SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 12 Water Environment

SSE Generation Ireland Limited

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Delivering a better world

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12. Water Environment

12.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents an assessment of the impacts of the Proposed Development upon the water environment.

This chapter defines the study area, the methodology used for developing the baseline and impact assessment, provides a description of the baseline environment in relation to water, and presents the findings of the impact assessment on water quality, hydrology, hydrogeology, hydromorphology, flood risk and water resources, as well as how these changes could impact on any water dependent ecosystems, such as wetlands.

The assessment considers the potential for non-conformance with the European Union (EU) Water Framework Directive (WFD), *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for the Community action in the field of water policy* objectives and ensures that:

- the need for the avoidance and reduction of impacts on the water environment is taken fully into account in the environmental evaluation; and
- the selection of appropriate means of preventing significant predicted impact is made through modification of the drainage design, choice of discharge location(s) and/or adoption of run-off treatment methods, with the objective of designing-out potential adverse environmental impacts.

The Proposed Development (‘red line boundary’) lies within the boundary of the SSE Tarbert Site (‘SSE Tarbert’) under the management of the Applicant.

Full details on the background and Site history are provided in EIAR Volume I Chapter 4 (Existing Site and Conditions), and details of the Proposed Development is provided in EIAR Volume I Chapter 5 (Description of the Proposed Development), and the Planning Statement submitted with this planning application.

This chapter should also be read in conjunction with Chapter 7 (Air Quality), Chapter 9 (Biodiversity), Chapter 13 (Land and Soils), Chapter 16 (Material Assets) and Chapter 17 (Climate) of EIAR Volume I, which pay particular attention to the potential for impacts upon the aquatic / riparian environment, hydrogeological environment, deposition of particles from emissions, flood risk due to climate change, and water usage respectively.

12.2 Legislation, Policy, and Guidance

12.2.1 Legislation

The following European legislation and transposing Irish regulations are of relevance to this water environment assessment and the Proposed Development:

- European Union Water Framework Directive (WFD) (2000/60/EC). The following legislation in Ireland governs the shape of the WFD characterisation, monitoring and status assessment programmes in terms of monitoring different water categories, determining the quality elements and undertaking characterisation and classification assessments.
- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003).
- European Union (Water Policy) Regulations, 2014 (S.I. No. 350 of 2014).
- European Union (Water Policy) (Abstractions Registration) Regulations, 2018 (S.I. No. 261 of 2018).
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014)
- European Communities Environmental Objectives (Surface Water) Regulations, 2009 ('S.I. No. 272 of 2009 as amended'), as amended in 2012 (by S.I. No. 327/2012), 2015 (by S.I. No. 386/2015) and 2019 (by S.I. No. 77/2019).
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 as amended), as amended in 2016 (S.I. No. 366 of 2016).
- European Union Environmental Impact Assessment (EIA) Directive 2011/92/EU as amended by 2014/52/EU.
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations S.I. No. 419 of 2012, as amended by S.I. No. 543 of 2014, 2018 (S.I. No. 296 of 2018), as amended by S.I. No. 404 of 2018 and S.I. No. 646 of 2018.
- The EU Floods Directive 2007/60/EC.
- European Communities (Assessment and Management of Flood Risks) Regulations, 2010 (S.I. No. 122 of 2010).
- European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470 of 2012).

12.2.2 Policy

The Kerry County Development Plan (Kerry CDP) 2022-2028, prepared in accordance with the provisions of the Planning and Development Act 2000 (as amended), sets out a range of proposed policy objectives for development up to 2028 (Kerry County Council, 2022). The Kerry CDP incorporates the mandatory objectives listed in the Act, including conservation and protection of the environment and promotion of compliance with environmental standard, including but not limited to the following:

- KCDP 11-15: Facilitate and support the protection and enhancement of wetlands as nature-based solutions to flood management, climate change, and the biodiversity crisis.
- KCDP 13-1: Ensure compliance with the Water Framework Directive.
- KCDP 13-2: Achieve water quality targets by implementing the national River Basin Management Plan (and associated programmes of measures).
- KCDP 13-5: Ensure that planning applications are assessed with regard to the Groundwater Protection Scheme and the potential impacts the development may have on groundwater quality.
- KCDP 13-6: Protect all sources and potential sources of public water supply, including their zones of contribution within the County from pollution resulting from any development and/or land use.
- KCDP 13-7: Protect existing and potential water resources for the county, in accordance with the EU Water Framework Directive (2000/60/EC), the current National River Basin Management Plan and any amending or replacement version, the Pollution Reduction Programmes for designated shellfish waters, the provisions of the Groundwater Protection Scheme for the county and any other protection plans for water supply sources, with an aim to improving all water quality.
- KCDP 13-18: Ensure that development proposals comply with the standards and requirements of the Irish Water: Code of Practice for Wastewater Infrastructure, (December 2016), and any updated version of this document during the lifetime of the Plan.
- KCDP 13-24: Support the incorporation of Sustainable Urban Drainage Systems (SUDs) in all public and private development in urban areas.

12.2.3 Guidance

The following guidance documents are of relevance to the Proposed Development and were adhered to in the preparation of this water environment assessment:

- Department of Housing, Local Government and Heritage, 2018. *River Basin Management Plan 2018-2021*.
- Environmental Protection Agency (EPA), 2022. *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*.
- EPA, 2003. *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*.
- EPA, 2013. *Management of Contaminated Land and Groundwater at EPA Licensed Sites*.
- National Road Authority (NRA), 2009. *Guidelines on Procedures for Assessment Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*.
- Institute of Geologists of Ireland (IGI), 2013. *Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements*.
- Department of housing, Local Government and Heritage (DHLGH) 2009, *The Planning System and Flood Risk Management – Guidelines for Planning Authorities.*

12.3 Methodology

12.3.1 Introduction

The following sources of information that define the Proposed Development form the basis of this assessment:

- EIAR Volume I Chapter 4: Existing Site and Conditions.
- EIAR Volume I Chapter 5: Description of the Proposed Development.
- EIAR Volume III Figures 12.1 – 12.3.
- EIAR Volume II Appendix 12A: Flood Risk Assessment for the Site; and
- EIAR Volume II Appendix 12B: Surface Water Drainage Strategy.

12.3.2 Study Area

The study area for water receptors encompasses the entire area within the Site, and water features within a 2km radius. The study area is considered appropriate to identify water environment receptors that could reasonably be affected and to take account of potentially significant impacts which could arise a greater distance away, i.e., groundwater dependent designated sites, which could be hydraulically connected over an extended distance to groundwater beneath the Site (NRA, 2009).

12.3.3 Determination of the Baseline Environment

The baseline water environment within the study area for water receptors has been determined from desktop review and site studies / investigations, as follows:

- Ordnance Survey Ireland (OSI) website for historical maps of 1:2,500 scale and 1:10,560 scale and aerial photographs.
- OSI Discovery series of 1:50,000 scale.
- Geological Survey of Ireland (GSI) online map viewer www.gsi.ie/mapping [accessed October 2023].
- EPA Maps online map viewer, https://gis.epa.ie/EPAMaps/ [accessed October 2023].
- EPA Catchments online map viewer, www.catchments.ie [accessed October 2023].
- EPA Hydronet online map viewer, https://epawebapp.epa.ie/hydronet/ [accessed October 2023].
- National Parks and Wildlife Service (NPWS) designated sites and protected areas online map viewer, www.npws.ie/mapping [accessed October 2023].
- Wetland Surveys Ireland wetland inventory online map viewer, www.wetlandsurveys.ie [accessed October 2023].
- GeoHive historic maps online map viewer, https://webapps.geohive.ie/mapviewer/index.html [accessed October 2023].
- Fluvial and Coastal Flood information mapping from the Catchment Flood Risk Assessment and Management Program (CFRAM) (OPW, 2023), https://www.floodinfo.ie [accessed October 2023].
- Causeway Geotech Limited, 2022. *Site investigation*.
- URS, 2009. *Environmental Site Assessment ESB Generating Station, Tarbert, Co. Kerry* Ref: 49341640 Final Issue No 4 dated 6 November 2009.
- AECOM, 2022. *Heavy Fuel Oil Spill Response - Tarbert Generating Station - Soil Sampling*. Ref: 60673806_ACM_EN_RP_003 dated 30 June 2022.
- AECOM, 2023a. *T-4 Site Investigation - Tarbert Generating Station,* ref: 60707258_ACM_RP_EN_0 dated 01 September 2023, for SSE Generation Ireland Limited.

- AECOM, 2021. Groundwater Monitoring Report, March 2022.
- AECOM, 2022. Groundwater Monitoring Report.

In addition, a site-specific Flood Risk Assessment (FRA) has been prepared for the Proposed Development and is submitted with this planning application, refer to EIAR Volume II Appendix 12A.

12.3.4 Impact Assessment Methodology

A qualitative assessment of the likely significant effects on the water environment has been undertaken, using the source-pathway-receptor approach. For an impact on the water environment to exist, the following is required:

- An impact source (such as the release of polluting chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or the loss or damage to all or part of a water body);
- A receptor that is sensitive to that impact (i.e., water bodies and the services they support); and
- A pathway by which the two are linked.

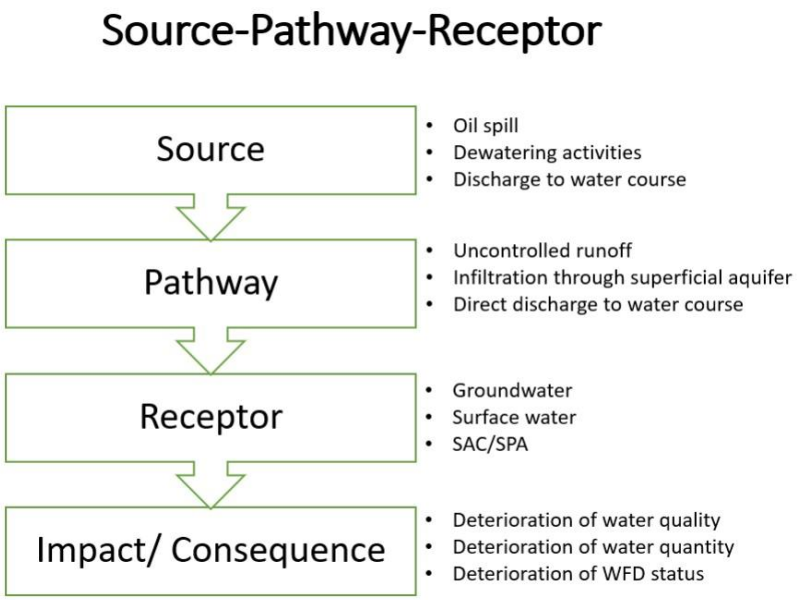

Plate 12.1: Source-Pathway-Receptor model

The first stage in applying the Source-Pathway-Receptor model is to identify the causes or ‘sources’ of potential impact from a proposed development. The sources have been identified through a review of the details of the Proposed Development, including the size and nature of the development, proposed construction methodologies and timescales. The next step in the model is to undertake a review of the potential receptors, that is, the water environment receptors that have the potential to be affected.

The last stage of the model is, therefore, to determine if there is a viable exposure pathway or a ‘mechanism’ linking the source to the receptor. This has been undertaken in the context of local

conditions relative to the water receptors within the study area, such as topography, geology, climatic conditions and the nature of the impact (e.g., the mobility of a liquid pollutant or the proximity to works that may physically impact a water body).

The assessment of the likely significant effects is qualitative and considers construction, operational and decommissioning phases, as well as cumulative effects with other developments. This assessment has considered the risk of pollution to surface water bodies and groundwater directly and indirectly from construction activities, particularly in relation to those water features which are within or close to the Site. The risk of pollution from runoff from the built environment has also been considered so that appropriate measures can be incorporated into the design of the Proposed Development.

12.3.5 Flood Risk Assessment

A Flood Risk Assessment is provided in Appendix 12A (refer to EIAR Volume II) which assesses flood risk for the Site. Refer to the Flood Risk and Drainage Assessment for a full description of the flood risk baseline, which is also summarised in Section 12.4 of this chapter.

12.3.6 Determination of Sensitive Receptors

When undertaking the impact assessment following the source-pathway-receptor process, the following has been considered:

- Considering the existing (baseline) status of the water environment within the Site and relevant surrounds with respect to surface water, groundwater and flood risk;
- Identifying likely impacts of the Proposed Development on the water environment during the operational, construction and decommissioning phases, based on a source-pathway-receptor approach.
- Proposing suitable mitigation measures to be incorporated into the development design, construction and operation to offset any adverse impacts (i.e., embedded mitigation).
- Reviewing any residual impacts and presenting additional mitigation measures to limit their impacts should these be required.

A qualitative assessment has been used to assign a sensitivity rating from negligible to high, based on the EPA's EIAR guidance (EPA, 2022), and considers their likely adaptability, tolerance, and recoverability, as well as their designation. In the absence of specific criteria for rating sensitivity in the 2022 EIAR guidance, the criteria from the NRA's *Guidelines on Procedures for Assessment Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009) have been used and are presented in Table 12.1.

Table 12.1: Receptor sensitivity/ importance

Sensitivity/ importance	Description	Example
Extremely High	Attribute has a high quality or value on international scale or protected by EU legislation	River, groundwater body, Surface Water Dependent Ecosystem (SWDE) or Groundwater Dependent Terrestrial Ecosystems (GWDTE) of Special Area of Conservation (SAC) or Special Protection Area (SPA) status

Sensitivity/ importance	Description	Example
Very High	Attribute has a high quality or value on regional or national scale	River, groundwater body, SWDE or GWDTE of Natural Heritage Area (NHA) status, regionally important aquifer or public water supply, active continuous hydrometric station, Quality Class A (Biotic Index Q4, Q5)
High	Attribute has a high quality or value on local scale	SWDE or GWDTE of county importance, locally important aquifer or potable water supply, Quality Class B (Biotic Index Q3-4)
Medium	Attribute has a medium quality or value on local scale	SWDE or GWDTE of local importance, local potable water supply, Quality Class C (Biotic Index Q3, Q2-3)
Low	Attribute has a low quality or value on a local scale	Local water supply used for domestic/ agricultural purposes, Quality Class D (Biotic Index Q2, Q1)

12.3.7 Magnitude of Impact

The magnitude of impact has been assigned based on the EPA 2022 EIAR guidance, taking into account the likelihood of the effect occurring. The likelihood of an effect occurring is based on a scale of certain, likely or unlikely. Likelihood has been considered in the case of the assessment of potential impacts to water bodies only, as likelihood is inherently included within the FRA. In the absence of specific criteria for description of magnitude of impact in the 2022 EIAR guidance, the criteria from Box 5.2 and Box 5.3 of NRA's *Guidelines on Procedures for Assessment Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009) has been used and are presented in Table 12.2. It should be noted the control measures, as outlined in Chapter 5 (Description of the Proposed Development), have been considered embedded in the project design and their application has been assumed in determining the significance of the impact. Mitigation measures will be devised for each potential complete pollutant linkage (comprising a source, pathway and receptor), no matter how significant the impact. Additional mitigation measures have then been considered prior to determination of residual impacts.

Table 12.2: Magnitude of impact rating (NRA, 2009)

Impact Level	Description:	Typical example
Large adverse	Results in loss of attribute and/ or quality and integrity of attribute	**Hydrogeology** • Removal of large proportion of aquifer • Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. • Potential high risk of pollution to groundwater from routine runoff • Calculated risk of serious pollution incident >2% annually **Hydrology** • Loss or extensive change to a waterbody or water dependent habitat • Increase in predicted peak flood level >100mm. • Extensive loss of fishery • Calculated risk of serious pollution incident >2% annually • Extensive reduction in amenity value
Moderate adverse	Results in impact on integrity of attribute or loss of part of attribute	**Hydrogeology** • Removal of moderate proportion of aquifer • Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. • Potential medium risk of pollution to groundwater from routine runoff • Calculated risk of serious pollution incident >1% annually **Hydrology** • Increase in predicted peak flood level >50 mm. • Partial loss of fishery • Calculated risk of serious pollution incident >1% annually • Partial reduction in amenity value
Small adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	**Hydrogeology** • Removal of small proportion of aquifer • Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. • Potential low risk of pollution to groundwater from routine runoff • Calculated risk of serious pollution incident >0.5% annually **Hydrology** • Increase in predicted peak flood level >10 mm. • Minor loss of fishery • Calculated risk of serious pollution incident >0.5% annually • Slight reduction in amenity value
Imperceptible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	**Hydrogeology** • Calculated risk of serious pollution incident <0.5% annually **Hydrology** • Negligible change in predicted peak flood level. • Calculated risk of serious pollution incident <0.5% annually

12.3.8 Describing Potential Effects

The methodology used for describing the potential impacts considers the "quality" of the impacts (*i.e.,* whether it is adverse or beneficial), the "probability" of the event occurring and the "duration" of the impacts (*i.e.,* whether it is short or long-term) and a rating of negligible to high, as per the EPA Guidelines[1]. The description or magnitude of impact (Table 12.2) is then combined with the sensitivity rating of the receptor (Table 12.1) to determine the significance of the potential effect (see Table 12.3).

Table 12.3: Effect significance ratings (NRA, 2009)

Sensitivity/ Importance of Attribute	Magnitude of Impact			
	Negligible	**Small**	**Moderate**	**Large**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant / Moderate	Profound / Significant	Profound
High	Imperceptible	Moderate / Slight	Significant / Moderate	Severe (Very significant) / Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight / Moderate

12.3.9 Limitations and General Assumptions

The assessment has been based on the description of the Proposed Development detailed within EIAR Volume I Chapter 5 (The Description of the Proposed Development).

Assumptions and limitations relating to flood risk are outlined in the Flood Risk Assessment (refer to EIAR Volume II, Appendix 12A).

Ground investigations have been undertaken at the Site and immediate surrounding area, and the details are presented in EIAR Volume I Chapter 13: Land and Soils, and in EIAR Volume II Appendix 13B Site Investigation Report (GQRA).

While Construction Method Statements will be prepared by the Contractor when appointed, all works will take place using best practice, in accordance with the Construction Environmental Management Plan (CEMP) (refer to EIAR Volume II Appendix 5A).

12.4 Baseline Environment

12.4.1 Land Use, Topography and Rainfall

The existing Tarbert HFO Power Station is positioned on Tarbert Island located approximately 1.8km north of the town of Tarbert in County (Co.) Kerry. The Proposed Development, which consists of an Open Cycle Gas Turbine (OCGT) power plant, administration building and workshop, ancillary plant, site works, services, grid connection and demolition of ancillary buildings associated with the existing Tarbert Heavy Fuel Oil (HFO) Power Station on land within the SSE Tarbert Site, will be located within the SSE Tarbert Site.

[1] EPA (2022).

The Proposed Development Site is located predominantly on brownfield land, and where there are existing structures, such as ancillary buildings/ structures associated with the existing Tarbert HFO Power Station, the works will include the demolition and removal of these structures. Hydrotreated Vegetable Oil (HVO) will be delivered to Site via tanker.

The topography of most of Tarbert Island is generally flat and lies at an elevation of 3m to 5m above Ordnance Datum (AOD), with the exception of the water reservoir. This structure is located to the south-east of the Site and is elevated above the remainder of the island by approximately 5m. On the mainland, to the south-west of the Site, the topography rises to around 62mAOD near Kilpadogue.

The surrounding land use is characterised by very sparsely populated farmland with one-off residential properties and farmhouses. Refer to EIAR Volume I Chapter 13: Land and Soils for more detail.

The closest Met Éireann weather observing station to the Site with available historical data is located at Tarbert (Kilpadogue) (Station No. 7111), at approximately 2.3km to the south-west. This station has been operational since 2021. The next closest is Ballyhahill (Glenbawn) (Station No.6311) at Glenbawn located 13km south-east of the Site and which has been operational since 2000. Plate 12.2 shows the available long-term average monthly rainfall data for 2000-2020 from Ballyhahill (Glenbawn) and average wet days per month and also the 2022 monthly rainfall for Tarbert weather station. The long-term average (LTA) annual rainfall (2000-2020) is 1,498.7mm. According to Met Éireann, most of the eastern half of the country gets between 750 and 1,000mm of rainfall in a year, while rainfall in the west generally averages between 1,000 and 1,400mm. The LTA annual rainfall for Ballyhahill is therefore just above the range for the west. The datasets show that monthly rainfall is generally lower in the spring months and wetter in the summer/ autumn months.

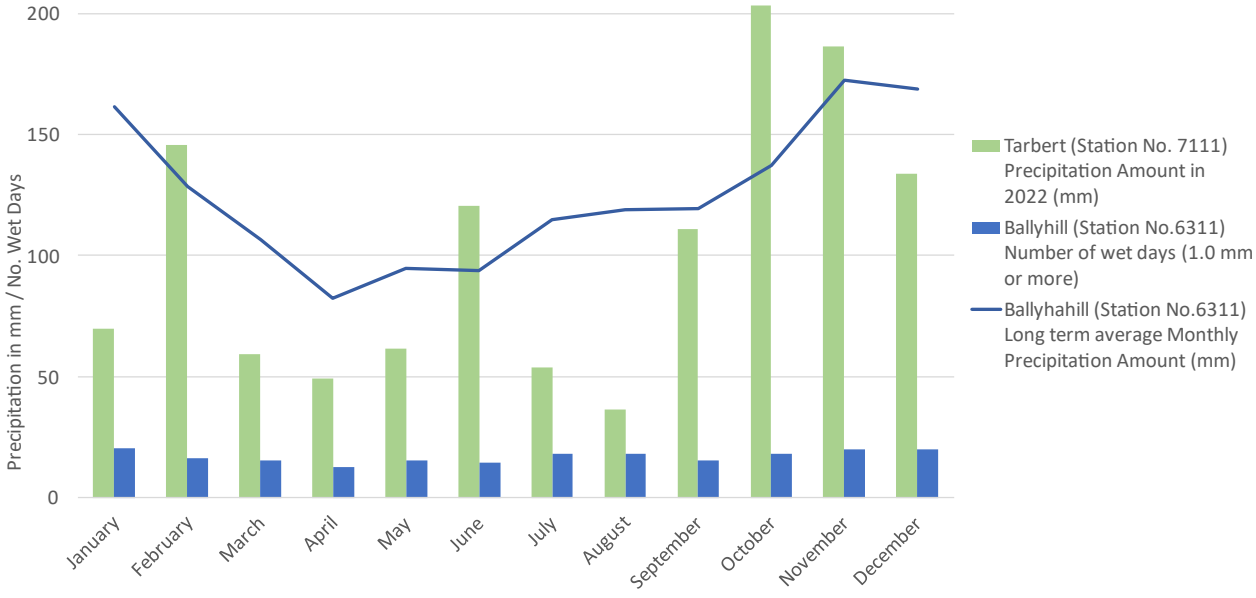

Plate 12.2: Rainfall data for Tarbert area (Source; Met Eireann, 2023)

12.4.2 Hydrology

The description of the baseline condition of the surface water environment and the identification of hydrological receptors with the potential to be impacted by the Proposed Development, focuses on the following constraint types:

- Surface waterbodies, and associated water quality and hydromorphology.
- WFD river sub basins.
- Surface water abstraction/ monitoring/ discharge points.
- Designated sites with surface water dependent habitats or species.
- Surface water flood risk areas.

12.4.2.1 Surface waterbodies

The Site is surrounded by the Lower Shannon Estuary WFD transitional water body (IE_SH_060_0300). A lagoon, located along the southern boundary of the Tarbert HFO Power Station site, separates Tarbert Island from the mainland.

The nearest EPA mapped river waterbody is at 1.7km to the south of the Site and is named Tarbert-010. This waterbody consists of a series of drainage ditches or streams which collate west of Tarbert village in a water source referred to as Doonard Lower, before discharging into the Shannon Estuary at Tarbert. According to the EPA Catchments Map Viewer, the hydromorphological condition (and heavily modified status) of this river waterbody is unknown.

The next nearest EPA mapped river waterbody is Farranmiller_010 located at 1.8km to the south of the Site. According to the EPA Catchments Map Viewer, the hydromorphological condition (and heavily modified status) of this river waterbody is unknown.

There is a small unnamed lake located approximately 200m to the south-east of the Site and is not classified by the EPA as a WFD lake body.

Surface water features within the study area are show in EIAR Volume III, Figure 12.1. The following table summarises the WFD status of each of the identified surface waterbodies.

Table 12.4: WFD surface waterbodies

WFD Waterbody	Waterbody name	WFD ID	WFD STATUS (2016-2021)	WFD AT RISK STATUS (3RD CYCLE) [2]
Tarbert_010	Doonard Lower associated tributaries	IE_SH_24T010100	Moderate	At risk
Farranmiller_010	Farranmiller Streams	IE_SH_24F320750	Good	Review
Lower Shannon Estuary	Shannon Estuary	IE_SH_060_0300	Good	Not at risk

Source: EPA, 2023

[2] For waterbodies that are 'At Risk' of not meeting their WFD objectives, a significant pressure will have been identified. For waterbodies that are categorised as 'Review', additional information is needed to determine their status before resources and more targeted measures are initiated or the measures have been undertaken, e.g. a wastewater treatment plant upgrade, but the outcome hasn't yet been measured/monitored. For waterbodies that are 'Not at Risk' and therefore are meeting their WFD objectives (EPA, 2023).

12.4.2.2 Surface water quality

According to EPA Catchments, there is one (No. 1) river monitoring station located on the Tarbert_010 river waterbody, at which latest river Q values have been assigned. The Q values refer to a biological rating system for freshwaters where the presence and quantity of specific organisms, primarily invertebrates, are surveyed and the overall health of the watercourse rated. The following table summarises this data.

Table 12.5: EPA latest river Q values

WFD Waterbody	Waterbody name	WFD ID	Latest river Q value (status)	Year
Tarbert_010	Doonard Lower associated tributaries	IE_SH_24T010100	3-4 (Moderate)	2020

Source: EPA, 2023

12.4.2.3 WFD river basins

The WFD was transposed into Irish Legislation by the European Communities (Water Policy) Regulations 2003, (S.I. No. 722 of 2003) on 22nd December 2003. This legislation established the River Basin Districts (RBDs) and provides support for the protection of the status of all waters. River sub basins are a management and reporting unit for the WFD. The Site falls within the Shannon Estuary South catchment 24, WFD Sub catchment ASTEE_WEST_SC_010 and River Sub Basin Ralappane_010.

12.4.2.3.1 Surface water flows

According to EPA Catchments, there is an available river flow estimate generated by the EPA's Hydrotool[3] for the Tarbert_010 river waterbody, at approximately 1.8km to the south of the Proposed Development. The following table summarises this data.

Table 12.6: EPA Hydrotool river flow estimates

WFD Waterbody	River Segment ID	Naturalised Flow Estimates (m^3/s)		
		Q10	Q50	Q95
Tarbert_010	24_1610	0.376	0.107	0.024

Source: EPA, 2023

12.4.2.4 Surface water abstraction/ monitoring/ discharge points

The Tarbert and Farranmiller surface waterbodies are not designated as drinking water rivers and therefore there are no known surface water abstraction locations within the area.

There is an EPA surface water monitoring point located on the Shannon Estuary at 1km to the east of the Site, Tarbert station number 24060 (see EIAR Volume III Figure 12.1). This station records water level only and is currently inactive (EPA Hydronet, 2023). Consistent and long-term level and flow

[3] The EPA's Hydrotool is a dataset of naturalised river flow duration percentiles for Irish rivers that will enable assessment of quantitative impacts relating to hydrological alterations. The flow estimates represent flows that could be expected in rivers under naturalised conditions and do not take account of artificial influences of any kind such as water supply abstractions or wastewater discharges.

gauging is important for many purposes including water quality, WFD and flood risk purposes, therefore all hydrometric stations with an 'operational' status would be identified as a constraint/ receptor, with the potential to be impacted by the Proposed Development.

There are no Section 4 (of the Local Government (Water Pollution) Act 1977, as amended) discharges recorded onsite, based on EPA Maps online map viewer [accessed October 2023]. The nearest Section 4 Discharge is located at 2.8km across the estuary to the north at Killimer Dock Local Authority (LA) Reference No WP085.

The existing Tarbert HFO Power Station has a cooling water intake from the Shannon Estuary on the east of Tarbert Island which discharges via the lagoon. There are two foul treatment units onsite to treat sewage before discharge to the Shannon Estuary. Process wastewater from the existing water treatment plant is neutralised prior to discharge. There are also four other process emission points licenced to discharge from the site e.g., from the main engine building, blow down tanks and a chemical bund. Surface water/ rainfall run-off from potential oil contaminated areas of the site drain though oil interceptors. Under Schedule 2 of the EPA Industrial Emissions (IE) Licence P0607-02 - there are ten (no. 10) permitted emission points, across the Site, to the Shannon Estuary.

12.4.2.5 Designated sites with surface water dependent habitats or species

The Site is surrounded by the Lower River Shannon Special Area of Conservation (SAC) (site code 002165) and the River Shannon and River Fergus Estuaries Specially Protected Area (SPA) (site code 004077) (see EIAR Volume III Figure 12.1). The SAC includes numerous Annex I protected habitats and species, including surface water dependent ecosystems (SWDE) such as intertidal flats and supports a diverse macro-invertebrate community (refer to EIAR Volume I Chapter 9: Biodiversity for more information). The SPA is designated for wintering birds, and therefore the qualifying interests are not considered relevant to this study and the SPA site has been scoped out of this assessment.

The Site is directly adjacent to the Tarbert Bay proposed Natural Heritage Area (pNHA). Tarbert Bay consists of a sandy intertidal bay fringed by saline vegetation, and deciduous woodland. It is also designated for habitats suitable for wintering birds. This area is considered likely to be a SWDE and has been included in this assessment.

12.4.2.6 Flood Risk Assessment (FRA)

A site-specific FRA has been prepared for the Site, refer to EIAR Volume II Appendix 12A. A brief summary of the baseline flood risk assessment from the site-specific FRA is provided in this section.

The site-specific FRA for the Site was undertaken in accordance with the requirements of "*The Planning System and Flood Risk Management – Guidelines for Planning Authorities"* (DHLGH, 2009) to demonstrate that the Proposed Development will:

- Not increase flood risk elsewhere and, if practical, will reduce overall flood risk.
- Include measures to minimise flood risk to people, property, the economy, and the environment as far as reasonably possible.

- Include measures to ensure that residual risks to the area and / or development can be managed to an acceptable level.

The ‘Stage 1 – Flood Risk Identification’ determined negligible risk of flooding to the Proposed Development from fluvial and groundwater sources. The Stage 1 exercise shows that the Proposed Development is in Flood Zone A and at risk of coastal/tidal flooding. The Proposed Development could also be at risk of pluvial flooding.

The ‘Stage 1’ assessment identified the potential flow flood mechanisms associated with coastal and pluvial events could impact the Proposed Development, which were further assessed in the ‘Stage 2 Initial Flood Risk Assessment’.

Further analysis was carried out as part of the Stage 2 Assessment. The CFRAM maps indicate that the Proposed Development is in Flood Zone A for the present day and therefore the risk of coastal flooding has a high probability (OPW, 2023). The CFRAM Climate Change future scenarios extents predict the Proposed Development and surrounding areas to be significantly flooded. Based on the CFRAM flood depth mapping, it is expected that the Proposed Development will flood to a depth of 0.25m to 0.5 m during a 0.5% AEP event. The study estimates that the Proposed Development and surrounding area will be inundated during peak tide levels for all Climate Change future scenarios indicating the risk of flooding is very high. The risk of pluvial flooding to the Site is unknown but will be mitigated by the comprehensive and detailed design of the surface water system.

12.4.2.7 Existing drainage, discharges, and monitoring

The existing drainage / storm water system onsite collects all water from impervious surfaces and pipes it to an underground drainage system. Surface water/ storm water is discharged to the Shannon Estuary via ten (No. 10) permitted emission points and operated under IE Licence P0607-02. All runoff with the potential to become contaminated passes though oil interceptors to retain any hydrocarbons present. The surface water/ storm water emissions points are monitored on a quarterly basis, in accordance with IE Licence P0607-02. There was one breach of surface water trigger level in 2022 of Total petroleum hydrocarbon (TPH) this was investigated, and corrective/ preventative actions were undertaken.

There are several wastewater processors on Site. Boiler “blow down” water and drainage from the engine room is discharged though three outflows via oil interceptors, the water quality from these outflows are tested quarterly. Process water from the demineralisation plant is neutralised before being discharged to the Shannon Estuary, continuous monitoring of pH and flow is undertaken at these emission points alongside quarterly testing. Two foul sewage treatment units treat water on site before discharging to the Shannon Estuary, the effluent from these is monitored quarterly. The final line of wastewater is condenser cooling water this is discharged into the lagoon, the temperature of the incoming and discharged cooling water is measured continuously.

12.4.3 Hydrogeology

The description of the baseline condition of the groundwater environment and identification of hydrogeological receptors with the potential to be impacted by the Proposed Development, focuses on the following constraint types:

- Aquifers, and associated water quality, levels, and flows.
- WFD groundwater bodies.
- Groundwater abstraction/ monitoring points/ discharges.
- Karst landforms and traced underground connections.
- Groundwater dependent terrestrial ecosystems (GWDTEs).
- Areas of groundwater flood risk.

12.4.3.1 Aquifers and groundwater conditions

The baseline superficial deposits and bedrock geology are detailed in EIAR Volume I Chapter 13 Soils and Geology. A summary of the mapped geology, aquifer classifications, groundwater vulnerability and subsoil permeability beneath the Site is provided (GSI, 2023) (refer to EIAR Volume III Figure 12.2 and Figure 12.3):

- The Site is underlain by superficial deposits mapped as industrial Made Ground [4]. These deposits are not mapped as being an aquifer but are considered likely to act as a pathway to the underlying bedrock aquifer.
- The Site is underlain by bedrock mapped as the Shannon Formation. This consists of a sequence of Namurian mudstone, siltstone, and sandstone. This formation is mapped as being a locally important aquifer, bedrock which is moderately productive only in local zones (Ll).
- The mainland immediately to the south of Tarbert Island is mapped as being underlain by till derived from the Namurian sandstones and shales beneath and outcropping bedrock.
- The subsoil permeability on the Site is mapped to be low.
- The groundwater vulnerability onsite is mapped as being Moderate.
- Well yields in the Tarbert area are generally classified as Poor to Moderate (<100m3/d) by GSI [5], but with one ‘Good’ well yield recorded at the former Tarbert Creamery site.

[4] Made ground: artificial deposits, such as embankments and spoil heaps, on the natural ground surface (https://www.bgs.ac.uk/datasets/bgs-geology/bgs-geology-themes/).

[5] GSI well yields are classified as Excellent = >400m^3/ day, Good = 100-400m^3/day, Moderate = 40-100m^3/day and Poor = <40m^3/day (GSI Groundwater Well and Spring Data - Datasets - data.gov.ie)

There have been many historic ground investigations (GI) undertaken on the main Site. A summary of the information from the most recent investigations is provided:

- In 2008 – 2009, URS (now AECOM) undertook a detailed GI of the Tarbert Site, which included eight soil bores and two trial pits, but no deep boreholes (>10m below ground level (bGL)). This included some continuing groundwater monitoring of both new and old monitoring wells (URS, 2009).
- The depth to bedrock was found to vary significantly on the island, with rock encountered at depths of approximately 1m bGL in the centre of the island but up to 9.3m bGL on the estuary shore. The superficial deposits were generally found to consist of a gravel fill material, underlain by clay.
- Numerous bedrock outcrops were observed on the shoreline to the north-west of the Site; however, the island has been built up above the tide line with coarse stone fill material to currents levels.
- In 2022, AECOM undertook a targeted GI following the loss to ground of HFO due to pipe clamp failure on the northern side of the Site. Groundwater samples were taken from five monitoring boreholes onsite (BH306, BH309A, BH319, BH09 and BH12). Shallow groundwater was recorded within the superficial deposits. Only BH319 is located within the Proposed Development site. Table 12.7 below summarises the monitoring boreholes across the existing SSE Tarbert site.
- The report shows a contour plot of shallow groundwater levels between 1 and 3mAOD (AECOM, 2022). Based on the ground elevations across much of Tarbert Island of 3 to 5mAOD, this suggests that groundwater is at approximately 2m bGL.
- The shallow soils encountered onsite were found to have a permeability ranging from 1.79 x 10-5 to 3.7 x10-5m/s (AECOM, 2022). The bedrock beneath the mainland tank farm was found to have a lower permeability for 5.5 x10 -7m/s (AECOM, 2022).
- Monitoring undertaken found that shallower groundwater in the superficial deposits was brackish, indicating that the groundwater quality and levels are tidally influenced. Groundwater in the superficial deposits on the island was inferred to flow in a divergent pattern locally towards the estuary and lagoon, and on the mainland to flow northward and eastward towards the estuary.

- In 2023, AEOM undertook a further GI to obtain recent soil and groundwater quality information with which to validate use of the 2009 soil and groundwater dataset (refer to Appendix 13A, EIAR Volume II). Two monitoring wells (MW401 and MW402) were installed, and groundwater samples collected. Only MW401 is located within the Proposed Development site. Total Petroleum Hydrocarbon (TPH) and heavy metals in groundwater remained below the relevant limits, with the exception of arsenic which was considered to be naturally occurring.

Table 12.7: Summary of monitoring boreholes across SSE Tarbert Site

Borehole name	Phase	Depth	Geological Units	Water strikes during drilling (m bgl)
BH9	LTM	6	Superficial deposits	2.00
BH11	LTM	4.71	Superficial deposits	3.00
BH12	LTM	4.52	Superficial deposits	-
BH26	LTM	-	Superficial deposits	4.30
BH318	LTM	5.70	Superficial deposits	2.50
RC1	LTM	3.40	Superficial deposits	-
BH1	AECOM Additional 2017	3.83	Superficial deposits	-
BH306	AECOM Additional 2017	6.68	Superficial deposits/ bedrock	-
BH319*	AECOM Additional 2017	4.04	Superficial deposits	2.50
BH27	HFO	1.53	Superficial deposits	0.10
BH28	HFO	2.30	Superficial deposits	-
BH29	HFO	3.70	Superficial deposits	1.80
MW401*	AECOM 2023	11.0	Bedrock	2.00
MW402	AECOM 2023	15.0	Bedrock	12.0

- Unknown
LTM Long term Monitoring well
* Within proposed development T-4 Site

12.4.3.2 Groundwater quality

Monitoring is undertaken at seventeen (17 no.) groundwater monitoring wells at the SSE Tarbert Site on a biannual basis, in accordance with IE Licence P607-02. However other groundwater monitoring boreholes have been installed during AECOM's 2008, 2022 and 2023 GIs. Of these locations, only BH319 is located within the Proposed Development.

Monitoring undertaken by SSE in 2022 indicated that there are high concentrations of redox-related parameters, including iron (II) and iron (III), ammonia, nitrite and nitrate, indicate aerobic/oxidizing conditions at most boreholes onsite and sulphur-type odours at some boreholes, particularly close to the reclaimed marshy cooling water lagoon. There is no significant evidence of site-derived pollution by other metals or by organic pollutants at the Site, other than low level hydrocarbons reported in the vicinity of the heavy fuel oil (HFO) pump house. BH319 had elevated ammonia above Drinking Water Standards (DWS) in the September 2022 sample.

More information on the geology and contamination encountered during the historic GI is included in EIAR Volume I Chapter 13 Land and Soils.

12.4.3.3 WFD groundwater bodies

The Site is located within the Ballylongford WFD groundwater body (GWB) (IE_SH_G_030). The most recent WFD status (2016-2021) was reported as 'Good' overall, with 'Good' for both chemical and quantitative categories. In the WFD 3rd Cycle of risk classification, the Ballylongford groundwater body was classified as 'Not at Risk' with respect to meeting 2028 WFD targets (EPA website, 2023). Refer to Appendix 12C WFD Screening Assessment for more detail.

12.4.3.4 Groundwater abstractions/ monitoring points/ discharges

There are no groundwater abstractions onsite. According to the GSI's National Well Database, the nearest mapped groundwater abstractions to the Site are as follows - it is unknown if any of these are active boreholes or are installed in the superficial deposits or bedrock (refer to EIAR Volume III Figure 12.2).

Table 12.8: Summary of groundwater abstractions within 2km

Borehole ID	Owner	Proximity to site	Drilled Date and Depth	Yield (GSI yield class)	Use/ other comments
0813NEW025	Unknown	Approx. 300m	Drilled in 1899 to depth of 12.2m	16.4m^3/d (Poor)	Agri & domestic use (assumed bedrock well)
0813NEW014	Unknown	Approx. 1.6km	Drilled in 1973 to depth of 2.7m	21.8m^3/d (Poor)	Agri & domestic use (assumed superficial deposits well)
0813NEW095	Tarbert Creamery	Approx. 1.8km	Drilled in 1899 Depth unknown	216m^3/d (Good)	Industrial use (assumed bedrock well)

The nearest Source Protection Zone (SPZ) – delineated for the protection of drinking water supplies - is mapped at over 6.5km from the Site.

There is an EPA groundwater monitoring station, Glin (GWIE_SH_G_03036000011), located at approximately 6.1km to the east of the Site (EPA Maps online web viewer, accessed October 2023). This station is not listed on the EPA's Hydronet viewer.

As outlined in EIAR Volume 1, **Chapter 1** (Introduction), the SSE Tarbert Generation Station site operates under an existing IE Licence issued by the EPA (PO607-02). There are no discharges to groundwater permitted on site. The existing IE Licence will be reviewed in consideration of the Proposed Development to determine if a new licence is required or if an amendment will be sufficient.

12.4.3.5 Karst Landforms

There are no karst features mapped within the Site or within 2km of the Site (GSI, 2023).

12.4.3.6 Groundwater Dependent Terrestrial Ecosystems (GWDTE)

The Ballylongford GWB IE_SH_G_030 is classified as a groundwater body important for SAC species and habitats and SPA habitats (EPA Maps online web viewer, accessed October 2023).

The qualifying interests listed for the Lower Shannon Estuary SAC include several habitats which have the potential to be groundwater dependent (Working Group on Groundwater, 2004). These are Atlantic salt meadows [EU Code 1330], Mediterranean salt meadows [1410], Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260], Molinia Meadows [6410] and Alluvial forests [91E0] (NPWS, 2013).

The qualifying interests listed for the River Shannon and River Fergus Estuaries SPA do not include groundwater dependent habitats; and therefore, the SPA site is not considered to be a GWDTE and has been scoped out of this assessment.

The Site is directly adjacent to the Tarbert Bay proposed Natural Heritage Area (pNHA). The site consists of a sandy intertidal bay fringed by saline vegetation, and deciduous woodland, it is also designated for habitats suitable for wintering birds. This area is considered likely to be a GWDTE and has been included in this assessment.

12.4.3.7 Groundwater flood risk

According to the GSI's Groundwater Flooding Data Viewer, there are no areas of historic groundwater flooding within the study area. In addition, the soil permeability is low, therefore the Site is deemed to be at low risk.

12.4.4 Summary of Baseline Conditions

Table 12.7 provides a summary of the baseline conditions of the water environment and the sensitivity of each surface water and groundwater receptor identified.

Table 12.9: Summary of water environment receptors and baseline condition

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
Surface water/ hydrology					
Transitional water bodies (and quality)	Lower Shannon Estuary (IE_SH_060_0300)	Surrounding the Site to the north, west, east and south-east	Classified as unpolluted, with Good WFD status and Not at Risk (2021, most recent) Designated as SAC (of EU and international importance)	EPA Maps Viewer [Accessed October 2023]	Extremely high
Surface watercourses (and quality)	Tarbert River IE_SH_24T0100	Within 1.7km to south of Site	Classified as Moderate WFD status and Not at Risk (2021, most recent) Hydromorphology status listed as unknown	EPA Maps Viewer [Accessed October 2023]	High
	Farranmiller_010 IE_SH_24F320750	Approximately 1.7km to south of Site	Classified as Good WFD status and Review (2021, most recent) Hydromorphology status listed as unknown	EPA Maps Viewer [Accessed October 2023]	High
SWDEs/ Designated sites	Lower River Shannon SAC	Surrounding the Site to the north, west, east and south-east	Designated (or proposed) status Contains wetland habitats as a qualifying interest and in a favourable conservation condition	NPWS Map Viewer [Accessed October 2023]	Extremely high
	Tarbert Bay pNHA	Within approximately 150m to the south of the Site			Very high
Flood Risk	Proposed Development Site classified as a Highly Vulnerable	Within Site boundary	The Proposed Development is situated in Flood Zone A of coastal flooding. No	FRA Appendix 12A	-

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
	Development due to use for essential infrastructure		past flood events are recorded on the Site according to the online OPW flood mapping tool. The FRA has demonstrated that, owing to the existing character of the frontage, the flood extent for with and without climate change, is expected to inundate large areas of the Site including those proposed for development.		
Groundwater/ hydrogeology					
Superficial deposits	Industrial Made Ground	Within site boundary	Not designated as an aquifer by the GSI, considered likely to act as pathway to bedrock aquifer	GSI Map Viewer [Accessed October 2023]	Low (Likely direct hydrogeological connection between Site and nearby protected sites)
	Till derived from Namurian sandstones and shales	Surrounding area	Not designated as an aquifer by the GSI, considered likely to act as pathway to bedrock aquifer	GSI Map Viewer [Accessed October 2023]	Low (Likely direct hydrogeological connection between site and nearby protected sites)
	Alluvium	Surrounding area	Not designated as an aquifer by the GSI, considered likely to act as pathway to bedrock aquifer	GSI Map Viewer [Accessed October 2023]	Low (Likely direct hydrogeological connection between

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
					site and nearby protected sites)
Bedrock	Shannon Group, undifferentiated	Underlying Site and surrounding area	Locally important aquifer (Ll)	GSI Map Viewer [Accessed October 2023]	Medium (Likely direct hydrogeological connection between site and nearby protected sites)
Groundwater abstractions/ supplies	Groundwater abstraction wells	Nearest at approx. 300 m from Site	Historical boreholes with reported Poor and Good well yields and used for agriculture and domestic/ industrial purposes	GSI Map Viewer [Accessed October 2023]	Low
WFD groundwater bodies (GWBs)	Ballylongford GWB	Underlying site and surrounding area	Good WFD status and Not at Risk of not achieving good status	GSI Map Viewer [Accessed October 2023]	Extremely high
GWDTEs	Lower Shannon Estuary SAC	Surrounding site	Designated status of EU and international importance Contains wetland habitats as a qualifying interest and in a favourable conservation condition	NPWS Map Viewer [Accessed October 2023]	Extremely high
	Proposed NHA Tarbert Bay	Adjacent to the south of the Site	Proposed designated site of national importance. Likely to contain wetland habitats	NPWS Map Viewer [Accessed October 2023]	Very high

12.5 Potential Impacts

Several activities during construction, operation, and decommissioning phases are likely to generate impacts, which have the potential to cause significant effects to the water environment, if unmitigated. The impacts and effects (both beneficial and adverse) are outlined in the following sections. It should be noted that the proposed activities have been assessed following consideration of the embedded mitigation measures (see Section 12.6.1).

12.5.1 Construction Phase

The main potential impacts associated with construction of the Proposed Development include:

- Pollution of water bodies by uncontrolled site runoff.
- Accidental pollution of water bodies by spillages.
- Accidental pollution of water bodies by mobilisation of existing contaminants.
- Changes to WFD status of waterbodies.
- Changes to groundwater levels, flows and contributions to GWDTEs by dewatering.
- Changes to flood risk by uncontrolled site runoff or by construction within areas at risk of flooding.

Pollution of water bodies by uncontrolled site runoff

Vegetation removal, site stripping, stockpiling, vehicle movements and bulk earthworks as part of the construction would leave topsoil and superficial deposits exposed to erosion by wind or rain. This could potentially lead to the accidental pollution of water bodies by uncontrolled site runoff and by increases in sediment loading leaving the Site and entering nearby water bodies, in this case, the adjacent Lower Shannon Estuary SAC. The impact of a high sediment load entering the SAC could impact on both water quality and the habitat (see EIAR Volume I Chapter 9: Biodiversity). The Tarbert and Farranmiller river waterbodies are at approximately 1.9km from the Site and are considered unlikely to be at risk of this potential impact. The shallow nature of groundwater and presence of outcropping bedrock suggests that there is a hydraulic connection between surface water and groundwater in this setting. This connection means that any potential for direct adverse impacts on surface water quality are also valid for groundwater quality in the bedrock aquifer and the Ballylongford WFD GWB.

Considering the CEMP, runoff containing large amounts of suspended solids leaving the construction areas and entering the estuary is considered unlikely to occur. The importance of the Lower River Shannon SAC and the Ballylongford WFD GWB is considered to be extremely high, and of the bedrock aquifer to be medium; the impact magnitude is considered to be negligible; which combined would result in an **imperceptible** effect on these receptors.

Accidental pollution of water bodies by spillages

Any construction activities carried out close to surface waters involve a risk of pollution due to accidental spillage and leaks. While liquids such as oils, lubricants, paints, bituminous coatings, preservatives and weed killers present the greatest risk, fuel spillages from machinery operating close to watercourses also present a risk. The refuelling of general construction plant also poses a significant risk of pollution, depending on how and where it is carried out. In addition, lime and concrete (specifically, the cement component) is highly alkaline, and any spillage could affect the pH of the receiving waterbody.

Accidental spillages may potentially result in a direct or indirect impact to surface water should contaminants enter surface waters directly, in this case, the adjacent Lower Shannon Estuary SAC. This potential for direct adverse impacts on surface water quality is also valid for groundwater quality in the bedrock aquifer and the Ballylongford WFD GWB.

Considering the CEMP, accidental spillages and leaks are considered unlikely to occur and should they occur are likely to be temporary. The importance of the Lower River Shannon SAC and the Ballylongford WFD GWB is considered to be extremely high, and of the bedrock aquifer to be medium; the impact magnitude is considered to be negligible; which combined would result in an **imperceptible** effect on these receptors.

Accidental pollution of water bodies by mobilisation of existing contaminants

Vegetation removal, site stripping, stockpiling, vehicle movements and bulk earthworks as part of the construction would leave topsoil and superficial deposits, and any existing contamination, exposed to erosion by wind or rain. Mobilisation of existing contamination could then either move downwards with rainfall providing a driving head into the underlying superficial deposits and/ or bedrock aquifer, or to move laterally towards and into surface waterbodies, in this case, the adjacent Lower Shannon Estuary SAC. More information on the existing groundwater contamination encountered during the GI is included in EIAR Volume I Chapter 13 Land and Soils.

Considering the CEMP, accidental pollution by mobilisation of existing contaminants is considered unlikely to occur and should they occur are likely to be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

Changes to WFD status of waterbodies

The potential impacts on the WFD status of the adjacent Lower Shannon Estuary transitional waterbody, and underling Ballylongford WFD GWB were assessed in EIAR Volume II, Appendix 12C: WFD Screening Assessment.

Considering the CEMP, the WFD Screening Assessment concluded that the Proposed Development is not going to:

- Cause a deterioration in the status of all surface and groundwater bodies assessed.
- Jeopardise the objectives to achieve ‘Good’ surface water/groundwater status.
- Jeopardise the attainment of 'Good’ surface water/groundwater chemical status.

- Jeopardise the attainment of 'Good' surface water/groundwater quantity status.
- Permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district.

Changes to groundwater levels, flows and contributions to GWDTEs by dewatering

The potential impacts on groundwater level, flow and availability during construction are likely to arise from potential dewatering activities required to facilitate excavations for the underground electrical connections, drainage infrastructure, as well as any foundations required for the development. The depths of the proposed excavations are 2-3m bGL. Shallow groundwater is present in the superficial deposits between 1 and 3m bGL such that the water table is likely to be intercepted during excavation works.

Temporary dewatering or altered drainage regimes may divert water away from GWDTEs, such as the SAC, or create flow barriers, leading to groundwater level and flow alteration. The magnitude of any temporary dewatering will depend on the depth of excavation; however, impacts associated with temporary dewatering or altered drainage regimes are likely to be localised to Tarbert Island. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

Changes to flood risk

Vegetation removal, site stripping, stockpiling, vehicle movements and bulk earthworks as part of the construction could leave topsoil and superficial deposits exposed to erosion by wind or rain. This could potentially lead to an increase in site-runoff leaving Site during construction and to an increase in flood risk from pluvial sources. Considering the CEMP, uncontrolled site-runoff leading to an increased flood risk from pluvial sources is considered unlikely to occur, and should it occur would be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

The CFRAM maps indicate that the Proposed Development is located in a Flood Zone A for the present day and therefore the risk of coastal flooding has a high probability. The CFRAM maps for Climate Change future scenarios predict that the Proposed Development and surrounding area to be significantly flooded. A flood defence scheme ('Proposed Flood Defence Scheme') was prepared for a previously submitted planning application for power generation on the southwest of the SSE Tarbert site. In 2022, AECOM carried out a review of the Proposed Flood Defence Scheme which concluded that the type and extent of flood defences proposed are considered suitable for the Proposed Development, with the addition of a revised flood defence wall. Refer to EIAR Volume II, Appendix 12A FRA for more detail.

The comprehensive and detailed design of the surface water system, ground levels, finished slab levels, and Sustainable Drainage Systems (SuDs) measures will mitigate pluvial flood risk to the Proposed Development and ensure that the Proposed Development does not increase the pluvial flood risk to neighbouring properties. Refer to EIAR Volume II, Appendix 12B Surface Water Drainage Strategy for

more detail. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** on the identified flood risk receptors i.e., neighbouring properties.

Table 12.10: Potential Construction Impacts and Effects (where impact pathways exist)

Potential impact	Impact pathway	Magnitude of impact with embedded mitigation (Section 12.6.1)	Identified receptor (and sensitivity/ importance)	Effect significance with embedded mitigation (Section 12.6.1)
Pollution of water bodies by uncontrolled site runoff	Potential direct linkage as surface runoff	Negligible (and temporary)	Lower River Shannon SAC (extremely high)	**Imperceptible**
	Potential indirect linkage as recharge via overlying superficial deposits		Bedrock aquifer (medium)	
	Potential indirect linkage as recharge via overlying superficial deposits		Ballylongford WFD GWB (extremely high)	
Accidental pollution of water bodies by spillages	Potential direct linkage as surface runoff	Negligible (and temporary)	Lower River Shannon SAC (extremely high)	**Imperceptible**
	Potential indirect linkage as recharge via overlying superficial deposits		Bedrock aquifer (medium)	
	Potential indirect linkage as recharge via overlying superficial deposits	Negligible (temporary, very localised impact and unlikely to change WFD status)	Ballylongford WFD GWB (extremely high)	
Accidental pollution of water bodies by mobilisation of existing contaminants	Potential direct linkage as surface runoff	Negligible (and temporary)	Lower River Shannon SAC (extremely high)	**Imperceptible**
	Potential indirect linkage as recharge via overlying superficial deposits		Bedrock aquifer (medium)	
	Potential indirect linkage as recharge via overlying superficial deposits	Negligible (temporary, very localised impact and unlikely to change WFD status)	Ballylongford WFD GWB (extremely high)	
Changes to groundwater levels, flows and contributions to GWDTEs by dewatering	Potential indirect linkage via superficial deposits	Negligible (and temporary)	Lower River Shannon SAC (extremely high)	**Imperceptible**
	Potential indirect linkage via superficial deposits or direct if excavations extend into bedrock		Bedrock aquifer (medium)	

Potential impact	Impact pathway	Magnitude of impact with embedded mitigation (Section 12.6.1)	Identified receptor (and sensitivity/ importance)	Effect significance with embedded mitigation (Section 12.6.1)
	Potential indirect linkage via superficial deposits or direct if excavations extend into bedrock	Negligible (temporary, very localised impact and unlikely to change WFD status)	Ballylongford WFD GWB (extremely high)	
Changes to flood risk	Potential direct linkage as surface runoff	Negligible (and temporary)	Proposed Development	**Imperceptible**

12.5.2 Operational Phase

The main potential impacts associated with operation of the Proposed Development include:

- Pollution of waterbodies by surface water (rainwater) and process water discharges.
- Accidental pollution of water bodies by spillages.
- Changes to WFD status of waterbodies.
- Changes to groundwater levels, flows and contributions to GWDTEs by underground structures.
- Changes to flood risk.

Pollution of waterbodies by surface water and process water discharges

During the operational phase, the placement of increased impervious surfaces at the Site could lead to an increase in the volume and rate of surface water runoff from the Site and to a pollution risk to the receiving waterbody, the Shannon Estuary. A Surface Water Drainage Strategy Report has been prepared and outlines the proposed point of discharge, attenuation (filter drains and geo-cellular storage), Sustainable Urban Drainage Systems (SuDS), oil separators and maintenance plan for the management of surface water (rainwater) at the Proposed Development. The drainage system for the Proposed Development will be an extension of the existing drainage infrastructure, which will tie-in at sampling point SE3/ outfall 8 and 9, located immediately south of the northern tip of the Site. There are ten (no. 10) existing emission points from the SSE Tarbert HFO Power Station site to the Shannon Estuary, to facilitate the discharge of boiler blowdown, boiler house drainage units, drainage from engine rooms, neutralised water treatment effluent, condenser cooling water and cooling water screen wash water, and each with emission limit values (ELVs) assigned (EPA, 2004). The proposed surface water discharges/ emissions will be regulated by a new IE Licence or by amendment of the existing IE Licence P0607-02, following a review. Refer to EIAR Volume II, Appendix 12A Flood Risk Assessment, and Appendix 12B Surface Water Drainage Strategy Report.

During the operational phase, the generation of process wastewater could lead to an increase in the overall discharge from the Site and to a pollution risk to the receiving waterbody, the Shannon Estuary. The process wastewater from the production of demineralised water will contain the naturally occurring minerals removed from the mains water. Wastewater will be treated to adjust the pH to neutral range before discharge to the surface water drainage system, and ultimately to sampling point SE3/ outfall 8 and 9. This discharge will be regulated by a new IE Licence or by amendment of the existing IE Licence P0607-02, following a review. The process wastewater generated by the fuel polishing system and wastewater generated from blade washing will be stored in a tank onsite. The waste from the tank will periodically be disposed offsite by road tanker in compliance with the Waste Management Act 1996 (as amended), and associated regulations for disposal. Refer to EIAR Volume I Chapter 16 (Material Assets) and Chapter 18 (Waste Management).

During the operational phase, the foul water generated by the Proposed Development will enter the foul water treatment network proposed on the SSE Tarbert site and will be piped to the new sewage treatment plant, located to the north-west of the proposed demineralisation water tanks. This treatment plant will comprise of a septic tank and trickle filter and will discharge to existing outfall 8 and 9/ SE3. Refer to EIAR Volume III Chapter 5 Figures for more details. The Proposed Development will not lead to an increase in staff and therefore there will be no additional foul water generated and as a result there will be no requirement for increased foul water management at the Site. Therefore, no impact is anticipated as result of this activity on the identified receptors.

Considering the CEMP, pollution of waterbodies by surface water and process water discharges are considered unlikely to occur and should they occur are likely to be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

Accidental pollution of waterbodies by spillages

Any activities carried out close to surface waters involve a risk of pollution because of accidental spillage and leaks. While liquids such as oils, lubricants, paints, bituminous coatings, preservatives and weed killers present the greatest risk, fuel spillages from machinery operating close to waterbodies also present a risk.

Similar to during the construction phase, accidental spillages may potentially result in a direct or indirect impact to surface water should contaminants enter waterbodies directly, in this case, the adjacent Lower Shannon Estuary SAC. This potential for direct adverse impacts on surface water quality is also valid for groundwater quality in the bedrock aquifer and the Ballylongford WFD GWB.

Considering the CEMP, accidental spillages and leaks are considered unlikely to occur and should they occur are likely to be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

Changes to WFD status of waterbodies

The potential impacts on the WFD status of the adjacent Lower Shannon Estuary transitional waterbody, and underling Ballylongford WFD GWB were assessed in EIAR Volume II, Appendix 12C: WFD Screening Assessment.

Considering the CEMP, the WFD Screening Assessment concluded that the Proposed Development is not going to:

- Cause a deterioration in the status of all surface and groundwater bodies assessed.
- Jeopardise the objectives to achieve ‘Good’ surface water/groundwater status.
- Jeopardise the attainment of 'Good’ surface water/groundwater chemical status.
- Jeopardise the attainment of ‘Good’ surface water/groundwater quantity status.

- Permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district.

Changes to groundwater levels, flows and contributions to GWDTEs

The potential impacts on groundwater level, flow and availability during operation that could arise relate to the presence of underground structures, such as foundations or permanent piling required for the Proposed Development. The depths and nature of the proposed underground structures are unknown. However, shallow groundwater is present in the superficial deposits between 1 and 3m bGL and therefore the water table is likely to be intercepted by underground structures.

Altered groundwater flow regimes in the superficial deposits may divert water away from GWDTEs, such as the SAC, or create flow barriers, leading to groundwater level and flow alteration. The magnitude of any change will depend on the depth and nature of the structures. Impacts associated with altered groundwater flow regimes are likely to be localised to the superficial deposits and to Tarbert Island. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the identified receptors.

Changes to flood risk

Drainage networks have the potential to be blocked and lose capacity, which can ultimately lead to surface water flooding.

Considering the CEMP, which includes flood defence infrastructure monitoring and maintenance, surface water flooding is considered unlikely to occur, and should it occur would be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the identified receptors.

Table 12.11: Potential Operation Impacts and Effects (where impact pathways exist)

Potential impact	Impact pathway	Magnitude of impact with embedded mitigation (Section 12.6.1)	Identified receptor (and sensitivity/ importance)	Effect significance with embedded mitigation (Section 12.6.1)
Pollution of water bodies by increased runoff/ discharge	Potential direct linkage as surface runoff	Negligible	Lower River Shannon SAC (extremely high)	**Imperceptible**
Accidental pollution of water bodies by spillages	Potential direct linkage as surface runoff	Negligible	Lower River Shannon SAC (extremely high)	**Imperceptible**
	Potential indirect linkage as recharge via overlying superficial deposits		Bedrock aquifer (medium)	
	Potential indirect linkage as recharge via overlying superficial deposits	Negligible (very localised impact and unlikely to change WFD status)	Ballylongford WFD GWB (extremely high)	
Changes to groundwater levels, flows and contributions to GWDTEs by underground structures	Potential indirect linkage via superficial deposits	Negligible	Lower River Shannon SAC (extremely high)	**Imperceptible**
	Potential indirect linkage via superficial deposits or direct if structures extend into bedrock		Bedrock aquifer (medium)	
	Potential indirect linkage via superficial deposits or direct if structures extend into bedrock		Ballylongford WFD GWB (extremely high)	
Changes to flood risk	Potential direct linkage as surface runoff	Negligible	Proposed Development	**Imperceptible**

12.5.3 Decommissioning Phase

It is expected that decommissioning will take up to one year. Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction phase and are therefore have not been considered separately.

12.6 Mitigation Measures

A range of measures that are standard good practice for development of this type, and which are required to comply with environmental protection legislation, will be implemented. These are well-developed and have been successfully implemented on infrastructure projects across the country and there is a high degree of confidence in their success. They can therefore be treated as embedded mitigation and will include the following measures.

12.6.1 Embedded Measures

Construction Environmental Management Plan

A CEMP has been prepared as part of the planning application, refer to EIAR Volume II Appendix 5A. In advance of work starting onsite, the appointed Contractor will update the CEMP, considering any additional requirements of the Design Team or Planning Regulator in agreement with the planning authority.

The CEMP covers all potentially polluting activities and includes a Site Emergency Response Plan (ERP). All personnel working on the Site will be trained in the implementation of the procedures. Refer to EIAR Volume I, Chapter 19: Major Accidents and Disasters for more detail.

Surface Water Management Strategy

A Surface Water Management Strategy has been prepared as part of the planning application, refer to EIAR Volume II Appendix 12B. The strategy outlines the proposed point of discharge, attenuation (filter drains and geo-cellular storage), SuDS, oil separators and maintenance plan for the management of surface water (rainwater) at the Proposed Development. The proposed drainage system will tie-in with existing drainage infrastructure at sampling point SE3/ outfall 8 and 9, located immediately south of the northern tip of the Site, and which allows disposal of surface water to the estuary. The maintenance required for drainage networks will be carried out in accordance with standard guidance and practice, such as the manufacturer's guidance for maximum efficiency of the oil interceptors.

Proposed Flood Defence Scheme

A flood defence scheme ('Proposed Flood Defence Scheme') was prepared for a previously submitted planning application for power generation on the south-west of the SSE Tarbert site. In 2023, AECOM carried out a review of the Proposed Flood Defence Scheme which concluded that a new flood defence design consisting of flood walls and gates positioned closer to the main elements of the proposed OCGT will be more appropriate for the Proposed Development given its position within the Site. Refer to EIAR Volume II, Appendix 12A and 12B for more detail.

12.6.2 Construction Phase Measures

Pollution Prevention Measures

During all phases of the Proposed Development (construction, operation, and decommissioning), pollution prevention measures, general surface water management and good practice will be adopted, as detailed within the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following:

- The existing surface water management system, such as drains, outfalls and interceptors / separators, will be inspected and confirmed to be in suitable working order prior to any development associated with the Proposed Development commencing on the Site.
- New drainage installations will be installed in early stages of construction and will be used to treat runoff for silt and hydrocarbons early in the programme. Daily weather forecasting will also be used to inform the works schedule, ensuring excavation works do not coincide with high intensity or extreme rainfall events.
- The proposed surface water management system, including existing and proposed infrastructure, will be inspected, and confirmed to be of sufficient capacity to treat any additional water generated by the Proposed Development, including runoff from dust suppression, prior to discharge.
- Washout from power cleaning of drainage lines, oil interceptors or any other pipework which may contain pollutants will be collected and treated. No contaminated washout will be allowed enter any water body or be discharged to ground.
- There will be regular monitoring and prompt maintenance of the overall surface water management system throughout the construction works for the Proposed Development. This will ensure that the drainage system continues to function as designed.
- There will be no direct discharge to any water body at any time during the demolition, construction, or decommissioning phases. All surface water run-off within the Site will be directed to this drainage system.

Sedimentation of Surface Waters

During the construction phase, the mitigation measures will ensure that no sediment contamination, contaminated run-off or untreated wastewater will enter watercourses on or near the Site. These measures are defined in the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following and will be implemented in full:

- Excavations will only remain open for the shortest possible time to reduce groundwater ingress. During site works, sediment mat or silt traps will be placed immediately downstream of any works to reduce silt loss, and these should be inspected and cleaned or replaced regularly.
- Run-off from spoil heaps will be prevented from entering watercourses by diverting it through settlement ponds and removing material off-site as soon as possible to designated storage areas.
- During site works, sediment mats or silt traps will be placed at any drainage crossing points to avoid siltation of channels and, if the need arises, silt fences will be used during the course of works in order to reduce the potential for pollution of watercourses. These will be maintained and cleaned regularly throughout the construction phase.
- Good construction practices will also be used during the construction phase, such as wheel washers and dust suppression on-site roads and at the Site access points.
- Surface water run-off from working areas will not be allowed to discharge directly to Shannon Estuary. To achieve this, the current underground drainage network will be used to collect all run off from impervious surfaces. All design and construction will be carried out in accordance with CIRIA C532 *Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors*.
- Dewatering fluids will be pumped via settlement tanks or collection basins where any solids in the water will settle out.

Fuel and Chemical Handling

During the construction phase, the mitigation measures will prevent spillages to ground and drains of fuels and any subsequent surface water impacts. These measures are defined in the CEMP as embedded mitigation The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following:

- Designate a bunded storage area at the Contractor's compound(s) away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks will be bunded to a volume of 110% of the capacity of the largest tank / container within the bunded area.
- Drainage from the bunded area will be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled so that appropriate remedial action can be taken

in the event of a spillage. When moving drums from the bunded storage area to locations within the Site, a suitably sized spill pallet will be used for containing any spillages during transit.

- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. Spill kit facilities will be provided at the fuelling area in order to provide for any accidental releases or spillages in and around the area. Any used spill kit materials will be disposed of via a hazardous waste contractor.
- All equipment and machinery will be checked for leaks and other potential sources of contaminants before arriving on-site and on a daily basis. Any equipment or machinery likely to introduce to contaminants will not be brought on-site or will be removed from the Site immediately if any leak is discovered. Spill kits will be available to machine operators, and they will be trained in their use.
- The storage of hazardous substances will be necessary during construction. Fuel will be stored at least 50m from a water body and refuelling will only take place in designated areas, on hardstanding by appropriately trained personnel.
- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and / or booms) will be held on-site to facilitate response to accidental spills. Spill response materials will also be stored on all construction vehicles.

Control of Concrete and Lime

During the construction phase, the mitigation measures will prevent uncontrolled runoff containing concrete and lime wash-down and any subsequent surface water impacts. These measures are outlined in the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following:

- No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the Site within 20m of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface.
- Concrete will be used to construct the Proposed Development and will therefore be managed to reduce the potential for pollution. The Contractor will manage and mitigate concrete works ensuring that no concrete is laid during wet weather if achievable, so to reduce the risk of concrete being washed off the Site and into the surface water drains or water bodies.

- Concrete mixing will be undertaken in designated impermeable areas, at least 10m away from a water body or surface water drain to reduce the risk of runoff entering a water body, or the sub-surface, or groundwater environment.

Accidental Spillage, Flooding or Other Emergencies

During the construction phase, the mitigation measures will prevent accidental spillage and any subsequent surface water impacts and will describe the actions to be taken in the event of a possible flood event or site emergency, as outlined in the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following:

- Leaking or empty oil drums will be removed from Site immediately and disposed of via an appropriately licensed waste disposal contractor.
- Spill kits and oil absorbent material will be carried by mobile plant and located at vulnerable locations (e.g., near oil filled equipment). Booms will be held on-site for works near water body/ drains. Spill kits will contain a breakable tie to show use and indicates whether it needs to be replenished. The Site Manager and Environmental Site Representative (ESR) will be responsible for replenishing spill kits.
- The Site ERP will be updated by the appointed Contractor and included in the CEMP and construction workers trained to respond to spillages.
- A copy of the Site ERP will be kept in the Site Emergency Information File (along with other safety emergency preparedness plans) together with the results of any test of the plan.
- Oil interceptors will be installed for refuelling areas; runoff from washing areas that contains detergents which may prevent oil interceptors from working correctly will be prevented from entering oil separators by providing separate designated areas for washing and refuelling.
- Discharge with oils and chemicals from vehicle washing areas will be considered as trade effluent and therefore will be disposed off-site.
- The installation of protective bunds along all water body boundaries and drains during construction will filter contaminants and prevent adverse runoff.
- Any plant, machinery or vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use.

- Any Site welfare facilities will be appropriately managed, and all foul waste disposed of by a licenced contractor to a suitably permitted facility.
- During the construction phase, the Contractor will monitor weather forecasts on a monthly, weekly, and daily basis, and plan works accordingly. The Contractor will describe in the Site ERP the actions it will take in the event of a possible flood event. These actions will be hierarchal meaning that as the risk increases the Contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase.
- Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 50m from the edge of the SAC. A regular log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.
- The coastal flood defences height levels are not to be compromised throughout the construction phase unless formally agreed with the Client and Designer, as this may increase the flood risk and/or risk of bank failure and subsequent flooding.
- Construction material(s), demolition materials and plant/welfare will not to be stored in the flood extents or elevated to minimise the impacts of flooding.
- All temporary works within the flood extents will be designed taking into account a flood impact loading and where possible, the Contractor will choose materials and/or equipment that are flood compatible to minimise the risk if a flood were to occur during any construction works.
- Continuous monitoring of weather conditions and tidal levels including surges will be completed throughout the works period.

Construction Dewatering

Shallow groundwater is present in the superficial deposits at the Proposed Development, such that the water table is likely to be intercepted during excavation works and dewatering activities required to facilitate excavations for the underground electrical connections, drainage infrastructure, as well as any foundations required for the development. The Contractor's CEMP will include a programme of groundwater level and quality monitoring at existing groundwater monitoring boreholes at the SSE Tarbert site and controlled discharge of water abstracted during dewatering. Any discharge of and any

consenting requirements for the discharge of such water, following treatment, will be discussed, and agreed with the EPA prior to the commencement of work.

12.6.3 Operational Phase Measures

Pollution Prevention and Control

During all phases of the Proposed Development (construction, operation, and decommissioning), pollution prevention measures, general surface water management and good practice will be adopted.

The Proposed Development will comply with the Industrial Emissions Directive (IED) [6] under a new IE Licence or an amendment to the existing IE Licence P0607-02, following review, which is required for operation. The IE Licence will set out strict conditions on how the Proposed Development must operate so that any impacts of emissions to air, soil, surface and groundwater, and effects on the environment and human health will be minimised and avoided, where possible.

The Site will be operated in line with appropriate standards and the Applicant will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development is operating to appropriate standards.

Hazard Prevention and Emergency Planning

Measures to prevent the risks of fire, flooding, spillages, or other potentially major incidents will be embedded in the design, as outlined in EIAR Volume I, Chapter 19: Major Accidents and Disasters. Measures that will be implemented to prevent potentially major incidents include the following:

- Compliance with all relevant health, safety, and environmental legislation, including COMAH.
- Design, build and operation in accordance with international, national, and established industry codes, standards, and practice.
- A detailed chemical inventory and risk assessments for all materials handled on-site will be produced in accordance with the requirements of the Chemical Agents legislation.
- All fuels and chemicals stored on-site will be subject to the Safety, Health and Welfare at Work (Chemical Agents) Regulations, as amended by *S.I. No. 231/2021* as well as compliance with the requirements of Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- Regular maintenance and inspections to reduce the risk of equipment failures which could lead to a loss of containment.
- Bunded or double-skinned storage areas for liquid chemicals.

[6] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast)

- Regular maintenance and site housekeeping to reduce the likelihood of leakages and improve leakage detection.
- Spill kits stored on Site.
- The Contractor will develop a Site ERP in accordance with legislative requirements including COMAH and IE Licence, which will include dealing with events such as fires, spillages, flooding etc. Refer to EIAR Volume I, Chapter 19: Major Accidents and Disasters for more detail. Procedures will be in place to clearly outline the responsibilities, actions and communication channels for operational staff and personnel on how to deal with emergencies should they occur. Such measures will be included in the Site operating and management system and regulated by EPA through the IE Licence.

Flood Risk Mitigation

The Proposed Flood Defence Scheme will be implemented to protect the Proposed Development from coastal/ tidal flooding, while the Surface Water Management Strategy will be implemented to mitigate pluvial flood risk to the Proposed Development and ensure that the Proposed Development does not increase the pluvial flood risk to neighbouring properties. Refer to EIAR Volume I, Appendix 12A FRA and 12B Surface Water Drainage Strategy for more detail.

12.6.4 Decommissioning Phase

As outlined in EIAR Volume I Chapter 5 (Description of the Proposed Development), in the event of decommissioning, measures will be undertaken to ensure that there will be no significant, negative environmental effects from the development.

12.7 Residual Impacts

12.7.1 Construction Phase

Considering the implementation of the mitigation measures set out in Section 12.6, the magnitude of construction phase impacts is considered to be negligible, which combined with the importance of the identified water environment receptors would result in an **imperceptible** effect. The residual impact on the water environment is therefore **imperceptible**.

12.7.2 Operational Phase

Considering the implementation of the mitigation measures set out in Section 12.6, the magnitude of construction phase impacts is considered to be negligible, which combined with the importance of the identified water environment receptors would result in an **imperceptible** effect. The residual impact on the water environment is therefore **imperceptible**.

12.7.3 Decommissioning Phase

As outlined in Section 12.5.3, effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction phase and are therefore have not been considered separately.

12.8 Cumulative Impacts

A search of planning applications within 5km of the Site is presented in Table 4.2 of EIAR Volume I Chapter 4. Should these developments be constructed at the same time as the Proposed Development, there is a potential for cumulative effects associated with accidental spills and leaks and the use of concrete and lime on the water environment.

The construction of the TEG project (Planning application ref. EE08.315838) is currently ongoing at the SSE Tarbert site and is due to be completed and operational by the time the construction works associated with the Proposed Development would be commencing. The TEG site will be utilising different discharge points and operated under a new IE Licence for the TEG installation, IE Licence reference P1201-01 (AECOM, 2023b). The BESS application (Planning ref. 20850) will potentially be developed after the decommissioning of the TEG project. The decommissioning of the TEG project is not expected to require ground intrusions. The construction and development of the BESS project will potentially occur at some point after 2028, after and at which point the construction of the Proposed Development would be complete.

If the EirGrid project (Planning Ref. 19115) were to be constructed concurrently with the construction phase of the Proposed Development, there would be limited potential for cumulative impacts with the Proposed Development on the water environment, due to the distance of 1.65km between the sites, and that both sites would be operated under an IE Licence minimising the potential for significant impacts on the water environment.

The EriGrid project (Planning Ref. 23350) is yet to be determined. This project is within the Site of the Proposed Development, and within the SSE Tarbert site. Therefore, there will be strict environmental management in place to ensure CEMPs are in place and adhered to. It is not known if these projects will occur concurrently or if the underground cabling project by EirGrid would commence and be completed before the construction of the Proposed Development would commence. However, as these projects will be within the same Site there will be CEMPs in place for these works to progress, therefore minimising the potential for significant impacts on the water environment.

As reported in Section 12.7, potential emissions to the water environment associated with the Proposed Development will be mitigated to the extent that the impact will not be significant. It is not unreasonable to assume that the committed developments detailed in Table 4.2, which have also gone through the planning process, will also implement standard and best practice mitigation measures to the extent that impacts are not significant. With the proposed control measures implemented at the Proposed Development Site and standard best practice control measures implemented as required on all sites, the **cumulative impact will not be significant**.

12.8.1 Do Nothing Scenario

Should the Proposed Development not be progressed, the baseline condition of the water environment would likely remain much the same and it is unlikely that there would be any significant cumulative impacts on the water environment in the vicinity of the Site as a result of the Proposed Development.

12.9 Summary

During the construction phase, potential impacts include pollution of waterbodies by uncontrolled site runoff, accidental pollution by spillages and mobilisation of existing contaminants, changes to groundwater levels, flows and contributions to GWDTEs by dewatering and changes to flood risk. The significance of effects was assessed following consideration of the embedded mitigation measures – the CEMP, the Surface Water Management Strategy and the Proposed Flood Defence Scheme. The residual impact on the water environment is considered **imperceptible.**

During the operational phase, potential impacts include pollution of waterbodies by surface water, process wastewater and foul water discharges, accidental pollution by spillages, changes to groundwater levels, flows and contributions to GWDTEs by underground structures and changes to flood risk. The significance of effects was assessed following consideration of the embedded mitigation measures. The residual impact on the water environment is considered **imperceptible.**

The potential impacts on the WFD status of the adjacent Lower Shannon Estuary transitional waterbody, and underling Ballylongford WFD GWB were assessed in EIAR Volume II, Appendix 12C: WFD Screening Assessment. Considering the CEMP, the WFD Screening Assessment concluded that the Proposed Development is not going to:

- Cause a deterioration in the status of all surface and groundwater bodies assessed.
- Jeopardise the objectives to achieve ‘Good’ surface water/groundwater status.
- Jeopardise the attainment of 'Good’ surface water/groundwater chemical status.
- Jeopardise the attainment of ‘Good’ surface water/groundwater quantity status.
- Permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district.

It was concluded cumulative effects will be **not significant**.

It is respectfully submitted that the Board is enabled to conclude under this assessment that the Proposed Development will not jeopardise the attainment or maintenance of Good WFD status for surface and groundwater water bodies within the study area and will not cause a deterioration of WFD status for surface and groundwater bodies within the study area.

12.10 References

AECOM (2022). Heavy Fuel Oil Spill Response - Tarbert Generating Station - Soil Sampling. Ref: 60673806_ACM_EN_RP_003 dated 30 June 2022.

AECOM (2023a). T-4 Site Investigation - Tarbert Generating Station, ref: 60707258_ACM_RP_EN_0 dated 01 September 2023, for SSE Generation Ireland Limited.

AECOM (2023b). Technical Amendment Submission, ref: 60697004_ACM_RP_EN_01_Technical Amendment, dated 19 October 2023, for SSE Generation Ireland Limited.

AECOM (2022). 2022 Groundwater Monitoring Report SEE Tarbert Generating Station.

CIRIA (2001). *C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors.*

Department of Housing, Planning, and Local Government (DHPLG) (2018). *River Basin Management Plan for Ireland 2018-2021*.

Environmental Protection Agency (EPA) (2003). *Advice Notes on Current Practice in the preparation of Environmental Impact Statements.*

EPA (2020). *Air Dispersion Modelling from Industrial Installations Guidance Note (AG4).*

EPA (2023). EPA Maps Available at: https://gis.epa.ie/EPAMaps/, accessed June 2023.

EPA (2023). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.*

EPA (2004). *Integrated Pollution Prevention and Control – Proposed Determination of Review of Licence (No. P0607-02).*

European Union (EU) (2000*). Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for the community action in the field of water policy*.

European Union (EU) (2007). *Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks*.

Geological Survey of Ireland (GSI) (2023). *Geological Survey Ireland Spatial Resources*. Available at: https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx , accessed June 2023.

National Road Authority (NRA), 2009. Guidelines on Procedures for Assessment Treatment of Geology, Hydrology and Hydrogeology for National Road Scheme.

NPWS (Department of Arts, Heritage, and the Gaeltacht), 2013. Site synopsis – Lower River Shannon SAC.

URS, 2009. Environmental Site Assessment ESB Generating Station, Tarbert, Co. Kerry Ref: 49341640 Final Issue No 4 dated 6 November 2009.

Working Group on Groundwater, 2004. Guidance on the application of groundwater risk assessment sheets SWRA 1-6 and GWDTERA 1-9 to areas designated for the protection of habitats and species – Guidance document no. GW11.

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