The Sizewell C Project

6.3 Volume 2 Main Development Site

Chapter 19 Groundwater and Surface Water

Revision: 1.0

Applicable Regulation: Regulation 5(2)(a)

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Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Contents

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Plates

None provided.

Figures

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19.4.8 Whilst the Chalk Group is present below the site, it is hydraulically isolated by the presence of the overlying low permeability London Clay Formation. It is therefore not considered further as a receptor.

19.4.9 Further detail on the geology of the site is presented in **Chapter 18** of this volume.

ii. Hydrogeology

19.4.10 Superficial deposits, comprising Marine Beach Deposits to the east of the site and the Lowestoft sands and gravels located in higher ground to the west of the site, are classified by the Environment Agency as Secondary A Aquifers[2]. The Lowestoft Formation (diamicton) deposits are classified by the Environment Agency as a Secondary Aquifer (undifferentiated)[3]. The superficial deposits are thought to be in partial hydraulic continuity with the underlying Crag aquifer. However, due to local variability in lithological composition, inconsistent areas of cohesive material may act to delay recharge to the Crag.

19.4.11 The Peat Deposits are classified by the Environment Agency as Unproductive Strata. However, they store and transmit water originating from groundwater, surface water and precipitation which is important in sustaining the SSSI habitats, particularly the reedbeds, fen meadows and rush pastures. Subsequently, due to their ecological importance associated with the Sizewell Marshes SSSI they are considered as a high value receptor for the purpose of the impact assessment.

19.4.12 The Crag and the Chalk bedrock aquifers are classified as Principal Aquifers and are hydraulically separated by the presence of the London Clay Formation (Paleogene Deposits). The thickness of the low permeability London Clay Formation aquiclude means that there is not considered to be the potential for significant environmental effects on the Chalk aquifer. The Chalk aquifer is therefore not considered in this assessment.

19.4.13 In addition to the aquifers identified above, other natural and anthropogenic deposits will act to modify, constrain or retard the movement of groundwater. Made Ground at the site, principally material deposited during excavation for the neighbouring Sizewell B power station, comprises a mix of granular and cohesive material which will modify recharge to the underlying strata relative to the surrounding area. Groundwater in the Made Ground, where present,

[2] Secondary A Aquifers are 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.
[3] A Secondary (Undifferentiated) Aquifer is designated in cases where it has not been possible to attribute either category Secondary A or Secondary B to a rock type.

is considered to be in partial hydraulic continuity with the underlying strata. The laterally inconsistent areas of cohesive material will act to delay recharge to the underlying aquifers, potentially resulting in locally perched water tables. Where present, low hydraulic conductivity deposits such as Alluvium, Marine Deposits and the Paleogene Deposits will restrict the movement of groundwater and potentially cause confined conditions in underlying aquifers.

19.4.14 The proposed development is located on the Waveney and East Suffolk Chalk and Crag groundwater body (water body ID GB40501G400600). The Environment Agency catchment data explorer 2016 classification shows that this groundwater body has been classified by the Environment Agency as being of Poor quantitative and Poor chemical status, with an objective to being of Good quantitative and Good chemical status by 2027. The Poor chemical status is attributed to impacts from agriculture as evidenced by elevated nitrate concentrations in groundwater. The proposed development falls within a groundwater nitrate vulnerable zone (NVZ).

19.4.15 There are no groundwater Source Protection Zones (SPZs)[4] within the site. There is an SPZ3[5] approximately 340m south-west of the LEEIE sub-area of the site, with its SPZ2[6] a further 360m south-west. The inner protection zone of the SPZ[7] is outside of the study area at approximately 1.2km south-west of the LEEIE and 3km south-west of the main platform. The SPZs are presented on **Figure 19.1** of this volume.

19.4.16 The Suffolk Coastal and Waveney District Strategic FRA makes no reference to groundwater flooding across the Suffolk Coastal and Waveney District. Flood risk is discussed further in the **Sizewell C Main Development Site FRA** (Doc Ref. 5.2).

19.4.17 An east to west cross section through the site is shown on drawing 5129919/SZC/010 of **Appendix 19B** of this volume and this illustrates the relationship between the main groundwater aquifer units and shows the lack

[4] Groundwater Source Protection Zones are areas defined around groundwater sources used for public drinking water supply. The SPZ shows the risk of contamination from activities that might cause pollution in the area. The closer the activity, the greater the risk

[5] Zone 3: (Total catchment) - This zone is defined as the total area needed to support the abstraction or discharge from the protected groundwater source

[6] Zone 2: (Outer Protection Zone) - This zone is defined by the 400-day travel time from a point below the water table. Additionally, this zone has a minimum radius of 250 or 500 m, depending on the size of the abstraction. The travel time is derived from consideration of the minimum time required to provide delay, dilution and attenuation of slowly degrading pollutants.

[7] Zone 1: (Inner Protection Zone) - This zone is defined by a travel time of 50-days or less from any point within the zone at, or below, the water table. Additionally, the zone has as a minimum a 50-metre radius. It is based principally on biological decay criteria and is designed to protect against the transmission of toxic chemicals and water-borne disease.

of hydraulic continuity between the Principal Chalk aquifer and the overlying Crag Formation.

iii. Water abstractions

Groundwater

19.4.18 The Phase 2 Geo-Environmental Interpretative Report in **Appendix 18A** of this volume and the numerical modelling report in **Appendix 19A** of this volume indicate multiple licensed groundwater abstractions within 1km of the site. These are detailed in **Table 19.5** and presented on **Figure 19.1** of this volume.

Table 19.5: Groundwater abstractions within the outer study area

Licence Number	Location (Including National Grid Reference, (NGR))	Source	Purpose	Maximum Annual Abstraction (m^3)
7/35/03/*G/0045 (potentially revoked).	645320, 264570. Well At Upper Abbey Farm, Leiston. On-site.	Crag	General farming and domestic.	Not supplied.
7/35/03/*G/0074 (potentially revoked).	647000, 263400. Wellpoint at Sizewell Power Station. On-site.	Marine Deposits.	Make-up or top up water.	Not supplied.
7/35/03/*G/0051	645050, 264250 (on-site). Bore Nr Leiston Old Abbey, Leis.	Glacial sand and gravel.	General farming and domestic.	Unknown
7/35/03/*G/0046	645950 265900. Well At Lower Abbey Farm, Leiston. On-site.	Crag	General farming and domestic.	Not supplied.
An/035/0003/007	645100, 263500 (20m east of site). Groundwater Basin A at Aldhurst Farm, Leiston.	Glacial sand and gravel groundwater.	Environmental: non-remedial river/wetland support: transfer between sources.	Unknown
7/35/03/*G/0089	646700 262900, 86m south-west of site.	Groundwater	General farming and domestic.	28,500
An/035/0003/007	645342, 263431 (85m east of site). Groundwater Basin B at Aldhurst Farm, Leiston.	Groundwater	Environmental: non-remedial river/wetland support: transfer between sources.	Not supplied.