Future Baseline

6.7.17 The future baseline scenario for the proposed development considers the scenario in which the July 2022 DUB-1 permitted development would be operational. Operational employment generation for the July 2022 DUB-1 permitted development would provide 135 FTE jobs.

Sensitive Receptors

6.7.18 The focus of this assessment is on community health and wellbeing; therefore, all those who are likely to experience population and health effects (positive or negative) associated with the proposed development are considered sensitive receptors. The main sensitive receptor that this assessment will focus on is the Clondalkin Village SA community, as this is where the development is located. The community receptors that have been considered within this assessment include:

- Local residents (including vulnerable groups such as children and the elderly within the population);
- Local economy; and
- Pedestrians, cyclists, and drivers.

6.8 Assessment of Effects

Demolition and Construction Effects

Employment Generation

6.8.1 The demolition and construction stage of the proposed development would create employment opportunities. Employment generation has been calculated using data from the July 2022 DUB-1 permitted development. Levels of employment for the demolition and enabling stage are estimated to be in the region of 67 direct workforce jobs, with approximately 34 additional jobs during the peak construction period.

6.8.2 Increased employment opportunities can have a positive influence on health through increasing social contact, involvement in a collective effort or activity and by forming social relationships. All of these contribute to wellbeing. In addition, those with insecure employment are likely to have poorer mental health than those with secure employment.

6.8.3 These types of jobs often have a related multiplier effect, creating additional indirect employment in business, which in turn benefit from increased spending by local workers. Procurement of goods and services may have the potential to create additional short-term employment opportunities, which in turn may potentially increase people's incomes and have a positive impact on their health. The extent of these benefits will be determined by the level of local procurement. Most of the procurement would be spread across the national economy due to the nature of the goods; this combined with the temporary nature of the demolition and construction stage would limit any health benefits.

6.8.4 The impact magnitude of employment generation on human health is considered to be low at the SA scale on a receptor of high sensitivity; therefore, health effects associated with employment generation during the demolition and construction stage at the SA scale would be **Temporary**, **Not Significant - Slight**, **Positive** in nature and **Not Significant** in terms of EIA. The ED and SDC scale are of medium sensitivity, therefore, health effects associated with employment generation (low magnitude) during the demolition and construction stage at these scales would be **Temporary**, **Imperceptible**, **Positive** in nature and **Not Significant** in terms of EIA.

Introduction of Resident Population

6.8.5 There is the potential for an increase in the temporary population of the area as a result of demolition and construction workers from outside the wider Dublin area choosing to reside in the immediate and wider local area.

6.8.6 While it is anticipated that some of the workforce would be sourced from outside the local area, their presence is unlikely to place additional demands on local services (most notably health care facilities) which cannot be met within the existing capacity. Therefore, it is unlikely that the presence of the additional workforce would result in negative health impacts. In addition, an increased temporary resident population could result in additional trade for local accommodation and services.

6.8.7 The impact magnitude of the introduction of a resident population on human health is considered to be low at the SA scale on receptor of high sensitivity. It is anticipated that the introduction of a resident population would not result in any effect at the ED and SDC scales. Given the estimated 67 direct workforce jobs and approximately 34 additional jobs created during the demolition and construction phase, the human health effects associated with the introduction of a resident population would be **Temporary**, **Not Significant to Slight**, **Neutral** in nature and **Not Significant** in terms of EIA.

Air Quality Effects

6.8.8 There would be air quality impacts from demolition and construction stage activities in terms of dust impacts and on-site vehicle emissions.

6.8.9 The air quality assessment, as reported in Chapter 8 of the EIAR volume, concludes that the demolition and construction dust and on-site vehicle emissions effects in the study area would be negative, temporary, imperceptible and Not-significant in terms of EIA.

6.8.10 Air quality effects have the potential to affect health in a variety of ways, in particular targeting vulnerable groups such as children, the elderly and those with respiratory problems. However, embedded mitigation and standard good practice measures would be implemented to reduce dust emissions and vehicle emissions, through the construction environmental management plan (CEMP).

6.8.11 The impact magnitude of air quality effects on human health is considered to be low due to the implementation of the CEMP. Local residents and vulnerable groups are all considered to be of high sensitivity and those located within the SA could be affected; therefore, health effects associated with dust and on-site vehicle emissions during the demolition and construction stage would be **Temporary**, **Not Significant to Slight, Negative** in nature and **Not Significant** in terms of EIA.

Noise Effects

6.8.12 There would be noise impacts from demolition and enabling stage activities and associated traffic that have the potential to cause effects to human health.

6.8.13 The noise and vibration assessment in Chapter 9: Noise and Vibration of this EIAR Volume reports that based on the predicted mitigated noise levels and distanced to receptors, demolition and enabling stage works are likely to give a rise in noise levels that are considered temporary, slight, negative in nature and not significant in terms of EIA.

6.8.14 The noise assessment also reports that noise associated with demolition and construction stage traffic would not exceed the construction noise limit of 65 dB L_{Aeg} and is therefore considered temporary, slight, negative and not significant in terms of EIA.

6.8.15 Noise has the potential to affect health in a variety of ways. Some negative effects can be auditory (i.e. damage to the ear) and occur as a direct impact of noise (i.e. at levels higher than considered here and in excess of statutory acoustic limiting values) whilst others are non-auditory; such as annoyance, night time effects (e.g. sleep disturbance) and mental health impacts and may be associated with exposure to excessive noise.

6.8.16 Annoyance is the most reported non-auditory health effect associated with noise with sleep disturbance also being common with certain vulnerable groups (such as the elderly, new-borns and shift workers).

6.8.17 Those sensitive human health receptors located within the immediate vicinity of the site would experience the greatest noise effects and therefore this has only been assessed at the SA scale.

6.8.18 The impact magnitude of noise effects on human health is considered to be of low magnitude due to noise levels not exceeding demolition and enabling noise limits. Residential receptors in close proximity to the site are considered to have a high sensitivity to change in the noise environment; therefore, any auditory and non-auditory health effects during the demolition and construction stage would be **Temporary, Not Significant to Slight, Negative** in nature and **Not Significant** in terms of EIA.

Transport and Accessibility Effects

6.8.19 The transport assessment in Chapter 7: Transport and Accessibility of this EIAR Volume reports that during the peak demolition and construction period (in 2024) there would be a maximum additional 156 vehicle movements per day (of which 44 would be heavy goods vehicles (HGV). This increase in vehicle movements is reported to be temporary, slight, negative in nature and not significant in terms of EIA in relation to pedestrian severance, delay, amenity, fear, and intimidation.

6.8.20 The assessment also reports that it is anticipated that there may be some driver delay at times during the demolition and construction stage. However, the CEMP would commit to ensuring deliveries are co-ordinated to ensure vehicles are not waiting on the local highway, and wherever feasible deliveries would be undertaken outside peak hours and the effect would be temporary, slight, negative in nature and not-significant in terms of EIA. However, some level of annoyance and stress amongst local residents and road users may occur due to the potential for increased journey times.

6.8.21 The assessment does not indicate a prevailing road safety issue which could be made worse by the demolition and construction works and reports the effect on accidents and safety to be temporary, slight negative and not-significant in terms of EIA.

6.8.22 Vulnerable groups in society would be affected most by the increase in traffic levels. Those such as young children and the elderly may experience negative health impacts. The elderly may experience annoyance from increased noise, whereas young children are at higher risk of road accidents and health impacts associated with potential air pollution.

6.8.23 Cyclists and pedestrians using the local road network may experience increased fear of accidents and injuries. Any increase in traffic also increases the risk of accidents resulting in injuries and potentially death of road users, especially for more vulnerable road users, such as the young and the elderly.

6.8.24 The increase in vehicle movements and the resulting effects on human health as a result of the demolition and construction of the proposed development would be localised to within the SA. The impact magnitude of traffic and transport effects on human health is considered to be low due to no significant effects being reported in the transport chapter. Road users, pedestrians and cyclists are all considered to be of high sensitivity; therefore, health effects associated with increased traffic during the demolition and construction stage would be Temporary, Not Significant to Slight, Negative in nature and Not Significant in terms of EIA.

Amenity Effects

6.8.25 The landscape and visual impact assessment (LVIA) in EIAR Volume 2, Chapter 1: Landscape and Visual Impact Assessment reports that the site is located in an area that has had successive recent developments of a similar scale to the proposed development. Landscape and visual effect during demolition and construction are generally reported as Temporary, slight, negative in nature and not significant in terms of EIA.

6.8.26 Visual disturbances can become a focus for concern and anxiety. The built environment can impact on public health and the way that people utilise their environment. The built environment can also influence physical activity which in turn can cause health impacts. The natural environment is known to have a restorative function in that it reduces stress and anxiety levels.

6.8.27 Light pollution from the built environment can also have a negative health impact through annoyance, discomfort and loss of visual environment and visibility.

6.8.28 Residents may experience feelings of decreased quality of life during the demolition and construction stage which can cause anxiety and concern as well as decreased wellbeing; however, as the area has undergone a period of change, transitioning from an agricultural to an industrial and commercial area it is thought nearby residents would be considered to be more resilient to change.

6.8.29 In terms of amenity effects on population and human health, the magnitude of effect is considered to be low on a receptor of high sensitivity; therefore, the effect would be **Temporary, Not Significant to Slight, Negative** in nature and **Not Significant** in terms of EIA.

Operation Effects

Employment Generation

6.8.30 Once operational the proposed development would employ approximately 45 full time equivalent (FTE) staff members on-site. Additional to this would be the ad-hoc attendance of maintenance contractors and visitors. It is anticipated that the data centers would be in operation on a shift basis with reduced numbers presented during night shifts.

6.8.31 Health benefits associated with employment would be felt most if employment is taken up by those who are currently unemployed or who are in short-term temporary employment. The scale of the employment opportunities is unlikely to have any health benefits at the population level, although individuals may benefit if they find employment and are moving from an unemployed status.

6.8.32 The magnitude of effect of increased employment on population and human health is considered to be of low magnitude at the SA scale on a receptor of high sensitivity. The effect would therefore be **Long-term to Permanent**, **Not Significant to Slight**, **Positive** in nature and **Not Significant** in terms of EIA. The ED and SDC scale are of medium sensitivity, therefore, health effects associated with employment generation (low magnitude) during operation at these scales would be **Long-term to Permanent**, **Imperceptible**, **Positive** in nature and **Not Significant** in terms of EIA.

Air Quality Effects

6.8.33 The air quality assessment in Chapter 8: Air Quality of this EIAR Volume considers the air quality effects during operation.

6.8.34 As discussed above, air quality impacts have the potential to affect health in a variety of ways, in particular targeting vulnerable groups such as children, the elderly and those with respiratory problems.

6.8.35 The magnitude of effect of air quality effects on human health is considered to be of low magnitude on a receptor of high sensitivity. Those sensitive human health receptors located within the immediate vicinity of the site would experience the greatest air quality effects and therefore this has only been assessed at the SA scale.; The effect would be **Long-term to Permanent**, **Not Significant to Slight**, **Negative** in nature and **Not Significant** in terms of EIA.

Noise Effects

6.8.36 There would be noise impacts during operation of the proposed development from the plant and servicing that have the potential to cause effects to human health. Noise impacts

6.8.37 The noise and vibration assessment in Chapter 9: Noise and Vibration of this EIAR volume reports that based on the predicted mitigated noise levels and distanced to receptors, the predicted operational noise rating levels meet the required limits and would be considered Long-term to Permanent, Slight, Negative in nature and Not Significant in terms of EIA.

6.8.38 Therefore, in terms of operation noise effects on human health the impact magnitude is considered to be low due to noise levels not exceeding operation noise limits on a receptor of high sensitivity. The effect would be **Long-term to Permanent, Not Significant to Slight, Negative** in nature and **Not Significant** in terms of EIA.

Transport and Accessibility Effects

6.8.39 The transport assessment in Chapter 7: Transport and Accessibility of this EIAR Volume reports that during the operation stage, there would be an additional 59 vehicle movements per day and 4 deliveries. This equates to an estimated increase of under 30 % in Profile Park in 2024. These movements could result in severance or an increase in fear and intimidation.

6.8.40 The assessment also reports that pedestrians would be safely accommodated by footpaths of approximately 3 m provided on both sides of Profile Park and an informal pedestrian crossing on the approach to the R134 New Nangor Road/Profile Park roundabout. The overall effect on pedestrians would be long-term to permanent, slight, negative in nature and not significant in terms of EIA.

6.8.41 As a result of the proposed development, the transport assessment reports that there may be some driver delay at times, causing some level of stress and annoyance amongst local residents and road users. The overall effect of driver delay would be long-term to permanent, slight, negative and not-significant in terms of EIA.

6.8.42 The assessment does not indicate a prevailing road safety issue which could be made worse by the operation traffic flows. The assessment reports that the effect on accidents and safety would be long-term to permanent, slight, negative and not-significant in terms of EIA.

6.8.43 As previously stated, vulnerable groups in society would be affected most by the increase in traffic levels. Those such as young children and the elderly may experience negative health impacts. However, the impact magnitude of traffic and transport effects on human health is considered to be low due to no significant effects being reported in the transport assessment. The increase in vehicle movements and the resulting effects on human health as a result of the demolition and construction of the proposed development would be localised to within the SA. Road users, pedestrians and cyclists are all considered to be of high sensitivity; therefore, health effects associated with increased traffic during the operation stage would be **Long-term to Permanent**, **Not-significant to Slight, Negative** in nature and **Not-significant** in terms of EIA.

Amenity Effects

6.8.44 The LVIA in EIAR Volume 2, Chapter 1: Landscape and Visual Impact Assessment reports that on completion, the data center buildings would be a new feature within the landscape, similar in size and visual appearance to surrounding developments. The size, scale and operation of the buildings are consistent with surrounding land uses and therefore it is anticipated that the proposed development would not be out of context and that landscape and visual impacts during operation would be not be significant in terms of EIA.

6.8.45 Residents may experience feelings of decreased quality of life which can cause anxiety and concern as well as decreased wellbeing; however, as the current immediate visual environment is dominated by similar size and scale buildings to that of the proposed development those nearby residents would be considered to be more resilient to change.

6.8.46 Therefore, in terms of amenity effects on population and human health the magnitude of effect is considered to be low on a receptor of high sensitivity; therefore, the effect would be **Long-term to Permanent, Not-significant to Slight, Negative** in nature and **Not Significant** in terms of EIA.

6.9 Additional Mitigation

Demolition and Construction Stage

6.9.1 Given no significant effects are identified, no additional mitigation measures are proposed.

Operation Stage

6.9.2 Given no significant effects are identified, no additional mitigation measures are proposed.

6.10 Enhancement Measures

6.10.1 It is proposed that the procurement of local employment wherever possible is encouraged. If feasible, and available, local suppliers should also be used for goods and services. Jobs created should be advertised and made available in the local area initially in order to maximise this opportunity. This would result in a more positive effect on local employment and the local economy.

6.11 Assessment of Residual Effects

Demolition and Construction Residual Effects

6.11.1 As no additional mitigation would be required, the residual demolition and enabling works effects remain as reported in the assessment of effects section.

Operation Residual Effects

6.11.2 As no additional mitigation would be required, the residual operation effects remain as reported in the assessment of effects section.

Summary of Residual Effects

Table 6.8 provides a summary of the outcomes of the population and human-health assessment of the proposed development. Where **Significant Positive** effects are likely these are highlighted in bold green and where **Significant Negative** effects are predicted these are highlighted in bold red.

Table 6-8: Summary of Residual Effects

Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
				+ -	L U	D I	R IR	M B T St Mt Lt P**
Demolition and Construction								
Local Residents and Economy	Creation of Employment (Small area scale)	None required	Not-significant - Slight	+	L	D	R	T
Local Residents and Economy	Creation of Employment (Electoral division and South Dublin County scale)	None required	Imperceptible	+	L	D/I	R	T
Local Residents and Economy	Introduction of Resident Population (Small area scale)	None required	Not significant – Slight	-	L	D/I	IR	T

Table 6-8: Summary of Residual Effects

Local residents	Air quality effects	None required	Not significant – Slight	-	L	D/I	IR	T
Local residents	Noise effects	None required	Not Significant – Slight	-	L	D	IR	T
Local residents	Transport effects	None required	Not Significant – Slight	-	L	D	IR	T
Local residents	Amenity	None required	Imperceptible	-	L	D	R	T
Operation								
Local Residents and Economy	Creation of Employment (Small area scale)	None required	Not-significant - Slight	+	L	D	IR	Lt - P
Local Residents and Economy	Creation of Employment (Electoral division and South Dublin County scale)	None required	Imperceptible	+	L	D	IR	Lt - P
Local residents	Air quality effects	None required	Not significant – Slight	-	L	D/I	IR	Lt - P
Local residents	Noise effects	None required	Not Significant – Slight	-	L	D	IR	Lt - P
Local residents	Transport effects	None required	Not Significant – Slight	-	L	D	IR	Lt - P
Local residents	Amenity	None required	Imperceptible	-	L	D	IR	Lt - P

Notes:

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

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

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

6.12 Cumulative Effects

Intra-Project Effects

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

Inter-Project Effects

Table 6-9 provides a summary of the likely inter-project cumulative effects resulting from the proposed development and the cumulative developments.

Table 6-9: Inter-Project Cumulative Effects

Cumulative Development	Demolition Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Microsoft - Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22 [SD20A/0283]	No	The demolition and construction stage would not overlap with the proposed development demolition and construction stage and therefore cumulative effects would not occur.	Yes	The operation of the cumulative scheme would overlap with the construction year of the proposed development (2024).
UBC Properties -Grange Castle South Business Park, Dublin 22 [An Bord Pleanála Reference – 308585]			No	The cumulative scheme would be operational at the same time as the proposed development; however, the air quality, noise and transport assessments have reported no significant operational cumulative effects.
Digital Reality Trust - Profile Park, Baldonnel, Dublin 22, D22 TY06 [SD17A/0377]			No	The proposed amendments to the cumulative scheme would not generate additional effects.
Cyrus One - Grange Castle Business Park, Clondalkin, Dublin 22 [SD18A/0134]			Yes	The opening year is 2020. Therefore, the operation phase will overlap with the construction and operation stage of the proposed development.
Cyrus One Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 [SD20A/0295]			No	The proposed amendments to the cumulative scheme would not generate additional effects.
Cyrus One - Grange Castle South Business			Yes	Building A partially open, Building B and the proposed GIS

Table 6-9: Inter-Project Cumulative Effects

Cumulative Development	Demolition Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Park, Baldonnel, Dublin 22 [An Bord Pleanála Ref - 309146]				substation is scheduled to be complete by Q4 of 2022. Operation stage would overlap with the operation stage of the proposed development.
Equinix (Ireland) Ltd – Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22 [SD22A/0156]			No	The proposed amendments to the cumulative scheme would not generate additional effects.
Digital Netherlands VIII B.V - Profile Park, Nangor Road, Clondalkin, Dublin 22 [SD21A/0217]			No	The cumulative scheme would be operational at the same time as the proposed development; however, the air quality, noise and transport assessments have reported no significant operational cumulative effects.
UBC Properties - Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 [SD20A/0121]	Yes	The construction phase would overlap[with he construction and operation of the proposed development.	No	The cumulative scheme would not be operational, when the proposed development would be operational. The opening year of the cumulative scheme is 2028.
Vantage Data Centers Dub 11 Limited - Profile Park Business Park and partly within Grange Castle Business Park, Dublin 22 [An Bord Pleanála Ref - 312793]	Yes	Construction phase would overlap with the construction stage of the proposed development.	No	The EirGrid connection would power the site data centers; however, the air quality, noise and transport assessments have reported no

Table 6-9: Inter-Project Cumulative Effects

Cumulative Development	Demolition Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
				significant operational cumulative effects.
Centrica Business Solutions – Profile Park, Baldonnel, Dublin 22 [SD21A/0167]	Yes	Construction Period 2023-2025 would overlap with the operation stage of the proposed development	No	The air quality, noise and transport assessments have reported no significant operational cumulative effects
Equinix (Ireland) Ltd – Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22 [SD21A/0186]	Yes	Two-year construction period (not defined 2023-2025). Assumed that the construction stage will overlap with both the construction of the proposed development.	Yes	Opening year is 2025.

Demolition and Construction Cumulative Effects

6.12.1 Demolition and construction cumulative effects would arise from the following development:

- UBC Properties – Profile Park [SD20A/0121] in respect of transport;
- Vantage Data Centers Dub11 Limited [An Bord Pleanála Ref - 312793] in respect of transport;
- Centrica Business Solutions – Profile Park [SD21A/0167] in respect of air quality and transport and accessibility effects; and
- Equinix (Ireland) Ltd – Plot 100 [SD21A/0186] in respect of air quality and transport and accessibility effects.

6.12.2 The demolition and construction stage of the cumulative developments listed above would overlap with the construction stage of the proposed development. To reduce the transport and accessibility effect the appointed demolition and construction contractor(s) and applicant would consult neighbouring developments on the programme and the scheduling of vehicle movements would be undertaken. Through these mitigation measures the effects of accidents and safety, driver delay and pedestrian severance, delay, amenity, fear, and intimidation, on human health would be minimised.

Operation Cumulative Effects

6.12.3 Operation cumulative effects would arise from the following developments:

- Microsoft - Grange Castle Business Park [SD20A/0283] in respect of transport and accessibility effects;

- Cyrus One - Grange Castle Business Park [SD18A/0134] in respect of transport and accessibility effects;
- Cyrus One - Grange Castle South Business Park [An Bord Pleanála Ref - 309146] in respect of transport and accessibility effects; and
- Equinix (Ireland) Ltd – Plot 100 [SD21A/0186] in respect of transport and accessibility effects.

6.12.4 The operation stage cumulative developments listed above would overlap with the operation stage of the proposed development. Within the traffic and transport assessment, daily trip generation and distribution traffic flows have been incorporated within the baseline assessment.

6.13 Summary of Assessment

Background

6.13.1 This chapter has detailed the potential population and human health effects associated with the demolition and construction stage and operation stage of the proposed development. The assessment has been undertaken considering the relevant national and local guidance and regulations.

6.13.2 The baseline assessment has been made using publicly available information from the 2016 South Dublin County Census, within which three areas were examined: South Dublin County, Clondalkin Village Electoral Division and Clondalkin Village SA. For the purpose of this population and human health assessment census data for Clondalkin Village SA was compared against the census data for Clondalkin Village ED and South Dublin County.

6.13.3 At the time of the 2016 Census, the Clondalkin Village SA population was 257. In terms of the population breakdown, Clondalkin Village has a lower-than-average younger population (0-19) and a significantly higher elderly population compared with Clondalkin Village SA and South Dublin County. When assessing population health. Clondalkin Village has a lower % of residents rating their health as good compared with Clondalkin Village ED and South Dublin County. The highest proportion of employment in Clondalkin Village SA is within the agriculture, forestry and fishing sector and the building and construction industry, compared with Clondalkin Village ED and South Dublin County as a whole.

Demolition and Construction Effects

6.13.4 Demolition and construction stage effects for population and human health were considered in terms of employment generation, introduction of resident population, air quality, noise, transport and accessibility and amenity effects.

6.13.5 Overall, it is considered that the demolition of the existing property and construction of the proposed development would result in a mixture of negative (air quality; noise; transport amenity effects and introduction of resident population) and positive (creation of employment) effect on population and human health receptors and would **not give rise to significant** effects on population and human health.

Operation Effects

6.13.6 Operation effects for population and human health were considered in terms of employment generation, air quality, noise, transport and accessibility and amenity effects.

6.13.7 The assessment identified numerous positive (Creation of employment) and negative effects (air quality; noise; transport and amenity effects) in relation to population and human health. Overall, it is considered that the operational development would result in a neutral effect on population and human health receptors and would **not give rise to significant effects** on population and human health.

Cumulative Effects

6.13.8 The cumulative effects of the proposed development and neighbouring schemes has been considered with the relevant technical topic assessments of the EIAR.

6.13.9 The demolition and construction stage of a number of cumulative developments would overlap with the construction stage of the proposed development. The increase in traffic resulting from the cumulative development is not predicted to result in any significant effects on population and human health.

6.13.10 The operation stage of a number of cumulative schemes would overlap with the operation stage of the proposed development. The increase in traffic resulting from the cumulative development is not predicted to result in any significant effects on population and human health.

7 TRANSPORT AND ACCESSIBILITY

7.1 Introduction

7.1.1 This chapter of the EIAR reports on the likely significant Transport and Accessibility effects to arise from the demolition and construction stage and the operation stage of the proposed development.

7.1.2 The chapter describes the Transport and Accessibility policy context; the methods used to assess the potential impacts and likely effects; the baseline conditions at and surrounding the site; the likely Environmental Impact Assessment Report effects taking into consideration embedded mitigation; the need for additional mitigation and enhancement; the significance of residual effects; and cumulative effects. Where relevant, the assessment follows the methodology set out in the Institute of Environmental Management and Assessment Guidelines for the Environmental Assessment for Road Traffic.[1]

7.1.3 This chapter is supported by the following technical appendices in EIAR Volume 3:

- Technical Appendix 7.1: Traffic Flow and Distribution Diagrams
- Technical Appendix 7.2: Accident Data;
- Appendix 7.3: Cumulative Schemes Daily Traffic Flow Diagrams; and
- Appendix 7.4: Proposed Development Trip Generation.

7.2 Methodology

7.2.1 The assessment has been informed by the following legislation, policies, and published guidance:

- International Legislation:
  - National Planning Framework (NPF) 2019[2];
- Regional Policy:
  - South Dublin County Development Plan 2022-2028[3];
- National guidance and Industry Standards:
  - IEMA Environmental Assessment for Road Traffic, 1993[4]; and
  - EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2017[5].

International Legislation

National Planning Framework (NPF) 2018

7.2.2 The National Planning Framework (NPF) was published in February 2018, and updated in November 2021, setting out a vision for Ireland in land use and planning terms to 2040. The NPF replaced the National Spatial Strategy once it was adopted as the long-term land use and planning vision for Ireland.

7.2.3 National Strategic Outcome 6 of the NPF relates to the creation of "A Strong Economy Supported by Enterprise, Innovation and Skills". This strategic outcome is underpinned by a range of objectives relating to job creation and the fostering of enterprise and innovation. The following objective, relating to Information and Communications Technology (ICT) infrastructure is included under National Strategic Outcome 6:

"Promotion of Ireland as a sustainable international destination for ICT infrastructures such as data centres and associated economic activities".

7.2.4 The NPF also states that "Ireland is very attractive in terms of international digital connectivity, climatic factors and current and future renewable energy sources for the development of international digital infrastructures, such as data storage facilities. This sector underpins Ireland's international position as a location for ICT and creates added benefits in relation to establishing a threshold of demand for sustained development of renewable energy sources."

7.2.5 National Strategic Outcome 5 relates to sustainable mobility and main target is "to expand attractive public transport alternatives to car transport to reduce congestion and emissions and enable the transport sector to cater for the demands associated with longer term population and employment growth in a sustainable manner through the following measures:

- Deliver the key public transport objectives of the Transport Strategy for the Greater Dublin Area 2016 to 2035;
- Provide public transport infrastructure and services to meet the needs of smaller towns, villages and rural areas; and
- Develop a comprehensive network of safe cycling routes in metropolitan areas to address travel needs and to provide similar facilities in towns and villages where appropriate".

Regional Policy

South Dublin County Development Plan 2022-2028

7.2.6 The South Dublin County Development Plan 2022-2028 has been prepared in accordance with the requirements of the Planning and Development Act 2000 (as amended) and sets out an overall strategy for the proper planning and sustainable development of the County.

7.2.7 The Sustainable Movement chapter contains policies and objectives that seek to achieve this goal, and which will assist South Dublin County in achieving its climate action targets. There is also significant scope for movement and transport corridors to form important links in the Council's green infrastructure network as they provide opportunities for additional and replacement planting of native species and pollinators, which will in turn contribute to biodiversity and carbon sequestration.

7.2.8 The Council recognises that new development, both residential and commercial, permitted in line with this Plan will lead to additional trips being generated. The Council will work with the relevant agencies to seek to ensure that as high a proportion as possible will be conducted by sustainable means. However, it is accepted that a residual proportion of the trips generated will be taken by private vehicle. The challenge is to ensure that this does not add to existing levels of congestion or saturation of the road network.:

- Policy SM1: Overarching – Transport and Movement- Promote ease of movement within, and access to South Dublin County, by integrating sustainable land-use planning with a high-quality sustainable transport and movement network for people and goods.

[1] Institute of Environmental Management and Assessment, 1993. Guidelines for the Environmental Assessment for Road Traffic.
[2] National Planning Framework, 2018
https://www.gov.ie/en/publication/daa56-national-planning-framework-ireland-2040-our-plan-npf-2018/
[3] South Dublin County Development Plan 2022-2028
https://www.sdcc.ie/en/devplan2022/stage-2-draft-plan/consolidated-draft-county-development-plan/1-draft-south-dublin-county-development-plan 2022-2028.pdf
[4] IEMA Environmental Assessment for Road Traffic, Institute of Environmental Assessment, 1993.
[5] Environmental Protection Agency, August 2017, Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

7.2.9 One of the major challenges facing the County during the life of this Plan is the need to promote and provide for sustainable transport options, whilst maintaining the effectiveness of the County's road network.

National Guidance and Industry Standards

IEMA Environmental Assessment for Road Traffic, 1993

7.2.10 As agreed with SDCC Highways, IEMA (Institute of Environmental Management and Assessment) methodology has been used for the appraisal of traffic impacts for the proposed development. It should be noted that Republic of Ireland forms part of the IEMA Regional Network.

7.2.11 The purpose of the IEMA Guidelines is to provide the basis for a systematic, consistent and comprehensive coverage for the appraisal of traffic impacts for a wide range of development projects.

7.2.12 The EIA process should be a continuous activity running throughout the planning and design stages of a project.

7.2.13 To ensure the comprehensive coverage of the environmental impacts arising from changes in traffic levels, the IEMA Guidelines identify a check list of potential impacts such as driver severance and delay, pedestrian severance and delay, pedestrian amenity, accidents and safety, hazardous and dangerous roads etc.

7.2.14 According to the IEMA Guidelines the assessment of the environmental impacts of traffic requires the following stages:

- Determination of existing and forecast traffic levels and characteristics;
- Determining the time period suitable for assessment;
- Determining the year of assessment; and
- Identifying the geographical boundaries of assessment.

7.2.15 Further, the study area will be defined by identifying any link or location where it is considered that significant environmental effects may occur as a result of the proposed scheme.

7.2.16 The IEMA Guidelines state two rules to be considered when assessing the impact of development traffic on a highway link:

- Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles (HGVs) will increase by more than 30%); and
- Include any other specifically sensitive areas where traffic flows will increase by 10% or more.

7.2.17 Less than a 30% increase is considered to result in imperceptible changes in the environmental effects of traffic. The IEMA Guidelines considered that projected changes in traffic flows of less than 10% create no discernible environmental effect.

7.2.18 Specifically, sensitive areas referred to above may include accident 'black spots', conservation areas, hospitals or links with high pedestrian flows.

7.3 Consultation

7.3.1 Table 7-1 summarises the key consultations that have been undertaken with respect to the Transport and Accessibility assessment.

Table 7-1: Summary of Consultation

Consultee /Date	Summary of Comments	Where in this Chapter Comments are addressed
South Dublin County Council (SDCC) Consultation Meeting 21/09/2022	Accepted the proposed approach to the assessment of potential effects for traffic and transport. It was explained to SDCC that the approach to the transport assessment within the EIA would be consistent with that of the July 2022 DUB-1 permitted development. Baseline traffic flows would be ascertained from the 2019 AWS TIA, and used as a basis for the transport assessment in the EIAR.	Contained herein

7.4 Assessment Scope

7.4.1 The IEMA Environmental Assessment for Road Traffic Guidance (1993) has been followed in undertaking the assessment. The EPA terminology has been applied where appropriate.

Technical Scope

7.4.2 The technical scope of the assessment has considered the potential impacts of the traffic generation during the demolition and construction stage and the operation stage.

7.4.3 The assessment will consider the potential impacts of operation and demolition and construction traffic generation on relevant receptors.

Spatial Scope

7.4.4 In accordance with the IEMA Guidelines, the study area has been defined by identifying any link or location where it is considered that significant environmental effects could occur as a result of the proposed development.

7.4.5 The local highway network study area has been informed by the following two rules, as set out in IEMA Guidelines:

- Rule 1: include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles (HGVs) will increase by more than 30%); and
- Rule 2: include any other specifically sensitive areas where traffic flows have increased by 10% or more.

7.4.6 The assessment has been undertaken when the perceived environmental impact is at its greatest during the operation stage, in 2025, and during the demolition and construction stage in 2024. The assessment scenarios considered are identified in 7.4.10.

7.4.7 Sensitive receptors on each arm of the following junctions along the R134 New Nangor Road have been considered:

- Junction 1: Adamstown Road (R120)/Nangor Road (R134);
- Junction 2: Nangor Road (R134)/Baldonnel Rad (L2001);
- Junction 3: Nangor Road (R134)/Kilcarbery Park/Falcon Avenue;
- Junction 4: Nangor Road (R134)/Grange Castle Business Park North/Grange Castle Gold Course; and
- Junction 5: Grange Castle Road (R136)/Nangor Road (R134).

7.4.8 The study area has been defined in Figure 7-1.

Figure 7-1 Study Area

Temporal Scope

7.4.9 The assessment has considered impacts arising during the demolition and construction stage and the operation stage which would be expected to be temporary (less than one year) and long term (15 to 60 years) to permanent (>60 years) in nature respectively.

7.4.10 The assessment would consider the future years at which the peak demolition and construction traffic of the development occurs and when the proposed development is built out and fully operational. It has been assumed that the peak demolition and construction traffic would occur in 2024, whilst according to the indicative programme the proposed development would be fully operational in 2025. The assessment scenarios are anticipated to be:

- Demolition and Construction Stage:
  - Existing Baseline (2022);
  - Future Baseline (2024) Construction and Operation Stage flows for 2024 associated with the July 2022 DUB-1 permitted development (Do Nothing – including cumulative developments);
  - Future Baseline (2024) Construction and Operation Stage flows for 2024 associated with the July 2022 DUB-1 permitted development + Year of Peak Demolition and Construction Works of Proposed Development (2024) + Cumulative Development (Do Something).
- Operation Stage:
  - Existing Baseline (2022);
  - Future Baseline (2025) July 2022 DUB-1 permitted development Operational (Do Nothing – includes cumulative developments);
  - Future Baseline (2025) July 2022 DUB-1 permitted development Operational + Operational Year Baseline of Proposed Development (2025) + Cumulative Schemes (Do Something).

7.5 Baseline Characterisation Method

Desk Study

7.5.1 In order to establish the existing Transport and Accessibility conditions in the study area, relevant data was reviewed and assessed. The data sets and associated sources can be summarised as follows:

- The approved SD20A/0121 Traffic Impact Assessment[6];
- Google Maps; and
- Road Safety Authority (RSA)[7].

Field Study

7.5.2 Specific traffic surveys have not been undertaken for this Transport and Accessibility EIAR. For consistency, the traffic data used in the July 2022 DUB-1 permitted development EIAR has been considered. The traffic data contained within the submitted Grange Castle Business Park South, Baldonnel, Dublin 22 Traffic Impact Assessment (Ref SD20A/0121) enables this EIAR to proceed in accordance with the agreed EIAR scope of assessment.

7.5.3 A Manual Classified Turning Count was undertaken on Tuesday 17 December 2019 by Irish Traffic Surveys (ITS) between 07:00 and 19:00. The weekday peak hour background traffic flows have been found to occur at:

- AM peak (07:30 to 08:30); and
- PM peak (16:30 and 17:30).

7.5.4 The junctions where traffic surveys were carried out and are within the study area are the following:

- Junction 1: Adamstown Road (R120)/Nangor Road (R134);
- Junction 2: Nangor Road (R134)/Baldonnel Road (L2001);
- Junction 3: Nangor Road (R134)/Kilcarbery Park/Profile Park;
- Junction 4: Nangor Road (R134)/Grange Castle Business Park North/Grange Castle Gold Course; and
- Junction 5: Grange Castle Road (R136)/Nangor Road (R134).

7.6 Assessment Method

Methodology

7.6.1 In the case of the proposed development the sensitive receptors have been considered to be pedestrians and cyclists, road users and the local highway network. The study area includes links and junctions which provide the most direct access routes to the application site and are, therefore, most likely to be affected by traffic arriving and departing the site. Any links that do not meet defined selection criteria, have not been considered as part of the study area and have been excluded from further analysis in the assessment of significance of effect section.

Assessment Scenarios

Demolition and Construction Stage

7.6.2 The demolition and construction traffic assessment has been limited to the roads immediately adjacent to the application site and any roads further afield where the 30% increase in traffic threshold is breached. Potential demolition and construction traffic impacts from the proposed development have been assessed proportionately based upon the number of vehicle movements identified in the July 2022 DUB-1 permitted development (SD21A/0241) which was based on the previous approved SD20A/0121 application. The assessment focuses on the most intensive year in terms of the number of demolition and construction vehicle movements, which has been considered against the 2022 Baseline.

7.6.3 The demolition and construction stage will take place between 2024 to 2025. It has been assumed that the most intensive year in terms of vehicle movements would be 2024.

Operation Stage

7.6.4 The proposed development is anticipated to be completed and fully operational in 2025, when all occupants will be on-site. The assessment would consider the full quantum of development at this future year.

7.6.5 Estimated trip generation for the proposed development was provided for the assessment.

7.6.6 Trips were distributed onto the local highway network based upon the directional splits from the 2019 traffic survey data that was used in support of the SD20A/0121 application.

Pedestrian Severance, Delay, Amenity, Fear and Intimidation

7.6.7 Pedestrian severance, delay, amenity, fear and intimidation has been assessed by considering baseline traffic flows, future year traffic flows, as well as the potential impact of the proposed development in terms of change in traffic flows on each link within the study area. Consideration has been given to daily traffic flows (24-hour Annual Average Daily Traffic (AADT)) in respect of pedestrian severance, amenity, fear and intimidation for the demolition and construction stage and the operation stage.

[6] Proposed Data Centres, Grange Castle Business Park South, Baldonnel, Dublin 22 Traffic Impact Assessment, prepared by CS CONSULTING GROUP for UBC Properties, May 2020.

[7] https://www.rsa.ie/

Driver Delay

7.6.8 The assessment considers the duration of delays or benefits occurring to road users on the local highway network based upon the estimated increase in traffic resulting from the proposed development for the demolition and construction stage and the operation stage.

Accidents and Safety

7.6.9 The likely increase or decrease in the number of accidents resulting from the changes in traffic flows and composition for the demolition and construction stage and the operation stage has been considered. Personal Injury Accident (PIA) data can usually be obtained from the Road Safety Authority website however, the RSA is currently in the process of reviewing its road traffic collision (RTC) data sharing policies and procedures. Therefore, the latest accident data available for a five-year period is from 2011 to 2016.

Cumulative Stage

7.6.10 A review of cumulative schemes and their potential impacts on traffic flows on the local highway network has been undertaken. Predicted traffic flows generated by each of the following cumulative schemes have been considered:

- Microsoft – Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22 (SD20A/0283);
- UBC Properties - Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 (SD20A/0121);
- Cyrus One - Grange Castle Business Park, Clondalkin, Dublin 22 (SD18A/0134);
- Cyrus One Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 (SD20A/0295);
- Cyrus One - Grange Castle South Business Park, Baldonnel, Dublin 22 (309146);
- Centrica Business Solutions, Profile Park, Baldonnel, Dublin 22 (SD21A/0167);
- Equinix (Ireland) Ltd, Plot 100 Profile Park, Nangor Road, Clondalkin, Dublin 22 (SD21A/0186);
- UBC Properties -Grange Castle South Business Park, Dublin 22 (An Bord Pleanála Reference – 308585);
- Digital Reality Trust - Profile Park, Baldonnel, Dublin 22, D22 TY06 (SD17A/0377);
- Equinix (Ireland) Ltd – Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22 (SD22A/0156);
- Digital Netherlands VIII B.V - Profile Park, Nangor Road, Clondalkin, Dublin 22 (SD21A/0217); and

7.6.11 SID Application to provide the proposed development and July 22 DUB-1 Consented Development permanent electrical connection to the EIR grid (312793).All the aforementioned cumulative schemes are located in close proximity to the site.

7.6.12 The traffic data associated with the selected cumulative developments has been sourced from their respective Traffic Impact Assessment reports on the South Dublin County Council planning portal. Details of the construction or operational phases of the cumulative developments included in this assessment are identified in Table 7.18.

7.7 Assessment Criteria

7.7.1 The EPA and IEMA Guidelines were reviewed in order to identify appropriate significance criteria applicable to the assessment.

7.7.2 Paragraph 4.5 of the IEMA Guidelines states that: "For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible".

7.7.3 Under EPA guidelines quality effects are described as either:

- Positive – a change which improves the quality of the environment (such as reduction of traffic, travel time or patronage, or provision of a new service, access or facility);
- Neutral – no effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error; or
- Negative – a change which reduces the quality of the environment (such as increase of traffic, travel time, patronage or loss of service or facility).

Pedestrian Severance, Delay, Amenity, Fear and Intimidation

7.7.4 The significance of pedestrian severance, delay, amenity, fear and intimidation effects has been determined by considering future baseline traffic flows obtained from the traffic surveys, as well as the potential impact of the proposed development in terms of change in traffic flows on each link within the study area by reference to the IEMA Guidelines and applying professional judgment.

Pedestrian Severance

7.7.5 The IEMA Guidelines acknowledge that the measurement and prediction of severance is extremely difficult and that the correlation between the extent of severance and the physical barrier of a road is not clear. It notes that there are no predictive formulae which give simple relationships between traffic factors and levels of severance. However, the IEMA Guidelines do accept that in general, marginal changes in traffic flows are, by themselves, unlikely to create or remove severance.

7.7.6 Factors which need to be considered when determining severance comprise road width, traffic flows, speed of traffic, the presence of pedestrian crossing facilities and the number of pedestrian movements across the affected route.

7.7.7 The IEMA Guidelines suggest that:

- Changes in flow of up to 30% would produce slight changes in severance;
- Changes in flow of up to 60% would produce moderate changes in severance; and
- Changes in flow of up to 90% would produce substantial changes in severance.

7.7.8 It is recognised that these are guidelines only and are highly dependent on existing ambient traffic levels. They are not considered to be definitive measures of severance and should be used with care and regard paid to specific local conditions. The guidelines have been used to inform impact magnitude criteria for the assessment. Professional judgment has been applied to identify the likely scale of effects.

Pedestrian Delay

7.7.9 The IEMA Guidelines note that changes in the volume, composition and or speed of traffic may affect the ability of people to crossroads. Typically, increases in traffic levels result in increased pedestrian delay, although increased pedestrian activity itself also contributes. The IEMA Guidelines do not set any thresholds for absolute or actual changes in delay, recommending instead that assessors use their judgment to determine the significance of the impact.

7.7.10 The IEMA Guidelines refer to a report published by the Transport Research Laboratory (TRL) as providing a useful approximation for determining pedestrian delay. The TRL research[8] concludes that the mean pedestrian delay was found to be eight seconds at flows of 1,000 vehicles per hour, and below 20 seconds at 2,000 vehicles per hour for various types of crossing condition.

[8] Transport Research Laboratory, 1991. The Estimation of Pedestrian Numbers.

7.7.11 A two-way flow of 1,400 vehicles per hour has been adopted as a lower threshold for assessment (equating to a mean 10 second delay for a link with no pedestrian facilities) in the TRL report. Below this flow, pedestrian delay is unlikely to be a significant factor. This is deemed a robust starting point for narrowing down the modelled routes within the study area and ensuring the routes selected exceeded the suggested threshold of analysis in IEMA Guidelines. It should be noted that for controlled forms of pedestrian crossing the pedestrian delays are less.

7.7.12 As a result, any road with a two-way flow of less than 1,400 vehicles is deemed to have a negligible effect. Roads above this are assessed on the basis of professional judgment.

Pedestrian Amenity

7.7.13 IEMA Guidelines define pedestrian amenity as the relative pleasantness of a journey and may be influenced by fear and intimidation if they are relevant. As with pedestrian delay, pedestrian amenity is considered to be affected by traffic volumes and composition along with pavement width and pedestrian activity. The IEMA Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flows are halved or doubled.

7.7.14 The Guidelines have been used to inform impact magnitude criteria for the assessment. Professional judgment has been applied to identify the likely scale of effects.

Pedestrian Fear and Intimidation

7.7.15 A number of factors are considered relevant in determining changes in the level of fear and intimidation experienced by pedestrians and cyclists including volume of traffic; percentage of HGVs; speed of traffic; proximity to people; and the availability and quality of pedestrian infrastructure.

7.7.16 The IEMA Guidelines sets out the criteria in Table 7-2 for measuring the effects of fear and intimidation.

Table 7-2: Pedestrian Fear and Intimidation Criteria

Degree of Hazard	Average Traffic Flow over 18hr day (vehicles per hour)	Total 18-hour HGV Flow	Average Speed (mph)
Extreme	1,800+	3,000+	20+
Great	1,200–1,800	2,000–3,000	15-20
Moderate	600–1,200	1,000–2,000	10-15

7.7.17 The IEMA Guidelines stress the need for professional judgment when applying the above criteria. Accordingly, the guidelines have been used to inform impact magnitude criteria for the assessment. Professional judgment has been applied to identify the likely scale of effects.

Driver Delay

7.7.18 IEMA Guidelines note that driver delay can occur at several points on the network, although the effects are only likely to be significant when the traffic on the highway network is predicted to be at or close to the capacity of the system. Professional judgment has been applied to determine the significance of residual effects.

Accidents and Safety

7.7.19 There is no formal published guidance for the assessment of accidents and safety. Therefore, professional judgment has been applied to assess the implications of local circumstances and the proposed development's likely effect which may increase or decrease the risk of accidents.

Receptor Sensitivity/Value Criteria

Highway Network

7.7.20 The potential receptors are the users of transport networks within the relevant study area. The sensitivity of a road can be defined by the vulnerability of the user groups who are likely to use it, i.e. the elderly or children. A sensitive area may be where pedestrian activity is high, near a school, or an accident black spot. it also takes into account the existing nature of the road, i.e. an existing residential area is likely to be more sensitive than an A road.

7.7.21 Professional judgement has been used to define the value of receptors in accordance with LA 104[9] Section 3.1.

7.7.22 The sensitivity of receptors has been classified as low, medium or high, in accordance with the criteria set out in Table 7-3.

Table 7-3: Receptor Sensitivity Criteria

Sensitivity	Criteria
High	Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, accident clusters, retirement homes, roads without footways that are used by pedestrians.
Medium	Receptors of moderate sensitivity to traffic flow: congested junctions, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, recreation facilities.
Low	Receptors with some sensitivity to traffic flow: places of worship, public open space, tourist attractions and residential areas with adequate footway provision.
Very Low	Receptors with very low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions.

Impact Magnitude Criteria

7.7.23 The magnitude of impact has been classified as low, medium, or high, in accordance with the criteria set out in Table 7-4.

Table 7-4: Impact Magnitude Criteria

Impact	Assessment Criteria			
	Low	Medium	High	Very High
Severance	Increase in total traffic flows of 30% or under	Increase in total traffic flows of 30%–60%	Increase in total traffic flows of 60% - 90%	Increase in total traffic flows of 90% and above
Pedestrian Severance, Delay, Amenity, Fear and Intimidation	This has been assessed on a case by case basis using professional judgement subject to the sensitivity and vulnerability of the receptor. Threshold for judging the significance of changes to pedestrian amenity where the traffic flows is halved or doubled.			
Driver Delay	This has been assessed on a case by case basis using professional judgement subject to the sensitivity and vulnerability of the receptor. Impacts are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system.			
Accidents and Safety	Accident data for the local area have been reviewed and professional judgement have been applied to assess the implications of potential increase/decrease in traffic.			

[9] LA 104 Environmental Assessment and Monitoring, Rev 01, DMRB, July 2019.

Scale of Effect Criteria

7.7.24 Impacts have been assessed on the basis of the value/sensitivity of receptors against the magnitude of impact to determine the scale of effect as presented in Table 7-5. The matrix has been informed by the EPA Guidelines.

Table 7-5: Scale of Effect Criteria

Magnitude	Sensitivity of Receptors			
	Very Low	Low	Medium	High
Low	Imperceptible	Not Significant	Slight	Slight
Medium	Not Significant	Slight	Slight	Moderate-Significant
High	Slight	Slight	Moderate-Significant	Very Significant
Very High	Slight	Moderate-Significant	Very Significant	Profound

7.7.25 Based on Environmental Protection Agency's (EPA) Guidelines on the information to be contained in Environment Impact Assessment Reports (2022), as described in Chapter 2: EIA Process and Methodology, effects ranging from 'moderate' to 'profound' are considered 'significant' in terms of EIA

7.7.26 Where the existing baseline HGV or total traffic flows are very minor, a small increase in vehicles would produce a large change in magnitude whereas in real terms the increase in traffic may still be considered to be negligible or slight. In these instances, appropriate professional and experienced judgements have been made.

Nature of Effect Criteria

7.7.27 The nature of the effect has been described as either negative, neutral, or positive as outlined in Chapter 2: EIA Process and Methodology.

7.8 Assumptions and Limitations

7.8.1 The assessment has relied on 2019 traffic survey data extracted from the approved SD20A/0121 Traffic Impact Assessment. It has been assumed that these data sets have been reported correctly.

7.8.2 It has been assumed that the AM and PM peak from each cumulative scheme will occur at the same peak periods with the 2019 traffic survey data.

7.8.3 Unit 5.5 of the TII Project Appraisal Guidelines[10] (Link-Based Traffic Growth Forecasting) has been used to apply growth factors to 2019 traffic data to generate the future baseline.

7.9 Baseline Conditions

Existing Baseline

7.9.1 The following paragraphs provide an overview of the current baseline transport and accessibility conditions within the study area considering pedestrian and cycle facilities and access; public transport accessibility; and the operation of the existing highway network. Consideration is also given to the existing baseline flows where available. This analysis provides the baseline context against which the transport movements and accessibility of the proposed development have been assessed.

Local Highway Network

7.9.2 The site is accessed off Falcon Avenue which is a street-lit dual carriageway providing access to the businesses within Profile Park and forms a junction with the R134 New Nangor Road and Grange Castle Business Park. Falcon Avenue is subject to a 50km/hr speed limit.

7.9.3 The site is located adjacent to the R134 New Nangor Road which is a street-lit single carriageway road and is subject to a 40km/h speed limit. The R134 connects the R120 to the west and R136 to the east.

7.9.4 The R136 is a street-lit dual carriageway road subject to an 80km/h speed limit. The R136 connects the N4 to the north with the N7 to the south. The R136 accommodates two lanes for general traffic and a bus lane in each direction, a shared foot/ cycle path of approximately 3m are present on both sides of the highway.

7.9.5 Traffic data from various sources including traffic surveys commissioned in December 2019 has been used to inform the assessment and to provide baseline traffic flows. Table 7-7 presents the baseline traffic figures 2022 AADT, % HGV and link speed limits.

Table 7-7: 2022 Baseline Traffic Data

Location	Direction	Speed Limit (kph)	2022 Baseline	
			AADT	%HGV
R120 Adamstown Road (N)	SB	80	5,082	5%
	NB	80	4,386	11%
R134 New Nangor Road (E)	EB	40	6,496	8%
	WB	40	5,339	9%
R120 Adamstown Road (S)	SB	80	4,109	6%
	NB	80	4,569	4%
R134 New Nangor Road (E)	EB	40	5,758	8%
	WB	40	5,317	9%
Baldonnel Road (S)	SB	60	3,503	10%
	NB	60	3,031	9%
R134 New Nangor Road (W)	EB	40	6,100	8%
	WB	40	5,186	10%
Kilcarbery Park (N)	SB	40	1,218	19%
	NB	40	1,172	26%
R134 New Nangor Road (E)	EB	40	7,002	9%
	WB	40	6,549	11%
Falcon Avenue	SB	50	278	20%
	NB	50	250	14%
R134 New Nangor Road (W)	EB	40	6,033	8%
	WB	40	5,599	9%
Grange Caste Business Park (N)	SB	40	2,671	11%
	NB	40	2,652	11%
R134 New Nangor Road (E)	EB	40	7,861	11%
	WB	40	7,617	12%
Grange Caste Business Park (S)	SB	40	126	0%
	NB	40	121	0%
R134 New Nangor Road (W)	EB	40	7,077	10%
	WB	40	6,847	11%
R136 Grange Caste Road (N)	SB	80	8,366	4%

[10] https://www.tii.ie/tii-library/strategic-planning/project-appraisal-guidelines/Unit-5.5-Link-Based-Traffic-Forecasting.pdf

Table 7-7: 2022 Baseline Traffic Data				
Location	**Direction**	**Speed Limit (kph)**	**2022 Baseline**	
			AADT	**%HGV**
R134 New Nangor Road (E)	NB	80	9,058	4%
	EB	40	7,749	7%
	WB	40	6,698	7%
R136 Grange Caste Road (S)	SB	80	13,223	7%
	NB	80	14,391	6%
R134 New Nangor Road (W)	EB	40	7,899	11%
	WB	40	7,363	11%

Public Transport

Bus Services

7.9.6 The nearest bus stops are located in both directions on the R134 Nangor Road, within 600 m of the site, from which frequent routes operate between the site and Dublin city centre. The bus stops are served by three bus services, which are presented in Table 7-8.

Table 7-.8: Bus Services				
Service/ Bus Stop	**Bus Route**	**Frequency (minutes)**		
		Monday	**Saturday**	**Sunday**
13	Grange Castle - Harristown	EB: 15mins (05:50-23:30) WB: 15mins (05:30-23:30)	EB: 15mins (06:10-23:30) WB: 15mins (06:10-23:30)	EB: 15mins (07:00-23:30) WB: 15mins (07:00-23:30)
68	Hawkins Street to Newcastle/Green-ogue Business Park	EB: 60mins (06:00-00:15) WB: approxi-mately 60mins (06:00-00:15)	EB: 60mins (06:35-00:15) WB: approxi-mately 60mins (06:40-23:30)	EB: 75mins (10:15-00:25) WB: 75mins (09:00-23:30)
68X	Newcastle/Green-ogue Business Park to Hawkins Street	One service at 07:30	N/A	N/A

National Rail

7.9.7 Clondalkin/Fonthill railway station is located at approximately 3km to the northeast of the site from which frequent commuter services operate to/from Dublin city.

7.9.8 Citywest Campus Luas Tram Stop is approximately 4km to the southeast of the site from which frequent tram services to Dublin city and beyond can be accessed.

Walking and Cycling Network

Pedestrians and Cyclists

7.9.9 The pedestrian and cycle environment in the site vicinity is of a high standard, with wide, well-lit lengths of dedicated and segregated off-road cycle and pedestrian routes.

7.9.10 Pedestrian and cyclist access to the proposed development will be via Falcon Avenue where footpaths of approximately 3m are provided on both sides of the road.

7.9.11 Falcon Avenue intersects with the R134 New Nangor Road at a four-arm roundabout. Pedestrian crossing facilities with dropped kerbs and tactile paving are provided an all arms of the roundabout, except the northern arm (Kilcabery Park).

7.9.12 A shared use footway/cycleway of approximately 5 m is provided on the northern side of the R134 New Nangor Road, whilst shared foot/cycle paths of approximately 3 m are present on both sides of the R136.

7.9.13 Signal-controlled toucan crossings with dropped kerbs and tactile paving are provided on all arms of the R134 New Nangor Road/R136.

Accident Data

7.9.14 A summary of reported accidents between 2012 to 2016, within the locality of the application site is presented in Table 7-9.

Table 7.9: 2012 to 2016 Accident Data				
Year	**Severity**			
	Slight	Serious	Fatal	Total Accidents
2012	1	0	0	1
2013	1	0	0	0
2014	2	0	1	3
2015	6	0	0	6
2016	4	0	0	4

7.9.15 One fatal accident occurred at the R134 New Nangor Road/R136 junction in 2014, with the remaining accidents within the study area reported as slight.

7.9.16 Most of the accidents occurred at the R134 New Nangor Road/R136 junction, with three slight accidents reported at the Falcon Avenue/R134 New Nangor Road junction.

Future Baseline

7.9.17 The proposed development is an extension to the July 2022 DUB-1 permitted development and is the final phase of the wider campus and, would be operated as part of that wider co-ordinated data center campus. As such the future baseline flows consider the flows associated with the July 2022 DUB-1 permitted development as described below.

7.9.18 The assessment has considered future years of 2024 (peak demolition and construction stage) and 2025 (fully operational year). Future baselines include the flows from cumulative developments under construction or operation in the respective future year (does not include DUB1 or DUB13 flows). The Do Nothing demolition and construction scenario assumes the July 2022 DUB 1 consented development will be two thirds operational in 2024. This scenario includes the Future Baseline (2024) flows, two thirds of the July 2022 DUB 1 consented development operational flow, an additional 54 HGVs a day for the operation of the MFGP using HVO as the fuel source and the construction flows associated with the July 2022 DUB 1 consented development The Do Something demolition and construction scenario includes the traffic flows described above plus the peak demolition and construction flows of the proposed development.

7.9.19 The Do Nothing operational scenario includes the Future Baseline (2025) flows and operational flows from the July 2022 DUB-1 permitted development in 2025. The Do Something operational scenario includes the traffic flows described above plus the operational flows of the proposed development.

7.9.20 The data center will be accessed from two main entrances which would be from Falcon Avenue. One access/egress point would be from Falcon Avenue on the eastern border, for staff, pedestrians, and

cyclists. HGVs, maintenance vehicles and delivery vehicles would access the site via the roundabout on Falcon Avenue, through the July 2022 DUB-1 permitted development.

7.9.21 The data center will be served by 60 car parking spaces that will be located generally to the east of the data center, of which 3 no. spaces will be disabled spaces and 6 of these spaces will be provided for electrical charging vehicles. Covered bicycle parking provision will be provided within the site. The data centre will be enclosed by landscape berms and planting to the north and north-east.

Local Highway Network

7.9.22 The 2024 and 2025 Baseline 'Do Nothing' traffic flows for the highway network are shown in Table 7-11.

7.9.23 Unit 5.5 of the TII Project Appraisal Guidelines (Link-Based Traffic Growth Forecasting) has been used to apply growth factors to 2019 traffic data to generate the future baseline. The factors applied are:

Table 7-10: Growth Factor

Years	Growth Factor
2019-2022	1.015
2019-2024	1.025
2019-2025	1.030

Table 7-.11: 2024 and 2025 Baseline ('Do Nothing') Traffic Data

Location	Direction	2024 Baseline AADT	2025 Baseline AADT
R120 Adamstown Road (N)	SB	5,279	5,288
	NB	4,548	4,570
R134 New Nangor Road (E)	EB	6,883	6,880
	WB	5,605	5,632
R120 Adamstown Road (S)	SB	4,244	4,265
	NB	4,792	4,795
R134 New Nangor Road (E)	EB	6,141	6,134
	WB	5,606	5,633
Baldonnel Road (S)	SB	3,886	3,904
	NB	3,394	3,409
R134 New Nangor Road (W)	EB	6,483	6,478
	WB	5,451	5,477
Kilcarbery Park (N)	SB	1,230	1,237
	NB	1,184	1,190
R134 New Nangor Road (E)	EB	7,791	7,526
	WB	7,244	7,012
Falcon Avenue	SB	756	457
	NB	727	428

Table 7-.11: 2024 and 2025 Baseline ('Do Nothing') Traffic Data

Location	Direction	2024 Baseline AADT	2025 Baseline AADT
R134 New Nangor Road (W)	EB	6,419	6,413
	WB	5,891	5,920
Grange Caste Business Park (N)	SB	2,698	2,711
	NB	2,678	2,692
R134 New Nangor Road (E)	EB	8,659	8,398
	WB	8,323	8,097
Grange Caste Business Park (S)	SB	127	128
	NB	122	123
R134 New Nangor Road (W)	EB	7,867	7,602
	WB	7,545	7,315
R136 Grange Caste Road (N)	SB	8,484	8,517
	NB	9,222	9,242
R134 New Nangor Road (E)	EB	7,963	7,959
	WB	6,895	6,890
R136 Grange Caste Road (S)	SB	13,865	13,699
	NB	15,000	14,856
R134 New Nangor Road (W)	EB	8,697	8,437
	WB	8,066	7,838

Public Transport

7.9.24 No public transport improvements within the study area have been identified which are proposed to be implemented by 2025. Therefore, it has been assumed that the future public transport baseline in 2024 and 2025 would be the same as the existing public transport baseline.

Walking and Cycling

7.9.25 No improvements to the walking and cycling facilities within the study area are proposed to be implemented by 2025.

7.9.26 Pedestrians and cyclists will access the site via Falcon Avenue in 2024 and 2025, with pedestrian and cycle routes aligned with existing routes around the site in 2025.

Sensitive Receptors

7.9.27 The receptors identified as sensitive to the proposed development, and which have been 'scoped-in' to the assessment are summarised in Table 7-12.

Table 7-12 Summary of Sensitive Receptors

Receptor	Sensitivity
Pedestrians and cyclists	High
Local highway network	Low

Table 7-12 Summary of Sensitive Receptors	
Receptor	**Sensitivity**
Road users	Medium

7.10 Assessment of Effects

7.10.1 The following section describes the potential transport and accessibility impacts and effects which could arise as a result if the proposed development during the demolition and construction stage and the operation stage.

Demolition and Construction Effects

7.10.2 It has been assumed that the demolition and construction traffic for the proposed development will be proportional (approximately 35%) to the construction traffic used for the July 2022 DUB-1 permitted development.

Local Highway Network

7.10.3 It has been assumed that the peak demolition and construction period would be in 2024 when there would be a maximum of 156 demolition and construction vehicle movements per day, as identified in Table 7-13.

Table 7-13: Maximum Daily Demolition and Construction Stage Trip Generation						
	Arrivals		**Departures**		**Total**	
Total Vehicles	**Car**	**HGV**	**Car**	**HGV**	**Arrivals**	**Departures**
Daily	56	22	56	22	78	78

7.10.4 Light and heavy vehicle construction traffic has been distributed across the surrounding network in the same manner as in the previous approved SD20A/0121 application. Light construction traffic has been distributed based upon the 2019 traffic surveys, whilst heavy construction traffic is anticipated to travel to the site from the N7 national road and from the M50 motorway orbital motorway, via the R136 and R134 regional roads, and depart along the same routes.

7.10.5 Table 7-14 identifies that there are no two-way highway links which would have an increase over 30% in demolition and construction vehicle movements.

Table 7-14: % Increase between Do Nothing and Do Something				
Location	**Direction**	**2024 Do Nothing**	**2024 Do Something**	**% Increase**
		AADT	**AADT**	
R120 Adamstown Road (N)	SB	5,279	5,283	0
	NB	4,548	4,548	0
R134 New Nangor Road (E)	EB	6,883	6,892	0
	WB	5,605	5,605	0
R120 Adamstown Road (S)	SB	4,244	4,244	0
	NB	4,792	4,797	0
R134 New Nangor Road (E)	EB	6,141	6,150	0
	WB	5,606	5,606	0

Table 7-14: % Increase between Do Nothing and Do Something				
Location	**Direction**	**2024 Do Nothing**	**2024 Do Something**	**% Increase**
		AADT	**AADT**	
Baldonnel Road (S)	SB	3,886	3,886	0
	NB	3,394	3,394	0
R134 New Nangor Road (W)	EB	6,483	6,492	0
	WB	5,451	5,451	0
Kilcarbery Park (N)	SB	1,230	1,230	0
	NB	1,184	1,184	0
R134 New Nangor Road (E)	EB	7,791	7,858	1
	WB	7,244	7,302	1
Falcon Avenue	SB	756	823	9
	NB	727	795	9
R134 New Nangor Road (W)	EB	6,419	6,428	0
	WB	5,891	5,891	0
Grange Caste Business Park (N)	SB	2,698	2,698	0
	NB	2,678	2,678	0
R134 New Nangor Road (E)	EB	8,659	8,726	1
	WB	8,323	8,381	1
Grange Caste Business Park (S)	SB	127	127	0
	NB	122	122	0
R134 New Nangor Road (W)	EB	7,867	7,934	1
	WB	7,545	7,603	1
R136 Grange Caste Road (N)	SB	8,484	8,487	0
	NB	9,222	9,230	0
R134 New Nangor Road (E)	EB	7,963	7,975	0
	WB	6,895	6,907	0
R136 Grange Caste Road (S)	SB	13,865	13,912	0
	NB	15,000	15,043	0
R134 New Nangor Road (W)	EB	8,697	8,765	1
	WB	8,066	8,124	1

Pedestrian Severance, Delay, Amenity, Fear and Intimidation

7.10.6 The demolition and construction stage would generate movements by HGVs and construction workers. It has been considered that these would have a temporary impact on the local road network. In addition, an outline Construction Environmental Management Plan (CEMP) has been prepared and includes the requirement for construction traffic including both construction plant and materials

deliveries to be programmed to avoid peak traffic periods on the surrounding local and strategic road network.

7.10.7 Due to the length of the proposed demolition and construction stage, any demolition and construction impacts are considered temporary in accordance with EPA Guidance. However, demolition and construction vehicle movements would fluctuate throughout the duration of the demolition and construction stage. Signs and temporary barriers would be used to inform the public of any changes to walking, cycling or highway routes during the demolition and construction stage.

7.10.8 Pedestrians are sensitive to traffic flows and considered to have a high receptor sensitivity.

7.10.9 Table 7-14 identifies all the two-way highway links are within the 30% threshold in demolition and construction vehicle movements. Therefore, it is considered that overall, the impact magnitude is low and the overall effect would therefore be **Temporary Slight, Negative** and **Not Significant** in terms of EIA.

Driver Delay

7.10.10 It is anticipated that there may be some delay to road users at times due to demolition and construction vehicles entering/exiting the application site. However, the CEMP commits to ensuring deliveries are co-ordinated to ensure vehicles would not be waiting on the local highway, and that wherever feasible deliveries would be undertaken outside peak hours.

7.10.11 Due to the length of the proposed demolition and construction stage any demolition and construction impacts are considered temporary. However, demolition and construction vehicle movements would fluctuate throughout the duration of the demolition and construction stage.

7.10.12 Road users are considered to have a medium sensitivity to traffic flow.

7.10.13 The impact magnitude would be low due to the potential scale of increase in HGV and private vehicle demolition and construction traffic movements. In addition, the CEMP considers how to manage and implement the volume of demolition and construction traffic and proposed safety measures. The effect would therefore be **Temporary, Slight, Negative** and **Not Significant** in terms of EIA.

Accidents and Safety

7.10.14 Impacts from the demolition and construction stage of the proposed development would be temporary.

7.10.15 The accident analysis does not indicate a prevailing road safety issue which could be made worse by the demolition and construction works.

7.10.16 Road users, pedestrians and cyclists are all recognised as receptors to accidents and safety, pedestrians and cyclists are considered to have a high sensitivity.

7.10.17 The impact magnitude is considered to be low due to the traffic flows associated with the demolition and construction works. The effect on accidents and safety would therefore be **Temporary Slight, Negative** and **Not Significant** in terms of EIA.

Operation Effects

7.10.18 The proposed development access hierarchy gives precedence to walking, cycling and public transport over private vehicles. The proposed development is focussed on people, including considered provision for people to be able to travel actively, sustainably and safety.

7.10.19 It has been assumed that the proposed development will be fully operational in 2025.

Proposed Development Trip Generation

7.10.20 The total vehicle trip generation for the proposed development is presented in Table 7-15.

Table 7-15: Proposed Development Trip Generation - Operation Stage

Total Vehicles	Arrivals		Departures		Total	
	Car	Deliveries*	Car	Deliveries*	Car	Deliveries
Daily	29	2	29	2	59	4

7.10.21 The total daily trip generation profile for the proposed development during the operation stage can be found in Appendix 7-4. Local Highway Network

7.10.22 All vehicular traffic will access the site via the four-arm roundabout on Falcon Avenue which leads to a roundabout on the R134 New Nangor Road.

7.10.23 Table 7-16 presents the baseline traffic figures 2025 Do Nothing and Do Something Annual Average Daily Traffic flow (AADT). The table also identifies the% change between the Do Nothing and the Do Something. The future baseline includes the July 2022 DUB-1 permitted development and background growth (including cumulative schemes).

7.10.24 In accordance with the IEMA Guidelines, the assessment is focused on links where a potential increase in traffic of greater than 30% has been identified. Table 7-16 identifies that the only % change is on Falcon Avenue with an increase of 6% and 7% (SB and NB respectively), well below the 30% threshold. The distribution of this traffic across the rest of the highway network is considered minimal.

Table 7-16: % Increase between 2025 Do Nothing and Do Something

Location	Direction	2025 Do Nothing	2025 Do Something	% Increase
		AADT	AADT	
R120 Adamstown Road (N)	SB	5,288	5,290	0
	NB	4,570	4,570	0
R134 New Nangor Road (E)	EB	6,880	6,884	0
	WB	5,632	5,632	0
R120 Adamstown Road (S)	SB	4,265	4,265	0
	NB	4,795	4,797	0
R134 New Nangor Road (E)	EB	6,134	6,139	0
	WB	5,633	5,633	0
Baldonnel Road (S)	SB	3,904	3,904	0
	NB	3,409	3,409	0
R134 New Nangor Road (W)	EB	6,478	6,482	0
	WB	5,477	5,477	0
Kilcarbery Park (N)	SB	1,237	1,237	0
	NB	1,190	1,190	0
R134 New Nangor Road (E)	EB	7,526	7,555	0
	WB	7,012	7,037	0
Falcon Avenue	SB	457	486	6
	NB	428	457	7
R134 New Nangor Road (W)	EB	6,413	6,418	0
	WB	5,920	5,920	0
Grange Caste Business Park (N)	SB	2,711	2,711	0

Table 7-16: % Increase between 2025 Do Nothing and Do Something

Location	Direction	2025 Do Nothing	2025 Do Something	% Increase
		AADT	AADT	
	NB	2,692	2,692	0
R134 New Nangor Road (E)	EB	8,398	8,427	0
	WB	8,097	8,121	0
Grange Caste Business Park (S)	SB	128	128	0
	NB	123	123	0
R134 New Nangor Road (W)	EB	7,602	7,631	0
	WB	7,315	7,340	0
R136 Grange Caste Road (N)	SB	8,517	8,519	0
	NB	9,242	9,246	0
R134 New Nangor Road (E)	EB	7,959	7,968	0
	WB	6,890	6,899	0
R136 Grange Caste Road (S)	SB	13,699	13,716	0
	NB	14,856	14,870	0
R134 New Nangor Road (W)	EB	8,437	8,466	0
	WB	7,838	7,863	0

Pedestrian Severance, Delay, Amenity, Fear and Intimidation

7.10.25 Pedestrians would access the site from one access/egress point from Falcon Avenue to the east, which leads to a roundabout on the R134 New Nangor Road.

7.10.26 Impacts from the operation of the proposed development would be long term to permanent whilst the site remains operational although would be reversible should the site cease operation.

7.10.27 Pedestrians are considered to have a high sensitivity to changes in traffic flows

7.10.28 No increase of traffic over 30% is anticipated as a result of the proposed development with no increase in severance or fear and intimidation anticipated. Pedestrians can be safely accommodated by footpaths of approximately 3m provided on both sides of Falcon Avenue, whilst they can cross the road via the informal pedestrian crossing with dropped kerbs and tactile paving on the approach to the R134 New Nangor Road/Flacon Avenue roundabout. Further, the speed limit of 50 Kph and the pedestrian routes of high standards on both sides of the road, it is considered that over all the highway network assessed, the impact magnitude is low.

7.10.29 The overall effect would therefore be **Long Term to Permanent, Slight, Negative** and **Not Significant** in terms of EIA.

Driver Delay

7.10.30 Impacts from the operation of the proposed development are considered to be long term to permanent whilst the site remains operational although would be reversible should the site cease operation.

7.10.31 Road users are considered to have a medium sensitivity to changes in traffic flows.

7.10.32 The impact magnitude would be low due to the anticipated small increase in peak hour traffic resulting from the proposed development. The effect on driver delay would therefore be **Long Term to Permanent, Slight, Negative** and **Not Significant** in terms of EIA.

Accidents and Safety

7.10.33 The proposed development would be designed in accordance with appropriate design standards.

7.10.34 Impacts from the operation of the proposed development would be long term to permanent whilst the site remains operational although would be reversible should the site cease operation.

7.10.35 The accident analysis does not indicate a prevailing road safety issue which could be made worse by the new development site.

7.10.36 Road users, pedestrians and cyclists are all recognised as receptors to accidents and safety, pedestrians and cyclists are considered to have a high sensitivity.

7.10.37 The impact magnitude is considered to be low due to the low traffic flows associated with the proposed development, the high standard of design of the proposed development and commitment to safety and reducing danger and fear associated with traffic. The effect on accidents and safety would therefore be **Long Term to Permanent, Slight, Negative** and **Not Significant** in terms of EIA.

7.11 Additional Mitigation

Demolition and Construction Stage

7.11.1 No additional mitigation measures beyond the CEMP and measures already described in the 'Potential Impacts and Likely Effects' would be required for the demolition and construction stage.

Operation Stage

7.11.2 No additional mitigation measures beyond the measures already described in the 'Assessment of Effects' would be required for the operation stage.

7.12 Enhancement Measures

7.12.1 No additional enhancement measures beyond the measures already described in the 'Assessment of Effects' would be required for the demolition and construction stage.

7.13 Assessment of Residual Effects

Demolition and Construction Residual Effects

7.13.1 No additional mitigation would be required; therefore, the residual demolition and construction effects remain as reported in the assessment of effects section:

- **Temporary, Slight, Negative** and **Not Significant** in terms of EIA for Pedestrian Severance, Delay, Amenity, Fear and Intimidation;
- **Temporary, Slight, Negative** and **Not Significant** in terms of EIA for Driver Delay; and
- **Temporary, Slight, Negative** and **Not Significant** in terms of EIA for Accidents and Safety.

Operation Residual Effects

7.13.2 No additional mitigation would be required; therefore, the residual operation effects remain as reported in the assessment of effects section:

- **Long Term to Permanent, Slight, Negative** and **Not Significant** in terms of EIA for Pedestrian Severance, Delay, Amenity, Fear and Intimidation;

- Long Term to Permanent, Slight, Negative and Not Significant in terms of EIA for Driver Delay; and
- Long Term to Permanent, Slight, Negative and Not Significant in terms of EIA for Accidents and Safety.

Summary of Residual Effects

7.13.3 Table 7-17 provides a summary of the outcomes of the Transport and Accessibility assessment of the proposed development. Where **significant positive** effects are likely these are highlighted in bold green and where **significant negative** effects are predicted these are highlighted in bold red.

Table 7-17 Summary of Residual Effects

Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
				+ -	L U	R IR	D ID	M B T St Mt Lt P**
Demolition and Construction Stage								
Pedestrians	Change in Pedestrian Severance, Delay, Amenity, Fear and Intimidation	None	Slight	-	L	R	D	T
Road users	Change in Driver Delay	None	Slight	-	L	R	D	T
Road users, pedestrians and cyclists	Change in Accidents and Safety	None	Slight	-	L	R	D	T
Operation Stage								
Pedestrians	Change in Pedestrian Severance, Delay, Amenity, Fear and Intimidation	None	Slight	-	L	R	D	Lt to P
Road users	Change in Driver Delay	None	Slight	-	L	R	D	Lt to P
Road users, pedestrians and cyclists	Change in Accidents and Safety	None	Slight	-	L	R	D	Lt to P

Notes:

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

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

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

7.14 Cumulative Effects

Intra-Project Effects

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

Inter-Project Effects

Table 7-18 provides a summary of the likely inter-project cumulative effects resulting from the proposed development and the cumulative developments.

Table 7-18: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Microsoft – Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22 (SD20A/0283)	No	Construction phase would be complete prior to scheme demolition and construction works in 2024	Yes	**Operation stage** (assumed 2024) would overlap with the **construction opening** year of the proposed development (2024). Considered to be in close proximity to the application site.
UBC Properties – Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 (SD20A/0121)	Yes	Although peak construction is 2021. The **construction phase** would still overlap with the **construction and operation stage** of the proposed development. [peak construction flows have been assessed to consider worst case scenario]	No	Development will not be operational by the fully operational year of the proposed development, therefore no effects considered likely. Opening year of the cumulative scheme is 2028.
UBC Properties – Grange Castle South Business Park, Dublin 22 (VA06S.308585)	No	Opening year of this cumulative development is anticipated to be 2021, therefore demolition and construction stage will not overlap with the opening year of the proposed development, therefore no effects considered likely.	No	The Grange Castle South Business Park EIAR describes a very low trip generation which professional judgement indicates would result in imperceptible associated traffic expected on each link within the study area. The proposed Clutterland substation does not require any full-time staff to operate it on a daily basis.
Digital Reality Trust – Profile Park, Baldonnel, Dublin 22, D22 TY06 (SD17A/0377)	No	The cumulative development has already been constructed.	No	It was not possible to locate all supporting transport documents but those available indicate that the proposed amendments under this application SD17A/0377 will not generate additional traffic to the previously permitted SD12A/0002.
Cyrus One – Grange Castle Business Park,	No	The cumulative development has	Yes	The opening year is 2020. Therefore, the **operation phase** will overlap with the **construction and**

Table 7-18: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Clondalkin, Dublin 22 (SD18A/0134)		already been constructed.		**operation stage** of the proposed development.
Cyrus One Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 (SD20A/0295)	No	According to the reports the construction works should be complete. Number of trips anticipated to be generated are very low (approximately 25HGVs between January 2021 and June 2021).	No	It was not possible to locate all supporting transport documents but those available indicate that the proposed amendments under this cumulative scheme will not generate additional traffic to the previously permitted SD18A/0134.
Cyrus One – Grange Castle South Business Park, Baldonnel, Dublin 22 (VA06S.309146)	No	Construction phase completed by 2023	Yes	**Operation stage** would overlap with the **construction and operation stage** of the proposed development.
Centrica Business Solutions – Profile Park, Baldonnel, Dublin 22 (SD21A/0167)	Yes	**Construction Period** 2023-2025 would overlap with the **construction stage** and **operation stage** of the proposed development	No	The operation stage will generate very low trip generation which is expected to result in imperceptible associated traffic impact on each road link within the study area.
Equinix (Ireland) Ltd – Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22 (SD21A/0186)	Yes	Two-year construction period (not defined 2023-2025). Assumed that the **construction stage** will overlap with the **construction stage** of the proposed development.	Yes	The opening year is 2025 therefore **operation stage** would overlap with the **operation stage** of the proposed development.
SID Application to provide the proposed site (and VDC DUB 1) permanent electrical connection to the EIR grid	Yes	Assumed construction phase would be complete by 2025. Assumed that the **construction stage** will overlap with the **construction stage**	No	The operation stage will generate very low trip generation which is expected to result in imperceptible associated traffic impact on each road link within the study area.

Table 7-18: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
		of the proposed development.		
Equinix (Ireland) Ltd - Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22 (SD22A/0156)	No	Modifications to the permitted data centre granted under SDCC Reg. Ref. SD21A/0186	No	modifications to the permitted data centre granted under SDCC Reg. Ref. SD21A/0186
Digital Netherlands VIII B.V - Profile Park, Nangor Road, Clondalkin, Dublin 22 (SD21A/0217)	No	Assumed construction completed by 2024.	No	TA states "The increase in traffic on the network is less than 5% of the background traffic at the roundabout junction of Profile Park Road and the R134. The assessment, based upon a robust set of assumptions, indicates that the traffic associated with the proposed development during both construction and operational stages, will be reflected in a non-significant increase to the existing peak time traffic volumes in the area."

Demolition and Construction Cumulative Effects

7.14.1 The assessment undertaken includes all the cumulative schemes that overlap with the demolition and construction stage of the proposed development, as identified in Table 7-18.

7.14.2 In relation to each of the cumulative schemes the operation stage of Microsoft (SD20A/0283), Cyrus One (SD18A/0134), Cyrus One (VA06S.309146) and the construction stage of UBC Properties (SD20A/0121), Centrica Business Solutions (SD21A/0167), Equinix (SD21A/0186) and SID Application would overlap with the demolition and construction stage of the proposed development. Cumulative assessment has been carried out by identifying the programmed dates of the cumulative schemes.

7.14.3 Trip generation and distribution for the demolition and construction stage has been extracted from the supporting Traffic Impact Assessments.

7.14.4 The appointed demolition and construction contractor(s) and Applicant would consult neighbouring schemes on the programme and local effects of the demolition and construction works, such as pedestrian routes, for example. In addition, collaboration around the scheduling of vehicle movements would be undertaken so that if works coincide with other demolition and construction activity already taking place within the immediate vicinity of the application site, the cumulative effect of dismantling and construction traffic can be minimised and would **not be significant in terms of EIA**.

Operation Cumulative Effects

7.14.5 The assessment undertaken includes all the cumulative schemes that overlap with the operation stage of the proposed development and may generate additional traffic on the local highway network

7.14.6 The demolition and construction phase of UBC Properties (SD20A/0121), Centrica Business Solutions (SD21A/0167) and the operation stage of Cyrus One, Grange Castle Business Park (SD18A/0134),

Cyrus One Grange Castle South Business Park (VA06S.309146) and Equinix (Ireland) Ltd (SD21A/0186) cumulative schemes would overlap with the operation stage of the proposed development. Cumulative assessment has been carried out by identifying the programme dates of the cumulative schemes.

7.14.7 Trip generation and distribution for the operation stage has been extracted from the supporting Environmental and Traffic Impact Assessments.

7.14.8 Daily trip generation and distribution diagrams for the cumulative schemes and the proposed development can be found in Technical Appendix 7-3 and 7-4.

7.14.9 The traffic flows from these developments have been included within the assessment and are therefore **not considered to be significant in terms of EIA.**

7.15 Summary of Assessment

Background

7.15.1 This chapter has detailed the potential Transport and Accessibility effects due to the demolition and construction stage and the operation stage of the proposed development. The assessment of the demolition and construction stage and the operation stage have been undertaken taking into account the relevant national and local guidance and regulations.

7.15.2 The pedestrian and cycle environment in the site vicinity is of a high standard, with wide, well-lit lengths of dedicated and segregated off-road cycle and pedestrian routes. This would allow for future employees of the application site to walk, cycle or use public transport and complete their journeys by alternatives to the private vehicle.

Demolition and Construction Effects

7.15.3 It has been assumed that the demolition and construction traffic for the proposed development of 12,893sqm will be proportional (≈33%) to the construction traffic used for the site in the approved SD20A/0121 application.

7.15.4 The peak demolition and construction period would be in 2024 with a maximum of 156 demolition and construction vehicle movements per day.

7.15.5 Whilst there would be some increase in demolition and construction traffic, the effects of the demolition and construction traffic on the sensitive receptors would be temporary to short-term as follows:

- Temporary, Slight, Negative and Not Significant in terms of EIA for Pedestrian Severance, Delay, Amenity, Fear and Intimidation;
- Temporary, Slight, Negative and Not Significant in terms of EIA for Driver Delay; and
- Temporary, Slight, Negative and Not Significant in terms of EIA for Accidents and Safety.

7.15.6 An outline CEMP has been prepared and includes both construction plant and material deliveries to be programmed to avoid peak traffic periods on the surrounding local and strategic road network and minimise any effect on the local highway network and road, pedestrian and cycle users. No additional mitigation would be required for the demolition and construction stage.

7.15.7 Therefore, it is considered that the demolition and construction stage would result in a slight negative effect on Transport and identified receptors, and as such **would not give rise to significant effects** on Transport and Accessibility in terms of EIA.

Operation Effects

7.15.8 The proposed development will be fully operational in 2025 and is anticipated to generate 59 two-way vehicle trips. The operation of the MFGP up to Q1 2025 using HVO as the fuel source would require an additional short term 54 HGV a day.

7.15.9 There would be a small increase in traffic at Falcon Avenue resulting from the operation of the proposed development. The effects of the operation stage would be permanent during the operation of the proposed development, however, should the site cease operation the effect would be reversible. All effects are considered likely.

- Slight, Negative and Not Significant in terms of EIA for Pedestrian Severance, Delay, Amenity, Fear and Intimidation;
- Slight, Negative and Not Significant in terms of EIA for Driver Delay; and
- Slight, Negative and Not Significant in terms of EIA for Accidents and Safety.

7.15.10 Overall, it is considered that the operational proposed development would result in a slight negative effect on Transport and identified receptors, and as such **would not give rise to Significant Effects** on Transport and Accessibility in terms of EIA.

7.15.11 No additional mitigation would be required for the operation stage.

Cumulative Effects

7.15.12 The cumulative effects of the proposed development, and neighbouring schemes has been considered within the traffic assessment.

7.15.13 The operation stage of Microsoft (SD20A/0283), Cyrus One (SD18A/0134), Cyrus One (VA06S.309146) and the construction stage of UBC Properties (SD20A/0121), Equinix (SD21A/0186) and SID Application would overlap with the demolition and construction stage of the proposed development. The demolition and construction phase of UBC Properties (SD20A/0121), Centrica Business Solutions (SD21A/0167) and the operation stage of Cyrus One, Grange Castle Business Park (SD18A/0134), Cyrus One Grange Castle South Business Park (VA06S.309146) and Equinix (Ireland) Ltd (SD21A/0186) cumulative schemes would overlap with the operation stage of the proposed development.

7.15.14 Whilst there will be an increase in traffic resulting from the cumulative schemes during both the demolition and construction stage and the operation stage, overall, there are **No Significant Effects** in terms of EIA anticipated as a result of the cumulative impacts and therefore no mitigation is proposed.

8 AIR QUALITY

8.1 Introduction

8.1.1 This chapter of the EIAR reports on the likely significant air quality effects to arise from the demolition and construction stage and the operation stage of the proposed development.

8.1.2 The chapter describes the air quality policy context; the methods used to assess the potential impacts and likely effects; the baseline conditions at and surrounding the site; the likely air quality effects taking into consideration embedded mitigation; the need for additional mitigation and enhancement; the significance of residual effects; and inter-project cumulative effects.

8.1.3 The potential exists for dust deposition and increased particulate matter concentrations to occur during the demolition and construction stage, as well as increased air emissions resulting from the operational phases of the proposed development. The main air pollutants of concern are dust and particulate matter with an aerodynamic diameter of less than 10 µm (PM_{10}), typically generated during demolition and construction activities, and nitrogen oxides (NO_x) represented as nitrogen dioxide (NO_2) typically generated by combustion engine emissions and road traffic.

8.1.4 The chapter is supported by the following technical appendices in EIAR Volume 3:

- Appendix 8.1: Air Quality Modelling Inputs.
- Appendix 8.2: Air Quality Detailed Results

8.2 Methodology

8.2.1 The assessment has been informed by the below legislation, policies, and published guidance and those outlined in Chapter 2: EIA Process and Methodology. The relevant policies are discussed throughout this chapter in more detail in the appropriate sections.

- International Legislation:
  - European Air Quality Framework Directive 2004/107/EC1 and daughter Directive 2008/50/EC2 on ambient air quality and cleaner air for Europe (CAFE), which set out a series of limit values for the protection of human health and critical levels for the protection of vegetation;
  - Directive 2010/75/EU industrial emissions (integrated pollution prevention and control)[3] known as Industrial Emissions Directive (IED);
  - Directive (EU) 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants (MCPD)[4];
- National Legislation and Policy:
  - Air Pollution Act 1987[5];
  - Environmental Protection Agency Act, 1992[6];
  - Protection of The Environment Act 2003[7]
  - Air Quality Standards (AQS) Regulations 2011[8] amended by the AQS (Amendment) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air (Amendment) Regulations 2016[9], which transposed the European Directive 2008/50/EC into Irish legislation;
  - European Union (Medium Combustion Plants) Regulations 2017[10] which transposed the European Directive 2015/2193 into Irish legislation;
  - The National Climate Action Plan 2021[11]
- Guidance and industry standards:
  - Institute of Air Quality Management (IAQM) guidance on the Assessment of Dust from Demolition and Construction, 2014[12];
  - Environmental Protection UK/IAQM (EPUK/IAQM) guidance on Land Use and Development Control for Air Quality, 2017[13];
  - Environmental Protection Agency (EPA) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)[14];
  - U.S. Environmental Protection Agency (USEPA) Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-Hour National Ambient Air Quality Standard[15]; and
  - UK Environment Agency Specified generators: dispersion modelling assessment [16, 17].

8.2.2 Specific Irish and European guidance and industry standards have been used to inform this assessment where available. International guidance and protocols from the UK or USA were used to supplement methodologies gaps where specific national guidance was not available, with a particular focus on UK guidance and protocols due to geographical proximity and for methodology consistency.

8.3 Assessment Scope

8.3.1 Dispersion of air pollutants is impacted by several factors including the height and location of a release, the prevailing meteorology, and the arrangement of buildings in the immediate vicinity. This EIAR has been based on the architectural and engineering design and drawings that accompany this application.

Technical Scope

8.3.2 The assessment considers the effects of the proposed development using the methodology set out below within the context of the policy framework and baseline conditions. The assessment considers the following potential impacts and associated likely effects:

1 European Air Quality Directive 2004/107/EC. European Air Quality Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel, and polycyclic aromatic hydrocarbons in ambient air.
2 European Commission. Directive 2008/50/EC. Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.
3 Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).
4 Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants.
5 Air Pollution Act, 1987. Number 6 of 1987
6 Environmental Protection Agency Act, 1992. Number 7 of 1992.
7 Protection of the Environment Act 2003. Number 27 of 2003.
8 Statutory Instruments S.I. No. 180/2011 - Air Quality Standards Regulations 2011.
9 Statutory Instruments S.I. No. 659 of 2016 – Air Quality Standards (Amendment) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air (Amendment) Regulations 2016.
10 Statutory Instruments S.I. No. 595/2017 - European Union (Medium Combustion Plants) Regulations 2017.
11 Government of Ireland, 2021. Climate Action Plan. Department of the Environment, Climate and Communications
12 Holman et al, 2014. IAQM Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, London.
13 Moorcroft and Barrowcliffe. et al., 2017, Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.
14 Environmental Protection Agency Office of Environment Enforcement (OEE), 2019. Air Dispersion Modelling from Industrial Installations Guidance Note (AG4).
15 USEPA, 2011. Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-Hour National Ambient Air Quality Standard.
16 Guidance Specified generators: dispersion modelling assessment. Available at: https://www.gov.uk/guidance/specified-generators-dispersion-modelling-assessment [Accessed on 04/08/2021]
17 UK Environmental Agency. Guidance Specified generators: dispersion modelling assessment. Available at: https://consult.environment-agency.gov.uk/psc/mcp-and-sg-regulations/supporting_documents/Specified%20Generators%20Modelling%20GuidanceINTERIM%20FINAL.pdf [Accessed on 04/08/2021]

- Development works, the resulting dust impacts from the demolition and construction and the associated effects on human health receptors and amenity, as per the IAQM Guidance on assessment of dust from demolition and construction[12];
- Development works demolition and construction stage and operation stage traffic emission effects on human health receptors, as per the IAQM Guidance on land use and development control for air quality[13].
- Operation of the proposed development data center associated emissions arising from combustion plant effects on human health receptors beyond the site boundary.

8.3.3 The UK EPUK/IAQM guidance is applicable to assessing the effect of changes in exposure of member of the public resulting from developments where a proposal could affect local air quality and for which no other appropriate guidance exists in Ireland, as such this guidance has been adopted. The guidance considers the proximity to an Air Quality Management Area (AQMA), which is an area likely to approach or exceed the values set by AQS. The guidance provides an indicative criterion to determine the level of an air quality assessment due to road traffic flows emissions:

- A change of Light Duty Vehicles (LDVs) flows of more than 100 Average Annual Daily Traffic (AADT) within or adjacent to an Air Quality Management Area (AQMA) or more than 500 AADT elsewhere.
- A change of Heavy-Duty Vehicles (HDVs) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.

8.3.4 The proposed development site and study area are not expected to approach or exceed the AQS (as shown in the Baseline Conditions of this Chapter) and therefore the criteria outside an AQMA would apply to determine the significance of effects arising on local air quality due to the proposed development traffic flows.

8.3.5 The estimated demolition and construction stage peak vehicle movements would result in a combined LGV and HGV two-way 156 daily trips, of which 44 two-way trips would be HGV. However, when the movements are averaged over a full year period (24-hour AADT), these would be expected to be lower than 12-hour daily movements. Demolition and construction works' traffic flows would therefore not be expected to exceed the threshold of 500 AADT LGV movements or the 100 AADT HGVs for a detailed modelling assessment to be necessary according to EPUK/IAQM guidance. In addition, HGV movements would be controlled through the implementation of a Construction Environmental Management Plan (CEMP) as described in Chapter 5: Construction Description, which would be secured by means of an appropriately worded planning condition. The effects of demolition and construction related traffic emissions would be short-term, negative, and imperceptible with relation to human health and considered to be not significant in line with the IAQM guidance. Accordingly, demolition and construction traffic emissions have not been considered further within this chapter.

8.3.6 The operational stage would be expected to generate 63 daily vehicles, i.e., well below the EPUK/IAQM criteria. The effects of operation stage related traffic emissions would be long-term to permanent, negative, and not significant with relation to human health in line with the EPUK/IAQM guidance. Accordingly, operational stage traffic emissions have not been considered further within this chapter.

8.3.7 There are no protected European sites, designated under the EC Habitats Directive (92/43/EEC)[18], or National Heritage Areas (NHAs), designated under the Wildlife Acts[19], within the proposed development boundary. The nearest European sites to the Proposed Development are the Rye Water Valley/ Carton Special Area of Conservation (SAC), approximately 5.8 km north-west of the site, and Glenasmole Valley SAC, approximately 8.0 km south-east of the site. The Grand Canal proposed NHA is located approximately 1.3 km north of the site. The nearest protected European sites and NHAs are considered to fall outside the zone of influence of the proposed development and therefore the demolition and construction stage and operation stage air quality effects would be expected to be long-term, negative, and imperceptible and have not been considered further within this chapter.

8.3.8 The Proposed Development will incorporate emergency diesel generators to provide power to the data center in the event of failure of the electricity supply. When in use in an emergency, all of the generators could be operational and therefore the impacts during an emergency are higher than those when individual or groups of generators are being routinely tested. The impacts during an emergency have therefore been assessed as the worst-case scenario.

8.3.9 The assessment includes a quantitative assessment of Proposed Developments emergency generators and the cumulative impact of all emergency generators running for DUB-13 and DUB-1 campus simultaneously. None of the other plant associated with the proposed development (i.e., chillers) would give rise to significant emissions of air pollutants.

8.3.10 The potential impact to air quality during the operation phase is a breach of the ambient AQS associated with emissions from proposed development combustion engines (emergency generators). The main pollutant of concern in relation to emissions from the combustion engines is NO_2 and the assessment concentrates on the impacts of NO_2 emissions on human health receptors. In relation to carbon monoxide (CO), sulphur (SO2), PM_{10}, $PM_{2.5}$ and benzene no detailed modelling was undertaken as combustion engines emissions of these pollutants' would be significantly lower when compared with NOx emissions relative to their respective ambient air quality standard. Ensuring compliance with NO_2 AQS would ensure compliance of other pollutants.

8.3.11 It is considered that the proposed development would not give rise to any odour impacts and associated effects and odour is not assessed as part of the EIAR Chapter.

Spatial Scope

8.3.12 The study area for the demolition and construction stage assessment is defined as up to 350 m from the site boundary for the assessment of demolition and construction dust emissions, and 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s) as per the IAQM guidance on the Assessment of Dust from Demolition and Construction[12].

8.3.13 For the operation stage assessment, the study area encompasses the application site, representative off-site receptors identified as at risk of impacts from the proposed development and receptor Cartesian grids with the site at the centre, as recommended by EPA AG4 guidance[14]. The off-site receptors and receptor grids are presented in the Baseline Conditions section of this EIAR. The study area also considers identified neighbouring cumulative development and commercial activities adjacent to the site (see Chapter 2: EIA Process and Methodology).

Temporal Scope

8.3.14 The assessment has considered impacts arising during the demolition and construction stage which would be of expected to be temporary (less than one year) and from the operation stage which would be expected to be long-term (15 to 60 years) to permanent (>60 years) in nature.

8.3.15 The assessment of the proposed development has been undertaken in line with the information provided in Chapter 5: Construction Description of this EIAR Volume. The works are anticipated to be undertaken over a 11-month period, with a completion targeted of Q4 2024. The indicative start of operation is Q4 2025. There is no phasing during the construction of the Proposed Development.

8.3.16 For the operational stage air quality assessment consideration has been given to the modelling scenarios outlined in Chapter 2: EIA Process and Methodology. Three scenarios have been proposed as the proposed development would be powered via the EirGrid connection through the wider DUB-1 campus or powered by the consented Multifuel Generation Plant (MFGP) on the DUB-1 campus. The MFGP has been designed to include the proposed data center and no change in capacity will be required

18 https://www.npws.ie/legislation/eu-directives

19 https://www.npws.ie/legislation/irish-law

to power the proposed development. The proposed development would not result in an increase in the MFGP air emissions, which have previously been assessed during its planning application (planning reference SD21A/0241). The proposed data center does not create any additional MFGP air emissions that have not already been assessed and consented and therefore no detailed modelling assessment of the MFGP air emissions have been carried out in this EIAR. From an air quality perspective, Chapter 2: EIA Process and Methodology proposed scenario 1 and scenario 2 would not generate additional air emissions and have therefore been scope out of this assessment. Only the Emergency scenario (Scenario 3) listed in Chapter 2: EIA Process and Methodology, has been assessed for the proposed development.

8.3.17 The proposed development is an extension to the July 2022 DUB-1 consented development and would operate as part the wider data center campus. As per Chapter 2: EIA Process and Methodology, the future baseline includes the operation of the July 2022 DUB-1 consented development reported within the DUB-1 EIAR. The proposed development operation future baseline has been assumed to be 2025, which is the projected year when the proposed development would become operational and is also when the July 2022 DUB-1 consented development would become fully operational with the MFGP powered by gas.

8.4 Baseline Characterisation Method

Desk Study

8.4.1 To establish baseline air quality conditions in the study area, relevant data was reviewed and assessed. Local air quality monitoring data was obtained from EPA air quality continuous monitoring network[20] and from cumulative schemes EIAR as outlined in Chapter 2: EIA Process and Methodology.

8.4.2 Traffic flows were provided by the project transport consultant (Ramboll) as per Chapter 7: Transport and Accessibility.

8.4.3 The air quality impacts for the July 2022 DUB-1 consented development and the cumulative developments described in Chapter 2: EIA Process and Methodology have been extracted from the EIARs submitted as part of the schemes planning applications.

Field Study

8.4.4 No site-specific field study was undertaken at the site as the data collected from other sources was deemed to be adequate and representative of the site and local air quality conditions.

8.5 Assessment Method

8.5.1 The assessment has been based on the planning application drawings and plans and the development description presented in Chapter 4: Proposed Development Description, as well as reported in Chapter 5: Demolition and Construction Environmental.

8.5.2 Full details of both demolition and construction stage, and operation stage assessment methodology, data and modelling parameters are provided in Technical Appendix 8.1 in the EIAR Volume 3.

Methodology

Demolition and Construction Stage

8.5.3 During the demolition and construction stage, the main potential impacts would be dust annoyance and locally elevated concentrations of PM_{10}. These impacts have the potential to occur when dust generating activities coincide with dry, windy conditions, and where sensitive receptors are located downwind of the dust source. Separation distance is also an important factor as significant dust annoyance is usually limited to within a few hundred metres of its source. This is due to the rapid decrease in concentrations with distance from the source due to dispersion.

8.5.4 Likely effects associated with demolition and construction dust emissions, unlike other air borne pollutants, cannot be accurately predicted and quantified because they are highly dependent on local weather conditions and mitigation measures implemented at source. This assessment has followed the guidance published by the IAQM on the assessment of the effects of demolition and construction on air quality[12].

8.5.5 The guidance recommends that the risk of dust emission magnitude is combined with the sensitivity of the area surrounding the site to determine the risk of dust impacts from demolition and construction stage activities. The risk of dust arising in sufficient quantities to cause annoyance and/or health impacts is determined using four risk categories: high, medium, low, or negligible. Depending on the level of risk for each activity, appropriate mitigation is selected. Full details of the dust risk assessment methodology which includes the assessment criteria are provided in Technical Appendix 8.1 in the EIAR Volume 3.

Operation Stage

8.5.6 Air dispersion modelling was carried out using Atmospheric Dispersion Modelling System (ADMS 5)[21] to ensure that adequate stack height was selected to aid dispersion of the emissions and achieve compliance with the NO_2 human health ambient AQS beyond the site boundary, considering the existing baseline level on ambient air quality concentrations.

8.5.7 ADMS is recommended as an appropriate model to assess the impact of air emissions from industrial facilities in the EPA Guidance AG4[14]. ADMS uses representative meteorological data for the local area and plant emissions data to predict ambient concentrations of pollutants in the vicinity of the site. A detailed description of the ADMS 5 model is provided in Technical Appendix 8.1 in the EIAR Volume 3. The air dispersion modelling input data consisted of information on the physical environment, design details for all emission points on-site, building configuration, etc. Full details of the model parameters are presented in Technical Appendix 8.1 in the EIAR Volume 3.

8.5.8 The proposed development Emergency Scenario 1 consists of:

- Building DUB-13 with 13 diesel emergency back-up generators and associated 22.3 metres flues operating in the unlikely event of an outage of the MFGP and grid connection.

8.5.9 The proposed development Emergency Scenario 2 consists of:

- Building DUB-13, and DUB-1 Campus with 49 diesel emergency back-up generators and associated 22.3 metres flues operating in the unlikely event of an outage of the MFGP and grid connection.

8.5.10 For dispersion modelling purposes it is assumed that for the relevant scenarios, the emergency generators would to be operating continuously all year round for the assessment of NO_2 annual average and hourly impacts.

8.5.11 Controlled maintenance including periodic testing of the emergency diesel generators is required so that they are ready to be started at full load during an emergency power failure. The testing regime and testing times are not currently known, but based on professional experience, the generators are likely to be tested one generator at a time and sequentially with a periodic testing regime of weekly run test at reduced load and quarterly at full load. The periodic test would be expected run for a short period of time between 30 minutes to one hour. Given the expected short period of testing operation and the elevated exhaust improving dispersion, it is unlikely that the NO_2 ambient AQS would be exceeded. When in use in an emergency, all the generators could be operational at full load and therefore the impacts during an emergency are higher than those when individual or groups of generators are being routinely tested. The impacts during the testing regimes have been scoped out

20 EPA, 2021, EPA Website: http://www.epa.ie/whatwedo/monitoring/air/ [Accessed on 03/10/2022]

21 Available at: http://www.cerc.co.uk/environmental-software/ADMS-model.html [Accessed on 03/10/2022]

of the modelling assessment and the emergency operation have therefore been assessed as the worst-case scenario.

8.5.12 The operation of the emergency generators has been assessed according to the methodology published by the UK Environment Agency guidance[16,17]. The UK guidance is a conservative probabilistic approach which uses the emergency generators maximum hourly emissions to determine the number of hours that all the generators could operate simultaneously in any one year with a 1% chance of exceeding the 1-hour mean objective based on the worst modelled meteorological year. The USEPA methodology[15] to assess the 1-hour NO_2 ambient AQS considers that a probabilistic method is too conservative and proposes to model impacts from intermittent emissions based on an average hourly rate (i.e., maximum hourly rate factored to a certain number of more realistic operating hours), rather than maximum hourly emissions. Given the conservative approach of the UK guidance, this assessment considers the UK guidance more suitable for protection of sensitive receptors and to demonstrate compliance with the ambient AQS and therefore it has been used to assess the likelihood of exceedance of the 1-hour NO_2 ambient AQS.

8.5.13 Following the UK Environment Agency methodology, the hourly emissions and the allowable operating hours for emergency operation were estimated from a statistical analysis of the likelihood of breaching the 1-hour objective for NO_2 concentrations by using the hypergeometric distribution function. The allowable operating hours were calculated for a 1% probability of exceeding the one-hour mean objective at the most impacted receptor location. In accordance with the emissions from specified generators guidance, in an emergency when the operating period is greater than one hour, the calculated probability has been multiplied by 2.5. For compliance with the annual mean AQS, the predicted concentrations were scaled to the total annual operating hours that the generators were determined to run for the 1% probability of exceeding the one-hour mean objective.

8.5.14 The likelihood of exceeding the 1-hour mean objective also considers the baseline pollutant concentrations in the vicinity of the site. For the short-term assessment, the background concentration is assumed to be twice the annual mean background concentration. As the dispersion modelling was undertaken for NOx emissions, for estimating the number of exceedances of the hourly mean NO_2 objective, the exceedance concentration in the model was set as follows:

- Model exceedance concentration = 200 – twice annual mean background)/0.35.

8.5.15 For the accessed scenarios, guidance on air emissions risk assessments produced by the UK Environment Agency[22] was used to support an assessment of the overall impact of the emissions resulting from the installations to confirm that the emissions are acceptable (i.e., do not cause significant environmental pollution). Emissions of NOx from combustion sources include both nitric oxide (NO) and NO_2, with the majority being in the form of NO. During the process of combustion, atmospheric and fuel nitrogen is partially oxidised via a series of complex combustion reactions, because of high temperature, to NO. In ambient air, NO is oxidised to form NO_2, a more harmful form of NOx with more significant health impacts. For this assessment, the conversion of NOx to NO_2 has been estimated using the worst-case assumptions set out in the UK Environment Agency guidance:

- For the assessment of long term (annual mean) impacts at receptors 70% of NOx is converted to NO_2; and
- For the assessment of short term (hourly mean) impacts at receptors 35% of NOx is converted to NO_2.

8.5.16 The UK Environment Agency assumptions offer a worst-case assessment as the conversion rates may be conservative as the oxidation of NO to NO_2 is not an instantaneous process particularly at short distance from the emissions source where the maximum impacts are predicted to occur.

8.5.17 Tall buildings can have a substantial impact on the dispersion of pollutants from stacks, as a result of building downwash i.e., pollutants being drawn down in the wake of a building, giving rise to high concentrations close to the base of the buildings. The buildings include in the ADMS model are shown in Technical Appendix 8.1 in the EIAR Volume 3. An initial model run was undertaken to confirm the flues heights would ensure adequate dispersion

8.5.18 To undertake the assessment, the emergency generators were allocated their own flues and the flues combined in ADMS in triples or quadruples when adjacent, according to the plan's configuration. The location and flue parameters used in the model are shown in Technical Appendix 8.1 in the EIAR Volume 3.

8.5.19 The dispersion modelling has been undertaken with five years of hourly sequenced meteorology data for the years 2015 to 2019 inclusive, from Casement Aerodrome which is approximately 1 km to the south of the site. Adopting the maximum hourly stack emissions across the five years of meteorological data will ensure the worst-case long and short-term concentrations from the stacks are considered within the assessment. The Casement Aerodrome windroses are presented in Technical Appendix 8.1 in the EIAR Volume 3.

8.5.20 For the emergency generators, emission rates, volumetric flowrates and stack parameters have been provided by the lead project consultant, Burns & McDonnell. Flue heights and diameters were taken from the CAD layout drawings. The emergency generators model input data used in the model is provided in Table 8-1.

Table 8-1: Stack Emissions Modelling Input Parameters

Plant	Equipment	Temperature (°C)	Volume Flux (Am^3/s)	Height (m)	Diameter (m)	NO_2 Emission Rate at discharge conditions (g/s)
Emergency Generators	CAT 3516E, EM4789	422	10.0	22.3	0.6	4.2

Cumulative Stage

8.5.21 Cumulative effects have been included in this Chapter following the review the cumulative schemes EIARs submitted as part of the planning applications as outlined in Chapter 2: EIA Process and Methodology

8.5.22 Additional cumulative development data center facilities with emergency only emission points would only operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis or simultaneously with the proposed development. Emergency generators emission points associated with the cumulative developments were not considered for the purpose of this assessment.

8.6 Assessment Criteria

8.6.1 The criteria used to assess if an effect is significant or not, is set out in subsequent sub-sections. This is determined by consideration of the sensitivity of the receptor, magnitude of impact and scale of the effect. In considering the significance of an effect, consideration has been given to the duration of the effect, the geographical extent of the effect and the application of professional judgement.

22 UK Environment Agency. Available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit. [Accessed on 04/08/2021]

Receptor Sensitivity/Value Criteria

Demolition and Construction Stage

8.6.2 The sensitivities of people to dust soiling effect has been classified as low, medium, or high, in line with the IAQM guidance criteria, as set out in Table 8-2.

Table 8-2: Sensitivities of People to Dust Soiling Effect– Demolition and Construction Stage

Sensitivity	Criteria
Low	• The enjoyment of amenity would not reasonably be expected; or • Property would not reasonably be expected to be diminished in appearance, aesthetics, or value by soiling; or • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.
Medium	• Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • First occupants moving into residential dwellings on a large, phased housing development; or • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work.
High	• Users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Indicative examples include dwellings, museums, and other culturally important collections, medium- and long-term car parks and car showrooms.

Operation Stage

8.6.3 To protect human health, national and European statutory bodies defined health or environmental-based AQS for a range of air pollutants. There are no degrees of sensitivity of receptors to poor air quality, rather, the assessment is based on whether members of the public are likely to be present for the proposed averaging period of the objective and air quality significance criteria are assessed based on compliance with the appropriate standards or limit values.

8.6.4 The AQS are the concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects on human health (including sensitive sub-groups) or ecosystems. In general, these are concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects. Standards are values often expressed as maximum concentrations not to be exceeded either without exception or with a limited number of exceedances within a specified timescale.

8.6.5 The applicable standards in Ireland include the AQS Regulations 2011[8,10], which incorporate European Commission Directive 2008/50/EC[2], and set limit values for NO_2, PM_{10} and $PM_{2.5}$ relevant to this assessment, as described in Table 8-3.

Table 8-3: Human Health Air Quality Standard

Pollutant	Time Period	Value
NO_2	Annual Mean for protection of Human Health	40 µg/m^3
	1-hour mean	200 µg/m^3 not to be exceeded more than 18 times a year
Particulate Matter (as PM_{10})	24 hours mean	50 µg/m^3 not to be exceeded more than 35 times per year
	Annual mean	40 µg/m^3
$PM_{2.5}$	Annual mean	25 µg/m^3

Impact Magnitude Criteria

Demolition and Construction Stage

8.6.6 The criteria provided in the guidance produced by the IAQM[12] was used to assess the potential risk of impacts to air quality from demolition and construction stage activity in the absence of mitigation during demolition and construction stage of the proposed development. The methodology combines the magnitude of dust emissions together with the sensitivity of the receptor to identify low, medium, or high risk of dust impacts in the absence of mitigation for the four stages of construction: demolition, earthworks, construction and trackout.

Operation Stage

8.6.7 The operation of the emergency generators has been assessed according to the methodology published by the UK Environment Agency [16,17] to determine the statistical likelihood of exceedance of the NO_2 hourly limit value. The allowable hours for emergency operation are estimated from a statistical analysis of the likelihood of breaching the hourly mean NO_2 AQS (considering baseline pollutant concentrations).

8.6.8 The hypergeometric probability distribution test (see Appendix 8.1 in Volume 3 for more details) provides an estimate of the probability of breaching the AQO given random use of the generators for a total number of operating hours per year. Table 8-4 shows how the calculated probabilities are judged; the 1% probability is normally used as the benchmark to calculate the allowable operating hours during emergency operation; if the generators had a life of less than 20 years then it may be possible to use the 5% probability level although this does not increase the allowable operating hours significantly.

Table 8-4: Probability Significance for hourly mean NO_2 AQS

Probability	Significance
1%	Indicates exceedance is highly unlikely
5%	Indicates that exceedance is unlikely provided generator lifetime is less than 20 years
>5%	Indicates potential for exceedance

8.6.9 To assess the potential impacts and associated likely effects of the emergency generators, the 5 years worst case NO_2 modelled concentration at sensitive receptors, known as process contribution (PC), were added to the background concentrations to obtain the process environmental contribution (PEC). The PEC was then compared with the relevant ambient AQS to assess the significance of the air quality effects associated with the proposed development emissions.

8.6.10 To consider the model uncertainty, this assessment also refers to the recommendations outlined within the EPA AG4 guidance[14]. The guidance recommends that if the facility is operated continually at close

to the maximum licenced mass emission rate the PC should be less than 75% of the ambient AQS and less than this where background levels account for a significant fraction of the ambient air quality standard based on the formula:

- Maximum Allowable Process Contribution= 0.75*(AQS-Background)

8.6.11 Based on the above and the average background concentrations in the study area described in the baseline conditions section of the Chapter, the annual mean PC should not exceed the value of 17.0 µg/m^3 and the 1-hour average PC should not exceed the value of 137.3 µg/m^3.

Scale of Effect Criteria

Demolition and Construction Stage

8.6.12 The IAQM guidance recommends that no assessment of the significance of dust effects is made without mitigation in place, as mitigation is assumed to be secured by industry best practice, planning conditions, legal requirements or required by regulations. With appropriate mitigation in place, the effect of demolition and construction stage dust emission impacts on air quality is always assessed as not significant in EIA terms. The purpose of the demolition and construction stage dust assessment has therefore been to identify the appropriate level of mitigation to employ.

8.6.13 Using the IAQM assessment methodology to identify the appropriate level of mitigation, and on the assumption that the identified mitigation measures are applied and are commensurate with the risk of potential dust impacts, the guidance indicates that that the potential for dust effects to arise during the demolition and construction stage would be at worst 'slight negative' and would be temporary in nature.

Operation Stage

8.6.14 The potential impact to air quality from the proposed development plant is a breach of the ambient AQS as a result of air emissions from the proposed development emergency generators.

8.6.15 In determining the significance of reported effects, the assessment has considered the Environmental Protection Agency's (EPA) Guidelines on the information to be contained in Environment Impact Assessment Reports (2022), as described in Chapter 2: EIA Process and Methodology, effects ranging from 'moderate' to 'profound' are considered 'significant' in terms of EIA.

Nature of Effect Criteria

8.6.16 The nature of the effect has been described as either negative, neutral, or positive as outlined in Chapter 2: EIA Process and Methodology.

8.7 Assumptions and Limitations

8.7.1 The assessment has relied on data extracted from the EPA and planning application EIAR air quality assessments. It has been assumed that the data sets have been reported correctly.

8.7.2 There are many components that contribute to the uncertainty in predicted concentrations. Although the model has been extensively validated against field data sets and their use has gained wide acceptance, no computer-based model is able to totally replicate actual conditions as it is required to simplify real-world conditions into a series of algorithms. The model used in this assessment is also dependent upon several sources of data which will have inherent uncertainties associated with them.

8.7.3 Tall buildings can have a substantial impact on the dispersion of pollutants from stacks, as a result of building downwash i.e., pollutants being drawn down in the wake of a building, giving rise to high concentrations close to the base of the buildings. ADMS5 can take account of this potential impact by the inclusion of rectangular buildings in the model. The buildings included within the modelling were based on the interpretation of the development parameters and plans.

8.7.4 The terrain within the study area is relatively flat with slopes less than 10 %, and therefore terrain effects have not been included within the modelling.

8.7.5 Emission rates, volumetric flowrates and flue parameters have been based on data provided by the project architect consultant, Burns & McDonnell. It has been assumed that the up-to-date data sets have been provided and reported correctly.

8.7.6 Overall, when considering the assumed number of operating hours; the approach taken to meteorological conditions; and the assumed NOx to NO_2 relationship, the assessment is expected to over-predict the impacts of the proposed development. The approach used therefore provides a robust assessment.

8.8 Baseline Conditions

Existing Baseline

8.8.1 Under the Ambient Air Quality and Cleaner Air for Europe Directive (2008/50/EC), Ireland designated four air quality zones for the purpose of air quality management and assessment[23]. In terms of air monitoring, the development site is within Dublin Zone A.

NO_2

8.8.2 Air Quality monitoring is carried out by the EPA and local authorities at Dublin Zone A urban and suburban background locations. A summary of the closest and most representative monitoring locations is presented in Table 8-5 and the locations shown in Figure 8-1.

Table 8-5: Measured Annual Average NO_2 Concentrations (µg/m^3)

Station	Type	Distance from Site (km)	2015	2016	2017	2018	2019	5 years Average
Ballyfermot	Suburban Background	≈ 6.5	16	17	17	17	20	17
Rathmines	Urban Background	≈ 11.8	18	20	17	20	22	19
Dun Laoghaire	Suburban Background	≈ 21.1	16	19	17	19	15	17
Swords	Suburban Background	≈ 21.8	13	16	14	16	15	15
AQS			40					

8.8.3 Measured NO_2 concentrations at the closest background automatic monitoring station to the site, Ballyfermot, have been well below the ambient AQS with an average annual mean concentration of approximately 17 µg/m^3 between 2015-2019.

23 https://www.epa.ie/air/quality/zones/ [Accessed on 03/10/2022]

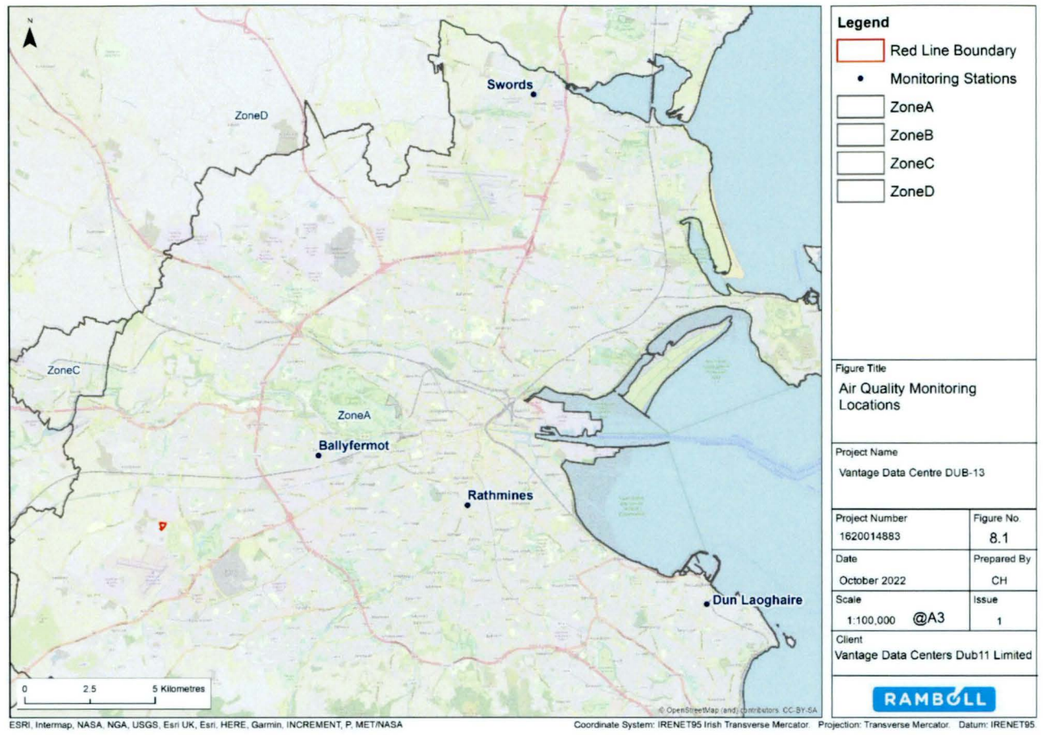

Figure 8-1: Nearest Monitoring Locations

Particulates (PM_{10} and $PM_{2.5}$)

8.8.4 Measured continuous PM_{10} monitoring carried out within Dublin Zone A background locations have been well below the ambient AQS with an average annual mean concentration of approximately 15 µg/m^3.

8.8.5 Measured continuous $PM_{2.5}$ monitoring carried out within Dublin Zone A locations have been well below the ambient AQS with an average annual mean concentration of approximately 11 µg/m^3.

Assessment of Monitoring Data

8.8.6 Ballyfermot background station is the closest station to the site and would therefore be considered representative of the air quality within study area. Measured NO_2 and PM_{10} at Ballyfermot have been well below the relevant AQS and therefore background concentrations at the site and within the study area would be expected to be below the AQS.

8.8.7 Measured $PM_{2.5}$ within Dublin Zone A have been well below the relevant AQS and therefore $PM_{2.5}$ background concentrations at the site and within the study area would be expected to be below the AQS.

8.8.8 For the purposes of this assessment, Ballyfermot NO_2 average background concentration measured between 2015-2019 with the value of 17 µg/m^3 has been used to estimate the PEC.

Future Baseline

8.8.9 As per Chapter 2: EIA Process and Methodology, the future baseline includes the operation of the July 2022 DUB-1 consented development reported within the DUB-1 EIAR. The MFGP permitted as part of the July 2022 DUB-1 consented development was designed to include the proposed data center and no change in capacity will be required to power the proposed development, as such the proposed development would not result in an increase in the MFGP air emissions further to those described as part of the EIAR for the July 2022 DUB-1 consented development. Moreover, the proposed development emergency generators would only operate in case of an outage of the MFGP and grid connection, and therefore would not operate simultaneously with the MFGP. The July 2022 DUB-1 EIAR Chapter 8 Air Quality showed that the operation of the MFGP powered by gas would result in a maximum annual mean NO_2 concentrations of approximately 1 µg/m^3. The MFGP process contribution, when combined with existing local background of 17 µg/m^3, would result in an overall concentration of approximately 18 µg/m^3 and therefore well below the AQS.

8.8.10 Air quality at background and roadside locations is expected to improve in future years due to the gradual improvement in vehicle combustion technologies and enforcement of national policies such as the Government of Ireland Climate Action Plan[24]. The climate plan proposes to achieve a net zero target by 2050 and commits to evaluate in detail the changes required to adopt such a goal in Ireland. Future baseline air quality within the study area would therefore be expected to improve and remain well below the AQS.

8.8.11 Although air emissions are predicted to decline with time, to take into account the uncertainties regarding future local air quality, the proposed development operational stage emergency generators PC were added to the 2019 measured background concentrations to obtain the PEC. This is considered to provide an appropriately conservative assessment assuming no future improvements on local air quality.

Sensitive receptors

8.8.12 The site is surrounded by large commercial areas occupied by industrial uses to the north and south within the Kilcarbery Park, Grange Castle Business Park and Profile Park. The closest potential residential property is located approximately 125 m to the northeast of the site boundary along Nangor Road. Residential development is primarily located in Deansrath, Clondalkin, approximately 600 m south of the site. The residential property within the site boundary is proposed to be demolished as part of the development.

8.8.13 Relevant sensitive locations are places where members of the public might be expected to be regularly present over the averaging period of the AQS. For the annual mean and hourly mean AQS that are the focus of this assessment, sensitive receptors will generally be residential properties, schools, nursing homes and temporary residence caravan parks. The locations of existing receptors were chosen to represent locations where impacts from the proposed development are likely to be the greatest.

8.8.14 The existing receptors identified as being sensitive to the proposed development and which have been 'scoped-in' to the assessment are summarised Table 8-6 and displayed on Figure 8-2. Existing receptor locations were modelled at a height of 1.5 m and 4.5 m representing typical two storey property with exposure at ground floor and top floor level, except for R1, R2 and R5 which have additional heights of 18 m and 12 m respectively, modelled representing top floor commercial exposure.

Table 8-6: Summary of Sensitive Receptors

Receptor ID	Location	X (m)	Y (m)	Type Exposure
R1	Kilcarbery Park	703862	730924	Commercial/Industrial

24 Government of Ireland, 2021. Climate Action Plan 2021. Securing our future. https://www.gov.ie/en/publication/6223e-climate-action-plan-2021/# [Accessed on 03/10/2022]

Table 8-6: Summary of Sensitive Receptors

Receptor ID	Location	X (m)	Y (m)	Type Exposure
R2	Kilcarbery Park	703970	730908	Commercial/Industrial
R3	Nangor Lea, Nangor Road	704053	730934	Potential Residential
R4	Nangor Road	703515	730878	Industrial/Commercial
R5	DUB-1	703703	730781	Industrial
R6	Castlegrange Green	704731	731119	Residential
R7	Oldcastlepark Lawn Caravan park	704658	731156	Residential
R8	Oldcastlepark Lawn Caravan park	704652	731171	Residential
R9	Kilbride House, Baldonnel Road	703686	730091	Residential
R10	Casement Aerodrome, Baldonnel	703654	730026	Residential
R11	Casement Aerodrome, Baldonnel	703482	730024	Residential
R12	Aungierstown, Baldonnel Road	703286	730109	Residential
R13	Aungierstown, Baldonnel Road	703257	730117	Residential
R14	Aungierstown, Baldonnel Road	703200	730136	Residential
R15	Aungierstown, Baldonnel Road	703129	730165	Residential
R16	Baldonnel Road	703027	730288	Residential
R17	Baldonnel Road	703014	730327	Residential
R18	Baldonnel Road	702964	730384	Residential
R19	Baldonnel Road	703024	730476	Residential
R20	Baldonnel Road	702940	730528	Residential
R21	Baldonnel Road	702897	730569	Residential
R22	Baldonnel Road	702876	730595	Residential
R23	Baldonnel Road Comex Mc Kinnon	702850	730615	Commercial

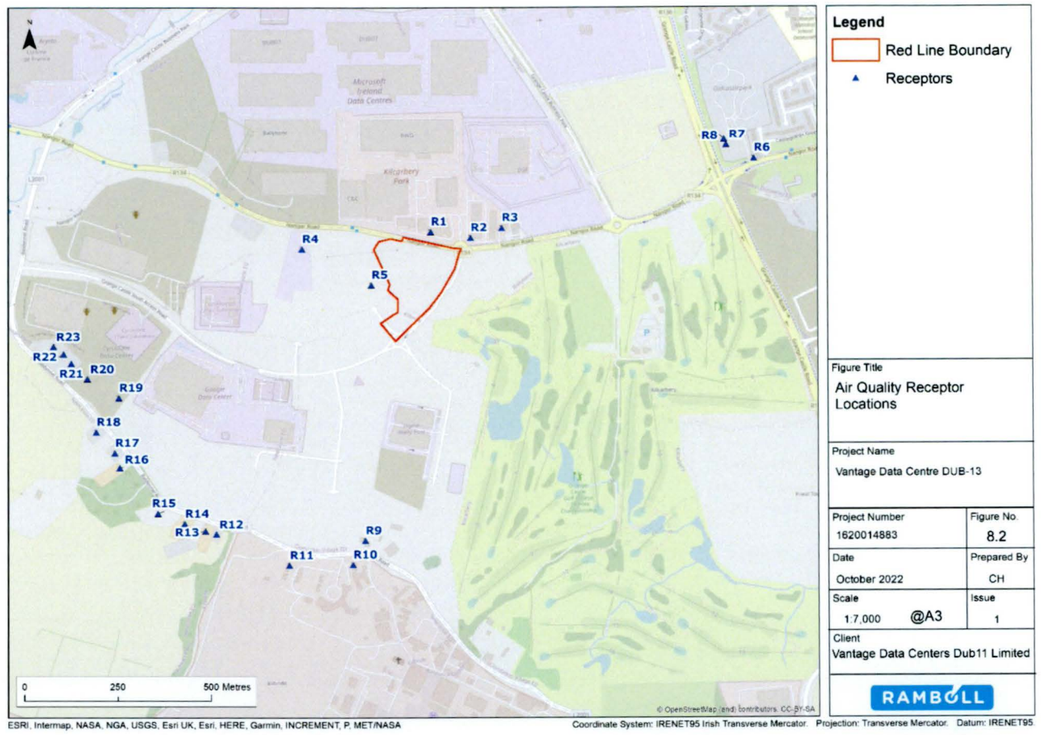

Figure 8-2: Air Quality Receptor Locations

8.8.15 Concentrations were also predicted for a grid of receptors (contours) mapped with sufficient resolution to ensure all localised "hot-spots" were identified and to visually demonstrate the pattern of dispersion, as recommended by EPA AG4 guidance. The grids were based on a Cartesian grid with the site at the centre and are described in Table 8-7 and modelled at a height of 4.m representing 1st floor residential buildings.

Table 8-7: Receptor Grids

Grid	Measure	Spacing (m)
Outer Grid	5x5 km	500
Middle Grid	3x3 km	100
Inner Grid	500x500 m	20

8.9 Assessment of Effects

Demolition and Construction Effects

8.9.1 The main activities with potential to cause emissions of dust construction will include:

- Demolition of existing buildings;
- Earthworks and site preparation;
- Construction of building structures, including foundations;
- Materials Handling such as storage of materials in stockpiles and spillage;

- Construction of on-site highway improvements; and
- Hard and soft landscaping.

8.9.2 Dust impacts would be greatest in dry weather following long periods without rain and with the wind blowing towards sensitive receptors. Depending on wind speed and turbulence it is likely that most of the dust will be deposited within 100 m of the source. Meteorological data for Casement Aerodrome, shown in Technical Appendix 8.1 in EIAR Volume 3, suggests that prevailing winds are typically south-westerly.

8.9.3 The risk of potential air quality impacts from demolition, earthworks, construction and trackout (the transport of dust and dirt from the application site onto the public road network) was assessed according to guidance developed by the IAQM to identify the appropriate level of mitigation.

8.9.4 Using the evaluation criteria within the IAQM's Guidance, the potential dust emission magnitude has been identified for each stage of the proposed development as shown in Table 8-8 based on information presented in Chapter 5: Construction Description of this Volume.

Table 8-8: Dust Emission Impact Magnitude for Proposed Development Works

Activity	Dust Emission Magnitude	Justification
Demolition	Small	Demolition of the former residential property within the site. The total building volume is estimated to be <20,000 m^3. Demolition activities would occur at height of more than 10 m above ground level.
Earthworks	Large	Total site area over 10,000 m^2.
Construction	Medium	The proposed development would have a total estimated construction volume of between 25,000m^3 - 100,000 m^3.
Trackout	Medium	HDV movements over the course of the worst-case phase would be up to 10-50 HDV movements in one day. Unpaved road length would be between 50 m- 100m.

8.9.5 The closest sensitive receptor to construction activity within 350 m of the site would be potential residential property to the north east of the site, identified as Receptor R3 in Table 8.6, and the places of work at Kilcarbery Park, identified as receptor R1.

8.9.6 The next stage of the process is to define the sensitivity of the assessment area to dust soiling and human health impacts. This process combines the sensitivity of the receptor with the distance from the source to determine the overall sensitivity. The sensitivity of the area to dust impacts (considering distance to construction activity) is provided in Table 8-9.

Table 8-9: Sensitivity of Study Area to Dust Impacts

Sensitivity to Dust Soiling	Sensitivity to Human Health Impacts
Low: places of work within 50 m of the site.	Medium: places of work within 50 m of the site. Average measured PM_{10} concentrations are below 24 $\mu g/m^3$ (see Baseline Conditions section).

8.9.7 The dust emission magnitude determined in Table 8-8 has been combined with the sensitivity assessment in Table 8-9 to define the risk of impacts for each stage of the proposed development works in the absence of mitigation, as shown in Table 8-10.

Table 8-10: Risk of Dust Impacts in Absence of Mitigation at Proposed Development

Sensitivity of Study Area	Dust Emission Magnitude for Each Phase of Works			
	Demolition (Small)	Earthworks (Large)	Construction (Medium)	Trackout (Medium)
Dust Soiling (Low)	Negligible Risk	Low Risk	Low Risk	Low Risk
Human Health (Medium)	Low Risk	Medium Risk	Medium Risk	Low Risk

8.9.8 Therefore, using professional judgement, the overall risk of dust impacts in the absence of mitigation has been assessed as the highest resulting risk, i.e. as being Medium Risk.

Embedded Mitigation and Standard Good Practice

8.9.9 The control of dust and construction traffic emissions from a demolition and construction site relies upon good site management and mitigation techniques to reduce emissions of dust and limit dispersion. A summary of the mitigation measures recommended IAQM guidance to reduce impacts from medium risk sites is provided Table 8-11. The mitigation measures for both direct impacts and those from traffic would be detailed within the site's CEMP. It is noted that these measures have already been accounted for in EIAR Chapter 5: Construction Description of this Volume.

Table 8-11: Dust Mitigation Measures for Medium Risk Sites

Phase	Mitigation Measure
Communications	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site • Display name and contact details of responsible person for dust issues on the site boundary (e.g. hoarding) in addition to head/regional office contact information. • Display the head or regional office contact information.
Dust Management Plan	• Develop and implement a Dust Management Plan (DMP) which is included as part of the CEMP.
Site Management	• Record all complaints and incidents in a site log. • Take appropriate measures to reduce emissions in a timely manner, and record the measures taken within the log. • Make the complaints log available to the Local Authority if requested. • Record any exceptional dust incidents on- or off-site. • Hold regular liaison meeting with other high-risk construction sites within 500 m.
Monitoring	• Undertake daily on and off-site visual inspections where there are nearby receptors. • Carry out regular inspections to ensure compliance with the DMP and record results in the site logbook. • 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 to locate dust generating activities as far as possible from receptors. • Use solid screens around dusty activities and around stockpiles. • Avoid site runoff of water and mud. • Fully enclose the site or specific operations where there is a high potential for dust production and the site is active for an extensive period. • Keep site fencing barriers and scaffolding clean using wet methods. • Remove dusty materials from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below

Table 8-11: Dust Mitigation Measures for Medium Risk Sites

Phase	Mitigation Measure
	• Minimise emissions from stockpiles by covering, seeding, fencing, or damping down.
Operating Vehicle/ Machinery and Sustainable Travel	• Enforce an on-site speed limit of 15 mph on surfaced roads and 10 mph on unsurfaced areas. • Ensure vehicles switch off engines when stationary. • Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable. • Produce a Construction Logistics Plan (CLP) to manage the sustainable delivery of goods and materials. • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Operations	• Only undertake cutting, grinding, or sawing equipment with suitable dust suppression equipment or techniques. • Ensure adequate water supply for effective dust and particulate matter suppression. • Use enclosed chutes, conveyors, and covered skips. • Minimise drop heights of materials. • Ensure suitable cleaning material is available at all times to clean up spills.
Waste Management	• Avoid bonfires. • Avoid explosive blasting using appropriate manual or mechanical techniques. • Bag and remove any biological debris.
Measures Specific to Demolition	• Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). • Ensure effective water suppression during demolition. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition.
Measures Specific to Construction	• Ensure aggregates are stored in bunded areas and are not allowed to dry out. • Avoid concrete scabbling where possible. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos. • For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Measures Specific to Trackout	• Use water-assisted dust sweepers to clean access and local roads. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving the site are appropriately covered. • Record inspections of haul roads in site log, including any remedial action taken. • Implement a wheel washing system. • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit. • Access gates to be located at least 10 m from the receptors where possible.
Measures Specific to Earthworks	• Re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil. • Only remove the cover in small areas during work and not all at once.

8.9.10 As per this chapter scale of effects section, the purpose of the demolition and construction stage dust risk assessment is to identify the appropriate level of mitigation to employ and no assessment of the significance of demolition and construction stage effects is made without mitigation in place. With the implementation of the CEMP and CLP (i.e. the measures outlined in Chapter 5: Construction Description), the demolition and construction dust and on-site vehicle emissions effects in the study would be **Temporary, Imperceptible** and **Negative,** i.e. **Not Significant** in terms of EIA.

Operation Effects

Emergency Scenario 1: DUB-13 emergency scenario.

8.9.11 The modelling has been undertaken to determine the DUB-13 emergency operation with a 1% probability of exceeding the 1-hour objective. The detailed results of the dispersion modelling at the sensitive receptors identified in Table 8-6 are shown in Technical Appendix 7.2 in Volume 3.

8.9.12 Table 8-12 shows the results of the modelling for the highest impacted receptor for any of the assessed receptor locations.

Table 8-12: Emergency Scenario 1 DUB-13 Emergency Generators Emergency Operation

Plant	Operating hours for 1% probability of exceeding the 1-hour mean objective
DUB-13 Emergency Generator	62

8.9.13 The DUB-13. Emergency Generators would operate for 62 hours to reach a 1% probability of exceeding the objective the 1-hour mean objective.

8.9.14 Table 8-13 shows the maximum predicted annual mean NO_2 concentrations at the worst-case receptor with the highest predicted concentration for the DUB-13 emergency generator maximum of 62 emergency operation hours. It should be recognised however that it is extremely unlikely that the generators would operate for maximum number of hours determined. It is considered that the predicted impacts are conservative as it would require a loss of grid power to this area of Ireland for approximately 2.6 days in a year.

Table 8-13: Emergency Scenario 1 DUB-13 Emergency Generators Maximum Annual Mean Concentrations for 62 hours Operation

Receptor	Height	NO_2 PC (µg/m³)	PC % AQS	NO_2 Average Background (µg/m³)	Annual Mean PEC (µg/m³)	PEC % AQS
R1 GF	1.5	0.36	0.89	17.4	17.8	44.4
R1 TF	7.5	0.79	1.99	17.4	18.2	45.5
R2 GF	1.5	0.43	1.07	17.4	17.8	44.6
R2 TF	7.5	0.59	1.49	17.4	18.0	45.0
R3 GF	1.5	0.45	1.12	17.4	17.8	44.6
R3 TF	7.5	0.45	1.14	17.4	17.9	44.6
R4 GF	1.5	0.05	0.12	17.4	17.4	43.6
R4 TF	7.5	0.05	0.12	17.4	17.4	43.6
R5 GF	1.5	0.12	0.31	17.4	17.5	43.8
R5 TF	7.5	0.21	0.53	17.4	17.6	44.0
R6	1.5	0.10	0.24	17.4	17.5	43.7
R7	1.5	0.11	0.28	17.4	17.5	43.8
R8	1.5	0.11	0.28	17.4	17.5	43.8

Table 8-13: Emergency Scenario 1 DUB-13 Emergency Generators Maximum Annual Mean Concentrations for 62 hours Operation

Receptor	Height	NO_2 PC (µg/m³)	PC % AQS	NO_2 Average Background (µg/m³)	Annual Mean PEC (µg/m³)	PEC % AQS
R9	1.5	0.01	0.02	17.4	17.4	43.5
R10	1.5	0.01	0.02	17.4	17.4	43.5
R11	1.5	0.01	0.02	17.4	17.4	43.5
R12	1.5	0.01	0.03	17.4	17.4	43.5
R13	1.5	0.01	0.03	17.4	17.4	43.5
R14	1.5	0.01	0.03	17.4	17.4	43.5
R15	1.5	0.02	0.04	17.4	17.4	43.5
R16	1.5	0.02	0.05	17.4	17.4	43.6
R17	1.5	0.02	0.06	17.4	17.4	43.6
R18	1.5	0.03	0.07	17.4	17.4	43.6
R19	1.5	0.04	0.10	17.4	17.4	43.6
R20	1.5	0.04	0.11	17.4	17.4	43.6
R21	1.5	0.04	0.11	17.4	17.4	43.6
R22	1.5	0.04	0.11	17.4	17.4	43.6
R23	1.5	0.04	0.10	17.4	17.4	43.6

GF = Ground Floor exposure
TF = Top floor Exposure

8.9.15 The maximum predicted annual mean PC concentrations occurs at receptor R1, on the top floor. As this property is commercial, annual mean AQS does not apply. The maximum predicted annual mean PC concentration at a residential property occurs at R3 (Top Floor), northeast of site, where the PC is below the maximum allowable PC recommended by EPA AG4 guidance.

8.9.16 The maximum results indicate that the ambient level concentrations due to emissions arising from the emergency scenario would be comfortably below the relevant NO_2 AQS. For the worst-case year modelled, predicted PEC (including background) would be below 75% of the ambient NO_2 annual AQS at all assessed receptors, with maximum PEC predicted at receptor R1 where concentrations would be approximately 45% of the NO_2 annual AQS.

8.9.17 The geographical variation in annual mean NO_2 PC concentrations (without background) resulting from 62 h emergency operation of DUB-13 are shown in Figure 8.3.

8.9.18 The localised air quality effects of the emergency generators are considered **Long-term to Permanent**, **Imperceptible and Neutral**, i.e. **Not Significant** in terms of EIA.

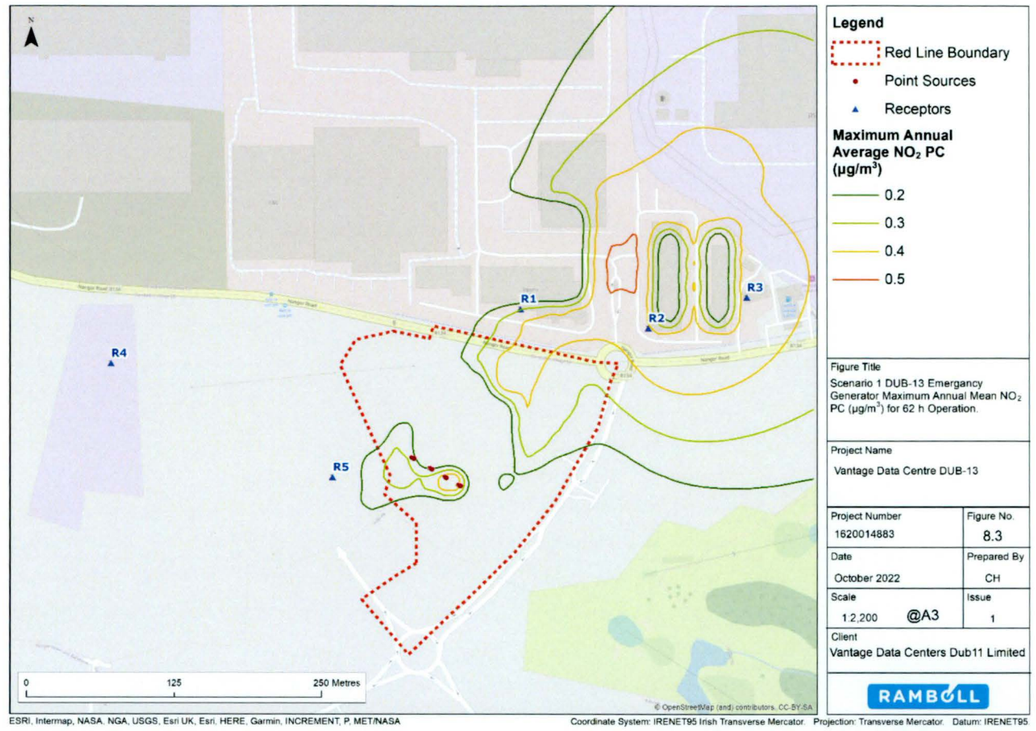

Figure 8-3: Emergency Scenario 1 DUB-13 Emergency Generator Maximum Annual Mean NO_2 PC (µg/m³) for 62 h Operation.

Emergency Scenario 2: DUB-13 and DUB-1 Campus emergency scenario.

8.9.19 The modelling has been undertaken to determine the DUB-13 and DUB-1 combined emergency operation with a 1% probability of exceeding the 1-hour objective. The detailed results of the dispersion modelling at the sensitive receptors identified in Table 8-14 are shown in Technical Appendix 7.2 in Volume 3.

8.9.20 Table 8-14 shows the results of the modelling for the highest impacted receptor for any of the assessed receptor locations.

Table 8-14: Emergency Scenario 2 DUB-13 and DUB-1 Emergency Generators

Plant	Operating hours for 1% probability of exceeding the 1-hour mean objective
DUB-13 and DUB-1 Campus Emergency Generator	29

8.9.21 DUB-13 and DUB-1 Campus Emergency Generators would operate for 29 hours to reach a 1% probability of exceeding the objective the 1-hour mean objective.

8.9.22 Table 8-15 shows the maximum predicted annual mean NO_2 concentrations at the worst-case receptor with the highest predicted concentration for the DUB-13 and DUB-1 Campus emergency generator maximum of 26 emergency operation hours. It should be recognised however that it is unlikely that the generators will be required to operate for maximum number of hours determined. It is considered

that the predicted impacts are conservative as it would require a loss of grid power to this area of Ireland for approximately 1.2 days in a year.

Table 8-15: Emergency Scenario 2 DUB-13 and DUB-1 Campus Emergency Generators Maximum Annual Mean Concentrations for 29 hours Operation

Receptor	Height	NO_2 PC (µg/m³)	PC % AQS	NO_2 Average Background (µg/m³)	Annual Mean PEC (µg/m³)	PEC % AQS
R1 GF	1.5	0.58	1.45	17.4	18.0	45.0
R1 TF	7.5	0.89	2.22	17.4	18.3	45.7
R2 GF	1.5	0.56	1.39	17.4	18.0	44.9
R2 TF	7.5	0.66	1.64	17.4	18.1	45.1
R3 GF	1.5	0.51	1.28	17.4	17.9	44.8
R3 TF	7.5	0.52	1.29	17.4	17.9	44.8
R4 GF	1.5	0.08	0.21	17.4	17.5	43.7
R4 TF	7.5	0.09	0.22	17.4	17.5	43.7
R5 GF	1.5	0.44	1.10	17.4	17.8	44.6
R5 TF	7.5	0.53	1.33	17.4	17.9	44.8
R6	1.5	0.14	0.34	17.4	17.5	43.8
R7	1.5	0.15	0.38	17.4	17.6	43.9
R8	1.5	0.15	0.38	17.4	17.6	43.9
R9	1.5	0.02	0.05	17.4	17.4	43.5
R10	1.5	0.02	0.04	17.4	17.4	43.5
R11	1.5	0.01	0.03	17.4	17.4	43.5
R12	1.5	0.02	0.04	17.4	17.4	43.5
R13	1.5	0.02	0.04	17.4	17.4	43.5
R14	1.5	0.02	0.05	17.4	17.4	43.6
R15	1.5	0.03	0.06	17.4	17.4	43.6
R16	1.5	0.04	0.10	17.4	17.4	43.6
R17	1.5	0.05	0.12	17.4	17.4	43.6
R18	1.5	0.06	0.14	17.4	17.5	43.6
R19	1.5	0.08	0.20	17.4	17.5	43.7
R20	1.5	0.09	0.22	17.4	17.5	43.7
R21	1.5	0.09	0.22	17.4	17.5	43.7
R22	1.5	0.09	0.21	17.4	17.5	43.7
R23	1.5	0.08	0.20	17.4	17.5	43.7

GF = Ground Floor exposure
TF = Top floor Exposure

8.9.23 The maximum predicted annual mean PC concentrations occurs at receptor R1 (Top floor). As this property is commercial, annual mean AQS do not apply. The Maximum predicted annual mean PC concentrations at a residential property occurs at R3 (Top Floor), northeast of site, where the PC is below the maximum allowable PC recommended by EPA AG4 guidance.

8.9.24 The maximum results indicate that the ambient level concentrations due to emissions arising from the emergency scenario would be comfortably below the relevant NO_2 AQS. For the worst-case year modelled, predicted PEC (including background) would be below 75% of the ambient NO_2 annual AQS at all assessed receptors, with maximum PEC predicted at receptor R1 where concentrations would be approximately 45% of the NO_2 annual AQS.

8.9.25 The geographical variation in annual mean NO_2 PC concentrations (without background) resulting from 29 h emergency operation of DUB-13 and DUB-1 Campus emissions are shown in Figure 8.4.

8.9.26 The localised air quality effects of the emergency generators are considered **Long-term to Permanent**, **Neutral** and **Imperceptible**, i.e., **Not Significant** in terms of EIA.

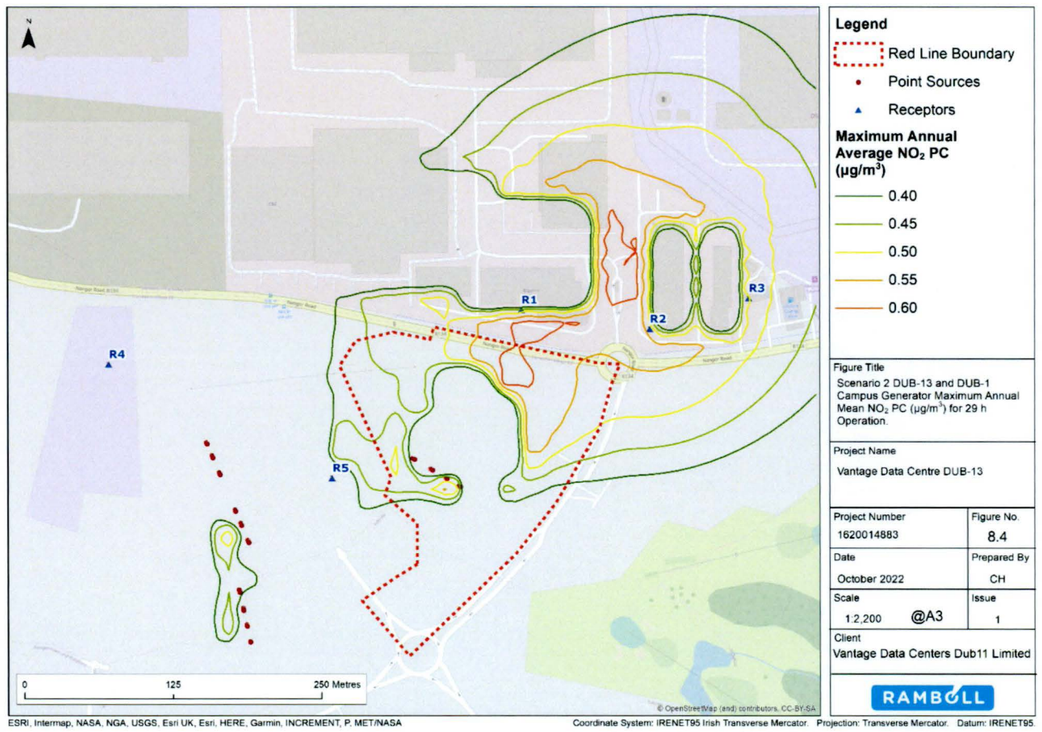

Figure 8-4: Emergency Scenario 2 DUB-13 and DUB-1 Campus Generator Maximum Annual Mean NO_2 PC (µg/m³) for 29 h Operation.

8.10 Additional Mitigation

Demolition and Construction Stage

8.10.1 No significant negative effects are predicted and consequently no additional mitigation is required.

Operation Stage

8.10.2 No significant negative effects are predicted and consequently no additional mitigation is required.

8.11 Enhancement Measures

8.11.1 No enhancement measures are proposed in respect of air quality.

8.12 Assessment of Residual Effects

Construction and Demolition

8.12.1 With the IAQM recommended mitigation measures include within the CEMP, the residual demolition and construction effects remain as reported in the assessment of effects section as being **Temporary, Imperceptible** and **Negative**, i.e. **Not Significant** in terms of EIA.

Operation Residual Effects

8.12.2 As no additional mitigation would be required, the residual operation effects of Emergency Scenario 1, DUB-13 emergency generators remain as reported in the assessment of effects section, **Long-term** to **Permanent**, **Neutral** and **Imperceptible**, i.e. **Not Significant** in terms of EIA.

8.12.3 As no additional mitigation would be required, the residual operation effects of Emergency Scenario 2, DUB-1 Campus and DUB-13 emergency generators remain as reported in the assessment of effects section, **Long-term** to **Permanent**, **Neutral** and **Imperceptible**, i.e. **Not Significant** in terms of EIA.

8.12.4 As no additional mitigation would be required, the residual operation effects remain as reported in the assessment of effects section.

Summary of Residual Effects

8.12.5 Table 8-16 provides a summary of the outcomes of the air quality assessment of the proposed development. Where significant positive effects are likely these are highlighted in bold green and where significant negative effects are predicted these are highlighted in bold red.

Table 8-16: Summary of Residual Effects

Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
				+ -	L U	D I	R IR	M B T St Mt Lt P**
Demolition and Enabling Works								
Existing Off-site Human Health and Amenity	Dust Soiling and PM_{10} due to demolition and construction works	None required	Imperceptible (not significant)	-	L	D	R	T
Existing Off-site Human Health	Change in NO_2, PM_{10} and $PM_{2.5}$ levels due to vehicle emissions	None required	Imperceptible (not significant)	-	L	D	R	T
Operation								
Existing Off-site Human Health	Change in NO_2, PM_{10} and $PM_{2.5}$ levels due to vehicle emissions	None required	Not significant	-	L	D	IR	Lt to P
Existing Off-site Human Health	Change in NO_2 levels due to DUB-13 emergency generators	None required	Imperceptible (not significant)	-	L	D	IR	Lt to P
Existing Off-site Human Health	Change in NO_2 levels due to DUB-13 and DUB-1 campus emergency generators	None required	Imperceptible (not significant)	-	L	D	IR	Lt to P

Notes:

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

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

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

8.13 Cumulative Effects

Intra-Project Effects

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

Inter-Project Effects

8.13.2 A review of potential cumulative schemes has been undertaken as listed in Chapter 1: Introduction and Chapter 2: EIA Process and Methodology.

8.13.3 The demolition and construction stage cumulative effects exercise has been undertaken for cumulative schemes within 350 m of the proposed development as demolition and construction stage effects of cumulative schemes beyond 350 m are not expected to combine with the demolition and construction effects of the proposed development according to IAQM guidance.

8.13.4 Table 8-17 provides a summary of the likely inter-project cumulative effects resulting from the proposed development and the cumulative developments.

Table 8-17: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Microsoft - Grange Castle Business Park, Nangor Road, Clondalkin, Dublin 22 [SD20A/0283]	No	Development constructed.	No	Microsoft application assessed the NO_2 Impacts for the continuous operation of gas generators, and backup generators. Emissions are unlikely to overlap with proposed development emergency generator emissions.

Table 8-17: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
				Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
UBC Properties - Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 [SD20A/0121]	No	Development located to the west beyond 350m of the site.	No	UBC properties Townlands only assessed emergency point generator emissions. Emissions are unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
UBC Properties - Grange Castle South Business Park, Dublin 22 [An Bord Pleanála Reference – 308585]	No	Scheme located west of the site at the edge of the 350m distance considered. Scheme anticipated to employ dust mitigation techniques as the proposed development.	No	There are no significant emission sources associated with UBC Properties Grange castle. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
Digital Reality Trust - Profile Park, Baldonnel, Dublin 22, D22 TY06 [SD17A/0377]	No	Development located beyond the 350m of the site and constructed.	No	Digital Reality Trust only assessed emissions from emergency point generators. Emissions are unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances

Table 8-17: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
				(except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
Cyrus One - Grange Castle Business Park, Clondalkin, Dublin 22 [SD18A/0134]	No	Development located to the west beyond the 350m of the site.	No	Cyrus One, Grange Castle only assessed emissions from emergency point generators. Emissions are unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
Cyrus One Townlands within Grange Castle South Business Park, Baldonnel, Dublin 22 [SD20A/0295]	No	Development located to the west beyond the 350m of the site.	No	Cyrus One, Townlands only assessed emissions from emergency point generators. Emissions are unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
Cyrus One - Grange Castle South Business Park, Baldonnel, Dublin 22 [An Bord Pleanála Ref - 309146]	No	Development located to the west beyond the 350m of the site.	No	There are no significant emission sources associated with Cyrus One, Grange castle. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be

Table 8-17: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
				expected to be in operation on a day-to-day basis.
Centrica Business Solutions – Profile Park, Baldonnel, Dublin 22 [SD21A/0167]	Yes	Development located immediately to the south of the site. There will be a potential for overlap with the site's development works. Scheme anticipated to employ dust mitigation techniques as the proposed development.	No	Centrica day-to-day basis gas fired power plant emissions unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
Equinix (Ireland) Ltd – Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22 [SD21A/0186]	Yes	Development located immediately to the east of the site. There will be a potential for overlap with the site's development works. Scheme anticipated to employ dust mitigation techniques as the proposed development.	No	Equinix, Plot 100, only assessed emissions from emergency point generators. Emissions are unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
Equinix (Ireland) Ltd – Plot 100, Profile Park, Nangor Road, Clondalkin, Dublin 22 [SD22A/0156]	Yes	Development located immediately to the east of the site. There will be a potential for overlap with the site's development works. Scheme anticipated to employ dust mitigation techniques as the proposed development.	No	Equinix, Plot 100, only assessed emissions from emergency point generators. Emissions are unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis

Table 8-17: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Operation	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Digital Netherlands VIII B.V - Profile Park, Nangor Road, Clondalkin, Dublin 22 [SD21A/0217]	Yes	Development located to the south in within the 350m distanced considered. Scheme anticipated to employ dust mitigation techniques as the proposed development.	No	Digital Netherlands day-to-day basis gas fired power plant emissions and emergency generators are unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.
Vantage Data Centers Dub 11 Limited - Profile Park Business Park and partly within Grange Castle Business Park, Dublin 22 [An Bord Pleanála Ref - 312793]	No	Development located immediately to the south of the site. There will be a potential for overlap with the site's development works. Scheme anticipated to employ dust mitigation techniques as the proposed development.	No	Vantage Data centres, only assessed emissions from emergency point generators. Emissions are unlikely to overlap with proposed development emergency generator emissions. Proposed development emergency only emission points would operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis.

Demolition and Construction Cumulative Effects

8.13.5 Demolition and construction significant cumulative effects are unlikely to occur as the Equinix and Centrica Business Solutions development are anticipated to employ similar dust mitigation techniques such that the individual construction stage effects are not significant, alone or in combination.

Operation Cumulative Effects

8.13.6 Nearby data centres with emergency emission points would only operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis. The emergency generators emission points associated with the nearby data storage facilities are unlikely to cause a significant cumulative impact.

8.14 Summary of Assessment

Background

8.14.1 This chapter has detailed the potential air quality effects due to the construction and operation stages of the proposed development. The assessment of construction and operation stages has been undertaken considering the relevant national and local guidance and regulations. Potential sources of emissions have been identified and assessed in the context of existing air quality and the nature and location of receptors.

8.14.2 The main air pollutants of concern are dust and particulate matter with an aerodynamic diameter of less than 10 microgram (PM_{10}), typically generated during demolition and construction activities and nitrogen dioxide (NO_2), typically generated by road traffic and combustion engines.

8.14.3 Air quality monitoring data was obtained from the EPA monitoring stations to establish the status of existing air quality. The data was used as the basis for air quality modelling and predictions.

8.14.4 NO_2 concentrations at the site and within the study area would be expected to be similar to measured concentrations at the closest monitoring sites and therefore likely to comfortably meet the relevant air quality standards.

Demolition and Construction Effects

8.14.5 During the demolition and construction works, there is the potential for vehicle emissions and dust emissions to arise at existing off-site human health receptors, as well as a loss of amenity at nearby existing residential and commercial properties.

8.14.6 The predicted annual average demolition and construction traffic flows are not expected to exceed the Institute of Air Quality Management (IAQM) guidance threshold such as to require formal assessment. In addition, traffic flows would be controlled through the implementation of the Construction Environmental Management Plan (CEMP). The effects of demolition and construction related traffic emissions would be temporary and not of a scale that would give rise to significant effects.

8.14.7 Based on criteria set out in the IAQM guidance, the construction works would present a medium risk of from dust impacts in the absence of appropriate mitigation. With the implementation of suitable mitigation measures, already incorporated within the proposed development's CEMP, it is anticipated that dust effects could be mitigated to at worst result in temporary negative, but not significant, effects at existing off-site receptors.

8.14.8 Overall, the demolition of existing buildings on the site and construction of the proposed development would result in an imperceptible effect on air quality and identified receptors, and as such would not give rise to significant negative effects on air quality in terms of EIA.

Operational Effects

8.14.9 The predicted annual average completed development traffic flows are not expected to exceed the Institute of Air Quality Management (IAQM) guidance threshold such as to require formal assessment. The effects of operation stage related traffic emissions would be long-term and not of a scale that would give rise to significant effects.

8.14.10 Concentrations of NO_2 have been predicted for several worst-case locations representing existing sensitive receptors in the study area.

8.14.11 The potential impact to air quality during the operation stage of the proposed development is a breach of the ambient air quality standards because of air emissions from the proposed development emergency engines. The modelled predicted concentrations are below the relevant standards at all the existing receptor locations for the operation stages.

8.14.12 It is considered that the operation of the proposed development emergency generators would result in an imperceptible effect on air quality and identified receptor that is **Not Significant** in terms of EIA.

Cumulative Effects

8.14.13 Demolition and construction stages of approved cumulative schemes within 350 m of the proposed development are not expected to combine with the demolition and construction stage of the proposed development. Significant cumulative effects are unlikely to occur as each scheme is anticipated to employ similar dust mitigation techniques such that the individual construction stage effects are not significant, alone or in combination.

8.14.14 The cumulative for emergency only emission points from other data centres which would only operate under exceptional circumstances (except for testing purposes) and therefore would not be expected to be in operation on a day-to-day basis. i.e. **Not Significant** in terms of EIA.

8.14.15 Overall, no significant long term cumulative effects on air quality are anticipated as a result of the operation of the proposed development.

9 NOISE AND VIBRATION

9.1 Introduction

9.1.1 This chapter of the EIAR reports on the likely significant noise and vibration effects to arise from the demolition and construction stage and the operation stage of the proposed development.

9.1.2 The chapter describes the noise and vibration policy context; the methods used to assess the potential impacts and likely effects; the baseline conditions at and surrounding the site; the likely noise and vibration effects taking into consideration embedded mitigation; the need for additional mitigation and enhancement; the significance of residual effects; and cumulative effects.

9.1.3 This chapter is supported by the following technical appendices in EIAR Volume 3:

- Technical Appendix 9.1: Acoustic Terminology; and
- Technical Appendix 9.2: Construction Noise Calculations.

9.1.4 The assessment has been informed by the following legislation, policies, and published guidance:

- International Legislation:
  - EU Directive 2002/49/EC[1]
- National Legislation and Policy:
  - Environmental Noise Regulations, SI number 140 of 2006[2]
  - Environmental Protection Agency Act 1992[3]
  - The National Climate Action Plan 2021[4]
- Regional & Local Policy:
  - Dublin Agglomeration Environmental Noise Action Plan December 2018 – July 2023[5]
- Guidance and Industry Standards:
  - EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)[6], which refers to the following British Standards:
  - BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites[7]; and
  - BS 4142:2014+A1 2019 for industrial and commercial noise[8].

9.2 Assessment Scope

Technical Scope

9.2.1 The technical scope of the assessment has considered the following:

- Demolition and construction noise from works being undertaken;
- Demolition and construction road traffic noise;
- Demolition and construction vibration; and
- Operational noise from plant.

9.2.2 In the context of this assessment, noise is defined as unwanted or undesirable sound derived from sources such as construction activities, road traffic, and building services plant. Vibration is defined as perceptible oscillations or ground and building structure transmitted from sources such as construction plant.

Effects Scoped Out

9.2.3 An assessment of the likelihood for building damage due to demolition and construction vibration has not been provided, as the generated vibration levels from demolition and construction works are not expected to be high at the assessed receptor locations, due to the proximity of the receptors to the site.

9.2.4 This magnitude of vibration is not considered likely as a result of the proposed construction activities being undertaken, and therefore an assessment of building damage has not been undertaken

9.2.5 There are no predicted significant road traffic noise, or operational vibration effects associated with the operational phase of the proposed development, therefore these elements have been scoped out of the noise and vibration assessment.

Spatial Scope

9.2.6 The study area incorporates the site and existing noise-sensitive receptors (NSR) at up to approximately 690 m from the nearest site boundary. This area encompasses the NSRs. NSRs beyond this distance are not expected to be affected by the demolition and construction or operation of the proposed development.

9.2.7 For the purposes of demolition and construction and operational noise and demolition and construction vibration impact assessments, a number of NSRs have been identified from site investigations, satellite imagery and the proposed development plans. These NSRs are considered to represent a worst case, such that other receptors located at greater distances from the site would not experience greater noise and vibration impacts.

9.2.8 The existing NSRs identified as sensitive to the proposed development, and which have been 'scoped-in' to the assessment are summarised in Table 9-1 and Figure 9-1.

Table 9-1: Summary of Sensitive Receptors

Receptor reference	Receptor	Type of Receptor	Approximate Distance from nearest proposed development phase	Sensitivity
NSR1	Office buildings on Nangor Road	Office, commercial	40 m	Medium
NSR2	Residential buildings at Nangor Lea, Nangor Road	Residential	120 m	High

[1] Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise - Declaration by the Commission in the Conciliation Committee on the Directive relating to the assessment and management of environmental noise
[2] Irish Statutory Instrument (S.I.) No. 140/2006 - Environmental Noise Regulations 2006
[3] Irish Environmental Protection Agency Act, 1992.
[4] Government of Ireland, 2021. Climate Action Plan. Department of the Environment, Climate and Communications
[5] Dublin Agglomeration Noise Action Plan 2018-2023(NAP) Relating to The Assessment and Management of Environmental Noise
[6] Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4, January 2016). EPA.
[7] British Standards Institute, 2009 + A1 2014. British Standard BS 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites. BSI
[8] British Standards Institute, 2014 + A1 2019. British Standard BS 4142: Methods for rating and assessing industrial and commercial sound. BSI

Table 9-1: Summary of Sensitive Receptors				
NSR3	Detached house off Baldonnel Rd to south west of site	Residential	690 m	High
NSR4	Detached house off Baldonnel Rd to south of site, outside the department of defence.	Residential	535 m	High
NSR5	Houses located south of Baldonnel Rd	Residential	680 m	High

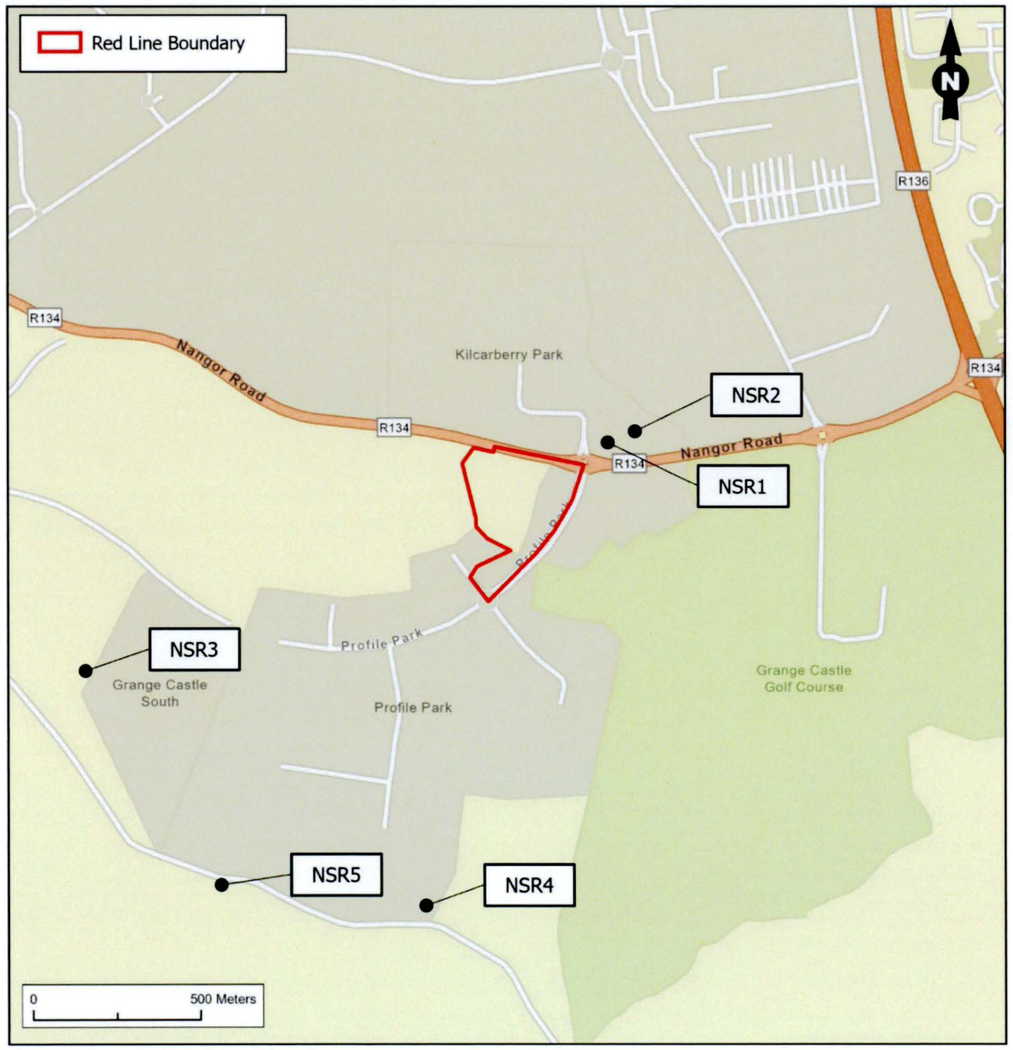

Figure 9-1: Noise Sensitive Receptor Locations

9.2.9 No identified NSRs have been scoped out of the assessment.

Temporal Scope

9.2.10 In line with EPA guidance, as outline in EIAR Chapter 2: EIA Process and Methodology of this EIAR Volume, the assessment has considered impacts arising during the demolition and construction stage (11 months) which would be expected to be temporary (less than a year) in nature and from the operation stage which would be expected to be long-term (15 to 60 years) to permanent (> 60 years).

9.2.11 In addition to assessing the effects of the proposed development, the assessment contained in this chapter would consider the effects of the proposed development over that of the consented DUB-1 campus (which is assessed as the future baseline). The assessment scenarios that were adopted for the July 2022 DUB-1 permitted development, and how these have been applied for the proposed development, are detailed in Table 9-2. Further information on the linkages between the proposed development and the July 2022 DUB-1 permitted development are described in Chapter 4: Proposed Development Description.

Table 9-2: Noise Modelling Scenarios used for DUB-1		
Assessment Scenarios described in the EIAR for the July 2022 DUB-1 permitted development		**Proposed Development EIAR Scenarios**
Scenario 1 (~from Q4 2023 to Q1 2025)	• DUB 11 powered by northern block of MFGP using HVO as the fuel source. • MFGP running 24/7. • Emergency scenario below applies if the MFGP fails.	Not relevant as the proposed development would become operational in 2025.
Scenario 2 (reasonable worst case from Q1 2025)	• DUB 11 and 12 powered from the EirGrid connection across Falcon Avenue. • MFGP powered by gas from GNI. In a reasonable worst case this is assessed to be operational 24/7 using natural gas. • Emergency scenario below applies if the gas connection from GNI to the MFGP fails and there is a local grid network failure from EirGrid.	Would form the operation assessment scenarios for the proposed development with the emissions from proposed development assessed against these future baseline scenarios.
Scenario 3 (reasonable best case from Q1 2025)	• DUB 11 and 12 powered from the EirGrid connection across Falcon Avenue • MFGP not in operation. • Emergency scenario below applies if there is a local grid network failure from EirGrid.	
Emergency Scenario	• Diesel used for day tanks for emergency backup generators for the data center in the unlikely event of an outage of the MFGP and grid connection (depending on scenario). MFGP and emergency generators would not be operational at the same time.	Would form the emergency scenario for the proposed development.

9.2.12 The scenarios described in Table 9-2 establish the future baseline for the proposed development associated with the operation of the July 2022 DUB-1 permitted development. Table 9-3 outlines the operational scenarios for the proposed development which would be used in the noise modelling of the proposed development for the operation assessment of effects.

Table 9-3: Operational Noise Assessment Scenarios	
Scenario 1 (reasonable worst case)	• Proposed Development powered from the EirGrid connection through wider DUB-1 campus. • MFGP on wider DUB-1 campus powered by gas from GNI. In a reasonable worst case this is assessed to be operational 24/7 using natural gas. • Emergency scenario below applies if the gas connection from GNI to the MFGP fails and there is a local grid network failure from EirGrid.
Scenario 2 (reasonable best case)	• Proposed Development powered from the EirGrid connection through wider DUB-1 campus. • MFGP on wider DUB-1 campus not in operation. • Emergency scenario below applies if there is a local grid network failure from EirGrid.
Emergency Scenario	• Diesel used for day tanks for emergency backup generators for the data center in the unlikely event of an outage of the MFGP and grid connection (depending on scenario). MFGP and emergency generators would not be operational at the same time.

9.2.13 The operational assessment presents the predicted operational noise levels for:

- Scenario 1: worst-case operation of the proposed development, with the impact of the proposed development assessed as a contribution to noise generated by the campus as whole, including the July 2022 DUB-1 permitted development;
- Operational Scenario 2: best-case operation of the proposed development, with the impact of the proposed development assessed as a contribution to noise generated by the campus as whole, including the July 2022 DUB-1 permitted development; and
- Scenario 3: emergency operation of the proposed development, with the impact of the proposed development assessed as a contribution to noise generated by the campus as whole, including the July 2022 DUB-1 permitted development.

9.2.14 The operational results are compared to the future baseline noise levels with the July 2022 DUB-1 permitted development operational.

9.2.15 The effects are described against the noise emission limits and the contribution of the proposed development to the future baseline noise levels with the July 2022 DUB-1 permitted development operational.

9.2.16 The existing and future baseline conditions have been characterised by means of desk studies, site visits, surveys and modelling, as described in the following sections.

9.3 Baseline Characterisation Method

Desk Study

9.3.1 In order to establish the existing baseline noise conditions in the study area, relevant data was reviewed and assessed. The data sets and associated sources can be summarised as follows:

- Noise prediction modelling of the July 2022 DUB-1 permitted development to establish the future baseline;
- Other previous planning applications in the public domain (planning portal);
- Satellite imagery (Google Maps);
- Architectural Drawings, Sections, Elevations of the proposed development; and
- Manufacturer supplied noise data for proposed plant installations associated with both the July 2022 DUB-1 permitted development and proposed development.

9.3.2 The operational results are compared to the future baseline noise levels with the July 2022 DUB-1 permitted development operational and the representative background noise levels from the Field Study.

9.3.3 It is not possible to accurately calculate the future baseline noise levels by combining the typical measured background noise levels with the predicted specific noise levels from the operation of the July 2022 DUB-1 permitted development. Therefore, it has been deemed appropriate to compare the rating noise levels of the proposed development with the contribution of the July 2022 DUB-1 permitted development, to the representative background noise levels as measured during the baseline noise survey (field Study), as the findings of the July 2022 DUB-1 permitted development assessment found that the DUB-1 operation was not expected to significantly affect the background noise levels at the NSRs.

9.3.4 Therefore, the noise impact of the proposed development has been assessed against the background noise levels without the contribution of the July 2022 DUB-1 permitted development and has been compared to the predicted rating noise levels with the July 2022 DUB-1 permitted development in operation, to calculate the difference between the rating noise levels of the proposed development and the July 2022 DUB-1 permitted development.

9.3.5 The noise impact of the proposed development has been compared to the predicted rating noise levels with DUB-1 in operation, to calculate the significance of effects for the difference between the rating noise levels of the proposed development and DUB-1. This is to enable the assessment of effects from the proposed development based on its contribution to the campus wide rating noise levels i.e. additional noise created by the proposed development further to the noise level ratings already consented as part of the July 2022 DUB-1 permitted development.

Field Study

9.3.6 The existing noise environment was characterised by baseline noise surveys to inform the assessment of the July 2022 DUB-1 permitted development. These were taken in and around the DUB-1 permitted development site to quantify the prevailing ambient and background noise levels during the daytime and night-time periods.

9.3.7 The results from the baseline noise survey of the July 2022 DUB-1 permitted development are deemed representative of the NSRs assessed for the proposed development. Therefore, no additional noise surveys have been completed.

9.3.8 The ambient and background noise levels have been used to inform the assessment criteria for plant noise emissions, building envelope and ventilation strategies and demolition and construction noise effects.

9.3.9 The surveys were taken outside of Covid-19 lockdown measures. However, the noise levels measured on site may have been lower due to reduced traffic levels. This is not considered to affect the assessments because the use of lower background levels would form a worst-case in terms of settling plant noise emission limits.

9.3.10 Attended and unattended measurements have identified the major noise sources around the site. The locations of noise measurements are detailed in Figure 9-1. Long term (LT) positions were unattended monitoring positions. Short term (ST) positions were attended monitoring positions.

9.3.11 At each measurement location, a comprehensive suite of noise level metrics was recorded. The following noise level indices are relevant to this assessment:

- $L_{Aeq,T}$ The A-weighted equivalent continuous noise level over the measurement period;
- $L_{A90,T}$ The A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe background noise.

9.3.12 Vibration surveys were not undertaken as there are no active rail links or considerable vibration generating sources within 100 m.

9.3.13 For the assessment of the proposed development, monitoring location LT1 is deemed to be representative of the noise climate at NSRs 1 and 2 as the dominant noise source was road traffic noise