

CHAPTER 17

Material Assets

Shannon LNG Limited
August 2021

Shannon Technology and Energy Park
Environmental Impact Assessment Report

Table of Contents

17.	Material Assets	17-5
17.1	Introduction.....	17-5
17.2	Competent Expert.....	17-5
17.3	Methodology	17-5
17.3.1	Legislation and Guidance.....	17-5
17.3.2	Study Area.....	17-5
17.3.3	Desktop Study	17-6
17.3.4	Determination of Sensitive Receptors.....	17-6
17.3.4.1	Utilities	17-6
17.3.4.2	Land Use and Properties	17-7
17.3.5	Describing Potential Effects	17-7
17.4	Baseline Environment	17-8
17.4.1	Utilities.....	17-8
17.4.1.1	Electricity Network.....	17-8
17.4.1.2	Telecommunications (including Phone and Broadband)	17-8
17.4.1.3	Gas Network	17-8
17.4.1.4	Water Supply Network.....	17-8
17.4.1.5	Drainage Network (Stormwater and Sewerage)	17-8
17.4.1.6	Land Use and Building.....	17-9
17.5	Assessment of Impact and Effect	17-11
17.5.1	Construction and Operational Phase	17-11
17.5.1.1	Electricity Network.....	17-11
17.5.1.2	Water Supply Networks	17-12
17.5.1.3	Telecommunications	17-13
17.5.1.4	Gas Network	17-13
17.5.1.5	Sewerage Networks	17-13
17.5.1.6	Process Effluent	17-14
17.5.1.7	Stormwater Drainage Network.....	17-14
17.5.1.8	Land Use and Buildings.....	17-14
17.6	Cumulative Impacts and Effects	17-15
17.6.1	Construction Phase.....	17-15
17.6.1.1	Grid Connections.....	17-15
17.6.1.2	Data Centre Campus.....	17-16
17.6.2	Operational Phase	17-16
17.6.2.1	Grid Connections.....	17-16
17.6.2.2	Data Centre Campus.....	17-17
17.6.2.3	Additional Developments	17-17
17.6.2.4	Summary.....	17-17
17.7	Mitigation and Monitoring Measures.....	17-17
17.7.1	Utilities.....	17-17
17.7.2	Land Use and Buildings	17-18
17.8	Do Nothing Scenario.....	17-18
17.9	Residual Impacts and Effects.....	17-18
17.10	Decommissioning Phase.....	17-18
17.11	Summary	17-18
17.12	References	17-22

Figures

No table of figures entries found.

Tables

Table 17-1 Sensitivity Criteria.....	17-6
Table 17-2 Examples of Sensitivities Assigned to Different Land Uses and Property Types	17-7
Table 17-3 Summary of Impacts and Effects	17-20

17. Material Assets

17.1 Introduction

This chapter presents an assessment of the potential impacts of the Proposed Development on Material Assets. This chapter defines the study area; the methodology used for developing the baseline and impact assessment; provides a description of the baseline environment; and presents the findings of the impact assessment.

The Environmental Protection Agency's draft '*Guidelines on the information to be contained in an Environmental Impact Assessment Reports*' (2017) describes Material Assets to be taken to mean 'built services' (i.e. Utilities networks including electricity, telecommunications, gas, water supply infrastructure and sewerage), 'waste management' and 'infrastructure' (roads and traffic).

This chapter presents an assessment of the potential impacts of the Proposed Development on built services, as well as infrastructure: land use and buildings (on the Proposed Development site). Chapter 11 discusses the assessment of roads and traffic and Chapter 16 discusses waste and as such these topics are not considered in this chapter.

17.2 Competent Expert

This assessment has been undertaken by Niamh O'Connell, Associate Director Environment and Sustainability, BA (Mod) Eng, H dip Env Eng, MSc, PM, MEnvSc CSci. Niamh is a Chartered Scientist and Associate Director in the AECOM Environment and Sustainability Team and has more than 16 years' post-graduate experience. She has extensive experience of managing environmental issues on major projects for both public and private sector clients taking projects from feasibility through EIAR, the planning process and later through detailed design and construction phases.

17.3 Methodology

The methodology used to assess impact on built services is in accordance with the draft '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (EPA, 2017) and as summarised in Chapter 01 – Introduction.

17.3.1 Legislation and Guidance

The legislation and guidance applicable to the material assets assessment include:

- Directive 2011/ 92/ EU of the European Parliament and the Council on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/ 52/ EU (the 'EIA Directive');
- *European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018)*;
- EPA Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (2003); and
- EPA's draft guidance document '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (2017).

17.3.2 Study Area

The study area is the Proposed Development site (Chapter 02 – Project Description), as well as the surrounding area in relation to utilities networks and land use that could be impacted by the Proposed Development. This study area has been used for the assessments associated with the utilities, land use and property impact assessment and is referred to herein as the material assets study area.

17.3.3 Desktop Study

A desktop assessment of client provided and publicly available information was undertaken to determine the baseline utility arrangements and existing land uses within the study area which could be impacted by the Proposed Development.

Data gathered included:

1. Location and description of existing utilities network;
2. Location and number of properties at risk of demolition, or from which land will be required/ access affected by the Proposed Development;
3. Existing land uses in the study area; and
4. Land registry maps;

For the utilities assessment, the information reviewed included site utility plans and preliminary design information. The Applicant/ AECOM consulted with EirGrid, the Commission for Regulations of Utilities (CRU), Irish Water, Gas Networks Ireland (GNI) and Electricity Supply Board Networks (ESBN) during the design of the Proposed Development.

The Applicant has made the following utility connection requests:

1. A connection request to export up to 600 MW of power to the electricity transmission system. The application was made to EirGrid under the Enduring Connection Process (ECP) 2.1 process;
2. A connection request to import up to 10 MW of power from the electricity transmission network. The application was made to ESBN; and
3. A connection request to the municipal water supply system. The application was made to Irish Water.

Offers have not been received yet for these connection applications.

17.3.4 Determination of Sensitive Receptors

The sensitivity of the existing environment can be determined by describing changes to the environment that could limit the access to, or use of, the material asset (EPA, 2003). For the purpose of this assessment, the sensitive receptors are regarded as the existing utilities networks infrastructure in the study area. Terminology used to describe the sensitivity of the receptor is as per the draft 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, 2017).

17.3.4.1 Utilities

Examples of the sensitivities used for existing utilities infrastructure within this chapter are outlined in Table 17-1.

Table 17-1 Sensitivity Criteria

Sensitivity	Description
High	<ul style="list-style-type: none"> • Electricity network 220 kV and above. • Transmission gas pipeline (high pressure).
Medium	<ul style="list-style-type: none"> • Distribution gas network (medium pressure). • Electricity network 38 kV and 110 kV.
Low	<ul style="list-style-type: none"> • Low pressure gas pipeline. • Low/ medium voltage electricity network 230 v and 400 v. • Telecommunications network. • Water supply network. • Drainage network including foul sewerage.
Negligible	N/A

17.3.4.2 Land Use and Properties

Criteria used when applying a sensitivity for land use and properties within this chapter are outlined in Table 17-2.

Table 17-2 Examples of Sensitivities Assigned to Different Land Uses and Property Types

Sensitivity	Description
High	<ul style="list-style-type: none"> Private residential buildings, or land allocated for development of housing. Buildings used for employment use, and land allocated for development of employment uses. Regularly used community buildings which have only limited alternatives available nearby. Designated public open spaces, or open spaces which attract users nationally e.g. national parks
Medium	<ul style="list-style-type: none"> Land associated with private residential buildings e.g. gardens. Community buildings which are regularly used or where there are only limited alternatives available in the local area. Open spaces which span over a regional area and attract visitors from a regional catchment e.g. country parks, forests. Public rights of way and other routes close to communities which are used for recreational or utility purposes, but for which alternative routes can be taken.
Low	<ul style="list-style-type: none"> Community buildings which are infrequently used or where there are many alternatives available in the local area. Open spaces which are used for informal recreation (e.g. dog walking), and where there are alternative open spaces available. Locally used community land e.g. local parks and playing fields. Property consisting of public road/ private road and small plots of land.
Negligible	<ul style="list-style-type: none"> Derelict or unoccupied buildings.

17.3.5 Describing Potential Effects

A development could impact existing utilities networks if it involves any of the following:

- Demolition of a utility;
- Diversion of a utility;
- Modification of a utility;
- Connections to existing infrastructure; and
- Additional demand on existing supply.

Impacts from a development on existing land use and buildings can include:

- Acquisition of land;
- Changes to accessibility and severance;
- Demolition of buildings; and/ or
- Revaluation of or change in the development potential of adjoining lands/ buildings.

The methodology used for evaluating impact levels and the terminology for describing the quality, significance, extent, probability and duration of effects is as per the draft '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (EPA, 2017) and as summarised in Chapter 01 – Introduction. In summary, it involves combining a sensitivity of a receptor with a description of an impact on that receptor (its quality, type, frequency, duration, probability and magnitude) to determine a significance of an effect.

17.4 Baseline Environment

17.4.1 Utilities

Please see Figure F17-1, Vol. 3 for an overview of the proposed 220 kV and medium voltage (10/ 20 kV) cable routes and substations.

17.4.1.1 Electricity Network

There is no electricity network infrastructure within the boundary of the Proposed Development site. The following infrastructure is located nearby, principally under the L1010, close to the entrance of the Proposed Development site.

- High voltage (HV) 220 kV, 110 kV cable route; and
- Medium voltage (MV) 38 kV and 20 kV cable route.

There is HV electricity grid in close proximity to the Proposed Development site. A 220 kV and 110kV electrical transmission is available from the nearby Kilpaddoge 220 kV substation approximately 3 km east of the study area. Additional electrical substations in the vicinity of the Proposed Development include the 590 MW Tarbert Power Station approximately 6 km from Proposed Development site and the 855 MW coal-fired station at Moneypoint 3.5 km north east of the Proposed Development. Tarbert Power Station is scheduled to close by the end of 2023 and Moneypoint is scheduled to close in 2025 (EirGrid and Soni, 2020).

The Kilpaddoge-Knockanure Project is a new EirGrid project which looks to install an underground electricity cable linking Kilpaddoge and Knockanure substations. This project aims to strengthen the transmission network in the south west of Ireland. The project is currently ongoing, and expected to be completed and the cables put into service in 2021 (Gas Networks Ireland, 2021).

17.4.1.2 Telecommunications (including Phone and Broadband)

An existing overhead telecom line (Eir phone line) runs along the L1010 road. There are no broadband connections within the footprint of the Proposed Development site. The closest fibre broadband infrastructure is located in Ballylongford, 3.5 km from the Proposed Development site.

17.4.1.3 Gas Network

There is no existing natural gas transmission network within the footprint of the Proposed Development site. A GNI owned gas transmission pipeline is located approximately 26 km from the Proposed Development site at its nearest point. The pipeline has a diameter of 762 mm (30 inches) and runs from its landfall on the south side of the estuary to the west and south of Foynes along its route to Craggs Above Ground Installation (AGI) (Gas Networks Ireland, 2021).

Planning permission exists for the development of a 26 km natural gas pipeline which will facilitate the connection of the Proposed Development site to the GNI transmission system at Foynes in Leahys, Co. Limerick.

17.4.1.4 Water Supply Network

Currently there is a group water scheme, supplied from Ballylongford, that extends to a distance of about 150 m beyond the entrance to the Proposed Development site. The condition of this water main is uncertain.

Ballylongford, which is approximately 3.5 km west of the Proposed Development site, is served by the Listowel Regional Water Supply with adequate water supply. Tarbert, which is approximately 4.5 km east of the Proposed Development site is designated as a District Town of the Listowel Municipal District. It is served by both the Listowel Regional Water Supply with adequate capacity and Tierclea spring, which has no additional capacity (KCC, 2020).

17.4.1.5 Drainage Network (Stormwater and Sewerage)

There are no existing piped stormwater or sewerage drainage systems within the footprint of the Proposed Development site, or along the L1010 adjacent to the Proposed Development site.

A wastewater treatment plant (WWTP) operated by Irish Water is located in Tarbert in proximity to Harold's Bridge to the south of Tarbert settlement. The treatment plant has a capacity of 1,300 Population Equivalent (P.E) (KCC, 2020).

A survey conducted by Irish Water inspected the existing foul network for the Tarbert area. It concluded that the existing sewerage is a partially combined system consisting of the following (Irish Water, 2014):

- 2,372 m of 100 mm and 150 mm diameter sewers;
- 2,261 m of 225 mm diameter sewers;
- 56 m of 300 mm diameter concrete sewers; and
- 23 m of 450 diameter sewers.

The WWTP serving Ballylongford has a capacity of 1,000 P.E, however, network constraints are known to exist in Ballylongford. According to the Listowel Municipal District Local Area Plan (LAP) 2020-2026, Irish Water intend to prepare a drainage area plan for the Ballylongford settlement (KCC, 2020), which is currently under review by Irish Water.

17.4.1.6 Land Use and Building

As outlined in Chapter 05 – Land and Soils, the Proposed Development site is located on the southern shore of the Shannon Estuary and predominantly comprises grassland, with minimal infrastructure in place.

The Proposed Development is in a predominantly agricultural area, with the following surrounding land uses noted:

- Immediately to the north is the Shannon Estuary;
- To the east is forestry and agricultural land;
- To the south is agricultural land and the L1010, with scattered residential properties; and
- To the west is agricultural land, beyond which is coastline.

The lands within the Proposed Development site are currently leased and in agricultural use, mainly in pasture with some tillage.

A small stream runs in a north-westerly direction through the Proposed Development site and discharges into the Shannon Estuary.

According to the latest Kerry County Development Plan 2015 – 2021 (KCC, 2015), the Proposed Development site is zoned for '*marine-related industry, compatible or complimentary industries and enterprises which require deep water access*' and 'Secondary Special Amenity'. The lands are accessed by the L1010 coast road. Widening works on the L1010 by KCC are ongoing, and it anticipated these will be complete prior to main construction works onsite.

There are a number of disused and unoccupied buildings within the Proposed Development site (see Figures F12-2 to F12-4, Vol. 3), including a derelict set of buildings which now appear used as agricultural outbuildings. It is intended that these will be demolished and removed during the initial stage of construction. Please see Chapter 12 – Cultural Heritage for additional information.



Figure 17-1 Utilities

17.5 Assessment of Impact and Effect

17.5.1 Construction and Operational Phase

Where pipe laying and connection to public utilities are required for the Proposed Development, tie-ins to public utilities for the construction phase will be specifically designed and installed following approved methods, and with the agreement of the relevant utility provider.

Utilities will likely come onsite from cables/ pipes under the L1010 and traverse along the side of the Proposed Development site access road before connecting into the infrastructure onsite.

17.5.1.1 Electricity Network

Construction

The Power Plant will have an installed capacity of up to 600 MW and will be designed in accordance with best available techniques (BAT) for large combustion plants, industrial cooling systems, energy efficiency and emissions from storage.

As there is no existing supply (See Section 17.3.1.1), during the construction phase of the Proposed Development, electricity will be supplied via a series of portable site diesel generators, until the 220 kV and medium voltage (10/ 20 kV) grid connections are installed (subject to a future planning application), as discussed in Chapter 02 – Project Description. Therefore, there will be no impacts on the existing electricity supply network.

Operation

It is anticipated that once operational approximately 10 MW of electricity generated by the Power Plant will be supplied to the LNG Terminal. During periods of high wind (renewable) generation it is expected that the Power Plant will be turned off by the system operator (EirGrid) to give priority to renewable power. In this event, the LNG Terminal will require power. In times when the Power Plant is shut down, power may be imported to the Proposed Development site via the proposed future 220 kV high voltage grid connection.

However, it is currently anticipated that the LNG Terminal will be operational before the Power Plant and the 220 kV grid connection are completed. Therefore, a medium voltage (10/ 20 kV) grid connection will be required to supply power to the LNG Terminal to provide approximately 10 MW of power to the LNG Terminal while awaiting the completion and availability of the Power Plant and/ or 220 kV HV grid connection. The medium voltage (10/ 20 kV) grid connection will be reserved as a backup power supply during periods when the Power Plant is shut down for maintenance.

A connection request for the 220 kV connection was made to EirGrid in September 2020 under the Enduring Connection Process (ECP) 2.1 process. A connection request to import up 10 MW of power from the electricity transmission network was made to ESBN in April 2021.

Therefore, there could be a temporary, negative effect on the existing electricity network as a result of the future medium voltage (10/ 20 kV) and 220 kV grid connections during times where the Power Plant is not operational.

However, although the medium voltage (10/ 20 kV) and 220 kV connection are both subject to separate connection agreements with EirGrid and ESBN respectively, and will be assessed under a separate planning application, overall it is anticipated that if the 220 kV grid connection is approved and consented, the Power Plant will likely have a **long-term, positive, high and very significant** effect on the existing electricity supply network (**high** sensitivity). As outlined in Chapter 02 – Project Description, the 220 kV GIS substation, which forms part of the Proposed Development, will accept the 220 kV output from each CCGT Block and BESS in the Power Plant and connect to the national electricity grid via the future proposed 220 kV grid connection. Electricity generated by the Power Plant (up to 600 MW) will be for sale to the integrated Single Electricity Market (iSEM). These future projects are considered further under cumulative impacts in Section 17.6.

Onsite gas power generators may also be used to power the LNG Terminal until the Power Plant is operational or until the medium voltage (10/ 20 kV) connection is approved and operational. The Applicant has submitted an application to ESBN networks (ref number 50000446571) for the medium voltage (10/ 20 kV) connection. When available, these onsite gas generators will be utilised as backup

power supply; for example, if the proposed future medium voltage (10/ 20 kV) and/ or 220 kV grid connections fail or are unavailable due to maintenance works. Potential impacts arising from the operation of these gas generators is outlined in Section 17.4.1.4.2.

Once operational, the Power Plant will generate power for its own needs via gas turbines utilising gas from the nearby LNG Terminal and will not require a supply from the existing electricity network to meet its power demands. The FSRU will also be self-sufficient in terms of producing the necessary electricity, for example, to power pumps and regasification equipment, for auxiliary systems and for staff accommodation. Generators onboard will be powered by dual-fuel engines which will use boil-off natural gas (BOG) from the LNG storage tanks as main fuel. Therefore, there will be no additional demand on the existing electricity supply network.

17.5.1.2 Water Supply Networks

Construction Phase

As detailed within Chapter 02 – Project Description, water supply will be required in the contractor compounds, wheel wash areas, welfare facilities, for general construction works, hydrotesting of tanks and pipework, for the construction of the concrete elements and for dust suppression during construction. The maximum potable water demand for construction personnel will be 98 m³/day. It is anticipated that water supply for the construction phase will be obtained from a water main along the L1010. The Applicant has submitted a pre-connection agreement application to Irish Water for this supply. If this supply is not available, water will be delivered by road and stored in a temporary tank onsite. The Proposed Development will incorporate water efficiency measures such as collection of grey water to minimise water consumption as far as possible.

It is not anticipated the additional demands on the water supply network during the construction phase will be excessive given the transient nature of the works; therefore, the additional demands will likely result in a **negative, short-term** and **medium** effect on an existing environment of **low** sensitivity; therefore, the significance of the effect on the existing water supply will be **moderate**.

The Applicant has submitted a pre-connection agreement application to Irish Water for this supply and for supply during operational phase. The temporary and/ or permanent connection works associated with connecting the Proposed Development site to the water main may temporarily disrupt services in the local area. However, this will be dependent on requirements from Irish Water, which will be set out in the connection agreement during the connection works. The water supply system will be metered to determine water consumption and facilitate leakage detection and will be in accordance with Irish Water requirements. The impact will likely result in a **negative, short-term, medium** effect on the existing water supply network of **low** sensitivity; therefore, the significance of the effect on the existing water supply network will likely be **moderate**.

See below section for potential effects from the additional demands on the existing supply network during the operational phase.

Operational Phase

As outlined above, to facilitate the water demand for the Proposed Development during operation, a new permanent water supply via a connection to the existing water supply infrastructure will be required during operations. The anticipated demand is as follows:

- Domestic Site Staff – 3.6 m³/day;
- Process Water – Ranging between 10 m³/hr and 33 m³/hr; and
- Fire water supply – non-continuous - to fill or top up onsite firewater storage tanks periodically.

Irish Water have confirmed that there is sufficient capacity to supply human drinking water and process water to the Proposed Development. It is anticipated that this will be provided along the Coast Road from Ballylongford to the Proposed Development site (see Chapter 02 – Project Description). The Proposed Development has been developed to minimise water consumption. The Proposed Development will adhere to all conditions of the connection offer from Irish Water.

As a result, it is anticipated that the additional demands on the existing water supply network during operation will likely be result in a **long-term, negative** and **low** effect on existing supply network (**low** sensitivity). The effect significance is therefore considered **slight**.

17.5.1.3 Telecommunications

Construction

Telecommunications requirements during the construction phase will be covered by mobile phone/broadband networks. It is not anticipated that the Proposed Development will impact or disrupt the existing telecommunication networks in the study area.

Operation

The Proposed Development supply will require a connection to a broadband network. It is anticipated that it will be serviced by a new fibre cable which will be supplied via a new duct under the widened L1010.

17.5.1.4 Gas Network

Construction

No requirement for natural gas is anticipated during the construction phase; therefore, there will be no impacts on the existing gas transmission network in the study area.

Operation

As outlined in Chapter 02 – Project Description, the Proposed Development will include onsite backup power generation capacity of up to 24 MW to power the LNG Terminal until the Power Plant is operational. The onsite power generation will consist of three 8 MW gas fired electricity generators. The fuel gas for these generators will be supplied primarily from gas from the FSRU. However, if there is no gas from the FSRU, for example if the FSRU is temporarily disconnected due to a storm (this is estimated to be about 1% of the time over the year), the generators may be powered by gas which will be reverse flowed from the already consented 26 km natural gas pipeline (known as the 'Shannon Pipeline') between the AGI and the existing GNI national gas transmission network near Foynes, Co. Limerick. This will supply power for the control room, warehouse and administrative building.

The generators will supply power for the LNG Terminal until grid power is available and in the event that both of the LNG Terminal's grid connections fail, as the LNG Terminal will need to be operational 24/7.

Consultation has been undertaken with GNI, who has confirmed that subject to a valid connection agreement being put in place, the consented pipeline connection to the existing gas transmission network near Foynes will be facilitated and potential gas demand from the LNG Terminal will be accommodated with current the network capacity. Therefore, it is anticipated that the Proposed Development will have a temporary, **neutral, negligible** and **not significant** effect on the existing gas supply network (**high** sensitivity), during occasions where there are interruptions to LNG deliveries.

Natural gas will be supplied to the Power Plant from the LNG Terminal. The Power Plant will use up to 2.7 million Sm³ per day of natural gas when operating at full capacity, and the LNG Terminal will have sufficient capacity to meet this demand. Therefore, there will be no requirement to utilise gas from the existing network and as a result, there will be no impact on the existing gas network. However, if there is no gas from FSRU, for example if the FSRU is temporarily disconnected due to a storm, the Power Plant may be powered by fuel gas which will be reverse flowed from the already consented 26 km natural gas pipeline (known as the 'Shannon Pipeline' between the Proposed Development site and the existing GNI national gas transmission network near Foynes, Co. Limerick).

During the operational phase, it is likely that there will be a **long-term, positive** and **high** effect on the existing gas network (**high** sensitivity) as the Proposed Development will facilitate an additional/alternative supply of natural gas into the national grid, reducing Ireland's reliance on deliveries through the UK gas interconnector. This will result in a **very significant** improvement in terms of security of supply of natural gas into the existing supply network, and overall improve Ireland security of supply of energy. The Proposed Development may supply up to 22.7 million Sm³/d of natural gas to the Irish gas transmission system via the already consented 26 km Shannon Pipeline.

17.5.1.5 Sewerage Networks

Construction

As outlined in Section 17.3.5, there is no existing piped stormwater drainage system on the Proposed Development site. As a result, during the construction phase sewage effluent arising from facilities within the construction compound, will be collected in tanks and portable self-contained toilet units for removal by tanker to a licensed water treatment plant.

Therefore, there will be no impacts from sewerage drainage arising from the Proposed Development on drainage networks as there is currently no piped network on the Proposed Development site.

Operation

As outlined in Chapter 02 – Project Description, during the operational phase, all foul water will be pumped or fall by gravity to a wastewater treatment plant (WWTP). The treated effluent from the WWTP will be discharged to the Shannon Estuary via the same discharge point as the surface water. All sanitary effluent arising onboard the FSRU will be retained onboard and discharged ashore via vacuum lorry and transferred to a licensed site by licensed waste operator. Estimated operational waste quantities are provided in Table 2-8 of Chapter 02 – Project Description.

Therefore, there will no impacts from sewerage drainage arising from the Proposed Development on drainage networks in the study area as there is no piped network on the Proposed Development site.

17.5.1.6 Process Effluent

There will be several process effluent streams generated in the Power Plant as outlined in Chapter 02 – Project Description. There will be no process wastewater from the onshore LNG Terminal and AGI. All process water discharge will be pumped to the effluent sump, and then discharged, via the storm water outfall pipe, to the Shannon Estuary. Therefore, there will no impacts from process effluent arising from the Proposed Development on drainage networks in the study area.

Please see Chapter 06 – Water for assessment of potential impacts from process effluent on receiving watercourses.

17.5.1.7 Stormwater Drainage Network

Construction

There are no existing piped stormwater drainage systems within the footprint of the Proposed Development site or along the L1010 (Section 17.3.1.5). During the construction phase, stormwater runoff will be diverted from the main construction area by a combination of suitable falls on subgrade surfaces, as well as temporary drainage ditches. All runoff will then be passed through a series of settlement and filtration ponds in order to remove any suspended solids, before being discharged to the Shannon Estuary. Therefore, in addition to the fact there are currently no stormwater drainage networks in the study area, there will no impacts from stormwater runoff arising from the Proposed Development.

Please see Chapter 06 – Water for assessment of potential impacts from stormwater drainage on receiving watercourses.

Operation

During the operational phase, it is proposed that all stormwater from vegetated and impermeable areas and groundwater from the groundwater drainage network of the Proposed Development site will be collected and discharged, where possible, to the existing stream/ drainage ditches, or discharge directly to the Shannon Estuary via the drainage outfall pipe, which will extend across the foreshore to the below the low water mark (see Chapter 02 – Project Description and Chapter 06 – Water for more detail). The drainage features along the access road all ultimately drain to a single surface water course, the Ralappane Stream, which discharges into the Shannon Estuary. Therefore, in addition to the fact there are currently no stormwater drainage networks in the study area, there will no impacts from stormwater runoff arising from the Proposed Development.

Please see Chapter 06 – Water for assessment of potential impacts from stormwater drainage on receiving watercourses.

17.5.1.8 Land Use and Buildings

The Applicant has entered into an agreement with the owner of the Landbank (Shannon Commercial Properties (DAC) for the purchase of the entire Shannon Landbank. The Shannon Landbank has a total area of 243 ha (603 acres). The Proposed Development requires 41 ha of this 243 ha. The total site area including the offshore elements is 52 ha.

An abandoned farmhouse and a ‘pillbox’¹ structure (within the Proposed Development site will need to be demolished to facilitate the construction of the Proposed Development. Refer to Chapter 12 –

¹ It is described as ‘a detached single-bay single-storey hexagonal pill box, built approximately 1942, now derelict. Flat concrete roof. Concrete walls with rubble limestone camouflage covering. Square-headed chamfered openings. Square-headed door

Cultural Heritage for more details and the location of identified cultural heritage assets. There will likely be a **permanent, neutral and negligible** effect due the demolition of the farm buildings as these are currently unoccupied and derelict (**negligible** sensitivity); therefore, the effects on existing buildings will be **imperceptible**. Please see Chapter 12 – Cultural Heritage for additional information on effects from the Proposed Development on existing buildings/ structures within the Proposed Development site.

As outlined in Section 17.3.1.6, the lands are currently zoned for industry, are identified as a strategic development location and are currently owned for the purpose of Proposed Development; however, the lands are currently leased to local farmers and the Proposed Development will impact on the existing agricultural land use. The effects from the removal of land from agricultural use is assessment in Chapter 05 – Land and Soils.

17.6 Cumulative Impacts and Effects

Cumulative effects are defined as the combination of many minor impacts creating one, larger, more significant effect (EPA, 2017). Cumulative effects consider existing stresses on the natural environment as well as developments that are underway and in planning.

This cumulative assessment has been undertaken with reference to Appendix A1-5, Vol. 4, which lists planning applications within 5 km and outside 5 km of the Proposed Development.

There are three future possible developments associated with the Proposed Development, which will form part of the future 'Shannon Technology and Energy Park' as described in Chapter 02 – Project Description and shown on the masterplan in Figure F1-1, Vol. 3:

1. Medium voltage (10/ 20 kV) grid connection;
2. 220 kV grid connection; and
3. Data Centre Campus.

These are also considered in the cumulative impact assessment.

17.6.1 Construction Phase

As outlined in Section 17.4, there will be no additional demands on the electricity, gas and telecommunications network during the construction phase of the Proposed Development. The Contractor may require a temporary connection to the existing water supply network; however, anticipated demands from the Proposed Development on existing water supply networks during the construction phase will not be excessive, as discussed above, and will not likely result in significant effects. Irish Water have been consulted in relation to provision of these services for the Proposed Development and have not signalled any difficulty with the proposed resources required.

Based on the review of the tables in Appendix A1-5, Vol. 4, there are no notable planning applications that will significantly increase demand on utilities supply networks utilised during the construction phase. Therefore, the cumulative effects of the Proposed Development on existing utilities networks with other surrounding permitted, planned and existing developments listed in Appendix A1-5, Vol. 4 will likely not be significant during the construction phase.

17.6.1.1 Grid Connections

Provided that the medium voltage (10/ 20 kV) and 220 kV grid connections are consented, the construction phases may coincide with the construction of the Power Plant. During the construction phase of these projects, there may be negative cumulative effects on the existing water supply, telecommunications and gas networks due to additional demands on these networks to facilitate their construction. However, the supply requirements are unknown at this stage. In addition to this, any required temporary connections by the Contractor will be conducted in consultation with the relevant service provider. Therefore, effects on the existing networks will be temporary, and as a result, negative and significant cumulative effects are not anticipated during the construction phase.

During the construction phase, the final connection of the proposed 220 kV grid into Kilapddoge may require an outage of the local 220 kV transmission system. However, it is anticipated that the

opening. Built within a field boundary. A typical WWII era pill box, of functional design. It remains in good condition due to its simple Design' (Laban, 2008).

construction and commissioning programme will be aligned with the standard EirGrid outage season which normally runs between April and September. In addition, works within the L1010 will be scheduled to avoid disruption to the local school between the site and Kilpaddoge. Therefore, this new electrical connection should have no impact or disruptions to the national grid during connection works.

17.6.1.2 Data Centre Campus

The third future project associated with the Shannon Technology and Energy Park is a Data Centre Campus that is proposed to be located in lands southwest of the Proposed Development. However, the Proposed Development and the Data Centre Campus will not be constructed simultaneously and there will likely be no cumulative impacts on existing utilities network during the construction phase associated with these developments.

17.6.2 Operational Phase

17.6.2.1 Grid Connections

The three future developments associated with the Proposed Development could also result in cumulative impacts on the existing electricity network during their operation.

Anticipated demands from the Proposed Development on existing utilities networks during the operational phase will not be excessive, as discussed in Section 17.4.1, and will not likely result in significant effects. The relevant service providers (Irish Water, ESBN, EirGrid, GNI and broadband suppliers along with KCC) have been consulted in relation to provision of these services for the Proposed Development and have not signalled any difficulty with the resources required.

It should also be noted that the 600 MW Power Plant will not be operational all year round and will see frequent periods where it is instructed to shutdown down by the system operator, EirGrid. This is because under current grid rules, renewable generation is given priority to generate ahead of gas fired generation i.e. Shannon Technology and Energy Park's 600 MW Power Plant. However, the LNG Terminal will need to be operational all year round.

As outlined in Chapter 02 – Project Description and Section 17.4.1, a high voltage 220 kV electrical connection to the national electrical transmission system will be required to export power from the Power Plant. An offer has yet to be received so the precise connection details cannot be confirmed at the time of writing. However, it is expected that the connection point will be the ESBN/ EirGrid Killpaddogue 220 kV substation which is approximately 5 km east of the Proposed Development site with the connection method being 220 kV cable(s) under the L1010 road.

It is expected that the 220 kV connection will also require an onsite ESBN/ EirGrid 220 kV substation and this is currently proposed to be located approximately 500 m from the main Proposed Development site entrance. This ESBN/ EirGrid 220 kV site substation will be included with the future 220 kV connection planning application and will be adopted by EirGrid post commissioning and will form part of the overall 220kV transmission system. Electricity generated by the Power Plant (up to 600 MW) will be for sale to the integrated Single Electricity Market (iSEM) via the proposed future 220 kV connection.

The onsite ESBN/ EirGrid 220 kV substation will also connect to the Power Plant 220 kV GIS substation, which forms part of this Proposed Development. As outlined in Section 17.4.1.1, in times when the Power Plant is shut down, power will be imported to the Proposed Development site via the proposed future 220 kV high voltage grid connection. However, this will be subject to a connection agreement with EirGrid. A small amount (approximately 20 MW) of the electricity generated by the Power Plant will be used in the LNG Terminal, and in the operation of the Power Plant itself. The balance of the electricity produced is intended for the market and will be sold into the integrated Single Electricity Market (iSEM).

The LNG Terminal may need to be operational before the Power Plant and/ or 220 kV high voltage grid connection are completed or operational. Therefore, the LNG Terminal will require a separate medium voltage (10/ 20 kV) connection to power the LNG Terminal in the absence of the Power Plant and/ or 220 kV high voltage grid connection. Once the Power Plant and/ or future 220 kV grid connection are completed, this medium voltage (10/ 20 kV) grid connection will be reserved as a backup power supply. However, this is subject to a connection agreement with ESBN and will be assessed under a separate planning application. Please see Chapter 02 – Project Description for further details.

17.6.2.2 Data Centre Campus

The Data Centre Campus will result in additional demands on the existing electricity grid. However, this will be subject to BAT, as well as its own licence and planning application; therefore, the power demands are unknown at this stage.

17.6.2.3 Additional Developments

In addition to the future developments associated with the LNG Terminal and Power Plant, a 1.4GW offshore wind farm using floating technology is proposed off the coast of Clare and Kerry, with Moneypoint power station set to become the base for the renewable energy project. A windfarm in the Townlands of Aghanagran Middle, Aghanagran Lower, Ballyline West, Tullahennell South, Ballylongford, Co. Kerry (planning application: 304807-19), located within 5 km from the Proposed Development site has also been proposed. There are also a number of solar farm developments proposed, which are located further than 5 km from the Proposed Development site.

It is anticipated that effects on the existing grid network in combination with the future Shannon Technology and Energy Park, will result in a **positive** and **very significant** cumulative effect.

During the operational phase of the aforementioned projects, there could also be cumulative effects on the existing water supply, telecommunications and gas networks due to additional demands on these networks. However, the supply requirements are unknown at this stage. In addition to this, any required connections will be conducted in consultation with the relevant service provider. Therefore, long-term, negative, and significant cumulative effects are not anticipated.

Based on the review of Appendix A1-5, Vol. 4, there are no other notable planning applications that will significantly increase the pressure on utilities networks utilised during both the construction and operational phase of these developments.

17.6.2.4 Summary

However, despite the limited additional demands on the existing electricity supply network associated with the developments of the future 'Shannon Technology and Energy Park', overall it is anticipated that the effects from these future developments, in combination with effects from the Proposed Development, will likely result in a **positive** and very **significant** cumulative effect on the existing electricity supply network due to the amount of electricity generated that could be generated and sold onto the national grid network (i.e. up to 600 MW).

17.7 Mitigation and Monitoring Measures

17.7.1 Utilities

Although it has been determined that the effects identified during the assessment on the existing utilities network in the study area will likely be not significant or imperceptible during the construction phase, the following best practice measures will be implemented by the Contractor during the construction phase:

- The Contractor will be obliged to put measures in place during the construction phase to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with the relevant service provider and local authority. When service suspensions are required during the construction phase, reasonable prior notice will be given to the residents in the area. The disruption to services or outages will be carefully planned so the duration is minimised. The timing of local domestic connections will be addressed between the Contractor and the local community at the detailed design stage;
- Works during the construction phase, including service diversions and realignment will be carried out in accordance with relevant guidance documents, including Gas Networks Ireland's publication 'Safety advice for working in the vicinity of natural gas pipelines'; the ESB's Code of Practice for Avoiding Danger from Overhead Electricity Lines', 2008 and the Health and Safety Authorities (HSA) 'Code of Practice for Avoiding Danger from Underground Services', 2010;
- All potential temporary connections will be agreed in advance with the relevant service provider; and
- Periodic water quality monitoring at point of supply.

During the operational phase, all conditions specified by Irish Water will be adhered to, therefore no additional mitigation or monitoring measures are required.

There will be no requirement for additional mitigation or monitoring measures during the operational phase.

17.7.2 Land Use and Buildings

No mitigation or monitoring measures have been proposed.

17.8 Do Nothing Scenario

If the Proposed Development did not proceed, there will be no change to the existing material assets.

17.9 Residual Impacts and Effects

With the implementation of best practice measures outlined in Section 17.5, the Proposed Development could still require a temporary suspension of services to facilitate the connection works to the water supply network during the construction phase; however, the residual effect significance on existing utilities network will likely be reduced to **slight** during the construction phase as consultation with service providers will ensure the disruption to services or outages will be carefully planned so the duration is minimised.

The effects from the additional demands on existing water supply will likely remain **negative, short-term medium** and **moderate** during the construction phase.

No utilities mitigation measures have been proposed during the operational phase of the Proposed Development. The effects on the existing gas and electricity supply network will likely remain **long-term, positive, high** and **very significant**. The effects on existing gas and water supply will likely remain **long-term, negative, low** and **slight** as a result of the additional demand on the networks.

The effects on the existing buildings which will be demolished within the Proposed Development site boundary will be **permanent, neutral** and **imperceptible** as no mitigation is possible to avoid or reduce the effect.

17.10 Decommissioning Phase

As outlined in Chapter 02 – Project Description, in the event of decommissioning, measures will be undertaken by the Applicant to ensure that there will be no significant, negative environmental effects from the closed LNG Terminal and Power Plant. Examples of the measures that will be implemented are outlined in Section 2.9, Chapter 02 – Project Description. As a result, additional potential impacts and associated effects arising during the decommissioning phase are not anticipated above and beyond those already assessed during the construction phase.

17.11 Summary

In summary:

- It has been assessed that the residual effects from connection works during the construction phase on the existing utilities networks will likely reduce to **slight** with the implementation of embedded mitigation measures.
- The effects from additional demands on existing water supply will remain **moderate** during the construction and **slight** during the operational phase.
- No utilities mitigation or monitoring measures have been proposed during the operational phase of the Proposed Development, which will be designed in accordance with best available techniques for energy efficiency. The effects on the existing gas and electricity supply network will remain **long-term, positive, high** and **very significant**, if the 220 kV grid connection is consented and becomes operational.
- The effects on existing buildings within the Proposed Development site boundary will remain **permanent, neutral** and **imperceptible** as no mitigation is possible to avoid or reduce the effect.

- It is anticipated that effects on the existing grid network from a number of future developments in combination with the future Shannon Technology and Energy Park, will result in a **positive** and **significant** cumulative effect.

Table 17-3 Summary of Impacts and Effects

Proposed Development Stage	Aspect/ Impact Assessed	Existing Environment/ Receptor Sensitivity	Effect/ Magnitude	Significance (Prior to Mitigation)	Mitigation and Monitoring Measures	Residual Impact Significance
Construction	Diversion/ connection works on existing utility infrastructure: water supply infrastructure	Low	Negative, temporary, medium	Moderate	<ul style="list-style-type: none"> Prior to excavation diversion works, the appointed Contractor will be supplied with accurate service drawings and additional site investigations will be carried out if necessary, to ensure services are not damaged during construction works. The Contractor will be obliged to put measures in place during the construction phase to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with the relevant service provider and local authority. When service suspensions are required during the construction phase, reasonable prior notice will be given to the residents in the area. The disruption to services or outages will be carefully planned so the duration is minimised. The timing of local domestic connections will be addressed between the Contractor and the local community at the detailed design stage; Works during the construction phase, including service diversions and realignment will be carried out in accordance with relevant guidance documents, including Gas Networks Ireland's publication 'Safety advice for working in the vicinity of natural gas pipelines'; the ESB's Code of Practice for Avoiding Danger from Overhead Electricity Lines', 2008 and the Health and Safety Authorities (HSA) 'Code of Practice for Avoiding Danger from Underground Services', 2010; All potential temporary connections will be agreed in advance with the relevant service provider; and Periodic water quality monitoring at point of supply. 	Slight
Construction	Demand on existing supply: <ul style="list-style-type: none"> Water supply 	Low	Negative, temporary and medium	Moderate	N/A	Moderate
Construction	Permanent acquisition of land.	Negligible	Permanent, neutral and negligible	Imperceptible	N/A	Imperceptible

Proposed Development Stage	Aspect/ Impact Assessed	Existing Environment/ Receptor Sensitivity	Effect/ Magnitude	Significance (Prior to Mitigation)	Mitigation and Monitoring Measures	Residual Impact Significance
Operational	Demand on existing supply:	Low	Long-term, negative and low.	Slight	N/A	Slight
	<ul style="list-style-type: none"> • Water supply • Gas supply 	High	Long-term, neutral-negative and low	Slight	N/A	Slight
Operational	Export to existing supply network:	High	Long-term, positive and high	Very significant	N/A	Very significant
	<ul style="list-style-type: none"> • Electricity network • Gas network 	High	Long-term, positive and high	Very significant	N/A	Very significant

17.12 References

EirGrid and Soni. (2020). *All-Island Generation Capacity Statement 2020-2029*. Available from: <https://www.eirgridgroup.com/site-files/library/EirGrid/All-Island-Generation-Capacity-Statement-2020-2029.pdf>.

EPA. (2003). EPA Advice Notes on Current Practice in the Preparation of Environmental Impact Statements. Environmental Protection Agency, Co. Wexford, Ireland.

EPA. (2017). EPA Guidelines on the information to be contained in Environmental Assessment Reports, Draft, August 2017, Environmental Protection Agency, Co. Wexford, Ireland.

EU. (2014). Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, European Union.

Gas Networks Ireland. (2021). Pipeline Map. Available online at <https://www.gasnetworks.ie/corporate/company/our-network/pipeline-map/>. Accessed 22/07/21.

Government of Ireland. (2018). S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

Irish Water (2014). Tarbet Waste Discharge Licence Application (D0283-01) (e-mail correspondence). Available online at http://www.epa.ie/licences/lic_eDMS/090151b2805139a8.pdf. Accessed 17/01/21.

KCC (2015). Kerry County Development Plan 2015-2021. Volume 1 Written Statement. Available online at <https://cdp.kerrycoco.ie/kerry-county-development-plan-2015-2021/>. Accessed 17/01/21.

KCC (2020). Listowel Municipal District Local Area Plan 2020-2026. Kerry Co. Council. Available online at <http://docstore.kerrycoco.ie/KCCWebsite/planning/listowellap/adoptedlap.pdf>. Accessed 11/02/21.

Laban, (2009). Report on an Architectural Survey carried out on the proposed Shannon LNG Site in the Townlands of Ralappane and Kilcolgan Lower, Kilnaughtin Parish, Co. Kerry published as part of EIS.

aecom.com