Assessment Method

Methodology

15.19 The EPA 2017 draft guidelines include information on the assessment of the effects of a development on material assets and advises on the nature of the material assets which should be examined as part of the preparation of an EIAR. These include the following:

- Economic assets of natural origin; and
- Economic assets of human origin.

15.20 Economic assets of natural origin, which include biodiversity, land and soil, cultural heritage, and the natural water environment, have already been addressed within other chapters of this EIAR. However, economic assets of human origin are considered in this chapter.

15.21 To assess economic assets of human origin, a desktop study was carried out on existing material assets found at the site and within the immediate surrounding area.

Demolition, Construction and Operation Stage

15.22 Projections of resource use on economic assets of human origin have been undertaken for the demolition, construction and operation stages of the proposed development, and the impacts have been assessed.

15.23 The baseline has been defined through a desktop review of existing and planned licences, studies, applications, and datasets. This established the current status of known and planned infrastructure within the study area.

Cumulative Stage

15.24 For the purposes of assessing the cumulative effects, consideration has been given to all cumulative schemes that have the potential to result in a significant cumulative effect alongside the proposed development. Full details of all the cumulative schemes are given in Chapter 2: EIA Process and Methodology. The baseline and assessment of significance, and the judgement of the magnitude of change stages are as above for the demolition and construction and operation stages. Only receptors for which the proposed development is predicted to result in a significant residual effect alone are included in this part of the assessment.

15.25 As part of the cumulative assessment, consideration has also been given to the proposed permanent electrical connection for the site that will be located <50m to the southeast of the site. This will comprise a 110 kV EirGrid Substation and two underground circuit transmission lines and will be subject to a strategic infrastructure development (SID) application to An Bord Pleanála (ABP) in due course. This scheme has been considered qualitatively.

Assessment Criteria

15.26 The criteria used to assess whether an effect is significant or not, are given in the EPA Guidelines 2017, and are set out in Table 2.1 in Chapter 2: EIA Process and Methodology. The significance of effects is determined by consideration of the sensitivity of the receptor, the magnitude of impact and scale of the effect. In assessing the significance of an effect, consideration has been given to the quality, duration, probability and type of the effect, and its geographical extent, and the application of professional judgement. There is some flexibility based on professional judgement to take account of any particular value a heritage asset or receptor may have because of its use or presentation for public amenity and tourism or education.

15.27 Based on professional judgement, effects of moderate significance and above are considered significant in EIA terms.

Assumptions and Limitations

15.28 The assessment has relied on data pertaining to existing licences or as-built infrastructure supplied by others. It has been assumed that these datasets have been reported correctly.

Baseline Conditions

Existing Baseline

Land Ownership

15.29 The subject site is as described in Volume 1, Chapter 4: Description of Development.

15.30 The application site is a material asset, as the land has been zoned for employment development and is owned by the Applicant. The nature of the proposed development means that the land's material asset should not be affected by the development and is not considered further.

Power and Electrical Supply

15.31 The main power supply to the Business Park is from the ESB EirGrid. This power network is known to be constrained in terms of providing electrical grid power to the area.

15.32 Power for the proposed development would be provided by the MFGP from approximately Q4 2023 to Q1 2025 during operation. Initially, MFGP would use HVO as the fuel source. Once the GNI gas connection is operational and available, HVO would be used as the primary back-up fuel for the MFGP

15.33 Once the EirGrid connection is available the main electrical supply to the campus would be provided from ESB via a network substation to a switch room on site with two diverse 20kV distribution feeds to each of the data centres. These would be via a connection to a 110 kV EirGrid ESB substation that will would be constructed and will be subject to a SID application to ABP. Once connected DUB 11 and 12 would be powered from the EirGrid connection across Falcon Avenue.

15.34 Once the EirGrid connection is available the MFGP will operate as a peaking power unit and would address DCC OPP requirements and would have the capacity to provide equal energy to the amount consumed on-site. In the event of a local grid network failure this power generation facility would provide additional power to the network infrastructure on demand, in accordance with the EirGrid DCC OPP.

Gas Supply

15.35 The Business Park is served by the Gas Networks Ireland network, which is a natural gas network. Supply is understood to not be constrained in the area.

Telecommunications

15.36 Multiple connection service lines currently exist along Falcon Avenue and Concorde Drive, including

- Virgin Media Fibre Cable;
- BT Fibre Cable;
- Colt Fibre Cable; and
- Eu Network Fibre Cable.

15.37 In addition, there are numerous Chambers situated along both Falcon Avenue and Concorde Drive, owned by Magnet and Virgin Media (UPC/NTL), that provide access to the underground utility services listed above.

15.38 A telecommunications network would be installed at the site which would serve all of the data center buildings on the site. The connection to the regional network would be implemented by the statutory network operator.

Surface Water Infrastructure

15.39 The Baldonnel Stream runs through the site. The FRA for the site undertaken by Kilgallen and Partners[4] has identified this water body as having capacity to accommodate the proposed surface water discharge from the site.

Foul Drainage Infrastructure

15.40 SDCC record drawings identify 3 No. 150mm / 225mm Ø spur connections, located adjacent to the southern boundary of the site and within Profile Park. Foul drainage is ultimately treated at the Dublin City Wastewater Treatment plant at Ringsend. The existing foul sewer network is understood to have adequate capacity to cater for the proposed discharge from the site and there are no known issues noted with the sewer network and Ringsend Wastewater Treatment plant. A pre-connection enquiry (PCE) form has been submitted to Irish Water and a response is awaited.

Water Supply

15.41 SDCC record drawings identify an existing 6" (160mm) Ø main located along the southern boundary of the site, within Falcon Avenue. Two 160mm Ø capped connections with sluice valves have been left off the aforementioned water main, in order to facilitate development at the site.

15.42 Additionally, there is an existing 700mm Ø trunk water main running parallel to the New Nagor Road adjacent to the northern boundary of the site.

15.43 From discussions with SDCC, it is understood that there is adequate capacity within the existing watermain network to supply the proposed development.

Receptor Sensitivity

15.44 The receptors identified as sensitive to the proposed development and which have been 'scoped-in' to the assessment are summarised in Table 15.1.

Table 15.1: Summary of Sensitive Receptors

Receptor	Sensitivity
Electrical grid capacity	High
Surface water infrastructure	Medium
Foul water infrastructure network	Low
Gas Network	Low
Water supply network	Low
Telecommunications network	Low

Assessment of Effects

Demolition and Construction Effects

Embedded Mitigation

15.45 As described in Chapter 5: Demolition and Construction Environmental Effects, a project-specific CEMP would be established and maintained by the contractors during the demolition and construction stage which would cover all potentially polluting activities and emergency response procedures. All personnel working on the site would be trained in the implementation of the procedures. The CEMP would be secured by means of an appropriately worded planning condition.

Power and Electrical Supply

15.46 During construction, contractors will require power for heating and lighting of the site and their onsite facilities. Some on site equipment/plant will also require power and a construction compound and temporary power supply will be installed for the demolition and construction stage.

15.47 Power and electrical supply receptors are of high sensitivity as the development is located in what is noted as a constrained area in terms of electrical grid capacity.

15.48 The construction of the MFGP would connect to the network via a step-up transformer to 20 kV on site and then distribute to EirGrid. Connections to the EirGrid substation will involve excavations in the vicinity of and connections to exiting services and these will be carried out in consultation with ESB Networks to ensure there is not impact on existing supplies. The permanent electrical connection of the site to the EirGrid once constructed will subject to a SID application to ABP in due course and is not considered here. These connections would not be in place prior to construction commencing.

15.49 Overall, the power demand and electrical effects from the demolition and construction stage are considered to be **Temporary to Short-term**, **Imperceptible** and **Neutral** i.e. **Not Significant** in terms of EIA.

Gas Supply

15.50 There is currently no gas supply to the site and supply is not anticipated to be required during the demolition construction stage. Connections to the gas supply network will be carried out in consultation with GNI to ensure there is no impact on existing supplies.

15.51 Overall, effects during the demolition and construction stage are considered to be **Temporary to Short-term**, **Imperceptible** and **Neutral** i.e. **Not Significant** in terms of EIA.

Surface Water Infrastructure

15.52 The site currently drains into the Baldonnel Stream. Above ground surface water attenuation features would be constructed during Phase 1 of the proposed development meaning they would be in place during the majority of the construction stage, as outlined in Chapter 5: Construction Description.

15.53 As with all construction projects, there is potential for surface water runoff to become contaminated with pollutants associated with the demolition and construction works. Contaminated water which arises from construction sites can pose a risk to surface water quality within the stream. The potential main contaminants include:

- Increase in suspended solids due to muddy water with increase turbidity, arising from excavation and ground disturbance;
- Spills and releases of cement and concrete causing an increase turbidity and pH arising from the use of these construction materials;
- Spills and releases of wastewater (nutrient and microbial rich) arising from poor on-site toilets and washrooms.
- There also is a risk of accidental pollution incidences from the following sources:
- spillage or leakage of temporary oils and fuels stored on-site;
- spillage or leakage of oils and fuels from construction machinery or site vehicles;
- spillage of oil or fuel from refuelling machinery on site; and
- run-off from concrete and cement during pad foundation construction.

15.54 With consideration of the embedded mitigation measures outlined above and within Chapter 5: Demolition and Construction Description predicted impacts from surface water runoff would be low.

[4] Kilgallen and Partners (2021). Report on Site-Specific Flood Risk Assessment.

Effects are considered to be **Temporary to Short-term**, **Imperceptible, and Neutral i.e., Not Significant** in terms of EIA.

Foul Drainage Infrastructure

15.55 Welfare facilities will be required for the construction compound and workers with portable toilets will be provided for construction workers. A temporary connection to the foul water drainage network within Profile Park may also be required to accommodate the site welfare facilities during construction. It is understood that the foul water drainage network has sufficient available capacity for the wastewater discharges for the short-term demolition and construction stage.

15.56 The permanent foul connection to the wider network in Profile Park would be undertaken in consultation with Irish Water to ensure there is no impact on the network when the connection is made.

15.57 Accordingly, foul drainage effects on the public sewerage network during the demolition and construction stage are considered to be **Temporary to Short-term**, **Imperceptible** and **Neutral** i.e., **Not Significant** in terms of EIA.

Water Supply

15.58 Welfare facilities will be required for the construction staff. A temporary connection to the mains water supply will be established for the construction phase. The water demand during the construction phase will not be significant enough to affect existing pressures and from discussions with the SDCC it is understood that there is adequate capacity within the existing watermain network to supply the proposed development.

15.59 Effects associated with water supply are considered to be **Temporary to Short-term**, **Imperceptible** and **Neutral** i.e., **Not Significant** in terms of EIA.

Telecommunications

15.60 During the demolition and construction stage a mobile connection will be provided. A telecommunications network will be installed at the site which will serve all of the proposed data center buildings. The connection to the regional network would be implemented by the statutory network operator.

15.61 Effects associated with telecommunications during the demolition and construction stage are considered to be **Temporary to Short-term**, **Imperceptible** and **Neutral** i.e., **Not Significant** in terms of EIA.

Operation Stage Effects

Embedded Mitigation

15.62 Prior to operation of the proposed development, a comprehensive set of operational procedures would be established which will include site-specific mitigation measures and emergency response measures, as outlined in Chapter 5: Demolition and Construction Environmental Management.

15.63 The primary potential impact on surface water infrastructure relates to a failure or accidental spill of HVO or diesel fuel which is stored and used on-site for back-up power generation for the MFGP and back up generators respectively.

Power, Electrical Supply & Gas Supply

15.64 During operation the power demands of the proposed development will be managed in line with the construction of DUB11 and DUB12.

15.65 DUB 11 would be constructed first including the emergency generators. Within Phase 1 power will originate from the northern MFGP block located in the west of the site. This would be in operation for 24 hours a day for an anticipated time period of up to 2 years. As these generators are powered by HVO and latterly natural gas impacts on the electrical grid will be unlikely to occur. The connection to the GNI network would only be made when a suitable level of supply is available.

15.66 DUB 12 would be operational in Phase 2 and at this time DUB 11 and DUB 12 would become connected to the EirGrid Substation to the south of Falcon Avenue which that would be subject to a separate SID application to ABP.

15.67 The MFGP would connect to the network via a step-up transformer to 20 kV in the south of the site and then distribute to the EirGrid. The MFGP would operate in response to signals proposed under the DCCOPP to support the EirGrid network. In addition to this, in the event of a local grid network failure, the MFGP facility on-site would have the capacity to provide equal energy to the amount consumed on site and as such would support the local power infrastructure requirements.

15.68 In the event of a loss of power supply to the data centers, diesel powered back-up generators are provided to maintain power supply. The back-up generators are designed to automatically activate and provide power to the plant pending restoration of mains power and are only anticipated to be required in an exceptional event.

15.69 Photovoltaic panels will also be installed on the roof of the office blocks to comply with Part L of the building regulations. These will generate on site renewable energy and will be back fed to the electrical general supply for the building, serving lighting, office area general services and office IT equipment.

15.70 The proposed development will be connected to a high-pressure gas point and there is understood to be sufficient capacity in the gas network to supply the proposed development. In the event of a failure in gas supply from GNI the MFGP can operate for up to 72hrs using the back-up underground fuel (HVO) storage tanks.

15.71 Please refer to Volume 1, EIAR, Chapter 4: Proposed Development Description for a more in-depth description of the power generation plan and connection.

15.72 Recent CRU policy sets[5] out that data centres must, due to Eirgrid's DCCOPP requirement, have an on-site back-up power source, and given that the MFGP provides additional resilience to the grid it has the potential to provide a positive impact on the wider power network. Under anticipated operation as a peaking power unit responding to network constraints the effects on power and electrical supply are considered to be **Permanent, Slight and Positive** i.e. **Not Significant** in terms of EIA. If the MFGP were required to provide power to the grid on a 24/7 basis under DCCOPP the effects on power supply could be Significant and Positive.

15.73 Effects on gas supply are considered to be **Permanent, Imperceptible** and **Neutral** i.e. **Not Significant** in terms of EIA.

Surface Water Infrastructure

15.74 Surface water from the proposed development has been designed in accordance with the Greater Dublin Strategic Drainage Strategy[6]. The is site currently greenfield and the proposed surface water measures incorporate SuDs and are aimed at improving the general surface water management of the site, by introducing interceptors, attenuation measures and by restricting the ultimate discharge to the existing surface water network and to the Baldonnel Stream.

15.75 Surface water from the rear roofs of the data centers, will be directed via rainwater pipes into an on-site drainage system. The outflow from this system will be connected into the surface water drainage network collecting run-off from the road areas and will be discharged via attenuation ponds in to the Baldonnel Stream.

[5] Commission for Regulation of Utilities (CRU), 2021. Direction to the System Operators related to Data Centre grid connection processing.

[6] Irish Water, 2018. Greater Dublin Drainage Strategy. Online. Available at: Greater Dublin Drainage Strategy Overview and Future Strategic Needs pdf (water.ie) [accessed 10/12/2021]

15.76 Surface water from car park areas and access roads / delivery areas will be drained via a series of on-site gullies and channels into a separate system of below ground gravity surface water sewers and permeable paving.

15.77 The outflow from the proposed development, will be restricted by way of a Hydrobrake facility, which will limit the total discharge to the calculated QBAR greenfield run-off rate.

15.78 Oil and fuel leaks from fuel storage, parked cars, service vehicles, HGV delivery's etc. have the potential to impact surface water. This will be managed through the inclusion of hydrocarbon interceptors in the design for the surface water network draining these areas.

15.79 Surface water is discussed further in Chapter 10: Water Resource and Flood Risk and the Engineering Planning Report accompanying the application.

15.80 Effects associated with surface water infrastructure during operation are considered to be **Permanent**, **Imperceptible,** and **Neutral** i.e. **Not Significant** in terms of EIA**.**

Foul Drainage Infrastructure

15.81 The proposed development will lead to an increase in foul water discharge from the site. It is proposed to discharge foul water via a 225 mmØ gravity foul sewer outfall into the existing 225mm Ø spur connection laid across Falcon Avenue, which is connected to the existing foul sewer network laid along the western edge of Falcon Avenue. It is understood that the foul water drainage network has sufficient available capacity for the wastewater discharges during operation.

15.82 As such, foul drainage effects on the public sewerage network during the operation stage are considered to be **Permanent**, **Imperceptible,** and **Neutral** i.e. **Not Significant** in terms of EIA.

Water Supply

15.83 It is proposed to serve the proposed development via connection off the 150 mm Ø network, as located in Falcon Avenue. Water meters, sluice valves and hydrants, in line with Irish Water requirements and specifications, will be installed at the connections onto the aforementioned existing water mains, as required. It is understood that there is adequate capacity within the existing water main network to supply the proposed development. As such, effects on water supply during the operation stage are considered to be **Permanent, Imperceptible,** and **Neutral** i.e., **Not Significant** in terms of EIA.

Telecommunications

15.84 Multiple connection service lines currently exist along Falcon Avenue and Concorde Drive and there is understood to be sufficient capacity available in the network to supply the proposed development with telecommunications. As such, effects associated with telecommunications during the operation stage are considered to be **Permanent, Imperceptible,** and **Neutral** i.e., **Not Significant** in terms of EIA.

Assessment of Residual Effects

Additional Mitigation

15.85 No additional mitigation measures are proposed.

Enhancement Measures

15.86 No enhancement measures are proposed aside from enhancements in flood risk and biodiversity associated with the Baldonnel Stream which are discussed in Chapter 10: Water Resource and Flood Risk and Chapter 11 Ecology.

Demolition and Construction Residual Effects

15.87 The residual demolition and construction effects remain as reported in the assessment of effects section:

- **Temporary to Short-term, Imperceptible** and **Neutral** effects on power, electrical and gas supply.
- **Temporary to Short-term, Imperceptible,** and **Neutral** effects on surface water infrastructure.
- **Temporary to Short-term, Imperceptible** and **Neutral** effects on foul drainage infrastructure, water supply and telecommunications.

15.88 These are **Not Significant** in terms of EIA.

Operation Stage Residual Effects

15.89 The residual operation stage effects remain as reported in the assessment of effects section:

- **Permanent, Slight and Positive** effects on power and electrical supply.
- **Permanent, Imperceptible,** and **Neutral** effects on gas supply.
- **Permanent, Imperceptible,** and **Neutral** effects on surface water infrastructure., foul infrastructure, and water supply.
- **Permanent, Imperceptible,** and **Neutral** effects on telecommunications.

15.90 These are **Not Significant** in terms of EIA.

Summary of Residual Effects

15.91 Table 15.2 provides a tabulated summary of the outcomes of the material assets assessment of the proposed development. Where **significant positive** effects are likely these are highlighted in bold green and where **significant negative** effects are predicted these are highlighted in bold red.

Table 15.2: Summary of Residual Material Asset Effects

Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
				+ -	L U	D I	R IR	M B T St Mt Lt P
Demolition and Construction								
Power and Electrical Supply	Increased demand on the surrounding network	None required	Imperceptible	+/-	L	D	IR	T to St
Gas Supply				+/-	L	D	IR	T to St
Foul Water Infrastructure				+/-	L	D	IR	T to St
Water Supply				+/-	L	D	IR	T to St
Telecommunications				+/-	L	D	IR	T to St
Surface Water Infrastructure	Risks of contamination from increased run-off, machinery on site, concrete activities, and/or accidental spillages.			+/-	L	D	IR	T to St
Operation								
Power and Electrical Supply	Increased demand on the surrounding network	None required	Slight	+	L	D	IR	P
Gas Supply			Imperceptible	+/-	L	D	IR	P
Foul Water Infrastructure				+/-	L	D	IR	P
Water Supply				+/-	L	D	IR	P
Telecommunications				+/-	L	D	IR	P
Surface Water Infrastructure	Risk of contamination to surrounding water environment.			+/-	L	D	IR	P

Notes:

* - = Negative/ + = Positive / +/- = Neutral; R = Reversible, IR = Irreversible; D = Direct, ID = Indirect;

L= Likely, U = Unlikely; M = Momentary, B = Brief, T= Temporary, St = Short-term, Mt = Medium-term, Lt = Long-term, P = Permanent.

Table 15.2: Summary of Residual Material Asset Effects

** Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, Profound.

Cumulative Effects

Intra-Project Effects

15.92 As explained in Chapter 2: EIA Process and Methodology, intra-project cumulative effects are discussed in Chapter 16: Intra Cumulative Effects.

Inter-Project Effects

15.93 Table 14.8 provides a summary of the likely cumulative effects resulting from the proposed development and the cumulative developments.

Table 14.8: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operational Stage	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
SD20A/0283 Microsoft, Grange Castle Business Park, Nangor Road Clondalkin, Dublin 22 VA06S.308585 SD20A/0121 UBC Properties, townlands within Grange Castle Business Park, Baldonnel, Dublin 22 UBC Properties - Grange Castle South Business Park, Dublin 22 SD17A/0377Digital Reality Trust - Profile Park, Baldonnel, Dublin 22, D22 TY06 SD18A/0134 Cyrus One - Grange Castle Business	No	There is some overlap with the demolition and construction stages of the Microsoft, UBC Properties, Cyrus One, Equinix and Centrica developments. However, during the demolition and construction stage demand on the network will be predominantly for minor temporary connections for welfare facilities and plant and or will be provided by mobile connections. The permanent connections to the wider network in Profile Park will be undertaken in consultation with statutory consultees to ensure there is no impact on the network when connections are made.	No	The design of the proposed development is such that cumulative effects are unlikely. In particular electrical and gas demand is managed though the site phasing. In Phase 1 power will originate from the MFGP from approximately Q4 2023 to Q1 2025. In Phase 2 the site will be powered by a permanent connection to the EirGrid with power demand offset when required by the MFGP onsite. The EirGrid substation will be subject to a separate SID application to ABP. Ongoing discussions are also underway with statutory undertakers to confirm that there is suitable capacity to support the development.

Table 14.8: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operational Stage	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Park, Clondalkin, Dublin 22 SD20A/0295 (amendment to SD18A/0134) Cyrus One Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 VA06S.309146Cyrus One - Grange Castle South Business Park, Baldonnel, Dublin 22 SD21A/0186 Equinix (Ireland) Ltd – Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22 SD21A/0167 Centrica Business Solutions – Profile Park, Baldonnel, Dublin 22				
Site proposed electrical connection and substation to EirGrid to the south	No	The permanent electrical connection to the substation would occur before Phase 2 and the connection will be undertaken in consultation with ESB to ensure there is no impact on the network when connections are made.	No	When operational the EirGrid substation will provide power to the site with power demand offset by the MFGP onsite. The EirGrid substation will be subject to a separate SID application to ABP.

Demolition and Construction Cumulative Effects

15.94 Cumulative effects during the demolition and construction stage of the proposed development are unlikely for material assets and effects are considered to be **Temporary to Short term**, **Imperceptible** and **Neutral**.

Operation Stage Cumulative Effects

15.95 Cumulative effects during the operation stage of the proposed development are unlikely for material assets and effects are considered to be **Permanent**, **Imperceptible,** and **Neutral**.

Summary of Assessment

Background

15.96 This chapter has detailed the potential material assets effects due to the construction and operation stages of the proposed development. The assessment of construction and operational stages has been undertaken considering relevant national and local guidance and regulations.

15.97 The site lies in the north of the Profile Park and the study area is considered to comprise the surrounding utility network with Profile Park and the wider area.

15.98 The main power supply to the Business Park is from EirGrid. This power network is known to be constrained in terms of providing electrical grid power to the area.

15.99 The Business Park is served by the Gas Networks Ireland network, which is a natural gas network. It is understood the network is not constrained.

15.100 The power requirements for the proposed development will be provided via a connection to a 110 kV EirGrid substation that will be constructed and will be subject to a separate SID application to ABP. When operational the substation will provide a 20 kV electrical power distribution at medium voltage throughout the site. The MFGP will connect to the network via a step-up transformer to 20 kV on site south of this building and then distribute to the EirGrid substation to offset the demand of the data centers.

15.101 Whilst the connection to the EirGrid is implemented the plant is proposed to be powered using a MFGP which will initially be powered using HVO and latterly natural gas. Emergency backup generators are also present within each data center in case of an EirGrid network failure and underground HVO fuel storage is present beneath the MFGP to provide back-up in the event of GNI network failure..

15.102 The Baldonnel Stream runs through the site. Surface water sewers are present in Falcon Avenue.

15.103 Surface water from the proposed development has been designed in accordance with the Greater Dublin Strategic Drainage Strategy. The is site currently greenfield and the proposed surface water measures incorporate SuDs and are aimed at improving the general surface water management of the site, by introducing interceptors, attenuation measures and by restricting the ultimate discharge to the existing surface water sewers and to the Baldonnel Stream) which will be restricted by way of a Hydrobrake, limiting the total discharge to the calculated QBAR greenfield run-off rate.

15.104 Foul water will be discharged via gravity sewer into the existing connection Falcon Avenue.

15.105 Water supply will be from a network connection located in Falcon Avenue. Water meters, sluice valves and hydrants will be installed at the connections. It is understood that there is suitable capacity in the network to supply to proposed development.

15.106 A telecommunications network will be installed at the site which will serve all of the data centers and will be connected to the regional network by the statutory network operator. It is understood that there is suitable capacity in the network to supply to proposed development.

Demolition and Construction Effects

15.107 During the demolition and construction stage demand on the networks outlined above will be predominantly for minor temporary connections for welfare facilities and plant and or will be provided by mobile connections.

15.108 The permanent connections to the wider network in Profile Park will be undertaken in consultation with statutory undertakers to ensure there is no impact on the network when connections are made.

15.109 Overall, effects during the demotion and construction are considered to be **Temporary to Short-term**, **Imperceptible** and **Neutra**l i.e., **Not Significant** in terms of EIA.

Operation Stage Effects

15.110 The baseline assessment identified that there are adequate facilities in regard to gas, foul water, water supply and telecommunications supplies for the operation stage of the proposed development.

15.111 Power and electrical demand is managed though the site phasing and will originate from the MFGP for Phase 1 which will operate from approximately Q4 2023 to Q1 2025. In Phase 2 power to the site will be provided through the permanent connection to the EirGrid substation. During the operation stage the MFGP will operate as a peaking power unit responding to network constraints and providing resilience to the network. As such effects on electrical supply and power are considered to be **Permanent, Slight** and **Positive** i.e. **Not Significant** in terms of EIA. If the MFGP were required to provide power to the grid on a 24/7 basis under DCCOPP the effects on power supply could be Significant and positive.

15.112 Surface water from the proposed development has been designed in accordance with the Greater Dublin Strategic Drainage Strategy with restricted discharge at greenfield run off rates to the existing surface water network and to the Baldonnel Stream. The network incorporates pollution presentation measures.

15.113 Effects on gas supply, surface and foul water infrastructure, water supply and telecommunications during operation are considered to be **Permanent**, **Imperceptible**, and **Neutral** i.e., **Not Significant** in terms of EIA.

Cumulative Effects

15.114 Cumulative effects during the demolition and construction and operation stages of the proposed development are considered to be unlikely for material assets.

16 CUMULATIVE EFFECTS

Introduction

16.1 The Planning and Development Regulations require that the likely significant environmental effects of a development are taken into account, including cumulative effects which are defined in the EPA Draft EIA Report Guidelines 2017 as *"the addition of minor or significant effects, including effects of other projects, to create larger, more significant effects".*

16.2 The relevant Institute of Environmental Management and Assessment (IEMA) Guidance[1] identifies two types of cumulative effects:

- Inter-project effects - incremental changes caused by other development schemes occurring together with the proposed development and the cumulative effects combining to worsen the effect of a particular impact; and
- Intra-project effects - those effects that occur as a result of impact interaction between different environmental topics within the same project. For example, a project might affect bird species as a result of direct loss of habitat and by noise and light disturbance. Each of these when considered in isolation may have a limited effect but taken together the sum is greater than the parts.

Inter-Project Cumulative Effects

16.3 A list of cumulative schemes for consideration in the inter-project cumulative effect assessment of the proposed development was presented to the SDCC as part of the pre-application meeting. Details of the full list of cumulative developments (EIAR Volume 1, Chapter 2: EIA Process and Methodology).

16.4 Inter-project effects have been addressed in each technical chapter of the EIAR (Chapters 6-15 of EIAR Volume 1 and EIAR Volume 2), as appropriate. To avoid significant repetition, information on the potential combined effects of the proposed development together with cumulative schemes is not presented within this chapter of the EIAR.

Intra-Project Cumulative Effects

16.5 The potential for intra-project cumulative effects is considered within this chapter.

Intra-Project Cumulative Effects

Assessment Approach

16.6 As indicated earlier, there is no established EIA methodology for assessing and quantifying the combined effects of individual effects on sensitive receptors. Accordingly, Ramboll has developed an approach which uses the defined residual effects of the proposed development to determine the potential for interactions between effects and consequently the potential for significant intra-project cumulative effects to arise. This is a tried, tested and robust approach that has been implemented and accepted on a wide range of planning applications over many years.

16.7 The approach comprised the following steps:

- First, a review of the likely residual effects (and in particular the likely significant environmental effects) presented within the EIAR was undertaken;
- Second, the likely receptors or receptor groups were identified;
- Third, the individual effects which may impact a singular receptor or receptor group were listed in a matrix format;
- Fourth, the potential for individual effects to interact for a given receptor was identified; and
- Fifth, the scale of the combined intra-project cumulative effects was assessed.

16.8 To ensure a proportionate approach, no/non-standalone imperceptible and not significant effects have been disregarded. Where a range of effects has been predicted, the full range has been considered e.g. imperceptible/not-significant to slight, negative.

16.9 It is noted that intra-project cumulative effects are more likely to arise when the receptor or receptor group is of higher sensitivity to change, such as human receptors.

16.10 Within this EIAR topics such as air quality, transport, noise and vibration and climate change are considered in their own right and also in the context of their associated human health effects; of which, these are then assessed against relevant receptor groups (which includes human health receptors and local residents etc.) as part of the population and human health assessment. Due to the nature of the population and human health assessment these are not considered within this intra-cumulative assessment, due to the need to ensure these effects are reported within their own right and are not double counted. As such, in the instance that human health effects result in an in-combination effect within the matrices presented in this section they are disregarded (as they are already considered from an intra- cumulative perspective in Chapter 6: Population and Human Health).

16.11 Where there is more than one effect likely to arise on a particular receptor or receptor group, the potential for effect interactions and the scale of the combined effect have been determined based on professional judgement and experience. The results of the assessment are presented within a matrix format in the Assessment Results section of this chapter.

Assessment Results

16.12 Based on the methodology detailed above, Figure 16.1 and Figure 16.2 present the results of the potential for interactions of individual effects on receptors during the demolition and construction stage and once the proposed development is in operation, respectively.

[1] Institute of Environmental Management and Assessment. The State of Environmental Impact Assessment Practice in the UK. 2011

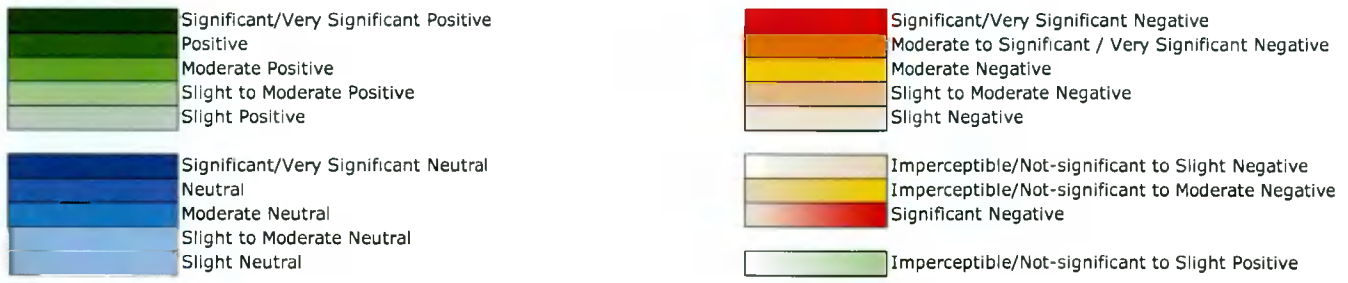
Likely Residual Effects		Receptors and Receptor Groups															
		Existing Off-Site Human Health	Existing Off-Site Local Residents	Existing and Future Pedestrians	Existing and Future Cyclists	Existing Road Users	Surface Water Receptors	Groundwater Supply	Fluvial Flood Risk	Water Supply and Foul Drainage Network	Designated Sites	Habitats and Protected Species	Global Climate	Existing Character Areas and Landscape Features	Site Landscape Features	Existing Views	Archaeology onsite
Human Health	Air Quality Effects																
	Noise Effects																
	Transport Effects																
Transport and Accessibility	Pedestrian Severance, Delay, Amenity, Fear and Intimidation																
	Driver Delay																
	Accidents and Safety																
Noise and Vibration	Demolition and construction noise																
	Demolition and construction traffic noise																
	Construction Vibration																
Water Resource and Flood Risk	Direct impacts on surface water quality and hydrodynamic status as a result of the construction works																
	Disruption of Groundwater during Construction Excavations																
	Reduced floodplain capacity																
Climate	GHG Emissions																
LVHIA	New uses and development in the wider setting of the landscape receptor																
Potential for Effect Interaction and so Combined Cumulative Effect?		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Figure 16.1: Demolition and Construction Intra-Project Cumulative Effects

- Significant/Very Significant Positive
- Moderate to Significant / Very Significant Positive
- Moderate Positive
- Slight to Moderate Positive
- Slight Positive
- Significant/Very Significant Negative
- Moderate to Significant / Very Significant Negative
- Moderate Negative
- Slight to Moderate Negative
- Slight Negative
- Significant/Very Significant Neutral
- Moderate to Significant / Very Significant Neutral
- Moderate Neutral
- Slight to Moderate Neutral
- Slight Neutral
- Imperceptible/Not-significant to Slight Negative
- Imperceptible/Not-significant to Moderate Negative
- Imperceptible/Not-significant to Significant/Very Significant Negative

Likely Residual Effects		Receptors and Receptor Groups														
		Local Economy and New Workers	Existing Off-Site Human Health	Existing Off-Site Residents	Existing Pedestrians and Cyclists	Future Pedestrians and Cyclists	Road Users	Surface Water Receptors	Flood Risk	Ecology and Habitats onsite	Buildings and Infrastructure	Global Climate	Exisiting Character Areas and Landscape Features	Site Landcape Features	Existing Views	Heritage Assets
Population and Human Health	Air Quality Effetcs															
	Noise Effects															
	Transport Effects															
Transport and Accessibility	Pedestrain Severence, Delay, Amenity, Fear and Intimidation															
	Driver Delay															
	Accidents and Safety															
Noise and Vibration	Plant noise emissions Phase 1															
	Plant noise emissions Phase 2 (worst-case)															
	Plant noise emissions Phase 2 (best case)															
	Plant noise emissions during Phase 1 and Phase 2 + emergency kit															
Water Resource and Flood Risk	Reduced flood risk from the Baldonnel Stream															
	Changes to flood risk as a result of changes to the surface water runoff regime of the site															
Ecology	Ecolgical enhancements and creation of habitat															
Climate	Higher temperatures leading to increased lightning strikes, resulting in damage to infrastructure or power loss.															
	Drought could lead to vegetation drying, increasing risk of vegetation fires															
	GHG Emissions															
Material Assets	Increased resiliance in power network due to the MFGP															
LVIA	New uses and development in the wider setting of the landscape receptor															
	The appearance of the proposed development in the view and subsequent change to visual amenity (VP 5 and 9)															
Cultural Heritage	Change to visual qualities of setting															
Potential for Effect Interaction and so Combined Cumulative Effect?		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Figure 16.2: Operation Intra-Project Cumulative Effects



Demolition and Construction

16.13 As shown in Table 16.1, no effect interactions are likely to arise during the demolition and construction period.

Operation

16.14 As shown in Table 16.2, effect interactions are likely to arise during operation in relation to off-site human health effects, however as previously discussed, in-combination human-health effects have been disregarded due to the nature of the human health assessment (i.e., as these effects have already been considered from an intra-cumulative perspective in Chapter 6: Population and Human Health).

16.15 Whilst effects have been identified in relation to buildings and infrastructure associated with higher temperatures leading to increased lightning strikes resulting in damage to infrastructure or power loss (slight to moderate negative) and increased resilience in the power network due to the MFGP (slight positive) these are not considered to have interactions.

16.16 Therefore, no further effect interactions are likely to arise during operation.

Conclusions

16.17 From the assessment of intra-project cumulative effects, no effects have been identified during demolition and construction or operation that have not already been discussed in Chapter 6: Population and Human Health.

17 RESIDUAL EFFECTS AND MITIGATION

Introduction

17.1 This chapter summarises the additional mitigation measures, the enhancement measures and the residual effects identified in the technical assessments of EIAR Volume 1 (Chapters 6-15) and EIAR Volume 2.

Additional Mitigation and Enhancement

17.2 As set out in Chapter 2: EIA Process and Methodology, the aim of an EIA is to develop measures to avoid, offset or reduce the significant negative environmental effects of a project and to enhance any beneficial effects.

17.3 Within each of the technical assessments, the need for additional mitigation measures has been considered in respect of likely significant negative effects as far as reasonably possible. In addition, opportunities for environmental enhancement have been explored where practicable. The proposed additional mitigation and enhancement measures are in addition to the embedded design and operational mitigation measures (as described in EIAR Chapter 4: Proposed Development Description) and standard embedded demolition and construction mitigation measures (as described in EIAR Chapter 5: Demolition and Construction Description), which have been considered within the technical assessments.

17.4 Table 17.1 presents a summary of the additional mitigation measures that have been identified over the course of the EIA of the proposed development categorised under the following stages:

- Demolition and Construction; and
- Operation.

17.5 It is noted that no enhancement measures have been identified within the individual technical assessments.

17.6 Reference should be made to individual technical assessment chapters for more detail.

Table 17.1: Summary of Proposed Additional Mitigation

Topic	Proposed Additional Mitigation
Demolition and Construction	
Population and Human Health	None
Transport and Accessibility	None
Air Quality	None
Noise and Vibration	None
Water Resource and Flood Risk	None
Ecology	• Pre-commencement checks recommended in Volume 3: Technical Appendix 11.3.
Ground Conditions	None
Climate Change	None
Waste	None
Material Assets	None
Operation	
Population and Human Health	None
Transport and Accessibility	None
Air Quality	None
Noise and Vibration	None
Water Resource and Flood Risk	• Site-Specific Flood Risk Mitigation Plan to be prepared and implemented throughout the operational life of the proposed development with an associated maintenance regime.
Ecology	None
Ground Conditions	None
Climate Change	• Regular inspection of drainage infrastructure and structures to assess conditions after extreme events. • Site-Specific Flood Risk Mitigation Plan to be prepared and implemented throughout the operational life of the proposed development with an associated maintenance regime.
Waste	None
Material Assets	None
Landscape and Visual	None
Cultural Heritage	None

Residual Effects

17.7 This section summarises the likely residual environmental effects of the proposed development following the adoption and inclusion of the additional mitigation measures that are set out in Table 17.1.

17.8 Reference should be made to EIAR Chapters 6-15 in EIAR Volume 1 and Volume 2 for a detailed description of likely significant residual environmental effects.

Demolition and Construction Residual Effects

17.9 Table 17.2 summarises the residual effects which have been identified by the individual technical assessments as likely to arise from the demolition and construction of the proposed development. Where **significant positive** effects are likely these are highlighted in bold green and where **significant negative** effects are predicted these are highlighted in bold red.

17.10 No significant positive environmental effects have been identified.

17.11 The following significant negative environmental effects have been identified and are highlighted in red text in Table 17.2:

Climate Change:

- GHG Emissions during demolition and construction.

Table 17.2: Demolition and Construction Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
Population and Human Health	Local Residents and Economy	Creation of employment	None	Non-significant – Slight	+	L	D/I	R	St
	Local Residents and Economy	Introduction of resident population	None	Non-significant – Slight	+	L	D/I	R	St
	Local Residents	Air quality effects	None	Non-significant – Slight	-	L	D/I	IR	St
	Local Residents	Noise effects	None	Non-significant – Slight	-	L	D	IR	St
	Local Residents	Transport effects	None	Non-significant – Slight	-	L	D	IR	St
	Local Residents	Amenity	None	Imperceptible	-	L	D	R	St
Transport and Accessibility	Pedestrians	Change in Pedestrian Severance, Delay, Amenity, Fear and Intimidation	None	Slight	-	L	D	R	T to St
	Road Users	Change in Driver Delay	None	Slight	-	L	D	R	T to St
	Road Users, Pedestrians and cyclists	Change in Accidents and Safety	None	Slight	-	L	D	R	T to St
Air Quality	Existing Off-site Human Health and Amenity	Dust Soiling and PM_{10} due to demolition and construction works	None	Imperceptible	-	L	D	IR	T to St
	Existing Off-site Human Health	Change in NO_2, PM_{10} and $PM_{2.5}$ levels due to vehicle emissions	None	Imperceptible	-	L	D	R	T to St
Noise and Vibration	Local Residents	Demolition and Construction Noise	None	Slight	-	L	D	IR	T to St
	Local Residents	Demolition and Construction Traffic Noise	None	Slight	-	L	D	IR	T to St
	Local Residents	Construction Vibration	None	Slight	-	L	D	IR	T to St
Water Resource and Flood Risk	Surface Water Receptors	Potential contamination as a result of silt-laden runoff across the demolition and construction site and potential for contaminants to be introduced to surface water by construction activities through leakages/spillages	None	Not Significant	-	L	D	R	T
	Surface Water Receptors	Direct impacts on surface water quality and hydrodynamic status as a result of the construction works	None	Slight	+	L	D	R	St

Table 17.2: Demolition and Construction Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
	Groundwater Supply	Disruption of Groundwater during Construction Excavations	None	Slight	-	L	D	R	T to St
	Fluvial Flood Risk	Loss of floodplain volume during construction	None	Slight	+	L	D	R	St
	Water Supply and Foul Drainage Network	Water Supply and Foul Drainage Capacity During Construction	None	Imperceptible	+/-	U	D	R	St
Ecology	South Dublin Bay and River Tolka SPA	Pollution	None	Imperceptible/Not Significant	-	L	I	IR	St
	Baldonnel stream	Pollution	None	Imperceptible	-	L	D	IR	St
	Terrestrial habitats	Habitat loss	None	Imperceptible	-	L	D	R/IR	St
	Terrestrial habitats	Pollution	Non	Imperceptible	-	L	I	R	St
	Bats	Commuting and foraging habitat loss	None	Imperceptible	-	L	D	R	St
	Birds	Disturbance / destruction of nest (if works are undertaken between March and August)	Pre-commencement checks recommended in Volume 3: Technical Appendix 11.3.	Imperceptible	-	L	D	IR	St
		Habitat loss as a result of displacement by disturbance	None required	Imperceptible	-	L	I	R	St
Ground Conditions	Construction Workers	Impact to human health from exposure to contaminated soils / dust / ground gases / water during enabling and construction works.	None	Imperceptible	-	U	D	IR	T to St
	Adjacent site users	Impact to human health from exposure to contaminated dust during enabling and construction works.	None	Imperceptible	-	U	I	IR	T to St
	Water environment (Baldonnel Stream)	Increased potential for leaching of contaminants from soils and mobilisation of contamination in surface water and groundwater during stream diversion and foundation works. Also, contaminants introduced to surface water by construction activities through leakages/spillages.	None	Imperceptible/Not Significant	-	U	D	IR	T to St
	Groundwater beneath the site (aquifers)		None	Imperceptible/Not Significant	-	U	D	IR	T to St
	Agricultural Land	Loss of agricultural land	None	Imperceptible	-	U	D	IR	P
Climate Change	CCR – Buildings and Infrastructure	Heavy rainfall leading to stockpile erosion and siltation of drainage assets	Implementation of Flood Mitigation Strategy	Imperceptible to Not Significant	-	L	D	R	St
	CCR – Buildings and Infrastructure	Heavy rainfall leading to an inability to undertake demolition/ construction activity and programme delays.	None	Imperceptible to Not Significant	-	L	D	R	Mt

Table 17.2: Demolition and Construction Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
	CCR – Human Health	Heatwaves and high temperatures leading to increased dust generation.	None	Imperceptible to Not Significant	-	L	D	R	Mt
	CCR- Human Health	Strong winds leading to damage of stockpiles and secondary impacts on site personnel welfare.	None	Imperceptible to Not Significant	-	L	ID	R	Mt
	CCR – Human Health	Heatwaves and high temperatures affecting site personnel welfare.	None	Imperceptible to Not Significant	-	L	D	R	Mt
	ICCI – Air Quality	Extended period of drought could increase exposure of sensitive receptors to dust generated from demolition and construction activities	None	Not significant	-	L	D	R	Mt
	ICCI – Air Quality	Extended period of drought could reduce availability of water for dust suppression which would reduce the effectiveness of embedded mitigation measures.	None	Not significant	-	L	D	R	Mt
	ICCI - Population and Human Health	Potential interactions of climate change with the identified Population and Human Health effects	None	Imperceptible to Not significant	-	L	D	R	Mt
	ICCI – Transport	Potential interactions of climate change with the identified transport effects.	None	Imperceptible to Not significant	-	L	D	R	Mt
	ICCI – Noise and Vibration	Potential interactions of climate change with the identified Noise and Vibration effects.	None	Imperceptible to Not significant	-	L	D	R	Mt
	ICCI – Water Resource and Flood Risk	Potential interactions of climate change with the identified Water Resource and Flood Risk effects.	None	Imperceptible to Not significant	-	L	D	R	Mt
	ICCI – Ecology	Potential interactions of climate change with the identified ecological effects.	None	Imperceptible to Not significant	-	L	ID	R	Mt
	ICCI – Ground Conditions	Potential interactions of climate change with the identified Ground Conditions effects.	None	Imperceptible to Not significant	-	L	D	R	Mt
	ICCI – Waste	Potential interactions of climate change with the identified Waste effects.	None	Imperceptible to Not significant	-	L	D	R	Mt
	ICCI – Material Assets	Potential interactions of climate change with the identified material effects.	None	Imperceptible to Not significant	-	L	D	R	Mt
	ICCI – Landscape and Visual	Potential interactions of climate change with the identified Landscape and Visual effects.	None	Imperceptible to Not significant	-	L	D	R	Mt
	ICCI – Cultural Heritage	Potential interactions of climate change with the identified Cultural Heritage effects.	None	Imperceptible to Not significant	-	L	D	R	Mt
	GHG – Global Climate	GHG Emissions	None	**Significant**	**-**	**L**	**D**	**IR**	**Lt**
Waste	Waste Management Infrastructure	Effect on capacity	None	Imperceptible/Not Significant	-	L	D	IR	T to St
	Landfill Sites	Effect on void space	None	Imperceptible/Not Significant	-	L	D	IR	P
Material Assets	Power and Electrical Supply	Increased demand on the surrounding network	None	Imperceptible	+/-	L	D	IR	T to St

Table 17.2: Demolition and Construction Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
	Gas Supply		None	Imperceptible	+/-	L	D	IR	T to St
	Foul Water Infrastructure		None	Imperceptible	+/-	L	D	IR	T to St
	Water Supply		None	Imperceptible	+/-	L	D	IR	T to St
	Telecommunications		None	Imperceptible	+/-	L	D	IR	T to St
	Surface Water Infrastructure	Risks of contamination from increased run-off, machinery on site, concrete activities, and/or accidental spillages.	None	Imperceptible	+/-	L	D	IR	T to St
Landscape and Visual	Newcastle Lowlands Character Area	Increased construction activity within allocated business park area. Similar in size and scale to existing activity	None required	Imperceptible	-	D	P	R	St
	Site Hedgerows and associated trees	Disturbance and impacts on function and character value	None required	Non Significant/Slight	-	D	T	R	St
	Baldonnel Stream	Disturbance and impacts on function and character value	None required	Non Significant/Slight	-	D	T	R	St
	The Grand Canal	Disturbance of linked green infrastructure	None required	Non Significant/Slight	-	I	T	R	St
	NIAH Listed Features	Disturbance and impacts on character amenity and tranquillity	None required	Imperceptible	-	I	T	R	St
	Site trees	Removal and disturbance impact on function and character value	None required	Non Significant/Slight	-	D	T	R	St
	VP1-11	Contribution to ongoing construction within area	None required	Imperceptible	+/-	I	T	R	St
Cultural Heritage	On site archaeology	None identified	None required	Imperceptible	+/-	U	D	IR	Lt
	Built heritage	None identified	None	Imperceptible	+/-	U	D	IR	T to St

Notes:

* - = Negative/ + = Positive / +/- = Neutral; R = Reversible, IR = Irreversible; D = Direct, ID = Indirect; L= Likely, U = Unlikely; M = Momentary, B = Brief, T= Temporary, St = Short-term, Mt = Medium-term, Lt = Long-term, P = Permanent.

** Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, Profound.

Operation Residual Effects

17.12 Table 17.3 summarises the residual effects which have been identified by the individual technical assessments as likely to arise upon completion and operation of the proposed development. Where **significant positive** effects are likely these are highlighted in bold green and where **significant negative** effects are predicted these are highlighted in bold red.

17.13 The following significant positive environmental effects for the completed development stage have been identified and are highlighted in green text in Table 17.3.

Water Resource and Flood Risk:

- Reductions in fluvial and surface water flood risk as a result of changes to the surface water runoff regime of the site and reduced risk of flooding from the Baldonnel stream.

Landscape and Visual:

- Site hedgerows and trees as a result of an increase in planting and strengthening of traditional landscape features.

17.14 The following significant negative environmental effects have been identified and are highlighted in red text in Table 17.3:

Climate Change

- GHG Emissions generated during operation.

Table 17.3: Operation Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
Population and Human Health	Local Residents and Economy	Creation of employment	None	Non-significant – Slight	+	L	D	IR	Lt
	Local Residents	Air quality effects	None	Non-significant – Slight	-	L	D/I	IR	Lt
	Local Residents	Noise effects	None	Non-significant – Slight	-	L	D	IR	Lt
	Local Residents	Transport effects	None	Non-significant – Slight	-	L	D	IR	Lt
	Local Residents	Amenity	None	Imperceptible		L	D	IR	Lt
Transport and Accessibility	Pedestrians	Change in Pedestrian Severance, Delay, Amenity, Fear and Intimidation	None	Slight	-	L	D	R	Lt to P
	Road Users	Change in Driver Delay	None	Slight	-	L	D	R	Lt to P
	Road Users, Pedestrians and cyclists	Change in Accidents and Safety	None	Slight	-	L	D	R	Lt to P
Air Quality	Existing Off-site Human Health	Change in NO_2, PM_{10} and $PM_{2.5}$ levels due to vehicle emissions	None	Non-significant	-	L	D	IR	Lt to P
	Existing Off-site Human Health	Change in NO_2 levels due to Phase 1 MFGP	None	Imperceptible	-	L	D	R	T to St
	Existing Off-site Human Health	Change in NO_2 levels due to Phase 2 MFGP	None	Imperceptible	-	L	D	IR	Lt to P
	Existing Off-site Human Health	Change in NO_2 levels due to Phase 1 and Phase 2 emergency generators	None	Imperceptible	-	L	D	IR	Lt to P
Noise and Vibration	Local Residents	Plant noise emissions Phase 1	None	Slight	-	L	D	R	T to St
	Local Residents	Plant noise emissions Phase 2 (worst-case)	None	Slight	-	L	D	R	Lt
	Local Residents	Plant noise emissions Phase 2 (best-case)	None	Slight	-	L	D	IR	Lt
	Local Residents	Plant noise emissions during Phase 1 and Phase 2 + emergency kit	None	Slight	-	L	D	IR	B to T

Table 17.3: Operation Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
Water Resource and Flood Risk	Fluvial Flood Risk	Reduced flood risk from the Baldonnel Stream	Site-Specific Flood Risk Mitigation Plan and associated maintenance regime	**Moderate**	+	L	D	IR	Lt
	Surface Water Flood Risk	Changes to flood risk as a result of changes to the surface water runoff regime of the site	None	**Moderate**	+	L	D	IR	Lt
	Groundwater	Potential to alter local groundwater flow paths and levels	None	Non-significant	-	L	D	IR	Lt
	Water Supply and Foul Drainage Network	Water Supply and Foul Drainage Capacity During Operation	None	Imperceptible	+/-	L	D	IR	Lt
Ecology	South Dublin Bay and River Tolka SPA	Pollution Ecological enhancement	None	Imperceptible	+/-	L	I	IR	Lt
	Baldonnel stream	Ecological enhancement	None	Slight	+	L	D	R	P
	Terrestrial habitats	Ecological enhancement	None	Imperceptible	+	L	D	R	P
	Bats	Disturbance through lighting	None	Imperceptible	+	L	D	R	P
	Birds	Foraging habitat enhancement	None	Imperceptible	+	L	D	R	P
Ground Conditions	Adjacent site users	Impact to human health from exposure to residual contaminated soils / dust / ground gases / water.	None	Imperceptible	-	U	I	IR	P
	Future site users		None	Imperceptible	-	U	D	IR	P
	Water environment (Baldonnel Stream)	Contaminants released by operation activities through leakages/spillages.	None	Imperceptible/Not Significant	-	U	D	IR	P
	Groundwater beneath the site (aquifers)		None	Imperceptible/Not Significant	-	U	D	IR	P
Climate Change	CCR – Building and Infrastructure	Increased frequency of intense rainfall leading to overwhelming of drainage assets and flooding	Detailed flood mitigation strategy provided and implemented. Regular monitoring and maintenance of drainage facilities and culverts	Imperceptible to Not Significant	-	L	D	R	Lt
	CCR – Infrastructure	Flooding of the underground foundations or services (electrical cables)	None	Imperceptible to Not Significant	-	L	D	R	Lt
	CCR – Environment, Buildings and Infrastructure	Flooding of Baldonnel stream	Detailed flood mitigation strategy provided and implemented.	Imperceptible to Not Significant	-	L	D	R	Lt

Table 17.3: Operation Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
			Regular monitoring and maintenance of drainage facilities and culverts						
	CCR – Environment	Overflow of contaminated water, impacting nearby watercourses	None	Imperceptible to Not Significant	-	L	I	R	Lt
	CCR – Buildings and Infrastructure	Increased frequency of intense rainfall leading to increased groundwater levels.	None	Imperceptible to Not Significant	-	L	D	R	Lt
	CCR – Human Health	Rainfall events resulting in wet pavement surface leading to reduced skid resistance leading to unsafe conditions	None	Imperceptible to Not Significant	-	L	D	R	Lt
	CCR – Environment	Drought conditions affecting landscape mitigation planting	None	Imperceptible to Not Significant	-	L	D	R	Lt
	CCR – Buildings and Infrastructure	Extreme heat events could result in overheating of the electrical equipment (e.g., data servers)	None	Imperceptible to Not Significant	-	L	D	IR	Lt
	CCR – Human Health	Increased mean temperatures and heatwaves leading to overheating in ancillary buildings and office spaces	None	Imperceptible to Not Significant	-	L	D	R	Lt
	CCR – Buildings	Higher temperatures could damage the building structure	None	Imperceptible to Not Significant	-	L	D	IR	Lt
	CCR – Buildings and Infrastructure	Higher temperatures leading to increased lightning strikes, resulting in damage to infrastructure or power loss.	None	Slight to Moderate	-	L	D	IR	Lt
	CCR – Buildings and Infrastructure, Human Health	Drought could lead to vegetation drying, increasing risk of vegetation fires	None	Slight to Moderate	-	L	I	R	Lt
	CCR – Human Health	Drought conditions affecting water and potable water availability	None	Imperceptible to Not Significant	-	L	D	R	Lt
	CCR – Buildings and Infrastructure	Freeze-thaw could damage of the proposed development, e.g., cracking	None	Imperceptible to Not Significant	-	L	D	IR	Lt
	ICCI – Population and Human Health	Potential interactions of climate change with the identified Population and Human Health effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Transport	Potential interactions of climate change with the identified transport effects.	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Air Quality	Potential interactions of climate change with the identified Air Quality effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Noise and Vibration	Potential interactions of climate change with the identified Noise and Vibration effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Water Resources and Flood Risk	Potential interactions of climate change with the identified Water Resources and Flood Risk effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI - Ecology	Potential interactions of climate change with the identified Ecological effects	None	Imperceptible to Not Significant	-	L	D	R	P

Table 17.3: Operation Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
	ICCI – Ground Conditions	Potential interactions of climate change with the identified Ground Conditions effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Waste	Potential interactions of climate change with the identified Waste effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Material Assets	Potential interactions of climate change with the identified Material effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Landscape and Visual	Potential interactions of climate change with the identified Landscape and Visual effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Cultural Heritage	Potential interactions of climate change with the identified Cultural Heritage effects	None	Imperceptible to Not Significant	-	L	D	R	P
	ICCI – Global Climate	GHG Emissions	None	**Significant**	**-**	**L**	**D**	**IR**	**Lt**
Waste	Waste Management Infrastructure	Effect on capacity	None	Imperceptible/Not Significant	-	L	D	IR	Lt
	Landfill Sites	Effect on void space	None	Imperceptible/Not Significant	-	L	D	IR	P
Material Assets	Power and Electrical Supply	Increased demand on the surrounding network	None	Slight	+	L	D	IR	P
	Gas Supply		None	Imperceptible	+/-	L	D	IR	P
	Foul Water Infrastructure		None	Imperceptible	+/-	L	D	IR	P
	Water Supply		None	Imperceptible	+/-	L	D	IR	P
	Telecommunications		None	Imperceptible	+/-	L	D	IR	P
	Surface Water Infrastructure	Risk of contamination to surrounding water environment	None	Imperceptible	+/-	L	D	IR	P
Landscape and Visual	Newcastle Lowlands Character Area	Additional data centre development within a business park on the urban fringe with boundary treatments that contribute to biodiversity and green infrastructure	None required	Not Significant/Slight	-	D	P	R	Lt
	The Grand Canal	Improved green infrastructure linked to sight	None required	Not Significant/Slight	+	I	P	R	Lt
	NIAH Listed features	Increased data centre development mitigated by increase in landscaping	None required	Imperceptible	-	I	P	R	Lt
	Site hedgerows and trees	Increase in planting and strengthening of traditional landscape feature	None required	**Moderate**	**+**	**D**	**P**	**R**	**Lt**
	Baldonnel Stream	Disturbance and impacts on function and character value	None required	Not Significant/Slight	+	D	P	R	Lt
	Site Trees	Removal and disturbance impact on function and character value	None required	Not Significant/Slight	+	D	P	R	Lt

Table 17.3: Operation Residual Effects

Topic	Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
					+ -	L U	D I	R IR	M B T St Mt Lt P**
	VP 8, 11	Not visible	None required	Imperceptible	+/-	I	P	R	Lt
	VP 1, 2, 3, 4,6, 7, 10	Slight increase in data centre development within business park area	None required	Imperceptible	-	I	P	R	Lt
	VP 5, 9	New large building within business park	None required	Not Significant/Slight	-	I	P	R	Lt
Cultural Heritage	On site archaeology	None identified; Potential for unidentified archaeology to be found on site	None	Imperceptible	+/-	U	D	IR	Lt
	Built heritage (TOR6-8)	Change to visual qualities of setting	None	Slight	-	L	D	IR	Lt
	Built heritage (TOR1-4, 12, 16, 17-24)	None identified	None	Imperceptible	+/-	U	D	IR	Lt

Notes:

* - = Negative/ + = Positive / +/- = Neutral; R = Reversible, IR = Irreversible; D = Direct, ID = Indirect; L= Likely, U = Unlikely; M = Momentary, B = Brief, T= Temporary, St = Short-term, Mt = Medium-term, Lt = Long-term, P = Permanent.

** Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, Profound.

GLOSSARY OF TERMS

Accurate Visual Representations	A static or moving image which shows the location of a proposed development as accurately as possible; it may also illustrate the degree to which the development will be visible, its detailed form or the proposed use of materials. AVRs are produced by accurately combining images of the proposed building with a representation of its context.
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near (LAFeq,T).
Amenity	A pleasant or advantageous aspect of the environment.
An Bord Pleanála	Ireland's national independent planning body.
Annual Probable Sunlight Hours	The Annual Probable Sunlight Hours (APSH) is a measure of sunlight that a given window may expect over the period of a year, and where there is no obstruction, equates to a maximum of 1,486 hours. Sunlight is measured using a sun indicator which contains 100 spots, each representing 1 % of APSH (i.e. 14.86 hours of the total APSH).
Applicant	Vantage Data Centers DUB11 Limited
Application	Means the full planning application, for the proposed development on the site.
A-weighting Sound Pressure Level	The sound pressure level with the A-weighting applied. The A-weighting is used for most environmental noise measurements and is used to weight a spectrum of sound to match the sensitivity of the human ear.
Background Sound/Noise Level	These are amongst the lowest noise levels measured over a given period of time and exclude short term, intermittent noise sources. The background noise level is quantified by the LA90 descriptor and is therefore the level which is exceeded for 90% of a given period of time.
Baseline Studies	Studies of existing environmental conditions which are designed to establish the baseline conditions against which any future changes can be measured or predicted.
Biodiversity	The diversity, or variety of plants and animals and other living things in a particular area of region. It encompasses landscape diversity, ecosystem diversity, species diversity and genetic diversity.
Brief Effects	Effects lasting less than a day
Completed Development	A development scheme which has been build out and is operational.
Construction Environmental Management Plan	A documented management system with environmental procedures to monitor residual effects of the demolition and construction stage of a development.
Construction Logistics Plan	A documented travel plan specific for a construction site.
Construction Method Statement	A document which addresses the health and safety risks to workers and other personnel on-site during the demolition and construction stage of the development.
Cumulative Effects	Effects that result from incremental changes caused by other past, present or reasonably foreseeable actions.
Cumulative Developments	Developments that have received a resolution to grant planning permission or have a signed legal agreement in place. They are likely to be delivered concurrently with the Proposed Development assessed in the EIA.
Decibel	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
Desk Study	A non-intrusive study and review of all available information pertaining to a site, including historical records, collated and monitored data, and consultation with relevant stakeholders.
Diffusion Tube	A passive sampler used for collecting NO_2 in the air.
Directive	European Union (EU) Directives impose legal obligations on European Member States. They are binding as to the results to be achieved but allow individual states the right to decide the form and methods used to achieve the results.
EIA Scoping	An initial stage in determining the nature and potential scale of the environmental impacts arising from a proposed development and assessing what further studies are required to establish their significance.
EIA Scoping Opinion	A written statement of the opinion of the relevant planning authority as to the information to be provided in the Environmental Statement.
EIA Screening	An initial stage in which the need for EIA is considered in respect of a development. Some developments are automatically subject to EIA by means of their inevitable size, nature and effects (Annex I developments). Other projects are made subject to EIA because it is anticipated that they are likely to have significant environmental effects (Annex II Developments).
Emission	A material that is expelled or released to the environment. Usually applied to gaseous or odorous discharges to the atmosphere.
Environmental Impact Assessment	A process by which information about the environmental effects of a development is collected and taken into account by the relevant decision-making body before a decision is given on whether the development should go ahead.
Environmental Impact Assessment Report	A statement that includes such information that is reasonably required to assess the environmental effects of a development.
Environmental Protection Agency	An independent public body established under the Environmental Protection Agency Act , 1992, responsible for protecting and improving the environment.
Equivalent Continuous A-Weighted Sound Pressure Level	The L_{Aeq} is an energy average and defined as the level of sound which, over a given period of time, would equate to the same A-weighted sound energy as the actual fluctuating sound.
Façade	The front or face of a building.

Fit-out	Installation of all non-substructure and non-superstructure items such as electrical water services, as well as final internal finishings.
Frequency	In sound, the number of cycles per second of a pressure fluctuation and frequency in sound is proportional to its pitch. Different frequencies are divided into octave and one third octave bands.
Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Frequency Weightings	Weightings can be applied to a spectrum of sound and act as a filter to account for different sensitivities and conditions.
Gross External Area	A measure of area of a building measured externally at each floor level.
Heavy Goods Vehicle	A vehicle with a gross vehicle weight greater than 3.5 tonnes.
Hydrotreated Vegetable Oil	A paraffinic bio-based liquid fuel originating from many kinds of vegetable oils.
Imperceptible Effect	An effect capable of measurement but without significant consequences
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Long-term Effects	Effects lasting fifteen to sixty years.
Maximum Noise Level	The maximum instantaneous noise level measured during a given period of time. The time weighting to which the meter is set for this measurement parameter is always indicated by either an F or S.
Medium-term Effects	Effects lasting seven to fifteen years.
Minimum Noise Level	The minimum instantaneous noise level measured during a given period of time. The time weighting to which the meter is set for this measurement parameter is always indicated by either an F or S.
Mitigation	Any process, activity of thing designed to avoid, reduce or remedy adverse environmental effects likely to be caused by a development project.
Mitigation Measure	Measure aiming at reducing an adverse environmental effect.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Momentary Effects	Effects lasting from seconds to minutes
Multifuel Generation Plant	A power generation plant with the ability to operate on natural gas and HVO.
National Planning Framework (2018)	At the national level, planning policy is contained within the National Planning Framework (NPF) 2018. The Department of Housing Planning and Local Government, on behalf of the Government of Ireland, published the NPF in February 2018 and is the Government's high-level strategic plan for shaping the future growth and development of our country out to the year 2040.
National Development Plan 2018-2027	The National Development Plan 2018-2027 (NDP) sets out the investment priorities that will underpin the implementation of the NPF, through a total investment of approximately €116 billion. Finalisation of the NPF alongside the ten-year NDP will culminate one plan to guide strategic development and the infrastructure investment at the national level.
National Spatial Strategy	The National Spatial Strategy (NSS) (2002) is a 20-year coherent national planning framework for Ireland. It aims to guide the achievement of a better balance of social, economic and physical development across the country, supported by more effective and integrated planning.
Negative/adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Nitrogen dioxide	Road transport and the burning of fossil fuels for power are the main sources of Nitrogen dioxide. In addition to being a greenhouse gas it also contributes to photochemical smog formation. It is an irritant to the respiratory system.
Noise Rating Level	This is a single figure value derived by plotting a noise spectrum against a set of curves. The curve under which the spectrum fits is the resulting Noise Rating Level.
Non-Technical Summary	A summary of the Environmental Statement in 'non-technical language'.
Normalised Element Level Difference	The normalised difference in sound level between a pair of rooms via a small element such as a trickle ventilator. The level difference in octave bands is normalised to a reference amount of absorption.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Objective EE	A classification under the South Dublin County Development Plan 2016-2022: to provide for enterprise and employment uses.
Ordnance Datum	Land levels are measured relative to the average sea level at Newlyn, Cornwall. This average level is referred to as 'Ordnance Datum'.
Particulate Matter	Discrete particles in ambient air, sizes ranging between nanometres (nm, billionths of a metre) to tens of micrometres (µm, millionths of a metre).
Pathways	The routes by which impacts are transmitted through air, water, soils or plants and organisms to their receptors.
Percentile Level	A-weighted sound pressure level obtained using time-weighting F, which is exceeded for N% of a specified time interval. An example of this is background noise which is quantified with the LA90 descriptor, which is the A-weighted level which is exceeded for 90% of the measurement period.
Permeant Effects	Effects lasting over sixty years.
Plant	A building's generator, heating, ventilation, and/or electricity-production system.
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Profound Effects	An effect which obliterates sensitive characteristics.
Quality of Effects	An effect that is positive, neutral, or negative.
Receptor (Sensitive)	A component of the natural, created, or built environment such as human being, water, air, a building, or a plant that is affected by an impact.
Residual Effects	Those effects of a development that cannot be mitigated following implementation of mitigation proposals.
Reverberation Time	The time that would be required for the sound pressure level to de-crease by 60 dB after the sound source has stopped. The descriptor T, often includes other nomenclature to describe the type of reverberation time

	measurement or if the reverberation time is an average taken for specific frequencies.
Reversible Effects	Effects that can be undone, for example through remediation or restoration.
Regional Spatial and Economic Strategy (2019)	The Draft Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly includes Regional Policy Objectives.
Regional Policy Objective 8.25	A policy objective under the RSES which outline the responsibility of local authorities to support the implementation of ICT infrastructures such as data storage facilities at appropriate locations.
Risk Assessment	An assessment of the likelihood and severity of an occurrence.
Short-term Effects	Effects lasting one to seven years.
Significance of Effect	The impact of an effect on a receptor defined at one of the following significance levels: imperceptible, not-significant, slight, moderate, significant, very significant and profound.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Site	Located at Irish grid reference O 03687 30780, within Profile Park, Dublin.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Sound Exposure Level	A level of a sound, of 1 s duration, that has the same sound energy as the actual noise event considered.
Sound Power Level	This is the total sound energy radiated from a given source. The sound power Level is 10 times the logarithm to base 10 of the ratio of the reference sound power level (1x10-12) and the measured power.
Sound Pressure Level	This is the unweighted or linear level which is measured prior to any weightings being applied. The sound pressure level is 20 times the logarithm to base 10 of the ratio of the reference sound pressure (2x10-5) and the measured sound pressure.
Sound Reduction Index	The laboratory measured sound insulation properties of a material or building element in octave or third octave bands.
South Dublin County Council	The South Dublin County Council (SDCC) which is the local planning authority for South Dublin County.
South Dublin County Council Development Plan 2016-2022	The relevant statutory development plan for the Site, adopted in May 2016.
Specific Noise Level	The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source (the noise source under investigation) over a given time interval (LAeq,T).
Standardised Weighted Level Difference	The standardised, weighted difference in sound level between a pair of rooms, stated as a single figure. The level difference in octave bands is first normalised to a reference reverberation time and then plotted against a set of reference curves to establish a single figure value.
Statutory Consultees	Groups or bodies that, by law, must be consulted as part of the planning application process for EIA development.
Structure Borne Noise	Audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements.
Study Area	Defined impact assessment area surrounding the site relative to the technical topic in question and determined based professional judgement.
Substructure	Elements of a development below ground level, typically basements and foundations.
Superstructure	Elements of a development above ground principally the mega frame, supporting core and outer shell cladding.
Sustainable Development	Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.
Temporary Effects	Effects lasting less than a year.
Time Weightings	A time weighting to denote the response of the sound level meter. For most measurements the Fast time weighting is selected (F) how-ever, a slow time weighting (S) is often used to for the measurement train noise and vibration.
Topography	The natural and man-made features of an area collectively.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Vibration	The periodic movements of structures transferred by ground and parts of the building, due to events such as train pass-by, piling, blasting or use of heavy machinery.
Vibration Dose Value	The Vibration Dose Value is the vibration dose a person is expected to be exposed to over the course of the day or night. It is given by the fourth root of the time integral of the fourth power of the acceleration after it has been frequency-weighted.
Weighted Sound Reduction Index	A single number which represents the sound reduction of a material. It is derived by plotting the sound reduction index against a set of reference curves. The curves are shifted until a best-fit is established and the curve which best fits the sound reduction spectrum is used to represent the single figure value.

ABBREVIATIONS

AA	Appropriate Assessment
AADT	Annual Average Daytime Traffic Flows
ABP	An Bord Pleanála
ADMS	Atmospheric Dispersion Modelling System
AEP	Annual Exceedance Probability
AI	Additional Information
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Standards
BAT	Best Available Technique
BH	Borehole
BMP	Biodiversity Management Plan
BT	British Telecommunications
CAFE	Directive 2008/50/EC on ambient air quality and cleaner air for Europe
CCTV	Closed Circuit Television
CDE	Construction, Demolition and Excavation
CDM	Construction Design and Management
CEMP	Construction Environmental Management Plan
CFA	Continuous Flight Auger
CFRAM	Catchment Flood Risk Assessment and Management
CGI	Computer Generated Image
CIEEM	Chartered Institute of Ecology and Environmental Management
CLEA	Contaminated Land Exposure Assessment
CLOCS	Construction Logistics and Community Safety
CLP	Construction Logistics Plan
CLR	Contaminated Land Report
CMP	Construction Management Plan
CO	Carbon Monoxide
COMAH	Control of Major Accident and Hazard
COSHH	Control of Substances Hazardous to Health
COVID 19	Coronavirus Disease
CSO	Central Statistics Office
CTMP	Construction Traffic Management Plan
DAS	Design and Access Statement
DC	Data Center
DMP	Dust Management Plan
DOAS	Dedicated Outside Air-handling Units
DS	Data Center
DSMP	Delivery and Servicing Management Plan
EB	East Bound
EC	Environmental Commissions
ED	Electoral Division
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIA	Environmental Impact Assessment
EMR	East Midlands Region
EMRA	Eastern and Midlands Regional Assembly
EPA	Environment Protection Agency
EPUK	Environmental Protection UK
EQS	Environmental Quality Standards
ERFB	Eastern Regional Fisheries Board
ESA	Ecological Survey Area
ESB	Electricity Switch Board
EU	European Union
EV	Electric Vehicle
EVCP	Electric Charging Point
FFL	Finished Floor Level
FM	Facilities Management
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
GA	General Arrangement
GAC	Generic Assessment Criteria
GDA	Greater Dublin Area
GDSDS	Greater Dublin Strategic Drainage Strategy
GEA	Gross External Area
GFA	Gross Floor Area
GHG	Greenhouse Gases
GIS	Geographical Information System
GLVIA	Guidance for Landscape and Visual Impact Assessment
GNI	Gas Networks Ireland
GSI	Geological Survey of Ireland

GTV	Groundwater Threshold Values
GWB	Groundwater Body
GWDTE	Groundwater Dependent Terrestrial Ecosystem
ha	Hectare
HDV	Heavy Duty Vehicles
HGV	Heavy Goods Vehicle
HRU	Heat Recovery Units
HSA	Health and Safety Authority
HV	High Voltage
HVO	Hydrotreated Vegetable Oil
IAQM	Institute of Air Quality Management
ICT	Information and Communications Technology
ID	Indirect
IDF	Intermediate Distribution Frame
IE	Industrial Emissions
IED	Industrial Emissions Directive
IEMA	Institute of Environmental Management and Assessment
IGI	Geologist of Ireland
IGR	Irish Grid Reference
IGV	Interim Guideline Values
IMS	Industrial Marine Silencers
IPPC	Integrated Pollution Prevention Control
IR	Irreversible
ISO	International Organisation of Standards
ITS	Irish Traffic Surveys
LCA	Landscape Character Area
LDV	Light Duty Vehicle
LGV	Light Goods Vehicles
LT	Long Term
LV	Low Voltage
LVHIA	Landscape, Visual and Heritage Impact Assessment
m	Metre
m AOD	Metres Above Ordnance Datum
MCPD	Medium Combustion Plan Directive
MFGP	Multifuel Generation Plant
MMP	Materials Management Plan
MPOE	Main Point of Entry
Mt	Medium Term
MV	Medium Voltage
MW	Megawatts
N/A	Not applicable
NB	North Bound
NBDC	National Biodiversity Data Centre
NDP	National Development Plan
NHA	National Heritage Area
NIAH	National Inventory of Architectural Heritage
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxide
NPF	National Planning Framework
NPWS	National Parks and Wildlife Services
NRA	National Roads Authority
NSS	National Spatial Strategy
nZEB	Nearly Zero Energy Building
NRA	National Roads Authority
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
NWCPO	National Waste Collection Permit Office
OCEMP	Operational CEMP
OPW	Office of Public Works
PAH	Polycyclic Aromatic Hydrocarbons
PC	Process Contribution
PCE	Pre-Connection Enquiry
PEC	Process Environmental Contribution
PEM	Project Environmental Manager
PI	Performance Indicator
PIA	Personal Injury Accident
$PM_{2.5}/PM_{10}$	Particulate Material of a particular size fraction
PPE	Personal Protective Equipment
PPG	Planning Practice Guidance
PPV	Peak Particle Velocity
PV	Photovoltaic
RFI	Request for Information
RPO	Regional Policy Objective
RSES	Regional Spatial and Economic Strategy
SA	Small Area
SAC	Special Area of Conservation

SB	South Bound
SCR	Special Catalytic Reduction
SDCC	South Dublin County Council
SFRA	Strategic Flood Risk Assessment
SID	Strategic Infrastructure Development
SRF	Soil Recovery Facility
SGV	Soil Guideline Values
SPA	Special Protection Area
SPOSH	Significant Potential of Significant Harm
ST	Short Term
SuDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TA	Transport Assessment
TRL	Transport Research Laboratory
USEPA	U.S. Environmental Protection Agency
VP	View Point
WB	West Bound
WMP	Waste Management Plan
WMU	Water Management Unit
ZOI	Zone of Influence
ZTV	Zone of Theoretical Visibility