oil storage regulations for businesses) to prevent spills and leaks during transport and to ensure that spills or leaks from stored containers (prior to use or disposal) are captured and dealt with quickly, in order to prevent releases to ground or to surface water drains. Quantities of oils and chemicals stored on site will be managed to ensure that the minimum volumes required for safe site operations are maintained but (where possible) not exceeded.</p>
Environmental Risk Assessment	<p>An Environmental Risk Assessment (ERA) of the proposed operations has been carried out and is included in Appendix 3 and in the SZC combustion activity environmental permit application.</p>

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Permitted Activities	
	<p>The ERA approach has been developed in accordance with the Environment Agency guidance note H1 environmental risk assessment. The ERA in Section 5 of the SZC combustion activity environmental permit application provides an example of the accidents identified in the hazard assessments for the standby generators at the SZC installation. The ERA provides details of the types of measures that may be implemented at the site to control and mitigate such events to achieve BAT.</p> <p>A quantified risk assessment has not been provided as the processes and mitigations are not sufficiently developed to either reflect the protection measures in place or to commit to specific measures. A fully quantified risk assessment will be provided as part of the IMS.</p> <p>The ERA concluded that, on the basis of the current plant design and the decision to fully enclose the tanks and generators in the diesel generator buildings, the risks that are considered to be the most significant on similar UK sites have both a reduced probability and hazard (when compared to existing operational sites); resulting in a lower overall risk.</p>
Relevant Hazardous Substances (RHS)	<p>In addition to the high level ERA undertaken for the proposed activities discussed above, which looked at multiple source – pathway – receptor (SPR) linkages, a specific assessment was undertaken relating to the potential for soil and groundwater contamination to be present at the proposed facility relating to the use, production or release of relevant hazardous substance (RHS), which is discussed further below.</p> <p>The RHS Risk Assessment (RHS RA) was conducted via a systematic review of the diesel generator buildings and storage areas, which took into consideration the substances used, the containment systems in place and the potential for pollution within each discrete site area.</p> <p>Source-pathway-receptor linkages were identified as per the EA risk assessment guidance “risk assessment for your environmental permit” (https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits).</p> <p>The output of the RHS RA is a conclusion whether or not there is a reasonable likelihood for pollution to occur within each discrete site area. The RHS RA conclusions inform the basis of a forward plan for the installation to align with the Best Available Technique (BAT) conclusions and if required developing a site condition baseline and a proposed monitoring regime for soil / groundwater conditions.</p>

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Permitted Activities	
	<p>The RHS study involves the following sequential steps:</p> <ol style="list-style-type: none"> 1. Review the site areas within the environmental permit boundary to identify discrete zones for assessment. 2. Identify the substances present within each zone. 3. Review the operational activities undertaken within each zone and identify those activities with the potential for pollution to occur in the event of a loss of containment. 4. Identify the pollution prevention measures in place to prevent a loss of containment from occurring during the identified activities. 5. Record the primary containment systems present in each zone, such as bulk storage tanks, pipework, drums and intermediate bulk containers (IBCs). Describe the protective systems associated with primary containment such as hardwired and software control systems. Record the testing and inspection procedures in place, to prevent a loss of primary containment from occurring, and to detect the loss of containment should this occur. 6. Record the secondary containment systems present in each zone, such as bunds and drip trays, along with their associated testing and inspection procedures. 7. Record the tertiary containment systems present in each zone, such as drains, lagoons, isolations such as penstocks and interceptors, along with their associated testing and inspection procedures. 8. Consider the effectiveness of the primary, secondary and tertiary containment systems in preventing a release of substances to the environment and make an informed qualitative judgement as to the likelihood of pollution occurring from each zone. <p>The sources of potential risk to ground and groundwater and are presented in Table 5.11 in the SZC combustion activities environmental permit application and include the substances used and / or stored on site. Table 5.11 is also provided in Appendix 4.</p> <p>The materials that are considered relevant hazardous substances are classified as harmful to the environment, in accordance with the Classification, Labelling and Packaging (CLP) Regulations. Hazardous substances proposed to be used at the installation include diesel fuel, lubricating oil, antifreeze (monoethylene glycol), and batteries. Other materials that may be reasonably included but which are to be confirmed include detergents and cleaning chemicals for the combustion plant,</p>

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Permitted Activities	
	<p>water for cleaning, water for demineralisation to replace cooling fluid losses, ignition gases (for engine start-up), and maintenance spare parts.</p> <p>An assessment has been conducted of the hazardous materials to demonstrate that the environmental characteristics of the materials sourced are well understood and that these materials are managed in a way that minimised the potential for spillage and loss of containment. The RHS RA is provided in Appendix 5. Only fuels and batteries will be stored on the installation and all other raw materials will be stored in dedicated site-wide facilities that are outside the scope of the installation.</p> <p>Diesel fuel oil will be delivered by road tanker and transferred into the main storage tanks, which are located inside the diesel generator buildings. The tanks will be all inside the building which will be made impermeable to the fuel and regularly maintained and inspected.</p> <p>Lubricating oil will be stored within either the engine sump if this constitutes an oil reserve, or storage tank and oil return line. Dirty lubricating oil and waste oil from maintenance activities will be collected within containers or in sumps and transferred to the station waste oil tank for disposal. All storage of lubricating and waste oil will be held outside the installation.</p> <p>The generators are cooled by demineralised water in re-circulating systems, which contain antifreeze. These are sealed systems and replacement fluid will be stored and delivered from outside the installation.</p> <p>Batteries will be delivered by lorry and transferred into the diesel generator buildings. The batteries will be all inside the building which will be made impermeable to the lead acid batteries and regularly maintained and inspected.</p> <p>The tanker delivery arrangements, drainage system, sumps, cooling systems and storage systems have not yet been designed; these arrangements will be provided as part of the FAP under the accident management plan (Refer to Section 6 of the SZC combustion activity environmental permit application– FAP Ref. 3). Oil storage areas at the installation will meet the requirements of the Control of Pollution (Oil Storage) (England) Regulations 2001, Environment Agency guidance on oil storage regulations for businesses, BS 5410 code of practice for oil firing and the Construction Industry Research and Information Association (CIRIA) advice where relevant.</p>
Conclusions:	<p>The Industrial Emissions Directive (IED) requires groundwater monitoring every 5 years and soil sampling every 10 years during the permit lifetime, where there is a risk of pollution from hazardous substances and a baseline has been set. If a</p>

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Permitted Activities	
	<p>significant pollutant linkage is not identified during the additional investigation, then it is recommended that no further groundwater monitoring and soil sampling be carried out unless there was a change in activities, or an incident occurred.</p> <p>The Environmental Risk Assessment for the proposed operations (Appendix 3) and Relevant Hazardous Substances Risk Assessment (Appendix 5), conclude that there is a negligible risk that the proposed operations and the proposed relevant hazardous substances would cause pollution of soil and groundwater given the physical and procedural measures in place to reduce the risk of releases. In addition, the installation forms part of a nuclear facility which has rigorous physical and procedural measures in place to reduce the risk of releases.</p> <p>In order to fully establish the baseline site condition, it is proposed that additional baseline data be collected upon finalisation of the site layout and construction excavations (as discussed in Section 2 of the SCR). The suite of chemical analysis would be determined based on the potential contamination sources that are present and would be tailored to assess the presence of hazardous substances proposed to be used at the installations (fuel, lubricating oil, mono-ethylene glycol and waste oils). This would form the basis of the updated SCR prior to any permitted activities commencing. The SCR will form part of the FAP (Refer to Section 6 of the SZC combustion activity environmental permit application – FAP Ref. 4i).</p>
Document References:	SZC Combustion Activity Environmental Permit Application (Ref; 100207658).

4. Changes to the Activity

Changes to the Activity	
Have there been any changes to the activity boundary?	Not applicable for permit application.
Have there been any changes to the permitted activities?	Not applicable for permit application.
Have any 'dangerous substances' not identified in the Application Site Condition	Not applicable for permit application.

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Changes to the Activity	
Report been used or produced as a result of the permitted activities?	
Checklist of supporting information	Not applicable for permit application.

5. Measures Taken to Protect Land

Measures Taken to Protect Land	
Not applicable for permit application.	
Checklist of supporting information	Not applicable for permit application.

6. Pollution Incidents That May Have Had an Impact on Land, and Their Remediation

Pollution Incidents That May Have Had an Impact on Land and Their Remediation	
Not applicable for permit application.	
Checklist of supporting information	Not applicable for permit application.

7. Soil Gas and Water Quality Monitoring (Where Undertaken)

Soil Gas and Water Quality Monitoring (Where Undertaken)	
Not applicable for permit application.	

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Soil Gas and Water Quality Monitoring (Where Undertaken)	
Checklist of supporting information	Not applicable for permit application.

8. Decommissioning and Removal of Pollution Risk

Decommissioning and Removal of Pollution Risk	
Not applicable for permit application.	
Checklist of supporting information	Not applicable for permit application.

9. Reference Data and Remediation (Where Relevant)

Reference Data and Remediation (Where Relevant)	
Not applicable for permit application.	
Checklist of supporting information	Not applicable for permit application.

10. Statement of the Site Condition

Statement of the Site Condition	
Not applicable for permit application.	

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Appendix 1: Figures

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Appendix 2: Baseline Data

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Appendix 3: Environmental Risk Assessment



COMBUSTION ACTIVITY PERMIT APPLICATION SITE CONDITION REPORT NOT PROTECTIVELY MARKED

Hazardous Event	Potential Environmental Consequences by Media	Risk Assessment			Comments/Controls
		S	L	R	
Raw Material Delivery					
Significant loss of diesel during delivery (tankers) or transfer (by bowser).	<p>Air: Short term localised air impact, some odour.</p> <p>Water: Spillage to drainage system or Sizewell Bay.</p> <p>Land: Spillage would be contained on hard standing or on ground.</p> <p>Key receptor: SSI, Leiston Drain and Greater Sizewell Bay.</p> <p>Pathway: Spillage would flow to the site drainage system or ground/groundwater.</p>	TBC	TBC	TBC	<p>Transfers of oils by tanker and bowser have sound primary containment; the need for secondary containment will be assessed as a part of the design risk assessment. Risks will be reduced by the design of the surface water system and procedures requiring spill mats to be placed over any local surface water drains. Forecourt separators are to be provided at all locations where fuel handling takes place. Penstock valves are to be provided at the point of discharge to all fore bays. Procedures will also be developed for filling of main oil tanks, emergency and spill response. Training will be provided for relevant personnel</p> <p>All operations will comply with the Oil Storage Regulations, Environment Agency guidance on oil storage regulations for businesses, BS 5410 code of practice for oil firing and the Construction Industry Research and Information Association (CIRIA) advice where relevant.</p> <p>Transfers will be supervised by appropriately trained and supervised site personnel (in addition to the vehicle drivers). Tanks will be checked for capacity before filling to prevent over filling and will have level indication/alarms and emergency cut-off switches. Any small spillage contained in delivery pipework will be managed through local containment.</p> <p>The site drainage system has still to be developed as part of the FAP (Refer to Section 6 of the SZC combustion activity permit application – FAP Ref. 1) and this process will consider the risks of tanker failure.</p> <p>Vehicle speeds will be controlled by site speed limits and all plant will be housed within the diesel generator buildings providing protection against vehicle damage.</p>
Raw Material Storage					



COMBUSTION ACTIVITY PERMIT APPLICATION SITE CONDITION REPORT NOT PROTECTIVELY MARKED

Hazardous Event	Potential Environmental Consequences by Media	Risk Assessment			Comments/Controls
		S	L	R	
<p>Diesel fuel storage.</p> <p>Damage to the diesel tanks and bunds through accidental impact, rupture or spontaneous failure of tank leading to loss of all tank contents.</p>	<p>Air: Short term localised air impact, some odour from building ventilation.</p> <p>Water: Spillage would be contained within the diesel generator buildings.</p> <p>Land: Spillage would be contained within the diesel generator buildings.</p>	TBC	TBC	TBC	<p>The tanks and associated pipework are fully enclosed within the diesel generator buildings which will act as an impermeable bund. Any leaks or spills would be captured in sumps or holding tanks and pumped out and removed from site by tanker for offsite treatment and disposal. Any loss would be fully contained.</p> <p>Tanks are located indoors and vehicles cannot cause damage from accidental impacts.</p> <p>Tanks, valves, pipework and flange points will be inspected as part of the IMS.</p> <p>Emergency and spill response plans will be developed and training provided to relevant personnel.</p>
Raw Material Distribution Systems					
<p>Loss of diesel fuel from the distribution system (pipework) during transfer from the bulk storage tanks to the combustion plant.</p>	<p>Air: Short term localised air impact, some odour from building ventilation, minor for smaller spills.</p> <p>Water: Spillage would be contained within the diesel generator buildings or flow to drainage system.</p> <p>Land: Spillage would be contained within the diesel generator buildings or flow to the drainage system.</p>	TBC	TBC	TBC	<p>All of the pipework is fully contained within the diesel generator buildings. Any leaks or spills would be captured in sumps or holding tanks and pumped out and removed from site by tanker for off-site treatment and disposal. Any leaks (minor or major) would be fully contained. The internal structure of the basement will be finished in an impermeable material (either building material or oil resistant coating). Underground pipework will be avoided in the design if possible.</p> <p>Pipework, valves and flange points will be inspected as part of the IMS.</p> <p>Emergency and spill response plans will be developed and training provided to relevant personnel.</p>
Fire					
<p>Major fire and/or explosion of combustible materials, including diesel fuel.</p>	<p>Air: Significant local air quality impact from combustion products/ dust/ smoke, etc.</p> <p>Water: Fire water would fill the diesel generator building basement and overflow into the site drainage system.</p> <p>Land: Firewater flow to ground.</p>	TBC	TBC	TBC	<p>Areas, which pose a significant threat of fire such as oil storage facilities, will be protected by dedicated installed fire prevention and mitigation systems. Extensive controls will be incorporated into the plant design to both prevent explosions and fires ('zoned' electrical equipment, alarms, automatic fire systems etc.) and minimise impact.</p> <p>The volume of the basement area of the diesel generator buildings is able to hold a significant volume of water. In addition, the fire water can then be discharged to a sump or holding tank and pumped out and removed from site by tanker for offsite treatment and disposal. A fire water management plan is to be completed to ensure that firewater can be collected and</p>



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Hazardous Event	Potential Environmental Consequences by Media	Risk Assessment			Comments/Controls
		S	L	R	
					<p>contained in the event of an emergency. Fire water capacity calculations will be provided to the Environment Agency as part of the FAP (Refer to Section 6 of the SZC combustion activity permit application – FAP Ref. 1).</p> <p>The station will operate a fire team and (if so) will develop and maintain a fire plan to deal with minor incidents; the diesel generator buildings will be part of a site-wide fire plan.</p> <p>More significant fires will be dealt with in collaboration with Suffolk Fire Brigade.</p>
Operation of the Combustion Plant					
Visible plume	Air: Release of steam or water plume forming a visible plume Water: No impact Land: No impact	TBC	TBC	TBC	<p>There is no steam cycle or wet cooling tower plume associated with the operation of the diesel generators and therefore condensing plumes are not expected to occur. The potential for visible plumes from the plant stacks is considered to be very low as a result of the water content and temperature of the flue gas.</p>
Failure or mal-operation of the diesel generators.	Air: Release of black smoke and PM Water: No impact Land: No impact	TBC	TBC	TBC	<p>In order to monitor the quality of fuel combustion, basic process monitoring will be incorporated (e.g. oxygen, CO and temperature monitoring). The plant is only planned to be operated for maintenance purposes and periodic nuclear safety tests, during which the operations will be closely observed and recorded to demonstrate the reliability of the combustion plant (so any failure of mal-operation will be noticed). If the combustion process is not operating as expected or causing off-site impacts the combustion plant will be shut down. Procedures will be developed relating to scenarios such as this will determine the specific actions required by the operator.</p>
Loss of containment of the cooling system (50% ethylene glycol).	Air: No impact. Water: Spillage would be contained within the diesel generator building. Land: Spillage would be contained within the building or enter the drainage system.	TBC	TBC	TBC	<p>The drainage system for the area housing the cooling circuit has not yet been designed. As part of the FAP (Refer to Section 6 of the SZC combustion activity permit application – FAP Ref. 1), this scenario will be considered, and appropriate mitigation put in place to prevent the cooling fluid reaching surface water drains. The cooling fluid will then be removed by a licensed contractor and disposed of as hazardous waste.</p> <p>Pipework, valves and flange points will be inspected as part of the IMS.</p> <p>Emergency and spill response plans will be developed and training provided to relevant personnel.</p>



COMBUSTION ACTIVITY PERMIT APPLICATION SITE CONDITION REPORT NOT PROTECTIVELY MARKED

Hazardous Event	Potential Environmental Consequences by Media	Risk Assessment			Comments/Controls
		S	L	R	
Loss of containment of lubricating oil	<p>Air: Short term localised air impact, some odour from building ventilation.</p> <p>Water: Spillage would be contained within the diesel generator building.</p> <p>Land: Spillage would be contained within the building or enter the drainage system.</p>	TBC	TBC	TBC	<p>All of the pipework is fully contained within the diesel generator buildings. Any leaks or spills would be captured in sumps or holding tanks and pumped out and removed from site by tanker for offsite treatment and disposal. The internal structure of the basement will be finished in an impermeable material (either building material or oil resistant coating).</p> <p>Pipework, valves and flange points will be inspected as part of the IMS.</p> <p>Emergency and spill response plans will be developed and training provided to relevant personnel.</p>
Flooding of the site and associated contamination of flood waters with chemicals/fuel stored on site	<p>Air: No impact.</p> <p>Water: Floodwater would be contained within the diesel generator building and/or enter the drainage system.</p> <p>Land: Floodwater would be contained within the diesel generator building and/or enter the groundwater via unsurfaced areas.</p> <p>Pathway: Flow by gravity/drainage systems/unsurfaced areas</p>	TBC	TBC	TBC	<p>The site will be protected against flooding from the sea by its elevation. This elevation of the platform on which the plant is to be constructed, will be created at 7.3 AOD. Although it will not ensure a dry site under all conditions, the elevation was determined as a solution that is ALARP. A Flood Risk Assessment took place, which took into consideration changes in extreme high water levels due to reasonably foreseeable climate change through to the end of the station operational lifetime assessed using UKCP09 10,000 year return period at 95% confidence level. The site also benefits from drainage arrangements and buildings are designed so that standing water does not enter buildings.</p>
Vandalism to plant, equipment and infrastructure and associated loss of fuel / chemicals from site	Negligible. Appropriate design and management action would prevent vandalism happening.	TBC	TBC	TBC	The site will be protected by high level security systems.



COMBUSTION ACTIVITY PERMIT APPLICATION
SITE CONDITION REPORT
NOT PROTECTIVELY MARKED

Appendix 4: SZC Raw Materials Assessment

**COMBUSTION ACTIVITY PERMIT APPLICATION
SITE CONDITION REPORT
NOT PROTECTIVELY MARKED**

Raw Material and Application	Chemical Composition	Hazard Statement	Annual Usage in Combustion Plant	Fate of Raw Material in the Combustion Plant	Environmental Impact Potential	Alternative of Lower Environmental Impact	Reason for Use of Raw Material
Fuel Oil-Diesel As fuel for the diesel generators.	Hydrocarbon - BS2869:2017 (or applicable standard at time of procurement and operation).	Health hazard (may cause cancer) Hazardous to the environment Flammable	Estimated as 1,280 tonnes for both reactors (130 tonnes per EDG and 60 tonnes per UDG)	Combustion of gas to air as exhaust gases.	Emission to air of NO _x , SO ₂ , CO ₂ , CO, VOCs and PM. Marine pollutant. Small spillages to ground will biodegrade. Major spillage to ground will penetrate sub soils-risk of groundwater contamination. Spillages contained within buildings and bunds.	Natural Gas - lower level of PM and small reduction in SO ₂ emissions	Storage of pressurised gas and reliance of external piped supplies are discounted on safety and security of supply grounds
						Kerosene - lower level of PM and sulphur emissions. Lower sulphur containing grade of fuel oil	No major environmental benefit. The sulphur content of the grade of fuel is limited to 0.1%. Reliability and experience of operating diesel generators is a key factor.

**COMBUSTION ACTIVITY PERMIT APPLICATION
SITE CONDITION REPORT
NOT PROTECTIVELY MARKED**

Raw Material and Application	Chemical Composition	Hazard Statement	Annual Usage in Combustion Plant	Fate of Raw Material in the Combustion Plant	Environmental Impact Potential	Alternative of Lower Environmental Impact	Reason for Use of Raw Material
Lubricating Oil Used for diesel generators	Assumed to be a mineral oil to SAE 40 - there will also be trace additives.	Health hazard (harmful if swallowed, harmful in contact with skin, causes serious eye damage, causes skin irritation and may cause respiratory irritation) Hazardous to the environment (very toxic to aquatic life; toxic to aquatic life with long lasting)	Annual usage on combustion plant is estimated as 3.5 tonnes (4,032 litres) (450 litres/year per EDG and 108 litres/year per UDG) for two UK EPR units.	Waste oil from maintenance activities will be recycled	Marine pollutant. Produces a hazardous waste. Degrades in soil over time.	None	Recommended by manufacturer.
Antifreeze Used by diesel generators and small pumps	Monoethylene Glycol	Health hazard (harmful if swallowed)	Initial fill usage is estimated as 88m ³ by the diesel generators per UK EPR unit. After this, usage will be restricted to loss replacement and a shelf life of 3-4 years.	100% to hazardous waste	Marine Pollutant.	Considered to be no engine compatible alternative of lower environmental impact	No engine compatible alternative

**COMBUSTION ACTIVITY PERMIT APPLICATION
SITE CONDITION REPORT
NOT PROTECTIVELY MARKED**

Raw Material and Application	Chemical Composition	Hazard Statement	Annual Usage in Combustion Plant	Fate of Raw Material in the Combustion Plant	Environmental Impact Potential	Alternative of Lower Environmental Impact	Reason for Use of Raw Material
Batteries	Unknown to be determined	Health hazard (harmful if swallowed, harmful in contact with skin, causes serious eye damage, causes skin irritation and may cause respiratory irritation)) Hazardous to the environment	Low – estimated 16 batteries/cells are replaced per annum	100% to hazardous waste	Corrosive and toxic	Compressed air systems	Certain scenarios will require battery start up

Appendix 5: Relevant Hazardous Substances Risk Assessment

Site Area/ Zone	Substances	Relevant Activity	Potential for Pollution from the Relevant Activity	Existence of Pollution Prevention Measures	Nature of Primary Containment	Testing and Inspection of Primary Containment	Nature of Secondary Containment	Testing and Inspection of Secondary Containment	Nature of Tertiary Containment	Testing and Inspection of Tertiary Containment	Adequacy of Pollution Prevention Measures? Yes / No	Are the proposed Integrity testing of pollution prevention measures adequate?	Is there an adequate documented management system to demonstrate operator management and competence with the relevant activity	Likelihood of pollution
Diesel Generator Buildings	Diesel	Delivery by vehicle	Spillage during off-loading e.g. flex hose / connection failure	Yes	Road Tanker / Retractable delivery Hoses	Visual inspection of road tanker and delivery hoses to be carried out Deliveries via reputable supplier using vehicles which are fit for purpose	Concrete hardstanding draining to an oil water interceptor. Penstocks are provided at the point of discharge to all forebays.	Visual inspection of concrete hardstanding, interceptor and penstocks to ensure they are in good working condition	Containment sump	Scheduled Inspections	Yes	Yes	Yes – to be developed prior to receipt of diesel	Negligible

Site Area/ Zone	Substances	Relevant Activity	Potential for Pollution from the Relevant Activity	Existence of Pollution Prevention Measures	Nature of Primary Containment	Testing and Inspection of Primary Containment	Nature of Secondary Containment	Testing and Inspection of Secondary Containment	Nature of Tertiary Containment	Testing and Inspection of Tertiary Containment	Adequacy of Pollution Prevention Measures? Yes / No	Are the proposed Integrity testing of pollution prevention measures adequate?	Is there an adequate documented management system to demonstrate operator management and competence with the relevant activity	Likelihood of pollution
		Storage	Leak from bulk storage	Yes	Bulk storage tanks	Newly built double skinned tank. Will be subject to routine visual checks and inspection in line with manufacturer guidance	The tank will be double skinned and installed internally within the diesel generator buildings within a concrete bunded room in compliance with CIRIA C736 guidelines. Level alarms	Regular visual inspection of bunding, and testing of alarms	Diesel generator buildings, hardstanding and containment sump	Scheduled Inspections	Yes	Yes	Yes – to be developed prior to receipt of diesel	Negligible

Site Area/ Zone	Substances	Relevant Activity	Potential for Pollution from the Relevant Activity	Existence of Pollution Prevention Measures	Nature of Primary Containment	Testing and Inspection of Primary Containment	Nature of Secondary Containment	Testing and Inspection of Secondary Containment	Nature of Tertiary Containment	Testing and Inspection of Tertiary Containment	Adequacy of Pollution Prevention Measures? Yes / No	Are the proposed Integrity testing of pollution prevention measures adequate?	Is there an adequate documented management system to demonstrate operator management and competence with the relevant activity	Likelihood of pollution	
	Lubricating Oil	Delivery by vehicle	Spillage during off-loading e.g. flex hose / connection failure	Yes	Road Tanker / Retractable delivery Hoses	Visual inspection of road tanker and delivery hoses to be carried out Deliveries via reputable supplier using vehicles which are	will be provided.	Concrete hardstanding draining to an oil water interceptor. Penstocks are provided at the point of discharge to all forebays.	Visual inspection of concrete hardstanding, interceptor and penstocks to ensure they are in good working condition	Containment sump	Scheduled Inspections	Yes	Yes	Yes – to be developed prior to receipt of diesel	Negligible

Site Area/ Zone	Substances	Relevant Activity	Potential for Pollution from the Relevant Activity	Existence of Pollution Prevention Measures	Nature of Primary Containment	Testing and Inspection of Primary Containment	Nature of Secondary Containment	Testing and Inspection of Secondary Containment	Nature of Tertiary Containment	Testing and Inspection of Tertiary Containment	Adequacy of Pollution Prevention Measures? Yes / No	Are the proposed Integrity testing of pollution prevention measures adequate?	Is there an adequate documented management system to demonstrate operator management and competence with the relevant activity	Likelihood of pollution
	Mono-Ethylene Glycol (cooling water with antifreeze)	Use in cooling circuit	Leak in the cooling circuit	Yes	Within sealed cooling circuit	Visual inspection of cooling circuit pipework and scheduled maintenance inspections. Scheduled coolant change outs to fit for purpose	Concrete hardstanding with sealed sump	Regular visual inspection of concrete hardstanding	Spill kits to be available on site	Scheduled inspections	Yes	Yes	Yes – to be developed prior to receipt of mono-ethylene Glycol	Negligible

Site Area/ Zone	Substances	Relevant Activity	Potential for Pollution from the Relevant Activity	Existence of Pollution Prevention Measures	Nature of Primary Containment	Testing and Inspection of Primary Containment	Nature of Secondary Containment	Testing and Inspection of Secondary Containment	Nature of Tertiary Containment	Testing and Inspection of Tertiary Containment	Adequacy of Pollution Prevention Measures? Yes / No	Are the proposed Integrity testing of pollution prevention measures adequate?	Is there an adequate documented management system to demonstrate operator management and competence with the relevant activity	Likelihood of pollution
						minimise corrosion risk								
	Batteries	Main use is for UDG start-up and for power to UDG speed regulators.	Leak from battery	Yes	Battery container	Visual inspection of batteries. Scheduled battery change to minimise corrosion risk	Concrete hardstanding with sealed sump	Regular visual inspection of concrete hardstanding	Spill kits to be available on site	Scheduled inspections	Yes	Yes	Yes – to be developed prior to receipt of batteries	Negligible
	Small quantities	Maintenance	Leak from storage	Yes	Dedicated waste containers,	New storage containers	The hazardous waste storage	Regular visual inspection of storage	Site hardstanding and	Scheduled inspections	Yes	Yes	Yes – to be developed	Negligible

Site Area/ Zone	Substances	Relevant Activity	Potential for Pollution from the Relevant Activity	Existence of Pollution Prevention Measures	Nature of Primary Containment	Testing and Inspection of Primary Containment	Nature of Secondary Containment	Testing and Inspection of Secondary Containment	Nature of Tertiary Containment	Testing and Inspection of Tertiary Containment	Adequacy of Pollution Prevention Measures? Yes / No	Are the proposed Integrity testing of pollution prevention measures adequate?	Is there an adequate documented management system to demonstrate operator management and competence with the relevant activity	Likelihood of pollution
	of waste chemicals				with segregated storage of hazardous and non-hazardous waste	. Will be subject to routine visual checks and inspection.	containers will be kept locked to prevent accidental loss		containment sump				prior to waste generation	

Appendix 6: Landmark Envirocheck