19. Cumulative Effects and Environmental Interactions

19.1 Introduction

This Chapter presents an assessment of the cumulative and interactive effects between the various environmental factors as a result of the Proposed Development.

Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from:

- The interaction between the various effects within the Proposed Development (i.e. the interaction between the various environmental aspects, for example the interaction between water and ecology); and
- The interaction between the other existing and/or permitted projects with this Proposed Development.

The cumulative impacts of a development refer to the way in which an environmental resource may be subject to a particular type of impact from more than one Proposed Development. The impacts from multiple projects may overlap or act in combination at a particular location or upon a particular resource, thereby leading to more significant environmental impacts than if the impacts were considered in isolation.

Refer to Appendix 1.1 for details of the author and contributors of this Chapter.

19.2 Assessment Methodology

19.2.1 Guidance

This Chapter has been prepared in accordance with the following guidance:

- Department of Housing, Planning and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, August 2018.
- EPA (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports, May 2022.
- European Commission (2017) Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report. (Office for Official Publications of the European Communities 2017).
- European Commission (1999) Guidelines for the Assessment of Indirect and Cumulative Effects as well as Impact Interactions, (Office for Official Publications of the European Communities 1999).

19.2.2 Definitions

The following definitions are generally used in the description of cumulative effects or interaction of effects.

It is noted that the terms "*effects*" and "*impacts*" are used interchangeably in this Chapter.

The EC guidance (2017) uses the following definition for cumulative effects:

"Changes to the environment that are caused by activities/projects in combination with other activities/projects".

EC guidance (2017) also states that:

"It is important to consider effects not in isolation, but together, that is cumulatively. [….] Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from:

The interaction between all of the different projects in the same area;

The interaction between various impacts within a single Project (while not expressly required by the EIA Directive this has been clarified by the CJEU [Court of Justice of the European Union] […]".

Under the EPA guidance (2022) cumulative effects are defined as*:*

"The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects".

The EC guidelines (1999) use slightly different definitions as follows:

"Cumulative Impacts: Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project".

The EC guidelines (1999) use definitions as follows:

"Impact Interactions: The reactions between impacts whether between the impacts of just one project or between the impacts of other projects in the area".

The term *'impact interactions'* is equivalent to the term *'inter-relationship of effects'*. The EC guidelines (1999) accept that their definitions overlap to a certain extent. The EC guidelines also refer to '*Cross-Media Impacts'*, in which the impact in one environmental medium may also have an indirect impact on another medium.

19.2.3 Cumulative Effects Assessment Methodology

Annex IV (5)(e) of the EIA Directive as amended by Directive 2014/52/EU provides that the EIAR contain:

"A description of the likely significant effects of the project on the environment resulting from, inter alia:

(e) the ***cumulation of effects*** *with other* ***existing and/or approved projects****, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; Furthermore, Annex IV (5) states that the EIAR shall contain:*

"The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, ***cumulative****, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project".*

At the initial stage of preparing the EIAR for the Proposed Development, the potential for significant cumulative impacts were examined and any potential effects were identified. These potential effects were included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental factors.

Potential significant cumulative effects of the Proposed Development in-combination with other existing and/or approved projects for each of the environmental factors were initially identified, considered and assessed in respective chapters of the EIAR.

Section 19.3 of this chapter presents a summary of the potential cumulative impacts between the Proposed Development and relevant plans and projects. Mitigation measures relative to those impacts are addressed in the individual assessment chapters.

19.2.4 Interactive Effects Assessment Methodology

Article 3 (1) of the EIA Directive as amended by Directive 2014/52/EU provides:

"The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape; (e) the interaction between the factors referred to in points (a) to (d)".

The consideration of interactive effects was an integrated process which commenced at the very outset of the project. At the initial stage of preparing the EIAR for the Proposed Development, the potential for significant interactions between environmental factors were examined and any potential effects were identified. This was completed through regular team workshops and communications between the environmental specialists and the design team throughout the design process which helped to identify and minimise the potential for significant interactions of effects arising in the first instance.

The interaction of effects within the Proposed Development in respect of each of the environmental factors, listed in Article 3(1) of the EIA Directive, have been identified and addressed in detail in the respective chapters in this EIAR. Thus, no additional mitigation is proposed in this chapter.

Section 19.4 of this chapter presents a summary of each assessment of the interaction (inter-relationship) of effects (from the Proposed Development) between the various environmental factors. Mitigation measures relative to those interactions are addressed in individual chapters.

19.3 Cumulative Effects

19.3.1 Overview

This Section presents an assessment of the potential impacts of the Proposed Development on the environment resulting from the cumulation of impacts with other existing and/or approved projects. The first stage was to identify the "other existing and/or approved projects" both within and outside the existing GIL Campus, to be included in the assessment. In addition, planned projects which have not yet been granted planning have also been considered where necessary. This process is described in Section 19.3.2.

19.3.2 Identification of Plans and Projects

Existing, approved or planned projects within 3km of the Proposed Development were considered for potential cumulative effects under the majority of environmental disciplines. 3km was considered a conservative buffer under which cumulative effects be assessed for major developments submitted to An Bord Pleanala, with smaller-scale projects within 300m considered for SDCC. In addition, small scale developments, such as one-off housing were excluded from the assessment. The planning files meeting these criteria provided by the following entities were examined:

- South Dublin County Council (SDCC);
- An Bord Pleanála (ABP); and
- Department of Housing, Planning and Local Government (DHPLG) EIA Portal.

Refer to Table 19.1 for full details of the projects and plans that were considered as part of the cumulative assessment. These projects and plans were generally considered as part of the cumulative assessment of potential effects as they are relatively local to the Proposed Development (within 3km). However, certain environmental topics, such as Resource and Waste Management and Climate take a broader regional/national approach to the cumulative assessment as potential effects are considered on that wider basis.

It should be noted that an ESB powerline diversion is required to be carried out on the southeastern side of the site. The works will be carried out by ESB under their own powers and will be completed in advance of site works associated with the Proposed Development. On this basis, and as these works are considered minor, no significant cumulative effects are likely to arise.

Table 19.1: Relevant projects for consideration in the cumulative assessments

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
An Bord Pleanala	ZF06S.315768	315768		Adamstown, Co. Dublin	Non-Material Amendment to the Adamstown Strategic Development Zone (SDZ) Planning Scheme.	2.5 km north west	Due to be decided by 15/06/2023
	PL06S.314272	314272	SD21A/0359	Hayden's Lane, Adamstown, Lucan, Co. Dublin	Residential development of 74 apartments	2.3 km north	Grant permission
	NA06S.316119	316119		County Dublin and County Kildare	DART+ South West Electrified Heavy Railway Order - Hazelhatch & Celbridge Station to Heuston Station, and Heuston Station to Glasnevin	2.1 km north	Lodged (further consideration needed)
	PL06S.317802	317802	SD22A/0333	townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin	Construction of 2 adjoined single storey data centres with associated site works	1.4 km north west	Case is due to be decided by 18/12/2023
	VA06S.314567	314567		Ballymakaily, Lucan to Grange Castle Business Park, Baldonnel, Co. Dublin.	Underground 110kV transmission line connections between the permitted Kishoge 110kV GIS substation and the permitted Aungierstown - Castlebaggot underground 110kV transmission line.	0.15 km west	Grant permission
	VA06S.312793	312793		Profile Park Business Park and partly within Grange Castle Business Park, Dublin 22.	110kV Gas Insulated Switchgear (GIS) Substation compound and 110kV transmission lines along with associated and ancillary works.	Immediately to north	Grant permission
	PL06S.313603	313603	SD22A/0013	4033, Citywest Avenue, Citywest Business Park, Dublin 24	The installation of an energy storage unit at an existing data centre facility. The development involves the placement of three ISO 40ft. shipping containers containing back up storage units at Keppel Data Centre.	2.8 km south east	Grant permission
	VA06S.308585	308585		Grange Castle South Business Park, Dublin 22	Clutterland 110kV GIS Substation building and 2 underground single circuit transmission lines	0.14km	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
	VA06S.309146	309146		Grange Castle South Business Park, Baldonnel, Dublin 22.	2 no. 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation	0.13km	Grant permission
	VA06S.VA0019	VA0019		Within Profile Park Business Park and partly within Grange Castle Business Park, Dublin 22	West Dublin 220/110kV substation and associated works in the Grange Castle area,	Adjacent to east	Grant permission
	VA06S.312793	312793		Within Profile Park Business Park and partly within Grange Castle Business Park, Dublin 22.	110kV Gas Insulated Switchgear (GIS) Substation compound and 110kV transmission lines along with associated and ancillary works.	Adjacent to east	Grant permission
	PL06S.302813	302813	SD18A/0134	Grange Castle Business Park, Clondalkin, Dublin 22	Construction of a two storey data centre and delivery bays with associated three storey office block and services.	0.19 km	Grant permission with revised conditions
	VA06S.317297	317297		Profile Park, Baldonnell, Dublin 22.	110kV substation and grid connection.	Adjacent to east	Grant permission
	VA06S.309773	309773		Lands along Peamount Road within the townlands of Milltown and Clutterland, Co. Dublin	The demolition of the existing two storey dwelling of Bulmer and associated outbuildings and the provision of two no. 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound and Transformers / MV switch room compound along with associated site works	0.6km	Proposed decision date not available at this time
	PL06S.305948	305948	SD19A/0042	Newcastle Road, Lucan, Co Dublin	Phased development of 4 single storey data halls all with associated plant at roof level, 32 standby generators, office and service areas, service road infrastructure, car parking, ESB substation/transformer yard, An EIAR was submitted with the application.	1.3 km north west	Grant permission with revised conditions
SDCC			SD23A/0012	Townland of Milltown, located to the north of Peamount Road (R120) & Peamount	Construction of a new Battery Energy System Storage (BESS) and Power Trunk building and all associated elements; Demolition of all existing structures on site associated with the current golf centre (total 1,009.84sq.m); Construction of a two	1.0 km north west	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
				Lane, Newcastle, Co. Dublin	storey power trunk building (maximum height 10.3m) over basement of 1,982.61sq.m containing MV switchgear; Construction of a BESS to reach a total capacity of 186.3 MWe; The facility will be within an open three storey structure (maximum height of 17.3m), totalling 18,560.9sq.m in area, containing 63 battery containers, & 63 no containers containing power invertors, step up transformers and electrical switchgear and roof level 1384 PV panels; 1 two storey administrative welfare buildings (298.26sq.m; It will be provided with a pre-cast wastewater treatment plant (up to 6 P.E.) discharging to percolation area with polishing filter for foul effluent; 1 single storey Fire Pump and Water Service Plantroom of 174.1sq.m, with associated water tank ; 1 underground rainwater harvesting tank (volume 125 cubic meters - associated with the BESS facility of 35sq.m;; The removal of an existing 15m high telecommunication support structure; Internal road network and new servicing access road from an entrance on Peamount Lane - with amendments to the existing entrance; Site landscaping, security fencing; and all associated site services, lighting, infrastructural works and attenuation (SUDS features, underground storage and an above ground pond).		
			SD19A/0153	Milltown Cross, Nangor Road, Clondalkin, Dublin 22	3 new buildings. Block A: two storey with six industrial and office units; Block B: two storey with one industrial and office unit; Block C: three storey; new perimeter wall and fence with two revised entrances and gates; surface car parking and all associated site works.	0.75 km north west	Grant permission
			SD18A/0134/EP2	Grange Castle Business Park, Clondalkin, Dublin 22	Demolition of the existing single storey house of 'Erganagh' and the construction of a two storey data centre and delivery bays with three storey office block and services that will have a gross floor area of 35,426sq.m on an overall site of 9.2 hectares.	Adjacent to north western boundary of site	Grant to extension of duration of permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					The two storey data centre facility and delivery bay (32,419sq.m) will be separated into two adjoined blocks over two floors with a single data hall on each floor with a two storey delivery bay attached to the data centre block. A three storey office block and delivery bay (2,882sq.m) is attached to the west of the data centre block. The data centre will be served by services and plant to the north of the data centre blocks that will include 32 standby generators with 2 associated flues per generator and grouped into 16 towers of flour flues each (each 20m high). There are proposed to be 32 acoustically attenuated chillers located on the upper level plant gantries to the north of the data hall blocks (eight on each gantry). The development will include a new substation with associated transformer yard and single storey transformer building (125sq.m) that will be located to the northeast of the site. The development will be accessed from the Grange Castle South Access Road from the north via the Baldonnel Road and will also include ancillary site development works. The development will be enclosed with landscaping to all frontages including a wetland to the west all on a site (9.2ha) located within lands in the Grange Castle Business Park South and the residential properties of Erganagh, Kent Cottage and Weston Lodge on land with the townlands of Aungierstown and Ballybane; Ballybane; and Milltown and bounding Baldonnel Road to the west and south and Grange Castle South Access Road to the north, Baldonnel, Dublin 22. An Environmental Impact Assessment Report (EIAR) has been submitted with this application.		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
			SD20A/0058	Townland of Milltown, located to the north of Peamount Road (R120), Newcastle, Co. Dublin	Demolition of the existing single storey house of 'Little Acre' and its associated buildings; demolition of the single storey stable building on the overall site; construction of a gas powered Power Plant with all its associated elements; the part single and part two storey property of Bulmer and an agricultural building to the east of the overall site will not be demolished; The Power Plant compound of 14,475sq.m will contain 2 Power Units each with 1 25m height stack ,transformers, air intakes and electrical modules; the Power Plant compound will contain a two storey administration and workshop building (427sq.m) and LV switchgear building (140sq.m) (567sq.m in total) plus an AGI connection, gas compressor, water tank, water treatment, firewater tank and pumps, fuel skids, fuel tank and 1 emergency diesel generator; the proposal also includes a battery energy storage system compound of 3,300sq. that will be linked to the Power Plant; the development will be accessed from a new vehicular entrance from Peamount Road at the rear of the site; all ancillary site development works connect to existing infrastructural services and network ; the development will be enclosed with landscaping to all frontages; an EPA-Industrial Emissions Directive (IED) licence will be applied for to facilitate the operation of the proposed development for a period of 10 years on a site of 8.2 hectares on lands that contain the 2 residential properties of 'Little Acre' and 'Bulmer'.	0.82 km northwest	Grant permission
			SD20A/0324	Within the townland of Milltown, located to the north of Peamount Road (R120), Newcastle, Co. Dublin	Demolition of existing two storey dwelling of 'Bulmer' and associated outbuildings and demolition of the existing single storey house and its associated buildings; demolition of single storey stable building on the overall site; construction of 2 two storey Information Communication Technology (ICT) facilities each with three storey plant levels and associated	0.82 km northwest	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					ancillary development which will have a gross floor area of 30,518sq.m on an overall site of 8.2 hectares; 1 two storey ICT facility (building A) will have a gross floor area of 15,196sq.m including 18 emergency generators located at ground and first floor level within a compound of the ICT facility with associated flues that will be 25m in height and will be grouped in four groups of four and 1 group of two flues ; 1 two storey ICT facility (building B) will and will have a gross floor area of 15,196sq.m including 18 emergency generators with associated flues that will be 25m in height and will be grouped in four groups of four and 1 group of two flues (18 flues overall); each of the two ICT facilities will include data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas; 2 pump rooms of 25sq.m each (4 overall - 100sq.m) plus water storage tanks and plant as well as a separate house generator that will provide emergency power to the admin and ancillary spaces; each generator will also include a diesel belly tank with a single refuelling area to serve the proposed emergency generators; 1 temporary and single storey substation (26sq.m); ancillary site development works including attenuation ponds and the installation and connection to the underground foul and storm water drainage network and installation of utility ducts and cables; and other ancillary site development works; the development will be enclosed with landscaping to all frontages including a wetland to the south-east and will be accessed from the Peamount Road (R120) located within the townland of Milltown on lands that contain 2 residential properties as well as agricultural lands and buildings which are located to the north of the Peamount Road and the lands to the north and within the overall site are subject to a concurrent application for a Power		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					Generation Facility under Reg. SD20A/0058; An Environmental Impact Assessment Report (EIAR) is included with the application.		
			SD188/0009	Grange Castle, Clondalkin, Dublin 22	Grange Castle West Access Road in the townlands of Brownstown, Clutterland, Loughtown Upper and Milltown. The proposed Grange Castle West Access Road will include the following features: 1.03km of Dual Carriageway with an average corridor width of 34m; 1.15km of Single Carriageway with an average corridor width of 25m; 1 double lane and 3 single lane fully segregated roundabouts; Raised 2m wide cycle path and separate 2m wide pedestrian walkway; An attenuation lake to accommodate surface water drainage requirements from the proposed road and surrounding hardstand areas (this will double up as a amenity area); Controlled and uncontrolled pedestrian and cyclist road crossings; Landscaped entrance and security structures to aesthetically harmonize with existing Grange Castle and Grange Castle South Business Park entrances: Bus stops and sustainable transport facilities; Underground utilities and services including: Storm Water Drainage, Foul Drainage, Watermain, Gas, Power, Telecoms, Public Lighting & CCTV; All associated ancillary works and integrated landscape plans.	0.83 km northwest	Part 8 approved by SDCC
			SD18A/0027	Milltown Cross, Nangor Road, Clondalkin, Co. Dublin	A new car sales show room building with car display, valet, service, and ancillary areas; a new perimeter wall and fence with a new entrance and gates, external car parking compound and all associated site works.	0.73 km northwest	Grant permission
			SD16A/0236	Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22.	A new 5 storey bio-pharmaceutical manufacturing building to be built in two phases. Phase 1 sized 20,320sq.ms and 28.2 meters high including a single storey link sized 1,203sq.m, and Phase 2 sized 14,320sq.m and 28.2 meters high, including a single storey link sized 750sq.m, located to the south of their existing Drug Substance Building.	0.9 km northeast	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					A single storey warehouse extension located to the south of the existing warehouse including new docking facilities sized 1,142sq.m and 11.2 meter high. A three storey extension located to the east of the existing laboratory building sized 1,328sq.m and 17.6 meters high. A new south elevation with new windows on the fourth floor of the existing drug substance building. New site works including 565 new car parking spaces of which 282 are relocated car parking spaces - 282 spaces lost due to the development footprint - located to the north of the site, together with a new bicycle parking facility, a new permanent heavy goods entrance at the current construction entrance to the south boundary of the campus and new fencing, 2.1 meters high, to the east, west and south side boundaries. Permanent car parking of 350 spaces for sustaining construction and contract personnel utilising a portion of the existing temporary contractor car park. Upon completion of the construction and commissioning activities, the remainder of the contractor car park will be decommissioned. A new single storey security building sized 56sq.m and revisions and alterations to the existing road, services and landscaping and new items of plant and equipment located in the existing and proposed yards, and associated pipe bridges. All associated site works. A 10 year planning permission is sought for this proposed development. The application consists of a variation to a previously permitted development on an activity for which a licence under Part IV of the Environmental Protection Agency Act 1992 (as amended for the Protection of the Environment Act 2003) is required and full details of the proposed development and its anticipated environmental impacts will be notified to the Environmental Protection Agency.		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					An Environmental Impact Statement accompanies this application, and it will be available for inspection or purchase at the office of the Planning Authority.		
			SD23A/0320	Pfizer Ireland Pharmaceuticals, Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22	Additions, alterations and modifications to the existing and permitted industrial facilities, with a total area of approximately 305.8 sqm (permitted under Reg Ref SD23A/0123) at the Pfizer site in Grange Castle. They include; A. a single storey extension to the link building adjacent to the DS2 building permitted under Reg Ref SD23A/0123. The proposed extension is approximately 240 sqm and approximately 7.9 meters high. B. Demolition of existing single-storey extension approximately 36 sqm and approximately 4.2 meters high and construction of a new single storey extension to the existing Softened Water Building. The proposed extension is approximately 65.8 sqm and approximately 7.2 meters high. C. The works also include modifications to internal roads and pathways, underground utilities, site lighting, internal roads and footpaths and all associated site works. This application consists of a variation to previously permitted development for an activity for which a licence under Part IV of the Environmental Protection Agency Act 1992 (as amended by the Protection of the Environment Act, 2003) is required.	0.9 km northeast	Grant permission
			SD23A/0123	Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22	Permission for development consisting of the completion of the development grant	0.9 km northeast	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
			SD22A/0071	Above ground installation at Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22	Extension to existing above ground natural gas installation; the extension will include a regulator/meter kiosk, boiler/generator kiosk, electrical/instrumentation kiosk, underground and above ground pipework, 2.4m high chain-link and palisade fencing, light/CCTV columns and all ancillary services and associated site works.	1.1 km northeast	Grant permission
			SD18A/0269	Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22	Extension to an above ground natural gas installation consisting: of regulator/meter kiosk, boiler/generator kiosk, underground and aboveground pipework, 2.4m high chainlink and pallisade fencing, light columns and all ancillary services and associated site works.	1.1 km northeast	Grant permission
			SD19A/0300	Grange Castle Business Park South, Townland of Milltown and bounding the Grange Castle South Access Road to the North, Baldonnel, Dublin 22	Single storey ESB substation (27sq.m) that will be accessed from the north off the Grange Castle South Access Road via the Baldonnel Road and off the permitted internal road granted under Reg. Ref. SD18A/0134, An Bord Pleanála Ref. ABP-302813-18 to the south; the proposal will result in a minor and temporary amendment to the landscaping and fencing permitted under Reg. Ref. SD18A/0134, An Bord Pleanála Ref. ABP-302813-18 that granted permission for a two storey data centre and delivery bays with associated three storey office block and services within the overall lands; no other changes to the permission granted under this decision are proposed under this application.	0.25 km east	Grant permission
			SD20A/0121	Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22	Permission for a period of ten years for development at this site of 16.5 hectares that is located within lands in the Grange Castle South Business Park and includes the residential property of Ballybane, Old Nangor Road on land within the townlands of Milltown; Ballybane and; Aungierstown and Ballybane; and bounding Baldonnel Road to the west; both the Old and New Nangor Road to the north; and Grange Castle South Access Road to the South, Baldonnel, Dublin 22.	0.15 km north (adjacent to northern boundary of site)	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					The development will consist of the following: (1) The demolition of the existing two storey dwelling of Ballybane and associated farm buildings (565sq.m) and the construction of 3 two storey data centres with mezzanine floors at each level of each facility and associated ancillary development that will have a gross floor area of 80,269sq.m on an overall site of 16.5hectares. (2) 1 two storey data centre (Building A) that will be located to the south-west of the site and will have a gross floor area of 28,573sq.m. and will include 26 emergency generators located at ground floor level within a compound to the northern side of the data centre with associated flues that will be 25m in height. The facility will also include 26 ventilation shafts which will be located above the northern end of each emergency generator that will measure 20m in height. (3) 1 two storey data centre (Building B) which will be located to the north-west of the site, and to the immediate north of Building A and will have a gross floor area of 21,725sq.m and which will include 18 emergency generators located at ground floor level within a compound to the northern side of the data centre with associated flues that will be 25m in height. The facility will also include 18 ventilation shafts which will be located above the southern end of each emergency generator that will measure 20m in height. (4) 1 two storey data centre (Building C) which will be constructed last, will be located to the eastern part of the site on a north-south axis and will have a gross floor area of 28,573sq.m. It will include 26 emergency generators located at ground floor level within a compound to the western side of the data centre with associated flues that will be 25m in height. The facility will also include 26 ventilation shafts that will be located above the western end of each emergency generator that will measure 20m in height. (5)		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					Each of the three data centres will include data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas, and plant including PV panels at roof level as well as a separate house generator for each facility which will provide emergency power to the admin and ancillary spaces. Each data centre will also include a diesel tank and a refuelling area to serve the proposed emergency generators. (6) The overall height of each data centre apart from the flues and plant at roof level is c. 19.85m above the finished floor level. (7) 1 temporary and single storey substation (29sq.m). (8) 3 single storey MV buildings (each 249sq.m - 747sq.m in total) which manage the supply of electricity from the substations to each data centre and are located to the immediate west of the generator compound within buildings A and B, and to the south of the generator compound withing building C. (9) 8 prefabricated containerised electrical rooms (65sq.m each and 520sq.m overall) that are stacked in pairs to the immediate south of the temporary substation. (10) Ancillary site development works, which will include attenuation ponds and the installation and connection to the underground foul and storm water drainage network and installation of utility ducts and cables which will include the drilling and laying of ducts and cables under Baldonnel stream. Other ancillary site development works will include hard and soft landscaping, lighting, fencing, signage, service road, entrance gate, sprinkler tank house (72sq.m), security hut (30sq.m) and 150 car parking spaces and 78 sheltered bicycle parking spaces. The development will be enclosed with landscaping to all frontages including a wetland to the west.		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					The development will be accessed from the Grange Castle South Access Road from the south via the Baldonnel Road. An Environmental Impact Assessment Report (EIAR) has been submitted with this application.		
			SD21A/0217	Profile Park, Nangor Road, Clondalkin, Dublin 22	10 year permission for development consisting of removal of an existing unused waste water treatment facility on site and the erection of two data centre buildings, gas powered energy generation compound, and all other associated ancillary buildings and works; the two data centre buildings, DUB 15 and DUB 16, will comprise a total floor area of c. 33,577sq.m over two storeys; the first 2 storey data centre building (DUB15), located to the southwest of the site, will comprise 16,865sq.m data storage use, ancillary office use and associated electrical and mechanical plant rooms, loading bays, maintenance and storage space; a second 2 storey data centre building (DUB16), located to the southeast of the site, will comprise 16,712sq.m data storage areas, ancillary office use and associated electrical and mechanical plant rooms, loading bays, maintenance and storage space; both data centre buildings will reach a height of 20m; emergency generators and associated emission flues and plant are proposed in compounds adjacent to each data centre building; gas powered energy generation is proposed to the north east corner of the site to provide electricity for the proposed development; the application proposes to re-route and widen an existing watercourse constructed following an earlier planning permission; it is proposed to reroute this watercourse along the eastern and southern boundary of the site; landscaping is proposed to the south of the site to screen the buildings; fencing and security gates are proposed around the site; new access roads within the site are proposed along with 71 car parking spaces and 26 cycle spaces, bin stores, site lighting, and all	Adjacent to the western boundary of the site	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					associated works including underground foul and storm water drainage attenuation and utility cables and all other ancillary works; a Natura Impact Statement will be submitted to the planning authority with the application.		
			SD21A/0167	Profile Park, Baldonnel, Dublin 22	Construction of a gas fired power plant with an electrical output of up to 125MW with associated balance of plant, equipment and buildings including; an Engine Hall building with a height of 18.9m, comprising 6 gas engines and ancillary infrastructure; an Electrical Annex Building with a height of 18.7m; a Workshop building with a height of 5. 1m; a Tank Farm building with a height of 5.68m; a Security hut with a height of 3.27m; an Exhaust Stack with a height of 31.8m; a Gas AGI including a kiosk with height of 3.3m; Radiator Coolers with a height of 8.46m; 2 electrical transformers with a height of 4.98m; Tanks including 2 x Diesel Oil Storage Tanks (volume of 2500m3 combined); SCR Urea Tank (26m3); Lube Oil Storage Tank (26m3); Lube Oil Maintenance Tank (26m3); Pilot Oil Tank (26m3); Fire Water Storage Tank (1000m3); Effluent Collecting Tank (26m3); Underground Surface Water Attenuation Tank (490m3); 2 new access onto the existing private road network with Profile Park; 12 parking spaces, footpaths, landscaping; fencing and all other associated site development plant and equipment and other works including surface water and foul wastewater drainage. An EIAR was submitted with this application.	0.12 km west of site	Grant permission
			SD21A/0186	Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22	Construction of a 3 storey (part 4 storey) data centre known as 'DB8' to include data halls, electrical/plant rooms including internal generators, offices, lobbies, ancillary staff areas including break rooms and toilets, stores, stair/lift cores throughout and photovoltaic panels at roof level;	0.39 km northwest	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					the total gross floor area excluding hot air plenums and external staircase is c.9,601sq.m and the overall height of the data centre ranges from c.16m to c.20m to roof parapet level and up to c.24.48m including roof top plant, flues and lift overrun; provision of 5 external generators, 8 fuel tanks and ancillary plant contained within a plant yard to the north of DB8; provision of a water tank plant room, air cooled chillers and ancillary plant contained within a chiller plant yard to the south of DB8; provision of a water sprinkler pump room (c.23sqm), 2 sprinkler tanks (c.12m high each), heat recovery plant room (c.17sqm), ESB substation (c.44sqm), waste/bin stores (c.52sqm); total floor area of ancillary structures and plant (c.303sqm); provision of a delivery yard and loading bays, 64 car parking spaces, 5 motorcycle spaces, bicycle shelter serving 14 spaces, smoke shelter, internal access roads and footpaths, vehicular and pedestrian access to the west from Falcon Avenue and closure of an existing vehicular entrance from Falcon Avenue; all associated site development works, services provision, drainage works including attenuation, landscape and boundary treatment works including berming, hedgerow protection areas and security fencing; no buildings are proposed above the existing ESB wayleave and SDCC watermain wayleave to the west and north of the site; the area to the southwest of the site (temporary meadow) is reserved for a future data centre, subject of a separate application to South Dublin County Council on a site bounded to the east and south by Grange Castle Golf Club, to the north by Nangor Road (R134) and to the west by an estate road known as Falcon Avenue. This application is accompanied by a Natura Impact Statement.		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
			SD20A/0124	Profile Park, Ballybane, Clondalkin, Dublin 22	(1) Demolition of existing single storey dwelling (c.108.5sq.m); (2) construction of a Distribution Warehouse Building comprising warehousing and ancillary areas at ground floor and support offices, staff areas and plant across two floors; (3) the development will be accessed from the existing Profile Park estate road; (4) provision of car parking, cycle parking, security gatehouse, landscaping and boundary treatments (including security fencing and gates); (5) all associated site development and services works (including diversion/culverting/reprofiling of existing stream on site); (6) total gross floor area of the development c.17,006sq.m.	Adjacent to northern boundary of the site	Grant permission
			SD21A/0241	In the townlands of Ballybane & Kilbride within Profile Park, Clondalkin, Dublin 22	Demolition of the abandoned single storey dwelling and associated outbuilding (206sqm); construction of 2 two storey data centers with plant at roof level of each facility and associated ancillary development which will have a gross floor area of 40,589sq.m consisting of 1 two storey data center (Building 11) which will be located to the south of the site and will have a gross floor area of 24,667sq.m. including 22 emergency generators located at ground floor level within a compound to the western side of the data center with associated flues that will be 22.3m in height; 1 two storey data center (Building 12) which will be located to the north of the site, and to the immediate north of Building 11 and will have a gross floor area of 12,915sq.m including 11 emergency generators located at ground floor level within a compound to the western side of the data center with associated flues that will be 22.3m in height; each of the two data centers will include data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas, and plant including PV panels at roof level as well as a separate house generator for each facility which will provide	Adjacent to northern boundary of the site	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					emergency power to the admin and ancillary spaces; each generator will include a diesel tank and there will be a refuelling area to serve the proposed emergency generators; the overall height of each data center apart from the flues and plant at roof level is c. 14.23m above the finished floor level; the overall height of each data center apart from the flues and plant at roof level is c. 14.23m above the finished floor level; single storey step-up substation (38sq.m) as well as 2 single storey switch substations (121sq.m); AGI Gas Regulator compound that include 3 single storey buildings (134sq.m); construction of a gas powered generation plant in the form of a 13m high single storey building with a gross floor area of 2,714sq.m that will contain 10 gas generators with associated flues that will be 25m in height, and grouped in pairs and threes; the Gas Plant will be located to the west of Building 11; ancillary site development works, that will include reorientation of the Baldonnel Stream, biodiversity management initiatives, attenuation ponds and the installation and connection to the underground foul and storm water drainage network, and installation of utility ducts and cables, that will include the drilling and laying of ducts and cables under the internal road network within Profile Park; other ancillary site development works will include hard and soft landscaping, lighting, fencing, signage, services road, entrance gates, sprinkler tanks and pump room; a temporary gas powered generation plant within a fenced yard containing 21 generator units in containers, each with associated flues (each 25m high), 12 transformers and 10 containers of controls to be located to the west of, and associated with the first phase of Building 11, and will be required for a period of up to 2 years if connection to the national grid is delayed; this temporary plant will not be built if the connection to the national grid is in place prior to the operation of Building 11 at		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					this site that includes an abandoned single storey residential property on the New Nangor Road (R134), Dublin 22; and on land within the townlands of Ballybane and Kilbride within Profile Park, Clondalkin, Dublin 22 on an overall site of 8.7 hectares.		
			SD23A/0291	Site at Profile Park, south of new Nangor Road (R134), within the townlands of Kilbride & Ballybane, Dublin 22	The application site comprises an area of c. 0.15 hectares. The proposed development comprises an alteration to planning permission Ref. SD21A/0241, as amended by Ref SD23A/0035. There is a separate application under consideration under Reg Ref SD23A/0203 for the provision of a temporary medium voltage substation on lands to the southeast of the application site. The proposed development (for which a temporary 3-year permission is sought) will comprise the following: Construction of a temporary power generation compound, comprising 24 no. generators (to be powered by hydrogenated vegetable oil), associated flues (c. 6m in height), 8 no. fuel storage tanks, a switchgear room, control room, spares containers, and ancillary structures, all within a fenced compound; The proposed generators will be enclosed within an acoustic panel enclosure c. 11m in height; The proposed temporary power generation compound will be located on an area for permitted car parking under Ref SD21A/0241, as amended by Ref SD23A/0035, which will be constructed following the removal of the temporary compound; The proposed development includes all associated and ancillary works.	0.23 km northwest of the site	Grant permission
			SD23A/0203	At Profile Park, to the South of the New Nangor Road (R134), Dublin 22	Amendments to planning permission Ref.: SD21A/0241 as previously amended by Ref. SD23A/0035. The proposed amendments consist of the following the provision of a temporary, single storey, medium voltage ESB substation building (with a gross floor area of c. 39.5 sq.m), accessed from the estate road to the south east.	0.23 km northwest of the site	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					Associated landscaping and tree planting. All associated and ancillary works.		
			SD24A/0019	Microsoft, Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22.	Amendments to a previously permitted development (Ref. SD21A/0203 which amended Ref. SD20A/0283); Amendments relate to the permitted Gas Skid Compound to provide layout details which will include the provision of a boiler house kiosk, Electrical & Instrumentation kiosk, regulators/meters kiosk, gas analyser kiosk and all associated infrastructure and site development works; The application relates to a development which comprises or is for the purpose of an activity requiring an Industrial Emissions Licence; The use of the site is an establishment to which the European Communities (Major Accident Hazards Involving Dangerous Substances) Regulations 2006 as amended by the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 apply.	0.45 km north west	Grant permission
			SD20A/0283	Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22	Demolition of existing single storey vacant house, garage and outhouse (total gross floor area (GFA) c.291.2sq.m) and removal of existing temporary construction car park; Construction of a single 1-4 storey Central Administration Building and 2 2-storey (with mezzanine) data centres (DUB14 & DUB15) all to be located west of data centres DUB9, DUB10, DUB12 & DUB13 within the MS campus; The Central Administration Building (c.6.03m to c.19.85m high) will comprise central office administration, with staff cafeteria, staff gym and reception (GFA c.3,520sq.m), with provision of PV panels on the roof; each data centre (c.15.6m high to parapet height and c.18.65m to top of roof plant) will include data halls, admin blocks (comprising offices, canteen, loading dock, storage and ancillary areas) and a variety of mechanical and electrical plant areas/structures including Modular Electrical Rooms (MERs), battery rooms and transformer	0.71 km north	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					areas. GFA of DUB14 is c.28,072sq.m and GFA of DUB15 is c.28,173sq.m (c.56,246sq.m in total); DUB14 will also include 21 diesel generators and associated sub-stations (E-houses) and 11 mechanical flues (each c.30.75m high); Provision of a gas generator compound (to serve DUB15) containing 20 generators, 5 E-houses and 5 flues (c.25m max height); Provision of a Gas Networks Ireland gas skid including 3 kiosk buildings; Expansion of existing electrical sub-station compound (originally granted under SD07A/0632) to provide 3 additional transformer bays. 3 E-houses and 1 control room, 2 auxiliary transformers; 2 sprinkler tank and pump house areas, 1 additional rainwater harvesting plant; Provision of 168 permanent car parking spaces and 40 cycle parking spaces; Provision of additional western access to the MS campus (to serves the Central Administration Building) from the Business Park estate road (including bridge over the Griffeen River) with existing temporary access to be extinguished; Physical integration with the remainder of the existing MS campus (including internal access roads and landscaping) with associated modifications to the western boundary of the DUB09/DUB10/DUB12/DUB13 data centre development as permitted under SD16A/0088; Provision of a new temporary construction car park (with 802 car spaces, shuttle bus stop and shelter) on site north of the main entrance to the business park; Total gross floor area of the development will be c.59,766sq.m; All associated site development works, drainage and services provision, landscaping, boundary treatments (including security fencing) and associated works; An Environmental Impact Assessment Report (EIAR) has been submitted with this application; The application relates to a development which comprises an activity requiring an integrated pollution prevention and control (IE) licence.		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
			SD21A/0203	Modifications and minor additions to previously approved scheme (Planning Register Reference SD20A/0283	Modifications and minor additions to previously approved scheme (Planning Register Reference SD20A/0283) at this site of c.16.23ha (in total) comprising of the following changes to previously approved scheme SD20A/0283; Approved Central Administration Building (CAB), relocation of building to the east by approx. 7m; reconfiguration and setting out of building plans at all levels (including roof level) resulting in increase in building footprint of approximately 170sq.m (from 1,424sq.m to 1,594sq.m) associated changes to building elevations (design and finishes); approved single storey Cafeteria Element, additional basement level below cafeteria to accommodate plant; 9 rooflights (2.8 m diameter) and 9 rooflight (1.8m diameter), inclusion of MEP Plant on roof level including new flue extending approx. 1m above parapet; approved four-storey Office element, parapet at roof level to be raised by approx. 1.1m (increased from approved 19.5m in height to proposed 20.6m); overall increase in GIFA of 395sq.m; reconfiguration of area available for PV panels and sedum roof finish in order to accommodate required MEP equipment at roof levels. approved Data Centres - DUB14 and DUB15, reconfiguration and setting out affecting building locations and plans at all levels (including roof level) resulting in reduction in overall building footprint (for each building) by 48sq.m (from 13,442sq.m to 13,394sq.m), associated changes to staircases design, building elevations design and finishes, increase in parapet height of Vent Houses (at roof level) by approx. 350mm and omission of previously proposed zone of sedum roof finish; overall decrease in GIFA of 1,352sq.m in respect of DUB 14 and decrease of 1,453sq.m in respect of DUB 15; all plant equipment at ground level - reduced in height compared to approved layout so that the screening is deemed not required; DUB 14, reduction in	0.48 km north west	Grant permission

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					height of approved flues by approx. 650mm, reduction in number of flues from 11 approved to 8 proposed; DUB 15, change to level of ground floor and associated increase in overall building height of approx. 700mm (parapet height increased from approved +83.0m O.D. to proposed +83.7m O.D.); reconfiguration of associated external plant at ground level (including generators / E-Houses & transformers) flues, omission of approved Modular Electrical Rooms (MERs) and associated screening serving approved Data Centres DUB14 &15; relocation, modifications to design and expansion of approved Water Treatment Building and associated plant to include, Water Treatment Tanks, 2 sprinkler tanks and relocated approved pump house (contained in the main Water Treatment Plant building) and 1 generator with additional proposed flue stack (height 30.75m) and 1 transformer; Gas Generator Compound - Relocation & reconfiguration of previously approved gas generator compound including, additional 4 generators (from 20 approved to 24 proposed), omission of approved E-houses; additional 7 electrical rooms, additional 7 flues (from 5 approved to 12 proposed); modifications to approved layout of internal site roads, yards and footpaths; relocation and modifications to design of approved Sprinkler Tanks and Pump Houses, Pump House serving DUB 14, relocated into proposed Water Treatment Building and compound, redesign of approved larger tank into proposed two smaller tanks; Pump House serving DUB 15, relocated to south of DUB15 the north facilitate space for electrical equipment redesign of approved larger tank into proposed two smaller tanks; relocation of Approved Gas Networks Ireland (GNI) gas skid & compound including approved 3 kiosk buildings; modifications to approved car park layouts and landscaping design; modifications to location and design of approved		

Source	Reference No.	Case No.	Planning Authority Case Ref	Location	Details	Distance from Proposed Development Boundary	Application Status
					bicycle shelters; modifications to site development works, including underground water and building services provision, landscaping, internal security and compound enclosure fencing, and associated works; the remainder of the development (including permitted temporary construction car parking) to be carried out in accordance with parent permission SD20A/0283. An Environmental Impact Assessment Report (EIAR) has been submitted with this application; The application relates to a development which comprises an activity requiring an integrated pollution prevention and control (IE) licence relating to lands located west of the existing MS Data Centre Campus and also a site located north of the main entrance to the business park from Grange Castle Road.		

19.3.3 Construction Phase

An assessment of potential cumulative effects under each environmental aspect is provided below.

19.3.3.1 Traffic and Transport

It is very unlikely that the Construction Phase of all projects local to the Proposed Development would occur concurrently. However, should two or more be under construction concurrently, significant effects on the local road network may arise due to queuing of HGV on internal site roads may occur. Interface liaison will take place by relevant Contractor personnel on a case-by-case basis, to ensure that there is coordination between projects which may be under construction concurrently, so that any additional construction traffic mitigation measures required to deal with cumulative effects are managed appropriately. Refer to the Construction Traffic Management Plan (CTMP) in Appendix 5.1.

19.3.3.2 Air Quality

Following the implementation of mitigation measures no Adverse Significant effects on air quality are likely to arise offsite during the Construction Phase. In accordance with IAQM guidance, construction dust effects are likely to arise within 250m of the site boundary. The following developments occur within 250m of the site boundary and may overlap with the construction period of the Proposed Development:

- SD20A/0121 – data centre development
- SD21A/0217 – data centre development and gas power station
- SD21A/0167 – gas fired power plant
- SD20A/0124 – distribution warehouse building
- SD21A/0241 – data centre development
- SD23A/0291 – amendment to SD21A/0241
- SD23A/0203 – amendment to SD20A/0283.

Each application for planning permission was accompanied by an EIAR which included mitigation measures to minimise off-site dust generation. On this basis, no significant adverse cumulative effects are likely to arise.

Should all developments be under construction concurrently, significant air quality effects may arise due to queuing of HGV on internal site roads. However, as no sensitive receptors are located within the Grange Castle and Profile Park Business Parks, no significant air quality effects are likely to arise. In addition, as outlined in the Construction Traffic Management Plan (CTMP) in Appendix 5.1, interface liaison will take place by relevant Contractor personnel on a case-by-case basis, to ensure that there is coordination between projects which may be under construction concurrently, so that any additional construction traffic mitigation measures required to deal with cumulative effects are managed appropriately.

19.3.3.3 Climate

The Proposed Development is expected to result in a Negative, Minor, Short-Term residual effect on carbon and climate in isolation. A number of major developments (other data centres and industrial facilities) are proposed to be developed within the Grange Castle and Profile Park Business Parks which have the potential to cumulatively result in significant adverse effects during the Construction Phases. However, following the implementation of mitigation measures provided as part of those other developments, no significant cumulative adverse effects are likely to arise.

19.3.3.4 Noise and Vibration

No likely Significant Adverse effects on noise sensitive receptors from the Proposed Development alone are predicted during the Construction Phase.

No construction phases of other projects are expected to coincide with the construction phase of the Proposed Development that would affect receptors within the noise and vibration study area as defined in Section 9.3.6 of Chapter 9 (Noise and Vibration). Each major development outlined in Table 19.1 was accompanied by an EIAR which included mitigation measures to minimise off-site noise generation. On this basis, no significant adverse cumulative effects are likely to arise due to construction activities or construction traffic.

In conclusion, no likely significant direct or indirect cumulative effects are predicted during the construction phase of the Proposed Development.

19.3.3.5 Population and Human Health

No significant adverse effects on population and human health are expected to arise during the Construction Phase of the Proposed Development in isolation following the implementation of mitigation measures. A positive effect will arise due to the provision of employment during the Construction Phase. Cumulatively with other developments, no significant adverse effects on population and human health are likely to arise following the implementation of mitigation measures and the CTMP, refer to Appendix 5.1.

19.3.3.6 Biodiversity

As discussed in Chapter 11 (Biodiversity) the surrounding lands are largely zoned as 'EE- Enterprise and Employment' in the South Dublin County Council Development Plan 2022-2028. There are numerous planning applications / permissions for industrial developments in the vicinity of the Proposed Development site which have the potential to be in construction at the same time as the Proposed Development. In this case, there is potential for cumulative impacts to arise, as a consequence of the Proposed Development acting in-combination with other plans and projects, on water quality in the downstream surface water environment and on disturbance to fauna. It is considered that these potential cumulative impacts would be temporary and occur at a local geographical scale.

Mitigation measures outlined in Chapter 11 (Biodiversity) will reduce the magnitude of potential impacts. It was concluded that cumulative impacts to the Key Ecological Receptors (KERs) (foraging/ commuting bats, breeding birds, mammals and amphibians) could arise as a consequence of the Proposed Development acting in-combination with other plans and projects. This potential cumulative impact would be significant, albeit temporary, and would occur at a local geographical scale. There will be no significant cumulative impacts on downstream European sites or pNHAs.

19.3.3.7 Water

A review of the projects listed in Table 19.1 which were deemed to be potentially relevant were screened to determine whether any of the projects give rise to a likely significant cumulative effect with the Proposed Development from a water quality and flooding perspective. Projects were screened out due to distance and not occurring within the same drainage area of the Proposed Development. Projects were screened in due to location within the same drainage area of the Proposed Development, location on the same watercourse and location within a flood zone.

The following ten projects were screened in and assessed with the following outcome:

- **VA06S.314567:** An EIAR has been prepared for the development. The works will result in potential water quality impacts to Lucan Stream and Griffeen River during construction if unmitigated. With the proposed mitigation measures in place, there are no significant long term adverse effects. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

- **VA06S.312793:** An EIAR has been prepared for the development. The southwest of the site is shown to be within an area of Medium fluvial flood probability. However, mapping suggests there is no direct topographical route from this area to the main area where the substation would be built. The proposed works is not deemed to have any significant risk of flooding and is classified as Zone C. With the proposed mitigation measures in place, there are no significant long term adverse effects. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

- **VA06S.308585:** An EIAR has been prepared for the development. The works will result in potential water quality impacts to Baldonnel Stream during construction if unmitigated. The route of the 110kV transmission line crosses a land drain associated with the Mooretown Stream. It is proposed to cross this land drain via horizontal directional drilling (HDD). A Stage 2 Flood Risk Assessment was completed. The assessment showed that the west part of the site is shown to be an area that is affected by the 0.1% AEP Flood Event (1 in 1000 year). With design measures and mitigation measures the predicted impact will be short term, imperceptible and neutral during construction. During operation there is no likely impact on receiving water bodies. Therefore, the assessed impact is long term imperceptible and neutral. As there is no overall change in the existing hydrological regime, the potential cumulative impact with respect to water and hydrology is deemed to be not significant. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

- **VA06S.309146:** An EIAR has been prepared for the development. The route of the 110kV transmission lines will cross under a culverted local stream. There is no direct hydraulic link to the Griffeen of Liffey Rivers or the Grand Canal pNHA to the north. A Stage 1 Flood Risk Assessment was completed. The assessment showed that the west part of the site is shown to be an area that is affected by the 0.1% AEP Flood Event (1 in 1000 year). With design and mitigation measures in place the predicted impact will be short term, imperceptible and neutral during construction. During operation there is no likely impact on receiving water bodies. Therefore, the assessed impact is long term, imperceptible and neutral. As there is no overall change in the existing hydrological regime, the potential cumulative impact with respect to water and hydrology is deemed to be long term, imperceptible and neutral. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

- **VA06S.VA0019:** Application accompanied with Environmental Report. The Grand Canal must be crossed by the 220 kV cable routes twice in order to connect the proposed substation with the existing overhead 220 kV line, once in the west (using the R120 road following the proposed upgrade (preferred option) or by going underneath the canal using horizontal direction drilling (alternative option) and once in the east (using cable ducts in the existing R136 road). A Flood Risk Assessment Report was submitted with the application. With design and mitigation measures in place no negative impact in the wider area in terms of flooding as a direct result of the works. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

- **VA06S.312793:** An EIAR has been prepared for the development. The works are not deemed to have any significant risk of flooding and is classified as Zone C. Overall, and considering embedded mitigation (primarily through the CEMP), it is considered that the construction of the works would not give rise to significant effects in EIA terms on water resources and flood risk. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

- **PL06S.302813:** An EIAR has been prepared for the development. The works will result in potential water quality impacts to Milltown Stream and Griffeen River during construction if unmitigated. The works is not deemed to have any significant risk of flooding and is classified as Zone C. With the proposed mitigation measures in place, there are no significant long term adverse effects. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

- **VA06S.317297:** An EIAR has been prepared for the development. The works will result in potential water quality impacts to Baldonnel Stream and Griffeen River during construction if unmitigated. With the proposed mitigation measures in place, there are no significant long term adverse effects. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

- **VA06S.309773:** An EIAR has been prepared for the development. The works will result in potential water quality impacts to Lucan Stream, Baldonnel Stream and Griffeen River during construction if unmitigated. With the proposed mitigation measures in place, there are no significant long term adverse effects. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.
- **PL06S.305948:** An EIAR has been prepared for the development. The proposed works will result in potential water quality impacts to Lucan Stream and Griffeen River during construction if unmitigated. With the proposed mitigation measures in place, there are no significant long term adverse effects. There are no likely significant cumulative effects in combination with the Proposed Development on water quality and flooding.

The screened in projects for cumulative effects in combination with the Proposed Development are expected to be Imperceptible and Short-Term, no Significant Adverse effects will arise.

19.3.3.8 Land, Soils, Geology and Hydrogeology

A number of approved planning permissions or planning applications are located within the study area of 1km. The earthworks are typically undertaken at the onset of the construction, and this is when any effects of construction activities on soils, land, geology and hydrogeology could occur. Therefore, only developments that have not commenced yet have been considered, as these would have a potential to contribute to cumulative effects.

The developments that have not yet been commenced include data centres, electricity substations, battery energy storage and extension to the pharmaceuticals plant. Only the proposed battery energy storage facility development comprises a basement with the remainder are anticipated to require relatively shallow earthworks to allow for construction of the foundations and/or infrastructure. Therefore, hydrogeology effects are likely to be negligible. The proposed battery energy storage facility is located 1km to the northwest of the Proposed Development. It is anticipated to be underlain by the same geological formations as the Proposed Development. Considering the hydrogeological properties of the bedrock aquifer and the distance, construction activities associated with the basement construction are unlikely result in a significant cumulative effect on the aquifer.

Majority of the applications that not yet have been implemented, are for development of either brownfield sites or extensions of existing developments. Therefore, the magnitude of impact on fertile soil and mineral resources is likely to be negligible, and unlikely to result in a significant cumulative effect on the aquifer.

Historical land use of the brownfield sites may have resulted in generation of made ground and pose land contamination issues. It is expected that land contamination and waste management would be undertaken in accordance with current Irish legislation and guidance, this will ensure the removal of contamination sources. Therefore, the magnitude of impact of land contamination is likely to be minor beneficial and will not result in Significant Adverse cumulative effects.

19.3.3.9 Archaeology, Architectural and Cultural Heritage

The Archaeological, Architectural and Cultural Heritage assessment has identified that there are no visible archaeological monuments within or in the immediate environs of the Proposed Development. Geophysical survey followed by archaeological testing and excavation will ensure the full resolution of any potential buried archaeological features that may be exposed. It is considered therefore that the construction of the Proposed Development alongside the existing or proposed projects will not result in any cumulative effects on the heritage resource.

19.3.3.10 Landscape and Visual

The Proposed Development is location within an active business park, where other sites are in varying stages of being complete, under-construction or recently complete (including Microsoft Campus SDCC Ref: SD16A/0088, Takeda Extension SDCC Ref: SD20A/0147, UBD Properties SDCC Ref: SD20A/0121, Moffash Ltd. SDCC Ref: SD20A/0124, CyrusOne Irish Datacentres SDCC Ref: SD18A/0134).

The Proposed Development will be constructed and operate within the context of the existing business park and the above permitted / planning developments. The Proposed Development is a relatively small component within an existing area of commercial development, and it is not anticipated that significant cumulative effects are likely.

The Proposed Development site is located within an area of the Newcastle Lowlands given over to development under its enterprise and employment zoning by SDCC. The nature of the development has focused on data centres that are large in scale and form, with flue structures extending from the roofline. This large-scale development within a lowland environment would change the character of the landscape within the area and the visual amenity experienced. As data centres already exist in the area the character of the landscape has already been altered due to their presence. Therefore, adding an additional data centre to this area will not change the landscape drastically.

In combination, the development of consented and Proposed Developments would change the character of the Profile Park / Grange Castle area from a scattered mosaic of fields and some commercial buildings to a relatively densely developed business park with some open spaces. In this circumstance, the character of the area has been predetermined and the focus from a landscape perspective should be a cohesive and high-quality design that assimilates the area effectively into its surrounding landscape.

19.3.3.11 Resource and Waste Management

Due to the nature of waste management in Ireland, cumulative effects for waste have been considered on a regional basis. A list of proposed projects planned within the region, was developed, including having regard to those projects set out in Project 2040 (Department of Public Expenditure and Reform 2018; Investment Projects and Programmes Office 2019). These projects were reviewed and screened based on the following criteria:

- Construction phases likely to overlap with the Proposed Development - where unknown, overlap is considered as a worst case; and
- Similar project waste profile is expected to be generated.

Refer to Table 19.2 for full details of projects considered.

Table 19.2: Regional projects included in Cumulative Assessment

Project Name	Project Type	Anticipated Construction Completion (year)	Waste Type Likely to be Generated
Metrolink	19km rail line running from Swords to Charlemont, majority of the line will be run underground via a single bore tunnel.	Circa 2032-2034	• Soil and stones • General C&D waste
Dart Underground	7.5km twin bore tunnel for electrified heavy rail in Dublin city centre, linking the Northern line to the Heuston Main line.	2029	• Soil and stones • General C&D waste
Dublin Port Masterplan 2040	Works include construction of new quays and jetties, remediation of contamination on the bed of the basin, capital dredging to deepen the basin, infilling of the Basin at some berth locations and construction of a new river berth with a double tiered Ro-Ro ram and deepening of fairway and approach to Dublin port.	2039	• Soil and stones • General C&D waste
BusConnects Dublin	Works include upgrades to sustainable transport corridors in Dublin including the upgrade to signalised junctions, bus lanes and cycle paths.	2030	• Soil and stones • Bitumen containing material • General C&D waste

Project Name	Project Type	Anticipated Construction Completion (year)	Waste Type Likely to be Generated
N2 Slane Bypass	3.4km long bypass that runs from the east of Slane to the existing N2 at a location 500m north of McGruder's crossroads	2026	• Soil and stones • Bitumen containing material • General C&D waste
Ardee Bypass	6km single carriageway, commencing in the townland of Mandistown to Glebe townland north of Ardee.	2024	• Soil and stones • Bitumen containing material • General C&D waste
Blanchardstown Regional Drainage Scheme	The project involves the upgrade of the sewer network currently serving Blanchardstown, Mulhuddart and Castleknock as well as a number of towns in Meath.	2023	• Soil and stones
North Dublin sewage plant (pipeline)	Construction of an underground pipeline beginning at Blanchardstown which will collect and transfer sewage, via a new pumping station at Abbotstown to the plant at Clonshaugh. The treated water will be discharged through a 6km marine outfall pipeline.	2026	• Soil and stones
Water Supply Project –Eastern and Midlands Region	Abstraction and treatment of water at Parteen Basin in Co. Tipperary, together with a 170km underground treated water pipeline from Parteen Basin to Dublin	2030	• Soil and stones
Greater Dublin Drainage Project	The orbital sewer route will intercept an existing sewer at Blanchardstown and will divert it from this point to the proposed wastewater treatment plant at Clonshaugh (13.7km in length; 5.2km of a 1.4m diameter rising main and 8.5km of a 1.8m diameter gravity sewer.)	2029	• Soil and stones
Eastern Bypass project	Cut and cover tunnel - Dublin Tunnel to Sandymount Strand	2032	• Soil and stones
O'Devaney Gardens Regeneration Programme	Development consists of 1,047 residential units across 10 blocks up to 14 storeys tall	2026	• Soil and stones • Bitumen containing material • General C&D waste
Belcamp Hall Residential Development	Residential development consisting 2,718 residential units (2,233 no. apartments, 485 no. houses), 2 no. creches and all associated site works.	TBC	• Soil and stones • Bitumen containing material • General C&D waste

In addition, a review of local developments that may give rise to cumulative effects (refer to Table 19.1) was carried out in order to determine whether each of those other projects have the potential to give rise to likely significant cumulative effects with the Proposed Development from a resource and waste perspective. Many of the other projects were screened out for a number of reasons including their location, scale and nature of the project.

The assessment concluded that there is potential for significant direct or indirect cumulative effects on resource and waste management predicted during the Construction Phase of the Proposed Development. However, waste is manage and regulated on national and regional level by the National Waste Management Plan for a Circular Economy 2024-2030 (Regional Waste Management Offices (RWMO)). Additionally, the RWMO published a Construction & Demolition Waste, Soil and Stone Recovery / Disposal Capacity Report in 2020 (RWMO, 2020) which states that:

"Licenced capacity is most prominent in the EMWR which has a healthy supply of active capacity and substantial new capacity due to come on stream. The Region contains 80% of the national capacity."

Therefore, the potential for significant effects is mitigated by the availability of waste management treatment capacity within the region.

19.3.3.12 Material Assets

No Significant Adverse residual effects on water, power and telecommunications are likely to arise during the Construction Phase of the Proposed Development in isolation. Other projects that may be under construction concurrently are unlikely to generate significant cumulative effects as the demand on material assets is expected to be minimal.

19.3.3.13 Major Accidents and Disasters

Regulation 15 of the Safety, Health and Welfare at Work (Construction) Regulations places a duty on designers carrying out work related to the design of a project to take account of the 'General Principles of Prevention' as listed in Schedule 3 of the Safety, Health and Welfare at Work Act. In addition to the duties imposed by Regulation 15 of the Safety, Health and Welfare at Work (Construction) Regulations, designers must comply with Section17(2) of the Safety, Health and Welfare at Work Act 2005 which requires persons who design a project for construction work to ensure, so far as is reasonably practicable, that the project is designed and is capable of being constructed to be safe and without risk to health, can be maintained safely and without risk to health during use, and complies in all respects, as appropriate, with other relevant legislation. This includes S.I. No. 138/2012 - Building Regulations (Part A Amendment) Regulations 2012 and, if the works being designed are intended for use as a workplace, the relevant parts of the Safety, Health and Welfare at Work (General Application) Regulations. In accordance with these requirements, the Proposed Development engineering design teams working on all projects will have designed the Proposed Development in accordance with relevant legislation, standards and guidance, thereby mitigating potential design and construction related risks.

19.3.4 Operational Phase

19.3.4.1 Traffic and Transport

The only potential cumulative effect identified is the Proposed Development on Plot 100, Profile Park, Nangor Road (planning application SD21A/0186, which proposes the construction of a 3 storey data centre. This development could potentially add additional traffic similar to the Proposed Development to the road network and have a cumulative effect on Junction No. 5, which has assessed as part of the traffic assessment for the Operational Phase. However, this junction currently operates within its capacity with ample spare capacity, as can be seen from the assessments in Table 6.11 to Table 6.13 of Chapter 6 (Traffic and Transport). The potential effect of the additional traffic generated by the Proposed Development only added a slight increase in the % RFC and vehicle queues and a similar increase due to the datacentre development will also only provide a slight increase. Therefore, the cumulative effect is considered to be minor and local.

The 2023 annual average daily traffic (AADT) were converted to 2025 AADT based on county specific link-based growth rates for light goods vehicles and heavy goods vehicles. These growth rates allow for projects within the vicinity that adds to traffic growth. Therefore, projects such as residential and commercial developments close and far from the Proposed Development site and of a small scale has been taken account of by applying the growth rates within the analysis.

It is judged that operation cumulative effects are unlikely to increase the magnitude of impact on landscape character, provided that the landscape mitigation measures are carried out, and therefore it is not anticipated that any additional or significant additional negative effects would be experienced.

Due to the Proposed Development's close association with active site of similar use, the operational cumulative impacts will be minimal. Due to the contained nature of the cumulative developments and the extent and form of the existing development within the vicinity of the development it is not anticipated, and any additional or significant additional negative effects would be experienced.

19.3.4.2 Air Quality

The assessment of air quality outlined in Chapter 7 (Air Quality) considered operational emissions from industrial developments in the vicinity of the Proposed Development. The assessment demonstrated that the inclusion of adjacent facilities complies with Air quality Standards. On this basis, no significant cumulative air quality effects are likely to arise during the Operational Phase.

19.3.4.3 Climate

It is expected that all major industrial facilities which generate significant carbon emissions will be regulated under the GHG permitting regulations. As outlined in Section 8.2.3 of Chapter 8 (Climate), the study area for the climate assessment encompasses the Republic of Ireland as the Project is assessed relative to climate commitments and carbon budget. CAP24 outlines measures to achieve Ireland's climate commitments and carbon budgets on a national level. CAP24 sets out measures to reduce carbon emissions in electricity, industry, buildings, transport and agriculture to ensure these commitments are reached. On this basis, no significant adverse cumulative effects are likely to arise on climate.

19.3.4.4 Noise and Vibration

No likely significant effects on noise sensitive receptors from the Proposed Development alone are predicted during the Operational Phase.

The following developments have been considered for the cumulative assessment due to the scale of each development and their proximities to the Proposed Development:

- SD16A/0236 – Bio-pharmaceutical manufacturing building located at 0.9km distance.
- SD18A/0134 – Data centre located at 0.19km distance.
- SD19A/0042 – Data centre located at 1.3km distance.
- SD19A/0153 – Three new buildings containing industrial and office units located at 0.75km distance.
- SD20A/0058 – Gas powered Power Plant located at 0.82km distance.
- SD20A/0121 – Data centre located at 0.15km distance.
- SD20A/0124 – Distribution warehouse building located adjacent to the site boundary.
- SD20A/0283 – Data centre and central administration building located 0.71km distance.
- SD21A/0167 – Gas fired power plant located 0.12km distance.
- SD21A/0186 – Data centre located 0.39km distance.
- SD21A/0241 – Data centre located adjacent to the site boundary.
- SD23A/0012 - Battery Energy System Storage (BESS) and Power Trunk building located at 1.0km.
- SD23A/0291 – Temporary power generation compound located at 0.23km distance.

A cumulative noise assessment including predicted or measured noise levels from the above projects has been undertaken, and the excess noise above existing measured levels has been calculated. The results are presented in Table 19.3. The cumulative impacts are assessed during the night time period as this is the most sensitive period for noise.

Table 19.3: Significance ratings of predicted cumulative noise levels in the vicinity of the Proposed Development.

Noise sensitive receptor	Total cumulative noise level including all screened-in activities (measured and predicted levels from other developments) $dBL_{Aeq,T}$	Measured night time noise level, $dBL_{Aeq,15min}$	Excess of cumulative noise level above existing measured level, dBA	Significance rating
R01	43	41	2	Imperceptible
R02	45	41	4	Slight to moderate
R03	45	41	4	Slight to moderate
R04	44	41	3	Slight to moderate
R05	44	41	3	Slight to moderate
R06	45	41	4	Slight to moderate
R07	45	41	4	Slight to moderate
R08	46	41	5	Slight to moderate
R09	46	41	5	Slight to moderate
R10	46	41	5	Slight to moderate
R11	46	41	5	Slight to moderate
R12	44	41	3	Slight to moderate
R13	43	41	2	Imperceptible

There is the potential for a slight to moderate increase in noise levels at nearby noise sensitive receptors due to all of the screened-in developments. This effect is expected to be long term, as the developments are generally expected to be operational for more than 15 years. This constitutes a potential significant effect on the noise environment due to cumulative noise levels in the vicinity of the Proposed Development.

It should be noted that the predicted noise levels from the Proposed Development are expected to be worst case, and actual day-to-day operations are expected to produce lower noise levels than those predicted. The Proposed Development and other development in the vicinity are required to comply with all noise limits as outlined under grants of permission and/or any limitations set by IEL.

19.3.4.5 Population and Human Health

Overall, a direct Positive, Moderate, Long-Term residual effect on population is predicted to occur as a result of the economic and employment opportunity associated with the Proposed Development. Similar positive effects are likely to arise due to other industrial developments in the area. On this basis, no significant adverse effects are likely to arise.

19.3.4.6 Biodiversity

No adverse effects are likely to arise during the Operational Phase of the Proposed Development, no significant negative cumulative effects are likely.

19.3.4.7 Water

The Proposed Development in combination with existing and planned developments in the area is well served by a comprehensive public water services network and impact on water supply and foul drainage capacity will not be adversely affected.

In relation to surface water, the development optimises SuDS measures to ensure a sustainable runoff rate to the Griffeen river and which takes into account existing and permitted developments in the vicinity which also rely on the same river system for controlled surface water runoff.

19.3.4.8 Land, Soils, Geology and Hydrogeology

No adverse effects are likely to arise during the Operational Phase of the Proposed Development, no significant negative cumulative effects are likely.

19.3.4.9 Archaeology, Architectural and Cultural Heritage

No adverse effects are likely to arise during the operational phase of the Proposed Development, no significant negative cumulative effects are likely.

19.3.4.10 Landscape and Visual

The Proposed Development site is located within an area of the Newcastle Lowlands given over to development under its enterprise and employment zoning by SDCC. The nature of the development has focused on data centres that are large in scale and form, with flue structures extending from the roofline. This large-scale development within a lowland environment would change the character of the landscape within the area and the visual amenity experienced.

In combination, the development of consented and Proposed Developments would change the character of the Profile Park / Grange Castle area from a scattered mosaic of fields and some commercial buildings to a relatively densely developed business park with some open spaces. In this circumstance, the character of the area has been predetermined and the focus from a landscape perspective should be a cohesive and high-quality design that assimilates the area effectively into its surrounding landscape.

19.3.4.11 Resource and Waste Management

No adverse effects are likely to arise during the operational phase of the Proposed Development, no significant negative cumulative effects are likely.

19.3.4.12 Material Assets

The Proposed Development is likely to have Negative, Moderate and Long-Term residual effects on power supply during the Operational Phase following the implementation of mitigation measures. Cumulatively with other developments requiring a large energy demand, there is the potential for a Negative, Significant and Long-term residual effect.

No Significant Adverse residual cumulative effects on water are likely on other material assets.

19.3.4.13 Major Accidents and Disasters

None of the projects outlined in Table 19.1 are expected to result in additional risk of a major accident and disaster. As the assessment of potential incidents and / or major accidents and / or disasters risk events as a result of the Proposed Development is Low, no significant cumulative adverse effects are likely to arise.

19.4 Environmental Interactions

Table 19.4 sets out a matrix to indicate where interactions between different effects on different environmental factors have been addressed. This is in line with the approach set out in EPA Guidelines (EPA 2022).

Interactions between Population and Human Health, Air Quality, Noise and Vibration and Landscape and Visual are inextricably linked. Chapter 10 (Population and Human Health) assesses the interactions between Landscape & Visual, Air Quality, Noise and Vibration. It therefore inherently addresses environmental interactions during both the Construction and Operational Phases.

Interactions also occur between Biodiversity, Land, Soils, Geology and Hydrogeology; Water; and Air Quality. The Biodiversity assessment (Chapter 11) has considered the interactions between species, habitats and various other environmental issues. There is an interaction between Water and Biodiversity as declines in surface water pollution can contribute to habitat degradation.

Interactions between Land, Soils, Geology and Hydrogeology and Waste and Natural Resources is also key. The main interaction between these topics will be during the Construction Phase. Natural Resources and Waste assesses the impact of imported materials and the use of site-won materials which can be re-used within the Proposed Development. There is an interaction between these issues as the amount of material to be imported will depend on the amount of material which can be recovered and re-used on-site. Chapter 13 (Land, Soils, Geology & Hydrogeology) provides an assessment of impacts on soils, including potentially contaminated land.

Table 19.4: Environmental Interactions Matrix

Typical Inter-relationship Matrix Environmental Elements	Traffic and Transport		Air Quality		Climate		Noise and Vibration		Population and Human Health		Biodiversity		Water		Land, Soils, Geology and Hydrogeology		Archaeology Architecture and Cultural Heritage		Landscape and Visual		Resource and Waste Management		Material Assets		Major Accidents and Disasters		
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	
Traffic and Transport																											
Air Quality	✓	✓																									
Climate	✓	✓	✓	✓																							
Noise and Vibration	✓	✓																									
Population and Human Health	✓	✓	✓	✓		✓	✓	✓																			
Biodiversity	✓	✓	✓	✓			✓	✓																			
Water		✓				✓			✓		✓	✓															
Land, Soils, Geology and Hydrogeology		✓							✓		✓		✓														
Archaeology, Architecture and Cultural Heritage																											
Landscape and Visual									✓	✓	✓	✓	✓		✓		✓	✓									
Resource and Waste Management															✓												
Material Assets	✓	✓							✓						✓		✓	✓									
Major Accidents and Disasters	✓			✓		✓			✓	✓	✓		✓	✓	✓				✓				✓				

Notes: This matrix should be read down, starting with each topic identified across the top. ✓ = significant interaction between. Blank cells indicate no or weak interaction. Con. = Construction Phase. Op. = Operational Phase.

19.5 Difficulties Encountered

The cumulative impacts of the Proposed Development with each of the 'other developments' were assessed to a level of detail commensurate with the information that was available at the time of assessment. Where information regarding other proposed developments was limited, these gaps were acknowledged within the assessment and the associated uncertainty in these cases is documented.

19.6 References

Department of Public Expenditure and Reform (2018) *Project 2040*

EPA (2022) *Guidelines on the information to be contained in Environmental Impact Assessment Reports Guidelines* (EPA 2022).

Government of Ireland (GoI) (2005) *Section17(2) of the Safety, Health and Welfare at Work Act 2005*

Government of Ireland (GoI) (2012) *S.I. No. 138/2012 - Building Regulations (Part A Amendment) Regulations 2012*

Government of Ireland (GoI) (2007) *S.I. No. 299 of 2007 Safety, Health and Welfare at Work (General Application) Regulations*

Government of Ireland (GoI) (2013) *S.I. No. 291 of 2013 Regulation 15 of the Safety, Health and Welfare at Work (Construction) Regulations*

Regional Waste Management Offices (RWMO) (2020) *National Waste Management Plan for a Circular Economy 2024-2030*

Regional Waste Management Offices (RWMO) (2020) *Construction & Demolition Waste, Soil and Stone Recovery / Disposal Capacity Report*

20. Summary of Mitigation and Monitoring Measures

20.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) identifies, describes and assesses the likely direct and indirect significant effects on mitigation and monitoring during Construction, Operational and Decommissioning Phases of the Data Centre Development DC3 (referred to as the "Proposed Development") in accordance with the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

The design of the Proposed Development has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental effects, where practicable. In addition, feedback received from consultation undertaken throughout the alternatives assessment and design development process has been considered, where appropriate.

A number of safeguards and management measures have been identified in order to mitigate potential negative environmental effects during construction, operation and decommissioning as described in detail in Chapter 6 to 19.

The mitigation and monitoring measures that have been established to minimise any likely significant negative effects arising from the Proposed Development on the surrounding environment are summarised in this Chapter.

The aim of the Proposed Development when in operation is to offer expanded compute capacity to GIL customers and products. The Proposed Development is described in detail in Chapter 4 (Description of the Proposed Development) and Chapter 5 (Construction) provides a description of the construction and demolition activities.

Refer to Appendix 1.1 for details of the author of this Chapter.

20.2 Summary of Construction Phase Mitigation and Monitoring Measures

A number of safeguards and management measures have been identified in order to mitigate negative environmental effects during construction and operation as described in detail in Chapters 6 to 19.

It should be noted that this generally excludes any inherent measures and elements that have been incorporated in the design as these design measures have been documented as part of Chapter 4 Description of the Proposed Development. Further, any environmental management measures during construction that have been identified and are associated with construction activity and methodology are documented in the CEMP which is included as Appendix 5.1.

The mitigation and monitoring measures that have been established to minimise any likely significant negative effects arising from the Proposed Development on the surrounding environment are summarised in Section 20.2 and 20.3.

20.2.1 Traffic and Transport

20.2.1.1 General

Construction traffic will be limited to certain routes and times of day, with the aim of keeping disruption to existing traffic and residents to a minimum. To minimise disruption to the local areas, construction traffic volumes will be managed through the following measures:

- The majority of construction traffic will be required to arrive at and leave the site outside of the AM and PM peak periods, where practical;
- During peak hours, ancillary, maintenance and other site vehicular movements will be discouraged.
- Daily construction programmes will be planned to minimise the number of disruptions to the surrounding area by staggering HGV deliveries to site;

- HGV routes to and from the will be developed in agreement with South Dublin County Council and with the objective of minimising the potential effect on the local areas for residents and businesses;
- Car parking will be provided for construction workers in a designated area in agreement with South Dublin County Council to avoid construction staff vehicles parking on public roads; and
- The Project Supervisor Construction Stage (PSCS) will be required to promote travel by sustainable modes of transport. The mobility management plan is detailed below.

20.2.1.2 Construction Traffic Management Plan (CTMP)

A CTMP has been prepared as part of the CEMP (Appendix 5.1). This will be agreed with SDCC in advance of the works. This includes provision of mobility management measures, wheel washing facilities, noise reduction measures, etc.

The CTMP will provide details of intended construction practices for the development, including:

- Access and egress;
- Routing of construction vehicles;
- Pedestrian and cycle provision;
- Parking and access;
- Traffic management signage;
- Timing of material deliveries;
- Traffic management speed limits;
- Vehicle cleaning;
- Road cleaning and conditions;
- Road closures and diversions (if any);
- Enforcement of the traffic management plan; and
- Emergency procedures during construction.

The CTMP and the Construction Stage Mobility Management Plan (refer to Appendix 5.1) will propose realistic targets for the number of construction staff vehicles arriving and departing from the site. The specific measures to reduce the potential number of vehicular arrivals and departures and the promotion of sustainable modes of transport will be defined and clarified once the construction force has been identified and an understanding can be made in terms of where construction staff is travelling from, how far staff are travelling, travel options available and what the potential for car sharing is.

20.2.2 Air Quality

The following mitigation measures will be implemented for the Construction Phase of the Proposed Development, in order to reduce the dust risk associated with construction, earthworks and track-out, in accordance with IAQM guidance (IAQM, 2024).

20.2.2.1 Measures Specific to All Sites

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager; and

- Display the head or regional office contact information.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked; and
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.

Monitoring

- Carry out regular site inspections of cleanliness, record inspection results, and make an inspection log available to the local authority when asked; and
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being reused on site. If they are being re-used on-site cover as described below; and
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles; and
- Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- No bonfires and burning of waste materials.

20.2.2.2 Measures Specific to Construction

The following measures are specific to construction:

- Ensure sand and other aggregates are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

20.2.2.3 Measures Specific to Trackout

The following measures are specific to trackout:

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site logbook;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable); and
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.

Dust deposition monitoring will be conducted at locations to the south and east of the Proposed Development where works are occurring within 250m. Monitoring will be carried out using the Bergerhoff method, i.e. analysis of dust collecting jars left on-site (German Standard VDI 2119, 1972). Results will be compared to the TA Luft guidelines (VDI, 2002). At least one month of dust deposition monitoring will be carried out in advance of the commencement of works to determine a baseline. In the event that guideline limits are exceeded, a review of mitigation measures will be carried out.

20.2.3 Climate

This section outlines the proposed Construction Phase mitigation measures for climate.

A series of mitigation measures have been incorporated into the construction design with the goal of reducing the embodied carbon associated with the Construction Phase of the Proposed Development. These mitigation measures include:

- The substitution of concrete containing Portland cement with concrete containing 25% ground granulated blast furnace slag (GGBS). This measure will lead to an estimated saving of c.2,200 tonnes of CO2eq during the Construction Phase;
- Opportunities for materials reuse will be incorporated within the extent of the Proposed Development including the use of reclaimed asphalt and recycled aggregate. This measure will lead to an estimated saving of 5,300 tonnes of CO2eq;
- Opportunities for the use of recycled steel, up to a minimum of 50%, will be incorporated within the extent of the Proposed Development construction. This measure will lead to an estimated saving of 1,335 tonnes of CO2eq;

- Where practicable, materials will be sourced locally to reduce the embodied emissions associated with transport;
- The combined measures, including the incorporation of GGBS, recycled and reused material, and recycled steel, will lead to an estimated saving of 8,885 tonnes of CO2eq;
- The Construction Traffic Management Plan (CTMP) will have the effect of reducing emissions from Construction Phase traffic, refer to the CEMP in Appendix 5.1; and
- All Field Integration & Assembly (FIA) products will be prefabricated and manufactured offsite before being shipped to site. This innovative solution limits construction waste, reduces the embodied carbon of the products and improves the construction efficiency

20.2.4 Noise and Vibration

Guidance on the approximate attenuation achieved by barriers surrounding the Proposed Development site is provided in BS 5228-1. It states that when the top of the plant is just visible to the receptor over the noise barrier, an approximate attenuation of 5 dBA can be assumed, while a 10 dBA decrease can be assumed when the noise screen completely hides the sources from the receptor.

Due to the proximity of the NSRs, a barrier height will be chosen to completely hide the source, and a 10 dBA reduction in noise levels is predicted at NSRs. All noise barriers shall be constructed of solid material that is free from holes or gaps (including to ground level) to achieve the stated noise reduction.

BS5228 Parts 1 and 2 offer detailed guidance on the control of noise and vibration from demolition and construction activities. Specific examples of such mitigation measures include:

- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Establishing channels of communication between the Contractor/developer, Local Authority and residents;
- Appointing a site representative responsible for matters relating to noise and vibration; and
- All site access roads will be kept even to mitigate the potential for vibration from lorries.

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed. These may include:

- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of barriers as necessary around items such as generators or high duty compressors; and
- Situate any noisy plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

It is proposed that during any rock breaking or similar vibration-generating works, vibration from construction activities to off-site residences be limited to the values set out in Table 9.6 through monitoring of vibration at the Proposed Development site boundary or at noise-sensitive locations. It should be noted that these limits in Table 9.6 are not absolute but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Where there is existing damage, these limits may need to be reduced by up to 50%, as stated in BS5228.

Monitoring of noise and vibration levels at the construction site boundary will be undertaken near working areas to identify where work procedures may need to be modified. In the event of a valid complaint, a noise monitoring protocol will be submitted to the relevant local authority prior to commencement of any noise monitoring. The protocol will include details of:

- A description of the complaint;

- Construction activities taking place at the time of the complaint;
- Noise monitoring methodology and results; and
- Any actions taken.

20.2.5 Population and Human Health

Construction Phase mitigation measures relating to those factors under which population and human health effects might occur have been addressed elsewhere in this EIAR, under the environmental factors for traffic and transport, noise and vibration, air quality and major accidents and disasters. Other than the mitigation measures outlined in Chapter 6, 7, 9, 15 and 18 no further mitigation measures are proposed with respect to population and human health.

20.2.6 Biodiversity

The mitigation measures have been drawn up in line with current best practice and include avoidance of sensitive habitats at the design stage and additional measures to prevent significant ecological impacts. The following mitigation measures will be implemented.

20.2.6.1 General Mitigation Measures

Industry good practice guidance will be followed by the Contractor during the Construction Phase including, where relevant, those listed in the guidance below (refer to the Construction Environmental Management Plan (CEMP) included in Appendix 5.1):

- Construction Industry Research and Information Association (CIRIA), (CIRIA, 2001). C532 Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- C650 Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (CIRIA, 2005);
- BPGCS005, Oil Storage Guidelines;
- Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition projects, (EPA, 2021);
- The SuDS Manual, CIRIA (C753);
- Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters, (IFI, 2016);
- The Management of Waste from National Road Construction Projects, GE-ENV-01101, (TII, 2017); and
- Best practice biosecurity measures.

Best practice construction processes will be implemented throughout the Construction Phase by the appointed Contractor which include pollution prevention control measures to manage surface water runoff. In addition, there will be monitoring and reduction of aerial emissions and noise. These measures are a standard operating procedure to adhere with Industrial Emissions Licence requirements; they are not included to protect any European site.

20.2.6.2 European Sites

The AA and NIS report of this EIAR provides proposals which will mitigate against the potential adverse effects of the Proposed Development on QIs/SCIs through the Construction Phase. The potential adverse effects were identified to be:

- Potential impairment of water quality through accidental spills in construction; and
- Potential impairment of water quality through sedimentation in construction.

Monitoring

- A suitably qualified Environmental Clerk of Works (EnCoW) and Ecological Clerk of Works (ECoW) will be appointed prior to commencement of works. The duties of these will be to monitor the efficacy of mitigation measures implemented by the Contractors and to report on the application and success of these measures;
- Water quality monitoring will be undertaken by a qualified person once in advance of construction to establish baseline levels of potential contaminants in an upstream and downstream location along the watercourse within the boundaries of the Proposed Development site;
- At the upstream culvert location background samples (i.e. baseline) will be collected in the same season as the watercourse construction will occur to ensure the results are representative;
- The downstream background samples will be tested at a laboratory for a range of parameters that occur naturally and for pollutants[1] including temperature, Electrical Conductivity (EC), pH, Dissolved Oxygen (DO), Turbidity, Total Petroleum Hydrocarbon (TPH) and Diesel Range Organics (DRO);
- Water pollution trigger levels will be determined against baseline monitoring results. The baseline monitoring results will present naturally occurring water quality conditions. Any abnormally high concentrations, when compared against baseline will be monitored by the EnCoW/ECoW during construction and will flag for construction to be stopped;
- During construction within the watercourse, field parameters (temperature, pH, turbidity, DO and EC) should be monitored upstream and downstream of the construction works twice a day. Visual inspections of the watercourse at these locations will be conducted daily during construction to identify any plumes of sediment or sheens of oil which may indicate spillages. If these are identified, works will stop until the source has been identified and remediated; and
- In the event of pollution occurring or the potential to occur, the EnCoW and ECoW have a 'Stop Works' authority to ensure measures to stop a pollution event are implemented immediately.

Prevention of Release of Hydrocarbons and Contaminants

During construction, the Contractor will be required to implement the following specific mitigation measures to prevent the release of hydrocarbons, polluting chemicals, sediment/silt:

- Storage of sand/gravel/soil will be as far as practicable from watercourses and grading adjacent to these stockpiles kept to a minimum;
- Surface water run-off from temporary works area to be collected in silt/gravel traps prior to discharge to the surface water drainage network;
- Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW;
- All refuelling to take place in bunded enclosures and a minimum of 50m from any watercourse;
- Visual checks of the working areas and all silt/gravel traps will be carried out during weekly audits and maintenance works undertaken, if required;
- All chemical/fuel etc. will be stored in bunded containers and all storage will have sufficient bunding for all liquids stored (110% of the capacity of the largest drum);
- Spill kits will be maintained on sites and works areas;
- The Contractor will prepare a spill response procedure and implement it, if required;

[1] According to CIRIA (2001) pollutants are defined as substances that occur either in a location where it is not naturally occurring or in an abnormally high concentration.

- Spill incidents will be reported to the EnCoW;
- Oil interceptors will be installed on surface water drainage network at the Proposed Development works areas for the Construction Phase;
- No foul sewer discharge will be allowed to enter the surface water drainage network; and
- Toolbox talks for all staff will be carried out by the Contractor before work commences to identify environmental and ecological issues.

Protection of Watercourses

- Construction works for the watercourse re-alignment shall take place as part of the enabling works and prior to the main Construction Phase. The sequencing of the new re-aligned channel and culverts and subsequent connection of the existing watercourse to this channel shall ensure limited increase in water levels upstream or downstream of the Proposed Development site;
- For works occurring within 50m of the open watercourse, weather forecasts will be monitored prior to and during works to avoid working in adverse weather conditions such as heavy rains. No excavations for watercourse crossings will take place during a yellow, or higher, issued rain warning by Met Eireann;
- Excavated material will be placed in such a way as to avoid any disturbance of areas near to the banks of watercourses and any spillage into the watercourses;
- An ECoW will be present for the entire duration of any instream works and monitoring will be conducted in line with the monitoring requirements above;
- Settlement tanks, silt traps / bags and bunds will be used where required to remove silt from surface water runoff. Sizing of the tanks will be based on best available guidelines. Any construction work within a 10m buffer zone of the watercourse edge will be provided with these measures to minimise sediment discharge to a watercourse;
- Where over pumping of water is required, flow will be discharged back to the watercourse at a downstream location to maintain continuity and avoid flooding and water quality impacts;
- Surface water generated on site will be diverted to on-site attenuation facilities. The outfall from these to be in agreement with the OPW;
- All machinery will have been suitably serviced and inspected prior to site delivery. A hydrocarbon/oil boom will be available at working areas for immediate deployment within the watercourse in the event of any hydrocarbon spillage at the Proposed Development site. A fuel spillage will be considered to be any loss of fuel, oil or lubricant, including hydraulic oil and spot leakage;
- Deposition areas for spoil will be enclosed with silt fencing to prevent mobilisation of solids during adverse weather conditions and no drainage from these areas will be directed into the temporary drainage systems. A SuDS will be implemented to allow controls to be designed for the retention of large volumes of water that may arise from spoil deposition areas;
- Silt traps and fencing to be placed in working areas that have the potential to carry silt laden material from the working area to aquatic environments. Silt traps and fences will not be erected within flowing watercourses as these can act as a barrier for movement of species;
- Re-seeding of all areas of bare ground or the placement of jute matting will take place as soon as practicable to prevent run-off;
- All onsite welfare facilities will be installed and managed as per regulations to prevent nutrient overloading of aquatic environments; and
- Mitigation measures in relation to soil stripping, earth removal, stockpiling are detailed in Chapter 13 (Land, Soils, Geology and Hydrogeology) of the EIAR.

20.2.6.3 Habitats

Loss of Habitat

Due to the permanent loss of dry meadows, grassy verges, hedgerows, scrub, treelines and watercourse, planting will be required to compensate for this impact. The SDCC Development Plan (SDCC, 2022) highlights the importance of these habitats and requires development to align a series of measures, including (but not limited to) those listed below:

1. NCBH5 Objective 1: To ensure that development does not have a significant adverse impact on biodiversity, including known rare and threatened species, and that biodiversity enhancement measures are included in all development proposals;
2. NCBH11 Objective 4: To protect the hedgerows of the County, acknowledging their role as wildlife habitats, biodiversity corridors, links within the County's green infrastructure network, their visual amenity and landscape character value and their significance as demarcations of historic field patterns and townland boundaries;
3. GI1 Objective 7: To develop linked corridors of small urban 'Miyawaki' native mini-woodlands, a minimum of 100m² in size, to capture carbon and encourage biodiversity in suitable existing built-up areas, in low grade parkland, and other areas of zoned lands were deemed suitable and appropriate;
4. GI2 Objective 2: To protect and enhance the biodiversity and ecological value of the existing GI network by protecting where feasible (and mitigating where removal is unavoidable) existing ecological features including tree stands, woodlands, hedgerows and watercourses in all new developments as an essential part of the design and construction process, such proactive approach to include provision to inspect development sites post construction to ensure hedgerow coverage has been protected as per the plan;
5. GI2 Objective 5: To protect and enhance the County's hedgerow network, in particular hedgerows that form townland, parish and barony boundaries recognising their historic and cultural importance in addition to their ecological importance and increase hedgerow coverage using locally native species including a commitment for no net loss of hedgerows on any development site and to take a proactive approach to protection and enforcement; and
6. GI5 Objective 4: To implement the Green Space Factor (GSF) for all qualifying development comprising 2 or more residential units and any development with a floor area in excess of 500 sq m. Developers will be required to demonstrate how they can achieve a minimum GSF scoring requirement based on best international standards and the unique features of the County's GI network. Compliance will be demonstrated through the submission of a GSF Worksheet.
7. GI3 Objective 4: To uncover existing culverts where appropriate and in accordance with relevant river catchment proposals to restore the watercourse to acceptable ecological standards.

Compensation for scrub, hedgerow and treeline vegetation is proposed through the landscape plan which concept is about integration and strengthening existing Green Infrastructure elements, to assist in implementing the objectives outlined above. The elements are further discussed in relation to mitigation of habitat loss under the following headings.

Hedgerow/Scrub Planting

Compensation has been proposed through compensation planting of hedgerow and scrub species. A total area of 2,000m^2 is proposed through the landscape plan. The landscape plan seeks to improve habitat by providing a variety of habitat structure with native scrub species such as hawthorn, blackthorn bramble, hazel etc along the boundaries to provide increased connectivity and foraging opportunities. The southern boundary will be with the addition of low-level border planting and an acoustic barrier. This in turn provides security benefits for the data centre.

The typical planting palette has been designed to promote and enhance biodiversity (native seeds, fruits and pollinator friendly species). The remainder have been chosen from the 'All Ireland Pollinator Plan'(AIPP). See Section 20.3.6.3 for more enhancements to be considered from the AIPP.

Species were also selected to respond to the requirement to provide structural planting to strengthen the ecological connections and wildlife corridors. For example, the native riparian buffer mix included hawthorn, elder, goat, willow and blackthorn.

Tree Planting

Tree removal is limited to the hedgerow and treeline habitat extending from the south boundary into the centre of the site (approximately 175m in length). Trees will be retained along the south and south-west boundaries. The tree planting strategy element of the landscape plan details woodland planting will occur to the south-west, along the south boundary, southwest and northern portion of the site. The total area to be planted under woodland is 24,340m^2.

The landscaping plan demonstrated the inclusion of Miyawaki forest to obtain forest cover. This design should be developed through collaboration between a qualified ecologist and the landscape designer on the project. SDCC Development Plan (SDCC, 2022_ makes reference to "Miyawaki forest". GI1 Objective 7: To develop linked corridors of small urban 'Miyawaki' native mini-woodlands, a minimum of 100 m² in size, to capture carbon and encourage biodiversity. This method of creating forest cover is considered effective because it is based on natural reforestation principles, i.e. using trees native to the area and replicating natural regeneration processes. The method is considered to have significant benefits over more traditional forestry methods when used in smaller afforestation projects and is particularly effective in the urban environment. Trees grow much faster and have been found to support more biodiversity than in neighbouring woodland, so it is considered an approach that replicated natural woodland ecosystems quicker.

Landmark trees to be planted adjacent the SuDS pond to the south-west, include native trees such as bird cherry (*Prunus padus*), holly (*Ilex aquifolium*) and oak.

The landscaping plan demonstrated the inclusion of Miyawaki forest in the south-west corner, south-east corner, north and along the south boundary of the Proposed Development. This design should be further developed through collaboration between a qualified ecologist and the landscape designer on the project.

Water Features

To comply with policy and mitigate (through compensation) the loss of the watercourse habitat the Proposed Development has included the diversion of the watercourse as detailed in Section 11.4.1. The realigned watercourse will result in the lengthening of the open watercourse habitat by approximately 40m. The landscape plan includes the planting of a new native riparian habitat along the diverted stream to add to the existing green corridors. This consists of native riparian species, reflective of species already present around the watercourse e.g. elder, hawthorn and willow spp.

Two attenuation basins (SuDS) are proposed. The basins will be planted with diverse mix of water tolerant and slope stabilising species. Species included in the attenuation basin mix include bugle (*Ajuga reptans*), yellow iris (*Iris pseudacorus*), soft rush (*Juncua effusus*) and hard rush (*Juncus inflexus*). The inclusion of SuDS ponds aligns with the SDCC Development Plan Objective GI4 1: ensure that SuDS is integrated into all new development in the County. One of the attenuation basins, will be an integration of bioswales (wetland) to expand the capacity for water harvesting and storage capacity needs. The planting plans includes native species such as common reed (*Phragmites australis*), brooklime (*Veronica beccabunga*) and branched bur-reed (*Sparganium erectum*). The bioswale will be located to the north of the Proposed Development building.

A re-naturalised zone is proposed using native soil to be re-used on site to enable native seedbank to establish.

20.2.6.4 Changes to Hydrology

The watercourse runs through the Proposed Development, and it is important that construction activities do not result in pollution of this watercourse, either through siltation, which interferes with water flow, vegetation growth and aquatic fauna, or pollution (e.g. chemical). Refer to the mitigation proposed in Section 0 that is also stated in Chapter 12 (Water) for water pollution prevention.

20.2.6.5 Habitat Degradation

Invasive Species

Despite no scheduled invasive species were identified on the Proposed Development site, best practice measures outlined within the CEMP (Appendix 5.1) will be adhered to. If any invasive species are found on site, a method statement detailing the treatment/management of invasive species will also be required.

The SDCC Development Plan (SDCC, 2022) highlights (NCBH10 Objective 1) if developments are proposed on sites where invasive species are or were previously present, applicants should submit a control and management programme with measures to prevent, control and / or eradicate the particular invasive species as part of the planning process and to comply with the provisions of the European Communities Birds and Habitats Regulations 2011 (S.I. 477 / 2011).

Water Quality

The Contractor will be required to put in place a Surface Water Management Plan (SWMP) to protect the water environment during construction. This will include all mitigation measures listed in Chapter 12 (Water) and any other water related mitigation measures listed in other chapters including but not limited to the Chapter 13 (Land, Soils, Geology and Hydrogeology). Please review Section 20.2.6.4 for mitigation in that relate to water pollution but also changes to hydrology.

Dust Management/Aerial Emissions

Best practice construction processes (CIRIA, 2015) will be implemented throughout the Construction Phase by the appointed Contractor which include pollution prevention control measures to manage dust emissions. In addition, there will be monitoring and reduction of aerial emissions and noise. These measures are a standard operating procedure to adhere with Industrial Emissions Licence requirements; they are not included to protect any European site.

20.2.6.6 Protected and Notable Species

Amphibians

Direct Mortality

As a precautionary measure, a visual search of the watercourse will be carried out in the days prior to commencement of maintenance works and any frogs or smooth newt will be removed to alternative habitats elsewhere within the landholding (northern boundary). This will be carried out under licence from the NPWS and under supervision of the EcOW.

Loss of Foraging Habitat

To mitigate against the loss of foraging habitat it is proposed that where possible a replacement ratio of 2:1 is achieved. As discussed above in Section 0, additional water features are proposed as part of the landscape plans (attenuation ponds and bioswale) which will increase foraging habitat. The realigned watercourse will result in the lengthening of the open watercourse habitat by approximately 40m. The landscape plan also includes the planting of a new native riparian habitat enhancing the connectivity for amphibians.

20.2.6.7 Bats

Direct Mortality

In accordance with current guidance, trees with low suitability were not subject to further survey. No roosts were recorded at the trees with moderate or high suitability. However, the BCT Best Practice Guidance states the difficulty in ascertaining if bat roosts are absent from trees and therefore on a precautionary basis this report makes precautionary recommendations in relation to tree clearing immediately prior to felling.

Where trees are considered to have potential for bats, a PRF (potential roosting feature) inspection survey will be conducted the day of the proposed felling by a suitably qualified and experienced ecologist.

Access to PRFs on the day of removal will be facilitated using a cherry picker/Mobile Elevating Work Platform (MEWP) where possible and the PRFs will be inspected with the aid of an endoscope and/or torch. Where bats are encountered, all relevant works will cease and an application for a derogation licence must be submitted to the NPWS to permit removal of the roost.

Where it is not possible for a qualified ecologist to inspect the PRFs at height, a bat emergence and re-entry survey should be conducted the night prior to felling. Where a bat roost is encountered, all relevant works will cease and an application for a derogation licence must be submitted to the NPWS to permit removal of the roost. If bat roosts are not encountered during the survey, trees will be section-felled (soft-felling) in the presence of a suitably qualified ecologist. Soft-felling can be defined as:

"*Work should be conducted in a sensitive manner, and where reasonably practicable, timber with bat potential should not be directly sawn through. If such timber is removed, it should be left at the base of the tree for at least 48 hours. Where it is impractical to lower potential bat roosts, piles of brash or logs can be used to soften the impact of them hitting the ground* " (Natural England, 2013).

Tree sections with PRFs will be left in-situ with bat access points facing upwards for 48 hours to allow any bats that may be present to emerge.

Bat roost potential in the area will be increased in the short to medium term through the installation of bat boxes (these should be woodcrete rather than wooden to ensure a "like for like "replacement) on hedgerows. It is recommended that these replace PRFs lost on a 2:1 ratio. Therefore, eight bat boxes should be placed on the south boundary vegetation.

Loss of Foraging Habitat

To mitigate against the loss of foraging habitat it is proposed that where possible a replacement ratio of 2:1 is achieved. However, given the lack of space available this is not possible to achieve on site. Mitigation focuses on promoting habitat diversity and enhancing quality to increase the availability of insect prey. The following is therefore proposed as mitigation:

- Comply with Landscape proposals of obtaining 11,000m^{2}of Miyawaki forests;
- Comply with Landscape proposals of obtaining 1,350m^2 of riparian buffer;
- Comply with Landscape proposals of obtaining 2,000m^2 of hedgerow and scrub planting; and
- Comply with Landscape proposals of obtaining 5 types of water features habitat (diverted watercourse, bioswale and SuDS).

The landscaping plan also includes native species with consideration made to night scented species to include in herbaceous borders to attract invertebrate prey. Species such as yellow iris, bugle and yarrow (*Achillea millefolium*). Tree species have also been included that promote the same benefit for foraging bats: pedunculate oak (*Quercus robur*), elder and hawthorn.

20.2.6.8 Breeding Birds

Direct Mortality

The following mitigation measures are proposed to comply with legislation protecting birds and their nests:

- In order to avoid disturbance of breeding birds, their nests, eggs and/or their unfledged young, all works involving the removal of trees or hedgerows will be undertaken outside of the nesting season (1st March to 31st August inclusive). Or where this seasonal restriction cannot be observed then; and
- A pre-construction check will be undertaken, prior to works commencing by an SQE in order to confirm whether birds are nesting within suitable habitat affected by or immediately adjacent to the subject lands. If no breeding birds are found nesting in trees or hedgerows on the Proposed Development, this vegetation must be removed within 48 hours or repeat surveys will be necessary. Should nesting birds be present during surveys, the removal of trees or hedgerows may be required to be delayed until after the nesting season (1st March to 31st August inclusive).

Loss of Foraging and Breeding Habitat

To mitigate against the foraging and nesting habitat, replacement nesting habitat will fulfilled woodland, hedgerow and scrub planting across the site (approximately 29,000m^2). Nesting boxes are proposed within the Landscape plan and should be included to mitigate loss of nesting habitat in the short term. Six nesting boxes are proposed around the boundaries of the site.

Disturbance from Noise and Vibration

Noise and vibration will be managed through best practice constructions measure implemented as part of the CEMP (Appendix 5.1).

20.2.6.9 Other mammals

Disturbance from Foraging and Commuting Habitat or Direct Mortality

Badger

Badger and their setts are protected under the Wildlife Acts. Given the evidence that badger are utilising the site (commuting only) and there is suitable habitat within [redacted] embankments with rabbit burrows) to support resting badger the following mitigation measures are required to comply with legislation:

- A pre-construction check for badger should be undertaken by a SQE 48 hours or less prior to works commencing to ensure that no additional setts have been constructed in the intervening period that may be impacted by the proposed works;
- If, during vegetation clearance, signs of badger are identified, including unidentified holes/burrows, works within that area should be stopped immediately, an exclusion area (30m) established and the SQE contacted to undertake a check;
- If a sett is identified consultation with NPWS is recommended as a licence may be required;
- An accompanying toolbox talk will be delivered to inform relevant construction staff of the sensitivities of working near an area utilised by badgers and include the following measures;
- During construction, any open excavations should be covered over night to ensure animals cannot fall in and become trapped. If this is not possible, a ramp should be provided that is at a suitable angle for animals to use as a means of escape; and
- Avoidance of facing light towards sensitively commuting corridors at night.

West European Hedgehog and Pygmy Shrew

An SQE should be installed for any woody vegetation removal to ensure that there are no pygmy shrew or west European hedgehog utilising the site during construction works.

Loss of Foraging and Commuting Habitat

To mitigate against the habitat lost a replacement for foraging and commuting habitat is proposed for the scrub, treeline and hedgerow habitats lost as a result of the Proposed Development. This will be achieved along the east, south and west boundary with the planting of native scrub and tree species. Miyawaki forest to the north will also provide this habitat. Please refer to Chapter 15 (Landscape and Visual).

20.2.7 Water

20.2.7.1 Project Wide Mitigation Measures

Industry good practice guidance will be followed by the Contractor during constructed including, where relevant, those listed in the guidance below (refer to the Construction Environmental Management Plan (CEMP) included in Appendix 5.1):

- Construction Industry Research and Information Association (CIRIA), (CIRIA, 2001). C532 Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- C650 Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (CIRIA, 2005);
- BPGCS005, Oil Storage Guidelines;
- Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition projects, (EPA, 2021);
- The SuDS Manual, CIRIA (C753);
- Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters, (IFI, 2016); and
- The Management of Waste from National Road Construction Projects, GE-ENV-01101, (TII, 2017).

The Contractor will be required to put in place a Surface Water Management Plan (SWMP) to protect the water environment during construction. This will include all mitigation measures listed in this Chapter and any other water related mitigation measures listed in other chapters including but not limited to the Chapter 11 (Biodiversity) and Chapter 13 (Land, Soils, Geology and Hydrogeology).

At a minimum, the Surface Water Management Plan (SWMP) will detail control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Development. The appointed Contractor immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to planning conditions imposed by any grant of approval.

At a minimum, all the control and management measures set out in the SWMP will be implemented. This includes measures relating to:

- A requirement for an Environmental Incident Response Plan;
- Construction Compound management including the storage of fuels and materials;
- Control of sediment;
- Use of concrete;
- Management of vehicles and plant including refuelling and wheel wash facilities; and
- Monitoring.

20.2.7.2 Specific Mitigation Measures

Other specific water pollution and flooding mitigation and / or monitoring measures include:

Works to Manage Flooding

The Contractor will be required to put in place a Flood Risk Management Plan (FRMP) to minimise damage to the construction works in case of flooding and to reduce risk of flooding to nearby properties. As part of the FRMP, the following will be included:

- The work near or associated with the watercourse will be planned to be undertaken at appropriate periods when low flow is expected;
- Weather warning notifications will be issued and the weather forecast checked regularly when working near areas at risk of flooding;
- A flood warning system and management plan will be implemented; and
- The Contractor will construct the large majority of the diversions prior to any works on the existing stream. The connection between the existing watercourse and the new diversions will be undertaken once the diversion works are finished and within few days.

Surface Water Quality Monitoring

- A suitably qualified Environmental Clerk of Works (EnCoW) and Ecological Clerk of Works (ECoW) will be appointed prior to commencement of works and employed when/where appropriate during the Construction Phase. The duties of these will be to monitor the efficacy of mitigation measures implemented by the Contractors and to report on the application and success of these measures. The EnCoW and ECoW will be responsible for water quality monitoring;
- Water quality monitoring will be undertaken by a qualified person once in advance of construction to establish baseline levels of potential contaminants in an upstream and downstream location along the watercourse within the boundaries of the Proposed Development site;
- At the upstream culvert location background samples (i.e. baseline) will be collected in the same season as the watercourse construction will occur to ensure the results are representative;
- The downstream background samples will be tested at a laboratory for a range of parameters that occur naturally and for pollutants including temperature, Electrical Conductivity (EC), pH, Dissolved Oxygen (DO), Turbidity, Total Petroleum Hydrocarbon (TPH) and Diesel Range Organics (DRO);
- Water pollution trigger levels will be determined against baseline monitoring results. The baseline monitoring results will present naturally occurring water quality conditions. Any abnormally high concentrations, when compared against baseline will be monitored by the EnCoW during construction and will flag for construction to be stopped;
- During construction within the watercourse, field parameters (temperature, pH, turbidity, DO and EC) will be monitored upstream and downstream of the construction works twice a day. Visual inspections of the watercourse at these locations will be conducted daily during construction to identify any plumes of sediment or sheens of oil which may indicate spillages. If these are identified, works will stop until the source has been identified and remediated; and
- In the event of pollution occurring or the potential to occur, the EnCoW and ECoW have a 'Stop Works' authority to ensure measures to stop a pollution event are implemented immediately.

Prevention of Release of Hydrocarbons and Contaminates

During construction, the Contractor will be required to implement the following specific mitigation measures to prevent the release of hydrocarbons, polluting chemicals, sediment/silt:

- Storage of sand/gravel/soil will be as far as practicable from watercourses and grading adjacent to these stockpiles kept to a minimum;
- Surface water run-off from temporary works area to be collected in silt/gravel traps prior to discharge to the surface water drainage network;
- Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW;
- All refuelling to take place in bunded enclosures and a minimum of 50m from any watercourse;

- Visual checks of the working areas and all silt/gravel traps will be carried out during weekly audits and maintenance works undertaken, if required;
- All chemical/fuel etc. will be stored in bunded containers and all storage will have sufficient bunding for all liquids stored (110% of the capacity of the largest drum);
- Spill kits will be maintained on sites and works areas;
- The Contractor will prepare a spill response procedure and implement it, if required;
- Spill incidents will be reported to the EnCoW;
- Oil interceptors will be installed on surface water drainage network at the Proposed Development works areas for the Construction Phase;
- No foul sewer discharge will be allowed to enter the surface water drainage network; and
- Toolbox talks for all staff will be carried out by the Contractor before work commences to identify environmental issues.

Protection of Watercourses

- The majority of the diversions will be undertaken prior to any works on the existing stream. The connection between the existing watercourse and the new diversions will be undertaken once the diversion works are finished and within few days. The sequencing of the new re-aligned channel and culverts and subsequent connection of the existing watercourse to this channel shall ensure limited increase in water levels upstream or downstream of the Proposed Development site;
- For works occurring within 50m of the open watercourse, weather forecasts will be monitored prior to and during works to avoid working in adverse weather conditions such as heavy rains. No excavations for watercourse crossings will take place during a yellow, or higher, issued rain warning by Met Eireann;
- Excavated material will be placed in such a way as to avoid any disturbance of areas near to the banks of watercourses and any spillage into the watercourses;
- An ECoW will be present for the entire duration of any instream works and monitoring will be conducted in line with the monitoring requirements above;
- Settlement tanks, silt traps / bags and bunds will be used where required to remove silt from surface water runoff. Sizing of the tanks will be based on best available guidelines. Any construction work within a 10m buffer zone of the watercourse edge will be provided with these measures to minimise sediment discharge to a watercourse;
- Where over pumping of water is required, flow will be discharged back to the watercourse at a downstream location to maintain continuity and avoid flooding and water quality impacts;
- Surface water generated on site will be diverted to on-site attenuation facilities. The outfall from these to be in agreement with the OPW;
- All machinery will have been suitably serviced and inspected prior to site delivery. A hydrocarbon/oil boom will be available at working areas for immediate deployment within the watercourse in the event of any hydrocarbon spillage at the Proposed Development site. A fuel spillage will be considered to be any loss of fuel, oil or lubricant, including hydraulic oil and spot leakage;
- Deposition areas for spoil will be enclosed with silt fencing to prevent mobilisation of solids during adverse weather conditions and no drainage from these areas will be directed into the temporary drainage systems. A SuDS will be implemented to allow controls to be designed for the retention of large volumes of water that may arise from spoil deposition areas;
- Silt traps and fencing to be placed in working areas that have the potential to carry silt laden material from the working area to aquatic environments. Silt traps and fences will not be erected within flowing watercourses as these can act as a barrier for movement of species;

- Re-seeding of all areas of bare ground or the placement of jute matting will take place as soon as practicable to prevent run-off;
- All onsite welfare facilities will be installed and managed as per regulations to prevent nutrient overloading of aquatic environments; and
- Mitigation measures in relation to soil stripping, earth removal, stockpiling are detailed in Chapter 13 (Land, Soils, Geology and Hydrogeology).

20.2.8 Land, Soils, Geology and Hydrogeology

20.2.8.1 Loss of Mineral Resources

Excavated material, where possible will be reused within the Proposed Development. The appointed Contractor will ensure acceptability of the material for reuse for the Proposed Development with appropriate handling, processing and segregation of the material in accordance with the CEMP (refer to Appendix 5.1).

Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff. Any surplus suitable material excavated that is not required for the Proposed Development, will be reused/recycled as set out in Chapter 16 (Resources and Waste Management).

20.2.8.2 Excavation of Made Ground

Any excavations within made ground will follow the criteria outlined in the CEMP (refer to Appendix 5.1). The CEMP will be updated by the Contractor prior to the commencement of construction.

Excavations in made ground will be monitored by an appropriately qualified person to ensure that any localised areas of contamination encountered are identified, segregated and disposed of appropriately and to ensure soils are consistent with the descriptions and classifications according to the waste acceptance criteria testing carried out as part of the site investigations. Any identified localised areas of contamination will be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage.

Care will be taken to ensure that the contaminated material does not cross-contaminate clean soils elsewhere throughout the site.

Samples of ground suspected of contamination will be tested for contamination and ground excavated from these areas will be disposed of to a suitably licensed or permitted site in accordance with the current Irish waste management legislation.

Any dewatering in areas of contaminated ground will be designed to minimise the mobilisation of contaminants into the surrounding environment. Where dewatering in such areas is unavoidable the water will be adequately treated prior to discharge.

20.2.8.3 Pollution of the Water Environment

The CEMP will be updated by the Contractor prior to the commencement of construction.

Good construction management practices will be employed to minimise the risk of transmission of hazardous materials as well as pollution of the diverted watercourse and groundwater.

The construction management of the Proposed Development site will take account of the recommendations of the CIRIA guidance Control of Water Pollution from Construction Sites – Guidance for consultants and Contractors (Masters-Williams et al., 2001) to minimise as far as possible the risk of soil, groundwater and surface water contamination.

Measures to be implemented to minimise the risk of spills and contamination of soils and waters will include:

- Employing only competent and experienced workforce, and site specific training of site managers, foremen and workforce, including all subcontractors, in pollution risks and preventative measures;

- Ensure that all areas where liquids (including fuel) are stored, or cleaning is carried out, are in designated impermeable areas that are isolated from the surrounding area and within a secondary containment system, e.g. by a roll-over bund, raised kerb, ramps or stepped access;
- The location of any fuel storage facilities will be considered in the design of all construction compounds and will be fully bunded. These are to be designed in accordance with relevant and current guidelines and codes of best practice at the time of construction.
- Good housekeeping will be maintained at the site (daily site clean-ups, use of disposal bins, etc.) during the entire Construction Phase;
- All concrete mixing and batching activities will be located in designated areas away from the watercourse and drains;
- Potential pollutants will be adequately secured against vandalism in containers in a dedicated secured area;
- Provision of proper containment of potential pollutants according to relevant and current codes of practice and legal requirements;
- Thorough control during the entire construction stage to ensure that any spillage is identified at early stage and subsequently effectively contained and managed; and
- Spill kits to be provided and to be kept close to the construction area and temporary construction compounds. Staff to be trained on how to use spill kits correctly.

20.2.8.4 Monitoring

Excavations in made ground will be monitored by an appropriately qualified person to ensure that any contaminated material is identified, segregated and disposed of appropriately. Any material from identified localised areas of contamination shall be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage.

Care will be taken to ensure that the localised area of contamination does not cross-contaminate clean soils elsewhere. All excavations will be monitored in accordance with good practice and guidelines at the time of the works.

Any excavation and stockpiled material shall be monitored during earthworks to ensure the stability of slopes and to ensure that the soils excavated for disposal are consistent with the descriptions and classifications according to the waste acceptance criteria testing carried out as part of the Proposed Development site investigations.

Implementation of the CEMP will be monitored on an ongoing basis.

20.2.9 Archaeology, Architecture and Cultural Heritage

In order to prevent accidental damage to the archaeological resource including any potential sub-surface archaeological finds or features, the below mitigation strategies are proposed.

20.2.9.1 Pre-Construction Phase

While there are no recorded archaeological sites within the lands proposed for development, the discovery of numerous archaeological sites during recent infrastructural work in the wider area highlights the archaeological potential of the Proposed Development. In this regard, the following pre-Construction Phase mitigation is proposed:

- Given the overall size of the Proposed Development site, it is proposed that a comprehensive geophysical survey be undertaken within the undisturbed greenfield land;
- The geophysical survey will inform where anomalies exist and such anomalies will subsequently be investigated by means of a comprehensive programme of archaeological test trenching. This work will be undertaken by a suitably qualified archaeologist licensed by the Department of Housing, Local

Government and Heritage. Test trenching will determine if sub-surface archaeological features are present and the extent to which they may be affected by the construction of the Proposed Development. In the event of archaeological features being exposed during testing, further work on the Proposed Development site will require consultation with the archaeological staff of the National Monuments Service, Department of Housing, Local Government and Heritage. Should archaeological artefactual material be uncovered, the requirements of the National Museum of Ireland with regard to such items shall be implemented; and

- A comprehensive photographic and descriptive record of the townland boundary extending north-south through the Proposed Development site should be undertaken by the archaeologist contracted to undertake the test excavation.

20.2.9.2 Construction Phase

The Construction Phase of any development involves considerable ground disturbance, therefore, the greatest potential effects on the archaeological resource will occur during the removal of topsoil and the reduction of ground levels. It is possible that archaeological features may exist in those areas not tested during the pre-Construction Phase of investigation.

The following mitigation measures are proposed during the Construction Phase:

- All topsoil removal operations shall be fully monitored by a qualified archaeologist. In addition, the monitoring archaeologist should be present to record the removal of the townland boundary that is required as part of the development. The archaeologist will require an excavation licence for archaeological monitoring, to be issued by The National Monuments Service, Department of Housing, Local Government and Heritage and approved by the National Museum of Ireland. Sufficient time will be allowed for the archaeologist to obtain an archaeological licence prior to the commencement of construction works, usually four weeks. The time-scale for the Construction Phase shall be made available to the archaeologist at an early stage with information on where and when topsoil stripping will take place;

- The monitoring archaeologist shall be empowered to halt the development if buried archaeological features or finds are uncovered. If archaeological remains are encountered, these sites will be protected by the National Monuments legislation. Further work on the site will require consultation with the archaeological staff of The National Monuments Service; and

- Provision, including financial and time, shall be made to facilitate any excavation or recording of archaeological material that may be uncovered during the developmental works. The excavations shall be undertaken in compliance with any measures that the National Monuments Service and the National Museum of Ireland deem appropriate. Following completion of monitoring, and other possible archaeological investigations, the archaeologist shall submit a report to the National Monuments Service and the National Museum of Ireland.

20.2.10 Landscape and Visual

The following measures are proposed to mitigate the potential negative landscape and visual impacts in the Site Clearance Phase:

- The site compound, car park and storage areas are located so as to minimize the impact to the existing vegetation to be retained;

- Securing of the construction site with fencing and hoarding to screen low level views of site works and construction;

- Provision of fencing in accordance with BS5837: 2012 for the protection of all existing vegetation to be retained; and

- Retention of topsoil for the creation of landscape berms and for reinstatement of disturbed landscape areas.

20.2.11 Waste and Resources

20.2.11.1 Introduction

A CDRWMP is included in the CEMP (Appendix 5.1). These plans meet the requirements outlined in the Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (EPA, 2021). The appointed Contractor will be obliged to further develop, implement and maintain the waste management plan and CDRWMP during the Construction Phase.

The key principles underlying the waste management plan and the CDRWMP will be to minimise waste generation and to segregate waste at source. The measures to achieve these which are relevant to the Proposed Development include:

- Where waste generation cannot be avoided, waste disposal will be minimised;
- Where possible, recyclable material will be segregated and removed off site to a permitted / licensed facility for recycling. Waste stream colour coding and photographs will be used to facilitate segregation by clearly labelling waste types;
- All staff on-site will be trained on how to minimise waste (i.e., training, induction, inspections and meetings);
- Materials on-site will be correctly and securely stored;
- Waste generated on-site will be removed as soon as practicable following generation for delivery to an authorised waste facility;
- Excavated material not required for the construction of the Proposed Development, will be screened by the appointed Contractor for suitable end uses
- The appointed Contractor will record the quantity in tonnes and types of waste and materials leaving the site during the Construction Phase. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material which is recovered, which is recycled and which is disposed of;
- Any hazardous waste arising will be managed by the appointed Contractor in accordance with the applicable legislation;
- Waste generated from on-site offices will be source separated at least into residual waste, dry mixed recyclables and organic waste; and
- The relevant appropriate waste authorisation will be in place for all facilities that wastes are delivered to (i.e., certificate of registration, waste facility permit and / or EPA waste licence).

20.2.11.2 Best Practice Waste Management

Table 20.1 sets out a list of best practice waste management measures which will be implemented as industry standard best practice by the appointed Contractor, where practicable during the scheme construction in accordance with the waste hierarchy.

Table 20.1: List of waste management best practice actions (Construction Phase).

Stage in Hierarchy	Action
General	Waste generated on-site will be removed as soon as practicable following generation for delivery to an authorised waste facility.
General	The appointed Contractor will ensure that any off-site interim storage facilities for excavated material have the appropriate waste licences or waste facility permits in place
Prevention	Paints, sealants and hazardous chemicals will be stored in secure, bunded locations.

Stage in Hierarchy	Action
Prevention	Take back schemes should be opted into where feasible for surplus products to be returned to suppliers.
Prevention	The site will be maintained to prevent litter and regular litter picking will take place throughout the site.
Prevention	'Just-in-time' delivery will be used as where practicable to minimise material wastage (Building Research Establishment (BRE) 2022; EPA 2015a)
Prevention	All hazardous waste will be separately stored in appropriate lockable containers prior to removal from site by an appropriate waste collection holder.
Prevention	All staff on-site will be trained on how to minimise waste (for example, training, induction, inspections and meetings).
Prevention	Materials on-site will be correctly and securely stored (BRE 2022).
Prevention / Recycling	Segregated skips will be used on-site if space permits (particularly for hazardous, gypsum, metal, timber, inert waste and general waste) (BRE 2022).
Recycling	Where possible, metal, timber, glass and other recyclable material will be segregated and removed off site to a permitted / licensed facility for recycling. Waste stream colour coding and photographs will be used to facilitate segregation.
Recycling	On-site office and food waste arising will be source separated at least into dry mixed recyclables, biodegradable and residual wastes
Recycling	Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types which they should contain, including photographs as appropriate.

20.2.11.3 Measures to Support a CE

Measures to support a CE have been included in Table 20.2 with reference to CE Objectives in the South Dublin County Development Plan 2022-2028. EDE7 Objective 2 of this Plan details *"measures to support the just transition to a circular economy"*.

Table 20.2: Design strategies to support the CE.

Design strategy	Description
Building in layers	Ensuring different parts of the building are accessible, can be maintained and can be replaced as necessary.
Designing out waste	Ensuring waste reduction is accounted for from project inception to completion, including consideration of standardised components, modular build, and reuse of secondary products and materials
Component or material reuse	Using a product in its original form with minimal reprocessing.
Designing for adaptability	Accommodating future structural changes and conditions, to prolong lifespan.
Flexibility	Accommodating changes in building use and occupant requirements.
Replaceability	Facilitate easy removal and upgrade.
Designing for disassembly	Designing to enable easy assembly or deconstruction of the building/layers with minimal damage to facilitate reuse or recycling.
Design for longevity	Avoiding a premature end of life for all components, considering durability and maintenance.

Design strategy	Description
Use of systems, elements or materials that can be reused and recycled	Use of a product in its original form with minimal reprocessing. Preparation for reuse involves checking, cleaning, or repairing materials so that they can be used again for their original purpose. Materials can be reused as a whole; redeployed as modules; or reused as a kit of parts on one or more different sites.

The Proposed Development aspires to incorporate CE principles into the whole life cycle of the development. The design principles align with the Climate Neutral Data Centre Pact (refer to Appendix 1.2).

The Proposed Development will be built and operated in accordance with European Union, National and Regional waste policy.

20.2.12 Material Assets

20.2.12.1 Power Supply and Telecommunications

No specific mitigation or monitoring measures are required as no Significant Adverse effects are likely to arise.

20.2.12.2 Water

No specific mitigation or monitoring measures are required as no Significant Adverse effects are likely to arise. Refer to Chapter 12 (Water) and the CEMP (Appendix 5.1) for measures to prevent surface water contamination with silt, and also control surface water runoff during construction.

20.2.13 Major Accidents and Disasters

A Construction Environmental Management Plan (CEMP) has been prepared and is included in Appendix 5.1 of this EIAR. The CEMP will be updated by the contractor/GIL prior to the commencement of the Construction Phase, so as to include any additional measures required pursuant to conditions attached to any decision to grant approval. It will be a condition of the Employer's Requirements that the successful contractor, immediately following appointment, must detail in the CEMP the manner in which it is intended to effectively implement all the applicable mitigation measures identified in this EIAR. The CEMP has regard to the guidance contained in the TII Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, and the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015).

The CEMP also provides details of other plans to be implemented during the Construction phase including a Construction Traffic Management Plan (CTMP) Surface Water Management Plan and Environmental Incident Response Plan (EIRP).

20.3 Summary of Operational Phase Mitigation and Monitoring Measures

20.3.1 Traffic and Transport

GIL will continue to operate its existing mobility management measures at its existing GIL Campus facility for its Proposed Development staff. These existing measures include:

- A flexible work time policy is in place at the GIL Campus providing staff the option to start anytime between 6.30 a.m. to 10.00 a.m. and to leave from 4.00 p.m. to 7.30 p.m. This distributes staff generated travel during the morning and evening commuter peak traffic periods;
- Staff showers, changing areas and lockers;
- Covered secure cycle parking;
- Revenue's tax saver scheme for public transport; and
- Revenue's bike to work scheme.

Operational Phase Mobility Management Plan has been developed as a support document to the planning application which is included in Appendix 6.1.

20.3.2 Air Quality

As the Proposed Development will result in a reduction in ground level concentrations, no mitigation measures are required during the Operational Phase. The reduction in emergency operational hours will be implemented and committed to under a revised IE licence for the full GIL Campus, resulting in a Positive and Long-Term effect when compared to the existing situation.

GIL will be required to continue to monitor emissions from the generators in accordance with the requirement of a revised IE licence.

In addition, GIL will continue to carry out ambient air quality monitoring of NO_2 in accordance with IE licence requirements.

20.3.3 Climate

20.3.3.1 Climate Change Vulnerability

As no Significant Adverse effects are likely due to the vulnerability of the Proposed Development to climate change and as the design already includes for climate change no further, additional mitigation measures are required.

20.3.3.2 Direct CO_2eq Emissions

As outlined in Section 8.2.1, CO_2eq emissions from the existing GIL Campus is regulated by the EPA under a greenhouse gas permit. This permit limits the carbon emissions from the GIL Campus due to the use of emergency generators for the purposes of testing and emergency use. This will need to be updated to account for the new combustion sources as part of the Proposed Development. Under the requirements of the ETS, GIL will be required to report annually to the EPA on CO_2eq emissions and reduce emissions and/or pay for CO_2eq allowances (100% of CO_2eq emissions by 2034).

It should be noted that GIL is currently limited by the EPA under IE Licence P1189-01 on the use of its generators both in the testing and emergency mode. As part of this planning application, GIL is committing to reducing the use of its generators in emergency mode from 150 hours per annum to 100 hours per annum. This will have the effect of mitigating emissions further.

In addition, energy efficiency is a key focus of GIL facilities and energy use is continuously monitored and reviewed. Existing energy use for DC1 and DC2 is managed through the Energy Management System (EnMS) which is implemented at the site since 2013 and is accredited to the ISO 50001 Standard. The EnMS includes regular cross-functional management reviews and is subject to both internal and external audits. All Google Data Centres are designed with high efficiency standards to use as little energy as possible through minimizing power loss and removing unnecessary parts. The servers are also designed as energy-proportional systems e.g. they use minimal energy when they're idle and waiting for a task.

Under licence P1189-01 which applies to DC1 and DC2, the following conditions apply to carbon emissions and energy usage that must be implemented on site:

- *Effects on climate due to release of CO_2 emissions will be mitigated through the limitations on the generators, which includes an operating hour restriction, conditions relating to energy efficiency and alternative energy sources, and through the requirement to participate in the EU Emissions Trading System (ETS).*
- *The licensee shall prepare, maintain and implement a Schedule of Environmental Objectives and Targets. The schedule shall, as a minimum, provide for a review of all operations and processes, as referred to in the conditions of this licence, including an evaluation of practicable options for:*
  - *(i) energy and resource efficiency;*
  - *(ii) increasing the use of solar power, sustainable biofuels and other renewable energy options on site;*

- *The licensee shall carry out an audit of energy use and the energy efficiency of the site with one year of the date of grant of this licence. The audit shall be carried out in accordance with the guidance published by the Agency, "Guidance Note on Energy Efficiency Auditing" and have regard to any other relevant published guidance. The audit shall be repeated at intervals as required by the Agency. The audit shall identify all practicable opportunities for:*
  - *Energy use reduction and efficiency; and*
  - *The use of alternate energy sources as a means of decreasing or offsetting the use of fossil energy.*
- *The recommendations of the audit shall be incorporated into the Schedule of Environmental Objectives and Targets under Condition 2 above.*
- *Alternative Energy Sources: The licensee shall carry out a feasibility study of opportunities to increase the use of solar power, sustainable biofuels and other renewable energy options including energy storage. The licensee shall submit a report within six months of the date of grant of the licence on the study under Condition 7.2.1 with recommendations for approval by the Agency on the options to decrease or offset the use (both directly and indirectly) of fossil fuelled energy.*

It is expected that a similar condition will be implemented under a revised IE licence regulating the full campus. Refer to Appendix 8.1 for the feasibility report submitted to the EPA under the requirements of its existing licence.

20.3.3.3 Indirect CO_2eq Emissions

In Ireland, GIL has signed a 14 year Power Purchase Agreement (PPA) (with the possibility to extend by five years) with Power Capital Renewable Energy for 58 megawatts (MW) of new-to-the grid capacity from the Tullabeg Solar Farm through an existing grid connection. This agreement has allowed the development of a new renewable energy project which was granted planning in 2022 is currently under construction. It will add new renewable energy to the grid that GIL's offices and data centres run on, contributing to the decarbonisation of Ireland's electricity system and of their operations.

GIL's current projections indicate that, once operational, this PPA will help its offices and data centres in Ireland to reach 60% carbon-free energy in 2025 when measured on an hourly basis. At present, GIL matches 100% of its electricity consumption of global operations with purchases of renewable energy on an annual basis. GIL will continue to apply that approach to mitigate carbon emissions generated during the Operational Phase of the development, in accordance with CAP24.

The Proposed Development includes measures to facilitate district heating where surplus heat is produced, in accordance with CAP24 and the SDCC CAP. This system has the potential to deliver heat for both space heating and water heating needs to nearby buildings through a network of insulated underground pipelines. This system will be realised only suitable offtakers are available.

In addition, it is proposed to provide photovoltaic (PV) panels on the roof of the Data Centre building. This is expected to generate 20% of the energy need associated with that occupied building through the use of renewable power.

Other site specific measures include:

- Variable Speed Drive (VSD) technology where appropriate to ensure that electrical drives operate efficiency over their demand range;
- Minimise water use through low flow sensor activated taps and other sanitary ware systems; and
- The water supply to toilets include solenoids so that when the room is unoccupied the water supply gets shut off; thus minimising water wastage.

GIL is certified under the Climate Neutral Data Centre Pact standard (as verified by Bureau Veritas). This standard is verified under the following headings:

- Energy efficiency;
- Clean energy;

- Water conservation;
- Circular economy; and
- Circular energy systems.

The standard is valid until 30 June 2027, refer to Appendix 1.2.

At DC3, GIL will align with the EU Climate Neutral Data Centre Pact energy efficiency and water use targets and set themselves targets to achieve zero carbon electricity use at all hours. System operators will work with large energy users to facilitate accurate hourly emissions reporting, grid carbon-intensity transparency, and allow data centre to optimise computing loads to maximise use of renewables and minimise carbon emissions (as per Action 99 of Climate Action Plan 2021).

The DC3 design aligns with the CNDCP principles and targets:

- Energy Efficiency: The design improves upon the annualised Power Usage Effectiveness (PUE) target of 1.3 that the CNDCP sets out;
- Water Conservation: The design is based on air chillers and minimal water consumption is expected; and
- Renewable Energy: GIL demonstrates a strong commitment to sustainability by using 100% renewable energy across all its global operations, including in Ireland. This goal was achieved in 2017 and has been maintained ever since. GIL continues to buy renewable energy as they grow.

In its 2023 Environmental Report (2023 Environmental Report (gstatic.com)), Google describes its target to achieve net-zero emissions across all operations and value chain by 2030. The Report outlines the work undertaken with suppliers that are committed to sustainability, and partners with them to develop decarbonisation roadmaps and build essential data infrastructure to accurately quantify emissions and reductions across the value chain. Google engages with suppliers—including hardware manufacturing and indirect services suppliers—to help reduce their energy consumption and GHG emissions, as stated in the 'Supplier Code of Conduct', which all suppliers are required to sign. Google assesses suppliers' practices to report, manage, and reduce their emissions and incorporate this into the supplier scorecard.

In 2022, Google engaged with suppliers directly to drive improved data and accounting, including increased completeness and accuracy for their Scope 1, 2, and 3 emissions.

As outlined in Section 8.2.1.3, significant additional reductions in CO_2eq emissions are expected to arise by 2030 due to the decarbonisation of the electricity grid through the growth of renewable energy provision. This will further mitigate the potential indirect effects on climate.

GIL is permitted to undertake activities resulting in emissions of CO2eq from generators at its GIL Campus site (No IE-GHG170-10431). Under this permit, GIL is required to report to the EPA on an annual basis on its GHG emissions. This permit will be extended to the full GIL Campus, prior to the commencement of operations.

20.3.4 Noise and Vibration

Mitigation measures for the Operational Phase are provided in the form of acoustic louvres, attenuators, and reduced fan speeds during the night time period that all reduce noise from equipment at the Proposed Development, and therefore reduce predicted noise levels at nearby NSRs.

Schedule C.4 of the IEL outlines the required noise monitoring. This is presented in Table 20.3.

Table 20.3: Noise monitoring requirements from Industrial Emissions Licence P1189-01.

Period	Minimum Survey Duration
Daytime	A minimum of 3 sampling periods at each noise monitoring location.[2]
Evening-time	A minimum of 1 sampling periods at each noise monitoring location.

[2] Sampling period is to be the time period T stated as per Schedule B.4 Noise Emissions, of this licence. This applies to day, evening and night-time periods

Period	Minimum Survey Duration
Night-time[3]	A minimum of 2 sampling periods at each noise monitoring location.

20.3.5 Population and Human Health

The Proposed Development operates under an IE licence and as such has prescribed Operational Phase monitoring measures set by the EPA. These controls and monitoring measures must be complied with by GIL in order to operate.

Operational Phase mitigation measures relating to those factors under which population and human health effects might occur have been addressed elsewhere in this EIAR, under the environmental factors for traffic and transport, noise and vibration, air quality, landscape and visual, and major accidents and disasters. Other than the mitigation measures outlined in Chapter 6, 7, 9, 15 and 18 no further mitigation measures are proposed with respect to population and human health.

During the Operational Phase ongoing monitoring, which is carried out in accordance with the GIL Campus IE licence, will include all aspects of the Proposed Development.

20.3.6 Biodiversity

During the Operational Phase the Proposed Development environmental management system will address management of potentially contaminating materials such as fuel, lubricating oils, solvent, etc. and ensure such material is appropriately controlled, in accordance with regulatory requirements and industry best practice.

The drainage design for the site will consider the magnitude of the changes in infiltration and runoff characteristics and the significance of potential impacts at the wetland. Further details on operational water management are included in Chapter 12 (Water).

20.3.6.1 Habitats

Dispersal of Species

Despite the lack of evidence of aquatic species within the Proposed Development, with the proposed opening of the watercourse and habitat enhancement measures, design of the open stream should adhere to Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016) as a mitigation measure.

Between the open stream and Culvert B, there is a 2m vertical transition, designed to allow for shallow slopes and reduced velocities within both the stream and Culverts A and B (Figure 11.8). To enable the 2m vertical transition, a series of 4 step pools of 0.5m height and 5m length each will be positioned between the two. The total length of the step pools is 25m (to include 5m of gentle slope at the end of the step pools and before entering Culvert B. The step pools should allow movement of any potential fish should they occur in the future. They are designed with stones and coarse bed material to prevent erosion due to the high local velocities. They will also provide energy dissipation. The surrounding proposed ground levels are set to 80m OD. As the base of the step pools will be between 75.7-77.75m OD, the difference with surrounding levels varies from 2.25m - 4.3m. A combination of retaining structure at the base and sloping grounds at higher levels is proposed to accommodate the vertical transition.

20.3.6.2 Protected and Notable Species (Bats)

Disturbance from Lighting

The primary lighting mitigation which will be implemented for this project relates to bats, as these are considered the most sensitive species in relation to night-time lighting. It is noted however that the mitigation proposed will also lessen in the impact in relation other nocturnal species such as badger.

[3] Night-time measurements should be made between 2300hrs and 0400hrs, Sunday to Thursday, with 2300hrs being the preferred start time.

The lighting scheme has considered best practice, as published by the Institute of Lighting Professionals and BCT Guidance Note 8 (GN08) Bats and Artificial Lighting (2023) in respect of mitigation strategies, to minimise the impact of outdoor lighting upon bat populations. To achieve the criteria set out in Guidance Notes for the Reduction of Obtrusive Light (GN01) and (GN08) and meet criteria around light intrusion, intensity of light source and upward light spill that is associated with sky glow, the following methods are proposed as mitigation to be employed across the site.

- Refine external lighting only to areas with necessity;
- Maintain no lighting preserved areas such as the SuDS pond and proposed hedgerow to the east;
- Specify luminaires with good cut-off optic to avoid light beyond task area;
- Luminaires with negligible upward light and zero tilt;
- Colum hights to minimise light spill and glare visibility;
- Light source - typically an LED source is considered to be more appropriate to reduce the impact to bats as it has less UV component and good colour rendition;
- Colour temperature - GN08 recommends a warm white colour temperature be used to reduce the amount of blue light component. It is proposed to utilise a 3,000K or lower (warm white), LED source, avoiding detrimental impact to both amenity performance and ecology; and
- Dark corridors - shall be kept dark to promote use by light-sensitive animals. This could be achieved by different control strategies or by lowering light level.

For more information, please consult the External Lighting Zone drawing (Drawing DC3-E-1210-SDT-0 in Appendix 11.12).

20.3.6.3 Enhancement

GIL has a preference to protect bees where possible. Whilst beehives may provide a social benefit and be of interest to employees of the data centre, this will not contribute towards biodiversity conservation. Native bees are for the most part those that are traditionally social nesters or solitary, the latter of which are cavity or mining bees. Bee banks are proposed as part of the landscaping proposals. Solitary bees are particularly endangered and efforts to conserve these species would align the project with the AIPP and allow the project to create a positive narrative for native bee species.

The planting strategy as part of the landscape plans selected species with consideration to predominately native species, pollinator-friendly species and habitat creation. The typical planting palleted has been designed to enhance biodiversity. The remaining have been chosen from the AIPP. Several species included within the landscape plan prepared for the Proposed Development however further tree species are listed below:

- Blackthorn;
- Hawthorn;
- Wild cherry (*Prunus avium*)
- Bird cherry (*Prunus padus*); and
- Willow (*Salix spp*).

In addition, the Proposed Development will enhance local efforts to conserve endangered solitary bees by installing a bee banks to mitigate the loss of the mining colonies as well as create totemic features for nesting solitary bees and interpretation opportunities. These should be positioned to ensure a southerly aspect. Design of these features should be carried out by a qualified ecologist. Other enhancement features detailed in the landscape plan include log pile and insect hotels and in-managed wildflower habitats.

20.3.6.4 Monitoring

Monitoring shall be carried out each year in the five years following works and will include monitoring of enhancement, mitigation measures and habitat being managed.

Monitoring shall be undertaken annually from the first year to the fifth and will involve one survey day carried out by a suitably-qualified ecologist. This will ensure that mitigation has been successfully implemented, and to determine if there are any issues that need to be remediated or update.

20.3.6.5 Reporting

After each annual inspection, a monitoring report shall be produced and detail the condition of KER habitats and species. Photographs of the mitigation area shall also be included.

20.3.7 Water

Operational Phase mitigation measures are described as follows:

- The attenuation basins (included in the design of the Proposed Development) will ensure that the instantaneous surface water runoff rate from the Proposed Development site will not exceed the greenfield runoff rate. Water quality will be managed by controlling the volume and treating the discharge in line with SuDS principles;
- Surface water drainage will not directly discharge to the watercourse;
- The IE Licence requires the applicant to maintain the storm water drainage system; and conduct daily visual inspections and monitoring for temperature, conductivity, TOC and pH, and any other parameters as required by the EPA;
- Any accidental spill that may occur during operation will be responded to in accordance with the requirements of the revised IE Licence under the Emergency Response Procedure; and
- Inspection of security screens at the new culvert inlets for any debris accumulation and prompt removal.

20.3.8 Land, Soils, Geology and Hydrogeology

No significant effects have been identified and therefore no mitigation or monitoring is considered necessary. The site will continue to operate under the conditions of a revised IE licence.

20.3.9 Archaeology, Architecture and Cultural Heritage

No mitigation or monitoring measures are required during the Operational Phase.

20.3.10 Landscape and Visual

The following measures are proposed to mitigate the potential negative landscape and visual effects in the Operation Phase:

- Retention of the existing hedgerow & mature tree vegetation along the south boundary of the site;
- Extension of the existing hedgerow planting to enhance and screen the site to the east and south. Proposal includes native evergreen species to ensure year round cover and integration within the wider green infrastructure context;
- Landscaped and vegetated berms throughout the site to screen the development;
- Provision of large wildflower meadow areas to ensure wildlife enhancement and protection and contribution to the wider green infrastructure network;
- Provision of a biodiversity refuge in the north of the site to compensate for vegetation loss resulting from the development;
- Nature based wet & dry attenuation ponds will be provided;
- Sustainable drainage systems, including swales will be integrated to provide ecological value; and

- Creation of stepped level benches to enable riparian planting areas to provide ecological value.

The implementation and reinstatement of all landscape proposals will be monitored during implementation and inspected, maintained and monitored for the twelve-month defects period. Any materials or plants which fail within this period will be replaced. Thereafter the landscape at the Proposed Development will be maintained as part of the overall landscape aftercare operations across the entire site owned by the applicant.

20.3.11 Waste and Resources

Resources and waste will be managed in accordance with the Circular Economy targets set in Google Inc. Environmental Report which includes achieving Zero Waste to Landfill for all global data centre operations (refer to 2023 Environmental Report - Google Sustainability). GIL aims to focus on designing out waste from the start, keeping materials in use for as long as possible, and promoting healthy materials.

Materials will be reused and recycled throughout the Proposed Development site and resources required will be locally and nationally sourced, to the maximum extent possible, thereby minimising potential effects. The sustainable resource and waste management principles will be implemented to ensure that circular economy principles are met and that the waste hierarchy is adhered to.

No additional mitigation or monitoring measures are considered necessary.

20.3.12 Material Assets

The Proposed Development will operate under an IEL and as such will have prescribed Operational Phase monitoring measures set by the EPA (as DC1 and DC2 currently operate). These controls and monitoring measures will require to be complied with by GIL in order to operate the Proposed Development if consented.

20.3.12.1 Power Supply

The design of the Proposed Development includes measures to mitigate the effects caused by the demand on power required during the Operational Phase. The design includes roof-mounted photovoltaic (PV) panels on DC3 to provide on-site renewable power to the Proposed Development. This is expected to generate 20% of the energy need of the Proposed Development through the use of renewable power.

In Ireland, GIL has signed a 14-year Power Purchase Agreement (PPA) (with the possibility of a five year extension) with Power Capital Renewable Energy for 58 megawatts (MW) of new-to-the grid capacity from the Tullabeg Solar Farm through an existing grid connection. This agreement has allowed the development of a new renewable energy project which was granted planning in 2022 is currently under construction. It will add new renewable energy to the grid that GIL's offices and data centres run on, contributing to the decarbonisation of Ireland's electricity system and of their operations.

The Proposed Development has been designed to facilitate district heating where surplus heat is produced. This system has the potential to deliver heat for both space heating and water heating needs to buildings external to the site through a network of insulated underground pipelines. This will be realised once a suitable off taker is available, and the adequate critical load is achieved.

20.3.12.2 Telecommunications

There are no mitigation measures required for telecommunication services as no Significant Adverse effects are likely to arise.

20.3.12.3 Water

The DC building incorporates a parapet which includes a rainfall collection system including gutters and downpipes which collect and convey rainfall to the sitewide underground stormwater drainage network.

The IE Licence requires the applicant to maintain the storm water drainage system and conduct water quality monitoring as required by the EPA. These requirements will continue to be complied with. There shall be no emissions to water of environmental significance.

The water quality monitoring programme operates so as to prevent the Proposed Development from having a negative effect on the water quality of the nearest Water Framework Directive waterbody, the Griffeen River. The two existing stormwater discharge points will be continued to be used to drain to both the stream on site and to a stormwater drainage system that was constructed as part of the Millltown Access Road scheme (SW-2 as per Figure 17.1). Monitoring of pH, Total Organic Carbon (TOC), Temperature, and Conductivity will continue weekly at these locations. GIL will continue to comply with the IE Licence by continuing to monitor these parameters at the frequency determined by the EPA and will meet any further requirements of any amended IE Licence which will require to be applied for prior to commencement of operation of DC3 if consented.

Uisce Eireann has processed the DC3 Pre-Connection Application for both water supply and foul water discharge and has confirmed that their networks can cater for the Proposed Development without an Infrastructure Upgrade.

20.3.13 Major Accidents and Disasters

GIL is committed to protecting the environment, preventing pollution and minimising adverse environmental impacts. An Environmental Management System (EMS) is implemented at the existing DC1 and DC2 facility which covers incident management, emissions and waste management, fuel delivery and chemical storage. This EMS will be reviewed to ensure it includes the full development once operational. The EMS outlines the management of the site's environmental program and is broadly in line with the principles of ISO 14001. The existing GIL Campus has recently achieved formal ISO14001 certification, this certification will be expanded to include the Proposed Development once operational.

As part of its IE licence (P1189-01) requirements, GIL has prepared an Emergency Action Plan (EAP) for current DC1/DC2 operations. The EAP provides instructions on how to prevent and/or mitigate injury to persons, and damage to the environment.

The EAP applies to the following incidents and activities:

- Evacuation;
- Spills/releases of oils, hazardous materials/wastes;
- Fires/explosions;
- Medical emergencies;
- Releases of refrigerant gases;
- Dangerous weather conditions; and
- Other emergencies requiring facility evacuation.

An Emergency Response Team (ERT) is currently established on the Proposed Development site to respond to incidents and potential emergencies. The ERT is comprised of assigned and volunteer employees who have received the training required to respond to minor incidents at the data centre prior to the arrival of external response personnel.

Aside from the monitoring measures to be carried out in accordance with the Proposed Development site's IE licence (P1189-01) and the GIL EMS, no additional monitoring is considered necessary during the Operational Phase of the Proposed Development.

20.4 Summary of Decommissioning Phase

In general, mitigation measures proposed for the Construction Phase of the Proposed Development will be implemented during the Decommissioning Phase. The decommissioning of the Proposed Development will be regulated by the EPA. As outlined in Section 5.7 of Chapter 5 (Construction), decommissioning activities will need to be undertaken in accordance with the requirements of the revised IE licence.

20.5 References

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Building Research Establishment (BRE) (2022) *SmartWaste Benchmarks Report. Prepared for Arup.*

British Standards (BS) (2012) *Trees in relation to design, demolition & construction BS 5837.*

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Construction Industry Research and Information Association (CIRIA) (2015) *The SuDS Manual (C753).*

Construction Industry Research and Information Association (CIRIA) (2005) *C650 Environmental Good Practice on Site.*

Construction Industry Research and Information Association (CIRIA) (2001) *C532 Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.*

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EPA (2015) *Designing out waste: Preparation of Waste Reduction Factsheets for Design Teams*.

Enterprise Ireland (EI) *Best Practice Guidelines BPGCS005 Oil Storage Guidelines.*

European Communities Birds and Natural Habitats Regulations (2011) S.I. 477.

Inland Fisheries Ireland (IFI) (2016) *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.*

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Natural England (2013) *Bat habitat assessment prior to Arboricultural operations Guidance for Natural England's National Nature Reserves.*

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Waste Management Act, (1996) *No.10 of 1996.*

21. Summary of Residual Effects

21.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) identifies, describes and assesses the likely direct and indirect significant effects on material assets during Construction, Operational and Decommissioning Phases of the Data Centre Development DC3 (referred to as the "Proposed Development") in accordance with the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency (EPA), 2022).

Residual effects are the final or intended potential effects which occur after the proposed mitigation measures have been implemented. They refer to the degree of change that will occur after the proposed mitigation measures have taken effect.

This Chapter presents the significant residual effects, following the implementation of mitigation as set out in Chapter 6 (Traffic and Transport) to Chapter 19 (Cumulative Assessment) of the EIAR, and as summarised in Chapter 20 (Summary of Mitigation & Monitoring Measures).

The terminology used in this Chapter to describe the significant residual effects reflects the assessment terminology and guidelines used within Chapter 6 (Traffic and Transport) to Chapter 19 (Cumulative Assessment) of the EIAR. While the terminology in the EPA's Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022) is predominantly used, some chapters use discipline specific guidelines, and this terminology is presented within this summary Chapter to maintain consistency with the assessments undertaken in Chapter 6 (Traffic and Transport) to Chapter 19 (Cumulative Assessment).

The design of the Proposed Development has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental effects, where practicable. In addition, feedback received from consultation undertaken throughout the alternatives assessment and design development process has been considered, where appropriate.

The aim of the Proposed Development when in operation is to offer expanded compute capacity to GIL customers and products. The Proposed Development is described in detail in Chapter 4 (Description of the Proposed Development) and Chapter 5 (Construction) provides a description of the construction and demolition activities.

Refer to Appendix 1.1 for details of the author of the chapters discussed in this Chapter (Summary of Significant Residual Effects).

21.2 Traffic and Transport

The residual effects on Traffic and Transport are predicted to be Not Significant and Short-term as construction traffic to and from the Proposed Development site will be carried out in accordance with the robust Construction Traffic Management Plan (CTMP), refer to Appendix 5.1. The CTMP will ensure that effects on the local road network during construction are minimised by setting specific measures to reduce the potential number of vehicular arrivals and departures and the promotion of sustainable modes of transport to the site. This CTMP will be updated by the Contractor, prior to the commencement of construction

During the Operational Phase, the Proposed Development will generate additional vehicle trips on the road network within the local vicinity, however, this predicted effect is considered Slight and Permanent.

The proposed new pedestrian and cycle link between Profile Park Road and Grange Castle Road is expected to have a Positive, Significant and Permanent effect on walking and cycling as travel distance by these modes of transport are significantly reduced.

During the Decommissioning Phase, the residual effects of the works are predicted to be similar to that of the Construction Phase, as traffic to and from the Proposed Development site will be temporary and likely run over a shorter period of time than that of the Construction Phase.

The decommissioning of the Proposed Development will be regulated by the EPA. As outlined in Section 5.7 of Chapter 5 (Construction), decommissioning activities will need to be undertaken in accordance with the requirements of the Industrial Emissions Licence (IEL).

21.3 Air Quality

Following the implementation of mitigation measures outlined in Chapter 7 (Air Quality) Section 7.5.1, no Adverse Significant effects on air quality are likely to arise offsite. Dust deposition monitoring will be carried out to ensure the effectiveness of mitigation.

During the Operational Phase of the Proposed Development, GIL will be required to comply with the requirements of its revised IEL. This revised licence will be issued by the EPA to reflect the changes arising from the Proposed Development. No Adverse Significant effects on air quality are likely to arise.

During the Decommissioning Phase of the Proposed Development, the likely residual effects of the Proposed Development on air quality are likely to be similar to those arising as a result of the Construction Phase, refer to Chapter 7 (Air Quality) Section 7.6.1. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

21.4 Climate

There are no adverse significant effects likely due to the vulnerability of the Construction Phase of the Proposed Development to climate change.

Following the implementation of mitigation measures and considering the significance criteria, the Proposed Development is expected to have an Adverse, Minor, Short-Term effect in EIA terms on carbon and climate during the Construction Phase.

Emissions arising during the Operational Phase of the Proposed Development will be limited by operational hours of the generators under the conditions of the IEL. Prior to the commencement of operations, GIL will be required to update its GHG permit in accordance with EPA requirements.

The Proposed Development is expected to have an Indirect Adverse, Minor, Short-Term effect in EIA terms on carbon and climate during its Operational Phase. The longer-term effects are considered Not Significant due to the ongoing transition to grid decarbonisation.

The Proposed Development is expected to have an Adverse, Minor, Short-Term effect in EIA terms on carbon and climate during the Decommissioning Phase. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

21.5 Noise and Vibration

A summary of the residual effects of construction noise on noise sensitive receptors (NSR) for each of the construction stages considered is presented in Table 21.1 to Table 21.7.

For the construction stage, a noise barrier has been modelled that is expected to reduce the predicted noise level at nearby NSRs by 10 dBA. This is the basis of the reduction in noise levels at the "post mitigation" stage presented below.

Table 21.1: Summary of residual effects at receptors from construction noise from Proposed Development site preparation works.

Receptor	Predicted Noise Level (Pre-mitigation), L_{Aeq}, dB	Potential Effect (Pre-mitigation)	Predicted Noise Level (Post-mitigation), L_{Aeq}, dB	Potential Effect (Post-mitigation)
R01	67	No Significant effect	57	No Significant effect
R02	79	Moderate to Significant, Negative	69	No Significant effect
R03	78	Moderate to Significant, Negative	68	No Significant effect

Receptor	Predicted Noise Level (Pre-mitigation), L_{Aeq}, dB	Potential Effect (Pre-mitigation)	Predicted Noise Level (Post-mitigation), L_{Aeq}, dB	Potential Effect (Post-mitigation)
R04	74	Slight to Moderate, Negative	64	No Significant effect
R05	81	Very Significant, Negative	71	Negative, Neutral to Slight
R06	81	Very Significant, Negative	71	Negative, Neutral to Slight
R07	77	Moderate to Significant, Negative	67	No Significant effect
R08	75	Slight to Moderate, Negative	65	No Significant effect
R09	74	Slight to Moderate, Negative	64	No Significant effect
R10	71	Neutral to Slight, Negative	61	No Significant effect
R11	67	No Significant effect, Negative	57	No Significant effect
R12	65	No Significant effect, Negative	55	No Significant effect
R13	63	No Significant effect, Negative	53	No Significant effect

[10] Sampling period is to be the time period T stated as per Schedule B.4 Noise Emissions, of this licence. This applies to day, evening and night-time periods

[11] Night-time measurements should be made between 2300hrs and 0400hrs, Sunday to Thursday, with 2300hrs being the preferred start time.

Table 21.2: Summary of residual effects at receptors from construction noise from preparation works for the substructure.

Receptor	Predicted Noise Level (Pre-mitigation), L_{Aeq}, dB	Potential Effect (Pre-mitigation)	Predicted Noise Level (Post-mitigation), L_{Aeq}, dB	Potential Effect (Post-mitigation)
R01	64	No Significant effect	54	No Significant effect
R02	69	No Significant effect	59	No Significant effect
R03	72	Neutral to Slight, Negative	62	No Significant effect
R04	74	Slight to Moderate, Negative	64	No Significant effect
R05	76	Moderate to Significant, Negative	66	No Significant effect
R06	73	Slight to Moderate, Negative	63	No Significant effect
R07	72	Neutral to Slight, Negative	62	No Significant effect
R08	78	Moderate to Significant, Negative	68	No Significant effect
R09	77	Moderate to Significant, Negative	67	No Significant effect
R10	74	Slight to Moderate, Negative	64	No Significant effect
R11	70	Neutral to Slight, Negative	60	No Significant effect
R12	66	No Significant effect	56	No Significant effect
R13	64	No Significant effect	54	No Significant effect

Table 21.3: Summary of residual effects at receptors from construction noise from concrete pouring works for the substructure.

Receptor	Predicted Noise Level (Pre-mitigation), L_{Aeq}, dB	Potential Effect (Pre-mitigation)	Predicted Noise Level (Post-mitigation), L_{Aeq}, dB	Potential Effect (Post-mitigation)
R01	52	No Significant effect	42	No Significant effect
R02	57	No Significant effect	47	No Significant effect
R03	61	No Significant effect	51	No Significant effect
R04	62	No Significant effect	52	No Significant effect
R05	65	No Significant effect	55	No Significant effect
R06	62	No Significant effect	52	No Significant effect
R07	60	No Significant effect	50	No Significant effect
R08	67	No Significant effect	57	No Significant effect
R09	65	No Significant effect	55	No Significant effect
R10	62	No Significant effect	52	No Significant effect
R11	59	No Significant effect	49	No Significant effect
R12	54	No Significant effect	44	No Significant effect
R13	53	No Significant effect	43	No Significant effect

Table 21.4: Summary of residual effects at receptors from construction noise from superstructure works.

Receptor	Predicted Noise Level (Pre-mitigation), L_{Aeq}, dB	Potential Effect (Pre-mitigation)	Predicted Noise Level (Post-mitigation), L_{Aeq}, dB	Potential Effect (Post-mitigation)
R01	62	No Significant effect	52	No Significant effect
R02	67	No Significant effect	57	No Significant effect
R03	70	Neutral to Slight, Negative	60	No Significant effect
R04	71	Neutral to Slight, Negative	61	No Significant effect
R05	70	Neutral to Slight, Negative	60	No Significant effect
R06	69	No Significant effect	59	No Significant effect
R07	68	No Significant effect	58	No Significant effect
R08	71	Neutral to Slight, Negative	61	No Significant effect
R09	70	Neutral to Slight, Negative	60	No Significant effect
R10	69	No Significant effect	59	No Significant effect
R11	68	No Significant effect	58	No Significant effect
R12	63	No Significant effect	53	No Significant effect
R13	62	No Significant effect	52	No Significant effect

Table 21.5: Summary of residual effects at receptors from construction noise from internal works/fitout.

Receptor	Predicted Noise Level (Pre-mitigation), L_{Aeq}, dB	Potential Effect (Pre-mitigation)	Predicted Noise Level (Post-mitigation), L_{Aeq}, dB	Potential Effect (Post-mitigation)
R01	48	No Significant effect	38	No Significant effect
R02	53	No Significant effect	43	No Significant effect
R03	56	No Significant effect	46	No Significant effect
R04	46	No Significant effect	36	No Significant effect
R05	56	No Significant effect	46	No Significant effect
R06	55	No Significant effect	45	No Significant effect
R07	54	No Significant effect	44	No Significant effect
R08	57	No Significant effect	47	No Significant effect
R09	56	No Significant effect	46	No Significant effect
R10	55	No Significant effect	45	No Significant effect
R11	54	No Significant effect	44	No Significant effect
R12	49	No Significant effect	39	No Significant effect
R13	47	No Significant effect	37	No Significant effect

Table 21.6: Summary of residual effects at receptors from construction noise from preparation for external works.

Receptor	Predicted Noise Level (Pre-mitigation), L_{Aeq}, dB	Potential Effect (Pre-mitigation)	Predicted Noise Level (Post-mitigation), L_{Aeq}, dB	Potential Effect (Post-mitigation)
R01	60	No Significant effect	50	No Significant effect
R02	63	No Significant effect	53	No Significant effect
R03	65	No Significant effect	55	No Significant effect
R04	66	No Significant effect	56	No Significant effect
R05	77	Moderate to Significant, Negative	67	No Significant effect
R06	79	Moderate to Significant, Negative	69	No Significant effect
R07	79	Moderate to Significant, Negative	69	No Significant effect
R08	77	Moderate to Significant, Negative	67	No Significant effect
R09	76	Moderate to Significant, Negative	66	No Significant effect
R10	73	Slight to Moderate, Negative	63	No Significant effect
R11	70	Neutral to Slight, Negative	60	No Significant effect
R12	61	No Significant effect	51	No Significant effect
R13	60	No Significant effect	50	No Significant effect

Table 21.7: Summary of residual effects at receptors from construction noise from concrete pouring for external works.

Receptor	Predicted Noise Level (Pre-mitigation), L_{Aeq}, dB	Potential Effect (Pre-mitigation)	Predicted Noise Level (Post-mitigation), L_{Aeq}, dB	Potential Effect (Post-mitigation)
R01	57	No Significant effect	47	No Significant effect
R02	60	No Significant effect	50	No Significant effect
R03	62	No Significant effect	52	No Significant effect
R04	63	No Significant effect	53	No Significant effect
R05	74	Slight to Moderate, Negative	64	No Significant effect
R06	76	Moderate to Significant, Negative	66	No Significant effect
R07	75	Slight to Moderate, Negative, Negative	65	No Significant effect
R08	74	Slight to Moderate	64	No Significant effect
R09	73	Slight to Moderate, Negative	63	No Significant effect
R10	70	Neutral to Slight, Negative	60	No Significant effect
R11	67	No Significant effect	57	No Significant effect
R12	58	No Significant effect	48	No Significant effect
R13	57	No Significant effect	47	No Significant effect

Predicted effects at NSRs due to construction noise demonstrate that, with mitigation, no significant effect is expected for the majority of receptors for all phases. At R05 and R06, during the site preparation works, a Negative, Neutral to Slight, Short-Term effect is predicted.

Due to the low level of predicted vibration levels, no likely significant effects are predicted for construction vibration to nearby sensitive receptors.

A summary of the residual effects on noise sensitive receptors is presented in Table 21.8 to Table 21.12 for Scenario 1 (day, evening, and night time), Scenario 2, and Scenario 3 respectively.

Table 21.8: Summary of residual effects from the Operational Phase noise – Scenario 1 – day time.

Receptor	Predicted Full GIL Campus Noise Level, dBL_{ArT}	Measured Background Noise Level, dBL_{A90}	Excess of Predicted Noise Level Over Measured Background Level, dBA	Exceedance of Predicted Noise Level over IEL Limit, dBA	Potential Effect (Pre and Post Mitigation)
R01	41	43	0	0	No Change
R02	45	43	2	0	Imperceptible
R03	45	43	2	0	Imperceptible
R04	44	43	1	0	Imperceptible
R05	42	43	0	0	No Change
R06	42	43	0	0	No Change
R07	43	43	0	0	No Change
R08	46	43	3	0	Negative, Slight to Moderate
R09	46	43	3	0	Negative, Slight to Moderate
R10	45	43	2	0	Imperceptible
R11	45	43	2	0	Imperceptible

Receptor	Predicted Full GIL Campus Noise Level, dBL_{ArT}	Measured Background Noise Level, dBL_{A90}	Excess of Predicted Noise Level Over Measured Background Level, dBA	Exceedance of Predicted Noise Level over IEL Limit, dBA	Potential Effect (Pre and Post Mitigation)
R12	41	43	0	0	No Change
R13	40	43	0	0	No Change

For Scenario 1 (day time), no change is predicted at 6 NSRs, an Imperceptible, Long-Term Effect is expected at 5 NSRs, and a Negative, Slight to Moderate, Long-Term Effect is predicted at 2 NSRs. It should be noted that predicted noise levels at all NSRs comply with the IEL noise limits.

Table 21.9: Summary of residual effects from the Operational Phase noise – Scenario 1 – evening time.

Receptor	Predicted Full GIL Campus Noise Level, dBL_{ArT}	Measured Background Noise Level, dBL_{A90}	Excess of Predicted Noise Level Over Measured Background Level, dBA	Exceedance of Predicted Noise Level over IEL Limit, dBA	Potential Effect (Pre and post mitigation)
R01	41	42	0	0	No Change
R02	45	42	3	0	Negative, Slight to Moderate
R03	45	42	3	0	Negative, Slight to Moderate
R04	44	42	2	0	Imperceptible
R05	42	42	0	0	No Change
R06	42	42	0	0	No Change
R07	43	42	1	0	Imperceptible
R08	46	42	4	0	Negative, Slight to Moderate
R09	46	42	4	0	Negative, Slight to Moderate
R10	45	42	3	0	Negative, Slight to Moderate
R11	45	42	3	0	Negative, Slight to Moderate
R12	41	42	0	0	No Change
R13	40	42	0	0	No Change

For Scenario 1 (evening time), no change is predicted at 5 NSRs, an Imperceptible, Long-Term Effect is expected at 2 NSRs, and a Negative, Slight to Moderate, Long-Term Effect is predicted at 6 NSRs. It should be noted that predicted noise levels at all NSRs comply with the IEL noise limits.

Table 21.10: Summary of residual effects from the Operational Phase noise – Scenario 1 – night time.

Receptor	Predicted Full GIL Campus Noise Level, dBL_{ArT}	Measured Background Noise Level, dBL_{A90}	Excess of Predicted Noise Level Over Measured Background Level, dBA	Exceedance of Predicted Noise Level over IEL Limit, dBA	Potential Effect (Pre and Post Mitigation)
R01	40	41	0	0	No Change
R02	43	41	2	0	Imperceptible,
R03	43	41	2	0	Imperceptible,
R04	42	41	1	0	Imperceptible
R05	41	41	0	0	No Change
R06	41	41	0	0	No Change
R07	41	41	0	0	No Change

Receptor	Predicted Full GIL Campus Noise Level, dBL_{ArT}	Measured Background Noise Level, dBL_{A90}	Excess of Predicted Noise Level Over Measured Background Level, dBA	Exceedance of Predicted Noise Level over IEL Limit, dBA	Potential Effect (Pre and Post Mitigation)
R08	44	41	3	0	Negative, Slight to Moderate
R09	44	41	3	0	Negative, Slight to Moderate
R10	44	41	3	0	Negative, Slight to Moderate
R11	43	41	2	0	Imperceptible
R12	40	41	0	0	No Change
R13	39	41	0	0	No Change

For Scenario 1 (night time), no change is predicted at 6 NSRs, an Imperceptible, Long-Term Effect is expected at 4 NSRs, and a Negative, Slight to Moderate, Long-Term Effect is predicted at 3 NSRs. It should be noted that predicted noise levels at all NSRs comply with the IEL noise limits.

Table 21.11: Summary of residual effects from the Operational Phase noise – Scenario 2.

Receptor	Predicted Full GIL Campus Noise Level, dBL_{ArT}	Measured Background Noise Level, dBL_{A90}	Excess of Predicted Noise Level Over Measured Background Level, dBA	Exceedance of Predicted Noise Level over IEL Limit, dBA	Potential Effect (Pre and Post Mitigation)
R01	42	43	0	0	No Change
R02	45	43	2	0	Imperceptible
R03	46	43	3	0	Negative, Slight to Moderate
R04	46	43	3	0	Negative, Slight to Moderate
R05	48	43	5	0	Negative, Slight to Moderate
R06	49	43	6	0	Negative, Moderate to Significant
R07	49	43	6	0	Negative, Moderate to Significant
R08	49	43	6	0	Negative, Moderate to Significant
R09	48	43	5	0	Negative, Slight to Moderate
R10	47	43	4	0	Negative, Slight to Moderate
R11	46	43	3	0	Negative, Slight to Moderate
R12	42	43	0	0	No Change
R13	41	43	0	0	No Change

For Scenario 2 (Maintenance), no change is predicted at 3 NSRs, an Imperceptible, Long-Term Effect is predicted at 1 NSR, a Negative, Slight to Moderate, Long-Term Effect is predicted at 6 NSRs, and a Negative, Moderate to Significant, Long-Term Effect is predicted at 3 NSRs. It should be noted that predicted noise levels at all NSRs comply with the IEL noise limits.

Note that the maximum noise level associated with Scenario 2 is only expected to occur over a 60 minute period once a month during the testing of each of the 45 generators. The maximum noise level at any one NSR will only occur when the generator that is closest to the NSR is being tested.

During the remainder of the generator testing period (when the other generators are being tested), noise levels at that specific NSR will be less than the maximum.

Table 21.12: Summary of residual effects from the Operational Phase noise – emergency scenario.

Receptor	Predicted Full GIL Campus Noise Level, dBL_{ArT}	Measured Background Noise Level, dBL_{A90}	Excess of Predicted Noise Level Over Measured Background Level, dBA	Exceedance of Predicted Noise Level over IEL Limit, dBA	Potential Effect (Pre and Post Mitigation)
R01	56	43	13	N/A	Negative, Very Significant
R02	57	43	14	N/A	Negative, Very Significant
R03	57	43	14	N/A	Negative, Very Significant
R04	58	43	15	N/A	Negative, Very Significant
R05	60	43	17	N/A	Negative, Very Significant
R06	60	43	17	N/A	Negative, Very Significant
R07	60	43	17	N/A	Negative, Very Significant
R08	56	43	13	N/A	Negative, Very Significant
R09	55	43	12	N/A	Negative, Very Significant
R10	54	43	11	N/A	Negative, Very Significant
R11	53	43	10	N/A	Negative, Moderate to Significant
R12	56	43	13	N/A	Negative, Very Significant
R13	56	43	13	N/A	Negative, Very Significant

For Scenario 3 (Full Site Blackout), a Negative, Moderate to Significant, Temporary effect is predicted for 1 NSR, and a Negative, Very Significant, Temporary effect is predicted for 12 NSRs.

Scenario 3 is unlikely to occur as it will only happen in the case that there is a loss of power to the Proposed Development. In the rare event that it does occur, it is only expected to last for a few hours and will thus constitute a brief effect, and not be a Significant Effect based on duration.

The residual effects for the Decommissioning Phase of the Proposed Development are anticipated to be similar to those for the Superstructure and Internal Works/Fit-out stages Construction Phase, for example, No Significant Effect for the mitigated scenario. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

21.6 Population and Human Health

Overall, a direct Positive, Moderate, Long-Term residual effect on population is predicted to occur as a result of the economic and employment opportunity associated with the Proposed Development. Following the implementation of construction, operation and decommissioning mitigation measures, no significant adverse effects on human health are expected to arise.

Chapter 12 (Water), Chapter 13 (Land, Soils, Geology & Hydrogeology) and Chapter 17 (Material Assets) do not report any Adverse, Significant residual effects that are likely to result in Adverse Significant effects on human health.

On this basis, the potential effect of other environmental hazards associated with the Construction, Operational and Decommissioning Phases of the Proposed Development on human health will be Neutral.

As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

21.7 Biodiversity

A summary of residual effects is included in Table 21.13.

21.7.1 Designated Sites

Potential adverse effects on designated European sites (SAC/cSAC/SPA) are specifically addressed in a Report for Screening for AA and NIS which has been submitted as part of this application (Arup, 2024). This report concluded the following:

"In light of the best scientific knowledge, with respect to the relevant European sites, the sources and pathways for effect, and how these may result in adverse effects on the integrity of identified European sites. With the provision of the identified mitigation measures provided in Section 8, it has been objectively concluded by Arup, through precise and definitive findings and conclusions capable of removing all reasonable scientific doubt that the Proposed Development will not result in adverse effects (directly or indirectly) on the integrity and conservation objectives of any of the QIs/SCIs of the South Dublin Bay and River Tolka Estuary SPA, South Dublin Bay SAC, North Dublin Bay SAC and North Bull Island SPA or any other European site, alone or in-combination with other plans and/or projects"

The competent authority will make the final determination in this regard.

However, the effects identified in this Chapter considered for EIA purposes were limited to habitat degradation in the Construction Phase. With the mitigation measures listed above, the residual effect can be described as Negative, Imperceptible, Un-likely, Short-Term on the Designated sites in Dublin Bay.

Significance of residual effects after mitigation: If mitigation measures are implemented during the Construction and Decomissioning Phases the habitat degradation is unlikely to be significant on designated sites.

21.7.2 Habitats

21.7.2.1 Loss of Habitat

Where the loss of sections of higher value habitats cannot be avoided the impact on these habitats has been minimised and the loss of these habitats has been compensated for through focused landscape design and mitigation measures. Several areas of high value habitat will be provided within the landscape design, considering the local flora and fauna, to provide biodiversity benefits that is valuable locally as well as making important contributions towards regional priorities for nature conservation. The project will enhance ecological connectivity within and outside the Proposed Development boundary. Ongoing monitoring of mitigation and design measures will ensure that, where required, these measures can be managed and adapted to secure long-term gains for biodiversity at the site.

The direct habitat loss of the treeline, hedgerow, scrub, watercourse and dry meadow and grassy verge habitats will result in a negative, long-term residual effect on the habitat KERs. However, as these habitats were identified as KERs due to the fauna and designated sites KERS they support/provide connectivity to. As such, these indirect effects are assessed under the relevant KERs.

Therefore, there will be no significant residual effect of habitat loss on the respective habitat KERs with implemented mitigation measures, the extent of the area lost and proportion of habitat available in the surrounding landscape.

21.7.2.2 Changes to Hydrology

Mitigation measures, outlined in Chapter 11 (Biodiversity) Section 11.6 will be implemented and inspected by a suitably qualified and experienced project ecologist making the residual effect is imperceptible. Therefore, no significant adverse effects are expected to arise.

Habitat Degradation

Mitigation measures, outlined in CEMP (Appendix 5.1) and Chapter 11 (Biodiversity) Section 11.6 will be implemented and inspected by a suitably qualified and experienced project ecologist to ensure that no adverse effects on habitats through surface water runoff or aerial emission during construction works, resulting in a residual effect that is imperceptible. Design will improve hydromorphological condition of the watercourse from 'poor' to 'moderate' through improved channel vegetation, substrate condition, bank structure and stability, bank vegetation and floodplain connectivity. Therefore, no significant adverse effects are expected to arise.

Dispersal of Species

Following design measures, residual effects on fish and aquatic invertebrates will be Neutral, Imperceptible and Long-Term at a local level. Therefore, no significant adverse effects are expected to arise.

21.7.2.3 Invasive species

Mitigation measures, outlined in in the CEMP (Appendix 5.1), neutral residual effects have been identified. Therefore, no significant adverse effects are expected to arise.

21.7.3 Protected and Notable Species

21.7.3.1 Amphibians

Direct mortality

Given the mitigation measures mentioned in Chapter 11 (Biodiversity) Section 11.6.4.1 the effect is unlikely and neutral. Therefore, no significant adverse effects are expected to arise.

Loss of foraging habitat

In the short to medium term, the loss of the watercourse associated with site clearance works and diversion will have a Slight, Negative effect on amphibians. However, as newly planted and enhanced habitats within the Proposed Development mature, this effect will be reduced.

The landscape plan will provide additional breeding and foraging habitat through a variation of water features both flowing and standing. New habitats within the Proposed Development are likely to increase foraging diversity at the site. These habitats are likely to provide connectivity to other foraging habitats.

Residual effects on amphibians are expected to be Neutral, Slight and Long-Term at a local level. Therefore, no significant adverse effects are expected to arise.

21.7.3.2 Bats

Direct mortality

Given the mitigation measures provided, no significant adverse effects are expected to arise.

Loss of foraging habitat

In the short to medium term there will be a Slight to Moderate effect on bat foraging habitat at the Proposed Development with the removal of two areas of key foraging habitat along the hedgerow and treeline. However, the landscape plan provides considerable areas of enhanced and new linear foraging habitat to the south and east. New habitats including open watercourse, hedgerow and Miyawaki forests and wetland that are likely to provide a variety of foraging habitats for bats in the Medium to Long-Term. As these habitats mature, there are likely to provide high value foraging and commuting habitats for local bat populations and provide connectivity to the wider landscape. Biodiversity enhancements, including a range of bat boxes, will create roosting opportunities for bats within the Proposed Development, where roosting habitat is currently largely absent. The residual effect of habitat loss will be Positive, Slight and Long-Term at a local level for bat populations. Therefore, no significant adverse effects are expected to arise.

Disturbance to foraging and commuting

As discussed, the lighting plan (Appendix 11.12) will be designed to limit light spill in ecologically sensitive areas such as the habitat enhancement areas and southern boundaries. There will be a minor decrease in the suitability of habitat, however, given the species composition (widespread), extent of habitat south of the site and mitigation measures listed in Chapter 11 (Biodiversity) Section 11.6.3.1, such as strengthening of ecological corridors (to offer additional foraging and connectivity to other habitat), the residual effect is predicted to be negative and not significant to the local bat population. Therefore, no significant adverse effects are expected to arise.

21.7.3.3 Breeding Birds

Direct mortality

Given the mitigation measures mentioned in Chapter 11 (Biodiversity) Section 11.6.4.2 the direct mortality and disturbance of nesting birds is unlikely. Therefore, no significant adverse effects are expected to arise.

Loss of foraging and breeding habitat

In the short to medium term, the loss of common habitats associated with site clearance works and disturbance will have a Slight, Negative effect on breeding birds. However, as newly planted and enhanced habitats within the Proposed Development mature, this effect will be reduced and foraging and breeding habitat improved.

The landscape plan will provide additional breeding and foraging habitat for other common bird species. New habitats within the Proposed Development are likely to increase breeding bird diversity at the site. These habitats are likely to provide nesting opportunities for specialist species such as grey heron (*Ardea cinerea*) and reed buntings (*Emberiza schoeniclus*).

Biodiversity enhancements have been designed to attract new species to the site, such as sand marten. Native berry producing plants, such as blackthorn and hawthorn, have been included in the planting scheme to provide additional foraging habitat for breeding birds. Residual effects on breeding birds will be Neutral, Slight and Long-Term at a local level. Therefore, no significant adverse effects are expected to arise.

Disturbance from noise and vibration

Given the mitigation measures mentioned in Chapter 11 (Biodiversity) Section 11.6.4.2 the direct mortality and disturbance of nesting birds is unlikely. Therefore, no significant adverse effects are expected to arise.

21.7.3.4 Other Mammals

Disturbance from foraging and commuting habitat or direct mortality

The habitats to be affected are common and there is no evidence to indicate that the Proposed Development areas are of particular value for these species in the context of the surrounding countryside, south of the Proposed Development. During the Construction Phase, disturbance and direct mortality from site clearance works are predicted to have a Negative, Slight and Short-Term effect on such mammal species at a local level. However, with the implemented mitigation measures provided, the direct mortality and disturbance of such mammals is Not Significant. Therefore, no significant adverse effects are expected to arise.

Loss of foraging and commuting habitat

The retention and enhancement of large areas of valuable habitats such as scrub, treelines and hedgerows will mean that small mammal species such as hedgehog and pygmy shrew are likely to quickly recolonise the area following construction works. The creation of new semi-natural habitats, including understorey planting, riparian buffers will provide substantial areas of cover for small mammals. As part of the management regime, unmanaged areas of scrub will be allowed to develop, providing opportunities for small mammals to colonise these areas. The inclusions of linear features within the existing and proposed areas of the site will ensure that connectivity is retained and improved throughout the construction and operation of the development. Overall, there will be a reduction in the area of such a habitat, but the above measures will provide a higher quality of habitat though reduced in size.

The residual effect of the loss of foraging and commuting habitat is predicted to be Neutral, Slight and Long-Term at a local level. Therefore, no significant adverse effects are expected to arise.

Table 21.13 Summary of potential effects from the Proposed Development on KER.

KER	Highest Value within Zone of Influence	Construction Phase Effects*	Ecological Significance if Un-Mitigated	Operational Phase Effects	Ecological Significance if Un-Mitigated	Mitigation Proposed	Residual Effect
European sites	International	Habitat degradation	Negative, Significant, Likely, Short-Term	Habitat degradation	Negative, Not Significant, Un-likely, Temporary	Yes	No significant residual effect
Watercourse	Local Importance (Higher Value)	Habitat loss	Negative, Slight-Moderate, Likely and Medium-Term	None	N/A	Yes	No significant residual effect
		Changes to hydrology including diversion of flow	Negative, Slight, Short-Term	Changes to hydrology including diversion of flow	Neutral, Slight, and Long-Term	Yes	No significant residual effect
		Habitat degradation	Negative, Slight, Likely and Short-Term	Habitat degradation	Negative, Slight, Unlikely, Temporary	Yes	No significant residual effect
				Dispersal of species	Negative, Slight / Moderate, Long-Term	Yes	No significant residual effect
Dry meadows and grassy verges	Local Importance (Higher Value)	Habitat loss	Negative, Slight-Moderate, Likely and Long-Term	None	N/A	Yes	No significant residual effect
		Habitat degradation	Negative, Slight, Likely and Short-Term	None	N/A	Yes	No significant residual effect
Hedgerow	Local Importance (Higher Value)	Habitat loss	Negative, Slight-Moderate, Likely and Long-Term	None	N/A	Yes	No significant residual effect
		Habitat degradation	Negative, Slight, Likely and Short-Term	None	N/A	Yes	No significant residual effect
Scrub	Local Importance (Higher Value)	Habitat loss	Negative, Slight-Moderate, Likely and Long-Term	None	N/A	Yes	No significant residual effect
		Habitat degradation	Negative, Slight, Likely and Short-Term	None	N/A	Yes	No significant residual effect
Treeline	Local Importance (Higher Value)	Habitat loss	Negative, Slight-Moderate, Likely and Long-Term	None	N/A	Yes	No significant residual effect

KER	Highest Value within Zone of Influence	Construction Phase Effects*	Ecological Significance if Un-Mitigated	Operational Phase Effects	Ecological Significance if Un-Mitigated	Mitigation Proposed	Residual Effect
		Habitat degradation	Negative, Slight, Likely and Short-Term	None	N/A	Yes	No significant residual effect
Amphibians Bats	Local Importance (Higher Value) Local Importance (Higher Value)	Direct mortality of individuals	Negative, Slight, Unlikely, Short-Term	N/A	N/A	Yes	No significant residual effect
		Loss of foraging habitat	Negative, Slight, Unlikely, Short-Term	None	N/A	Yes	No significant residual effect
		Direct mortality of individuals	Negative, Slight, Unlikely, Long-Term	None	N/A	Yes	No significant residual effect
Birds Birds	Local Importance (Higher Value) Local Importance (Higher Value)	Loss of foraging habitat	Negative, Slight-Moderate, Likely, and Long-Term	None Disturbance to foraging and commuting N/A	N/A Negative, Slight, Likely, Long-Term N/A	Yes	No significant residual effect
		Disturbance to commuting and foraging	Negative, Not Significant, Unlikely and Short Term			Yes	No significant residual effect
		Direct mortality of individuals	Negative, Slight/Moderate, Short-Term			Yes	No significant residual effect
Other mammals: badger, pygmy shrew and west European hedgehog Other mammals: badger, pygmy shrew and west European hedgehog	Local Importance (Higher Value) Local Importance (Higher Value)	Loss of foraging and breeding habitat	Negative, Slight, Likely, Long-Term	N/A N/A	N/A N/A	Yes	No significant residual effect
		Disturbance from noise and vibration	Negative, Slight, Likely, Temporary			Yes	No significant residual effect
		Direct mortality of individuals	Negative, Slight, Short-Term and Unlikely			Yes	No significant residual effect

*During the Decommissioning Phase of the Proposed Development, the likely residual effects of the Proposed Development on biodiversity are likely to be similar to those arising during the Construction Phase

As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IE licence.

21.8 Water

Following implementation of the mitigation measures outlined in the Chapter 12 (Water) Section 12.6.1, there will be no likely significant residual effects on water quality or quantity as a result of the construction of the Proposed Development.

21.8.1 Residual Effects on Surface Water: Flood risk

The flood risk receptor of any potential properties in the flood plain of the watercourse that crosses the site has low sensitivity (refer to Chapter 12 (Water) Table 12.1). The potential effect due to an increased risk in in-channel flood levels of up to 50mm is reduced through design and mitigation measures to Imperceptible and Short-term.

21.8.2 Residual Effects on Surface Water: Water quality

Residual effects on surface water quality include:

- A temporary, insignificant effect on downstream protected areas;
- A temporary, insignificant effect on watercourses and WFD waterbodies through silty water runoff and contamination from hazardous substances; and
- A temporary, insignificant effect on watercourses and WFD waterbodies through re-exposure of historic contaminants.

The WFD waterbody has a low sensitivity. The potential effects on water quality during the Construction Phase are predicted to be Negative, Slight and Short-Term. Through mitigation measures the significance of the effect will be reduced to Imperceptible and Short-Term.

21.8.3 Residual Effects on Surface Water: Hydromorphology

The potential effects on hydromorphology relates to the stream realignment through a change in flow regime and change in morphology. The potential effect rating on hydromorphology during the Construction Phase is large but the importance of the watercourse is low. This has the potential to result in a Negative, Slight / Moderate and Long-Term effects. Design measures have aimed to improve the baseline hydromorphological condition of the watercourse from ‘poor’ to ‘moderate’ through improved channel vegetation, substrate condition, bank structure and stability, bank vegetation and floodplain connectivity. Design measures include introduction of open channel flow at two sections, which have improved vegetation and substrate conditions. There is also opportunity for lateral floodplain connectivity through introduction of a floodplain bench to the watercourse design. All culverts will have appropriate design measures to limit biodiversity effects. Through the design measures and mitigation described herein, the significance of the effect on hydromphology will be reduced to Imperceptible and Short-Term.

21.8.4 Residual Effects on Groundwater

On application of mitigation measures, the identified likely effects during the Construction Phases, as identified in Chapter 13 (Land, Soils, Geology and Hydrogeology), would be Imperceptible and Short-term on all hydrogeological features of concern.

21.8.5 Residual Effects on Surface Water: Flood Risk

According to the Planning System and Flood Risk Management Guidelines (2009), the Proposed Development is considered highly vulnerable to flooding (an IE site), which is appropriate in areas at low risk of flooding (Flood Zone C). As the Proposed Development is proposed within Flood Zone A (1 in 100 year flood event), a Justification Test is required.

The Justification Test is adopted by a planning authority when developments vulnerable to flooding are proposed in areas at moderate or high risk of flooding (Flood Zones A and B). Prior to granting permission for the development, the planning authority must be satisfied that the development meets the criteria set out in the Development Management Justification Test in the Planning System and Flood Risk Management Guidelines.

The site is zoned under the South Dublin Development Plan for 'Objective EE': to provide for Enterprise and Employment related uses. The Proposed Development is a data centre, which is compatible with the zoning of providing enterprise and employment. The Proposed Development will not increase flood risk to other sites and includes measures to mitigate risk of flooding to people, property and the economy. Residual risks are managed to acceptable levels through the mitigation measures outlined in Appendix 12.1. The Proposed Development satisfies the criteria of the Justification Test. More information is included in Appendix 12.1. There will be no likely Significant residual effects on flooding risk as a result of the operation of the Proposed Development, as the modelling undertaken has demonstrated no significant increases in flood levels due to the proposals offsite.

21.8.6 Residual Effects on Surface Water: Water Quality

The monitoring conditions of the IEL (P1189-01) will continue to be met through daily inspection and continued water quality monitoring at SW-1 and SW-2. The Emergency Response Procedure required by the IEL will allow for any accidental spill that may occur during operation to be minimised and acted upon. Given that the Proposed Development site surface water drainage will be managed by controlling and treating the discharge in line with Sustainable urban Drainage Systems (SuDS) principles, and regular inspections of the security screens are done Page 27 for debris accumulation, no Significant residual effects are anticipated during the Operational Phase of the Proposed Development. There will be no likely Significant residual effects on water quality as a result of the operation of the Proposed Development.

21.8.7 Residual Effects on Surface Water: Hydromorphology

Based on potential risks, the potential effect rating on hydromorphology during the Operational Phase is large but the importance of the watercourse is low (according to the hydromorphological assessment). This results in potential Negative, Slight / Moderate and Long-Term effects. Through the design measures of improved channel vegetation, substrate condition, bank structure and stability, bank vegetation and floodplain connectivity described herein, the significance of the effect will be reduced to Imperceptible and Short-Term.

21.8.8 Residual Effects on Groundwater

No significant operational effects are likely to arise.

During the Decommissioning Phase of the Proposed Development, the likely residual effects of the Proposed Development on water quantity and quality are likely to be similar to those arising during the Construction Phase.

As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

21.9 Land, Soils, Geology and Hydrogeology

On application of mitigation measures, the identified likely effects during the Construction and Decommissioning Phases, are expected to be Imperceptible and Short-term on all geological and hydrogeological features of concern, refer to Table 21.14. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of a revised IE licence.

No significant operational effects are likely to arise.

Table 21.14: Summary of residual construction and operational effects on geological and hydrogeological features at the Proposed Development site

Category	Feature	Importance[1]	Magnitude of Potential Effect[2]	Significance of Effect Prior to Mitigation	Mitigation	Magnitude of Potential Effect Post Mitigation8	Significance of Effect Prior to Mitigation
Construction / Decommissioning Phases							
Mineral aggregate resources	Crushed rock aggregate potential	Medium to High	Negligible	Imperceptible	Materials management during construction to maximise reuse as aggregate	Negligible	Imperceptible
Land Contamination	Casement Aerodrome	Medium	Effects assessed in Chapter 12 (Water)				
	Made ground	Medium	Negligible	Imperceptible	CEMP (Appendix 5.1)	Negligible	Imperceptible
	Till	Medium	Negligible	Imperceptible	CEMP (Appendix 5.1)	Negligible	Imperceptible
Aquifer	Bedrock -locally Important Aquifer (LI)	Medium	Small Adverse	Slight Negative Short-Term	CEMP (Appendix 5.1)	Negligible	Imperceptible
			Negligible	Imperceptible	-	Negligible	Imperceptible
Operational Phase							
Mineral Aggregate Resources	Crushed rock aggregate potential	Medium	No potential effect	None			
Land Contamination	Casement Aerodrome	Medium	Potential effect assessed in Chapter 12 (Water)				
	Made ground	Medium	Negligible	Imperceptible	-	Negligible	Imperceptible
	Till	Medium	Negligible	Imperceptible	-	Negligible	Imperceptible
Aquifer	Bedrock -locally Important Aquifer (LI)	Medium	Negligible	Imperceptible	-	Negligible	Imperceptible
			Negligible	Imperceptible	-	Negligible	Imperceptible

[7] Refer to Table 13.13 for sensitivity ranking justification

[2] Refer to Table 13.16 and Table 13.17 for justification of the magnitude of effect pre mitigation

21.10 Archaeology, Architecture and Cultural Heritage

All archaeological and cultural heritage issues will be resolved by mitigation during the pre-Construction Phase or Construction Phase, in advance of the Operational Phase, therefore no other significant residual effects have been identified. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

21.11 Landscape and Visual

The assessment findings are set out within the carious tables above and summarised in tables and record the significance of effects upon the character, views and visual receptors. Whilst the significance of the effects varies greatly from receptors, the site has provided a considerable amount of measures to mitigate adverse effects to sensitive receptors. Where effects have not been mitigated fully, the development will reinforce an emerging new local character that is appropriate to the development and the immediate neighbouring sites.

Given the scale of the proposed buildings and associated structures, it is inevitable that there will be significant change to the site landscape which will change from existing scrub vegetation to an operational industrial site , however the proposed project will provide large areas of landscaped areas to provide a more biodiverse and richer environment that relates well to the surrounding landscape character and the urban edge and aims to improve the biodiversity value of the site. Due to the existing industrial character of the site and surroundings of Profile Park Industrial Estate, effects on Landscape character are considered to be minor for both the Profile Park Commercial/industrial character area and the wider Newcastle lowlands landscape character area.

Beyond the immediate surrounding, both the scale of effects and the geographical extent of effects is expected to be small and the Proposed Development would not be likely to have a perceptible effect on character, refer to Table 21.15.

As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

Table 21.15: Summary table of landscape effects

Landscape Character Area / Type	Sensitivity	Residual Effect
Newcastle Lowlands	Medium	Negligible
Athgoe & Saggart Hills	Medium to High	Negligible
Limestone Farmlands	Medium	Negligible
Green Space	High	Negligible
Urban Fringe	Low	Negligible

Due to the existing industrial visual character of the site and surroundings of Profile Park industrial estate effects on visual character are considered to be minor for all receptors identified. Proposed tree planting and greening at the site boundaries would add positive visual amenity and green infrastructure to Baldonnel Road to maintain and enhance the existing character while ensuring the scheme is screened from existing residents, refer to Table 21.16.

Table 21.16: Summary table of visual effects

Receptor	Representative Viewpoint	Residual Effect
Residential receptors are scattered along the Baldonnel Road to the south of the site. The ZTV shows limited visibility from the area due to the screening vegetation along the Baldonnel Road.	VP03, VP04	Moderate – low effect

Receptor	Representative Viewpoint	Residual Effect
Employment Receptors include the commercial premises along the Baldonnel Road and the businesses within the Grange Castle Business Park.	VP01, VP04, VP05, VP06	Moderate – low effect
Transport Receptors using the existing roads including the Baldonnel Road and the R134 Nangor Road.	VP01, VP02, VP03, VP05, VP06	Moderate – low effect
Recreational Receptors using the Grange Castle Golf Club to the east and the adjacent Corkagh Park.	VP07	Negligible

21.12 Resource and Waste Management

The Construction Phase of the Proposed Development is not predicted to give rise to any Significant residual effects with the adoption of sustainable resource and waste management principles. Nonetheless, appropriate mitigation measures have been identified to further ensure that the sustainable resource and waste management principles outlined in Section 16.2.7 of Chapter 16 (Resource and Waste Management), including circular economy principles related to the use of resources and adherence to the waste hierarchy, are implemented.

A summary of the predicted (post-mitigation) effects during the Construction Phase is set out in Table 21.17. The Construction Phase effects of the Proposed Development are considered to be Not Significant.

Table 21.17: Summary of predicted residual Construction Phase effects.

Assessment Topic	Potential Effect (Pre-Mitigation and Monitoring)	Residual Effect (Post-Mitigation)
Demolition waste	No change	No change
Excavation waste	Negative, Minor and Short-Term	Negative, Minor and Short-Term
Construction waste	Negative, Minor and Short-Term	Negative, Minor and Short-Term
Municipal waste	Negative, Negligible and Short-Term	Negative, Negligible and Short-Term
Construction resource use	Negative, Negligible and Long-Term	Negative, Negligible and Long-Term

The Operational Phase of the Proposed Development is not predicted to give rise to any Significant residual effects with the adoption of sustainable resource and waste management principles. Nonetheless, appropriate mitigation measures have been identified to further ensure that the sustainable resource and waste management principles outlined in Section 16.2.7 of Chapter 16 (Resource and Waste Management), including CE principles related to the use of resources and adherence to the waste hierarchy, are implemented.

A summary of the predicted (post-mitigation) effects during the Operational Phase is set out in Table 21.18

Table 21.18: Summary of predicted residual Operational Phase effects.

Assessment Topic	Potential Effect (Pre-Mitigation and Monitoring)	Residual Effect (Post-Mitigation)
Construction waste	Negative, Negligible and Short-Term	Negative, Negligible and Short-Term
Municipal waste	Negative, Negligible and Short-Term	Negative, Negligible and Short-Term
Operational resource use	Negative, Negligible and Long-Term	Negative, Negligible and Long-Term

The Decommissioning Phase of the Proposed Development is not predicted to give rise to any Significant residual effects with the adoption of sustainable resource and waste management principles.

Nonetheless, appropriate mitigation measures have been identified to further ensure that the sustainable resource and waste management principles outlined in Section 16.2.7 of Chapter 16 (Resource and Waste Management), including CE principles related to the use of resources and adherence to the waste hierarchy, are implemented.

A summary of the predicted residual effects during the Decommissioning Phase, following the implementation of the appropriate mitigation measures, is set out in Table 21.19. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

Table 21.19: Summary of predicted residual Decommissioning Phase effects

Assessment Topic	Potential Effect (Pre-Mitigation and Monitoring)	Residual Effect (Post-Mitigation)
Decommissioning waste	Negative, Negligible and Short-Term	Negative, Negligible and Short-Term

21.13 Material Assets

No Adverse Significant residual effects on water, power and telecommunications are likely to arise during the Construction Phase.

The Proposed Development is likely to have Negative, Moderate and Long-Term residual effects on power supply during the Operational Phase following the implementation of mitigation measures.

No Adverse Significant residual effects on water are likely to arise during the Operational Phase.

The Proposed Development is likely to result in a Positive, Moderate and Long-Term effects on telecommunications provision.

There will be no likely Adverse Significant residual effects on utilities post mitigation during the Decommissioning Phase. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

21.14 Major Accidents and Disasters

There are no identified incidents and / or major accidents and / or disasters risk events that present a sufficient combination of risk likelihood and consequence of effect that would be deemed to generate a risk event is Low.

No Significant Adverse residual effects have been identified in the Construction, Operational and Decommissioning Phases of the Proposed Development. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IEL.

As mentioned previously, the design of the Proposed Development has evolved through comprehensive design iteration, with particular emphasis on avoiding or reducing the potential for environmental effects, where practicable, whilst ensuring the objectives of the Proposed Development are attained. The design of the Proposed Development has been developed in compliance with the relevant design standards which include provisions to reduce the likelihood of risk events occurring (for example, structures have been designed to avoid the risk of collapse, drainage systems have been designed to cater for increased rainfall events etc.).

Processes will be in place during all phases of the Proposed Development including the proposed mitigation and monitoring measures (refer to Chapter 18 (Major Accidents and Disasters) Section 18.5) that will be introduced to avoid and/or reduce the vulnerability of the Proposed Development to major accidents and/or natural disasters. Therefore, it is considered that there will not be any likely Significant Adverse environmental effects arising from the vulnerability of the proposed Project to major accidents and/or natural disasters.

21.15 Cumulative Effects and Environmental Interactions

In general, no additional residual cumulative effects have been identified other than those outlined above.

However, there is the potential for additional significant residual effects on climate and noise during the Operational Phase of the Proposed Development when considered cumulatively with other developments proposed, refer to Chapter 20 (Cumulative Effects) for further details. As outlined in Chapter 5 (Construction) Section 5.7, decommissioning activities will need to be undertaken in accordance with the requirements of the IE licence.

21.16 References

Arup (2024) Appropriate Assessment for the Data Centre Development DC3. Dublin, Ireland.

Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports. Available online at: Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (epa.ie). Wexford, Ireland.

OPW and DHPLG (2009) The Planning System and Flood Risk Management Guidelines for Planning Authorities. Available online at: https://www.bing.com/search?pglt=41&q=OPW+and+DHPLG+(2009)+The+Planning+System+and+Flood+Risk+Management+Guidelines+for+Planning+Authorities.&cvid=cf02e612c9ce4accbc24df597620a2fe&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIICAEQ6QcY_FXSAQc1NTRqMGoxqAIAsAIA&FORM=ANNAB1&PC=U531. Dublin, Ireland.

South Dublin County Council (SDCC) (2022) South Dublin County Development Plan 2022-2028. Available online at: Development Plan - SDCC. Dublin, Ireland.