5 POPULATION AND HUMAN HEALTH

5.1 Introduction

This Chapter of the EIAR has been prepared by Stephen Little and Associates, Chartered Town Planners and Development Consultants to assess the likely impacts associated with Population and Human Health during the construction and operational phases of the proposed residential development at Woodbrook, Shankill, County Dublin.

The proposed development will consist of 685no. residential units, ancillary uses a temporary surface car park and 2no. replacement golf holes, and all associated ancillary site development works including road and water services infrastructure, green infrastructure networks and amenity open spaces, all on a site of approximately 21.9 Ha.

In accordance with the Draft EPA EIAR Report Guidance (2017), this chapter has considered that:

> *"In an EIAR the assessment of impacts on population and human health should refer to the assessment of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under environmental factors of air, water soil etc"*.

The Guidelines also note: -

> *"The legislation does not generally require assessment of land-use planning, demographic issues or details socio-economic analysis. Coverage of these can be provided in a separated Planning Application Report to accompany an application for planning permission*"

The environmental aspects examined in this Chapter include the following: -

- Chapter 9: Climate (Air Quality and Climate Change).
- Chapter 12: Air (Noise and Vibration).
- Chapter 13: Landscape and Visual Impact.
- Chapter 14: Material Assets (Transportation).

Where these environmental aspects have been assessed in further detail elsewhere in this EIAR, reference has been made within this chapter.

5.2 Assessment Methodology

The effects of the proposed development on Population and Human Health are analysed in compliance with the requirements of the Draft EPA "Guidelines on Information to be Contained in Environmental Impact Assessment Reports" (2017).

This assessment is conducted by reviewing the existing health status in the areas close to the proposed development as well as the country as a whole. The proposed development site is wholly within the Shankill – Shanganagh Electoral Division (ED).

5.3 Receiving Environment

The proposed development is located in the townlands of Cork Little and Shanganagh. It is noted that the proposed residential development is fully within the Cork Little townland, with only the proposed golf holes in the Shanganagh townland. As such, for the purposes of this EIAR Chapter, the focus will be on the Cork Little townland only.

Given the nature of the proposed development of 685no. housing units on a greenfield site, it is considered that the key study areas for the purpose of the study are the 'Local Area' (Shankill-Shanganagh ED) and the 'County Area' (Dun Laoghaire Rathdown County Council Administrative Area).

5.3.1 County Area

The subject site is located at the southern end of Dun Laoghaire Rathdown County administrative area, as shown on Figure 5.1. Dun Laoghaire Rathdown County is largely urbanised except for an area of the Dublin mountains to the south. The County borders Dublin City Council jurisdiction to the north, South Dublin County Council to the west and Wicklow County Council to the south.

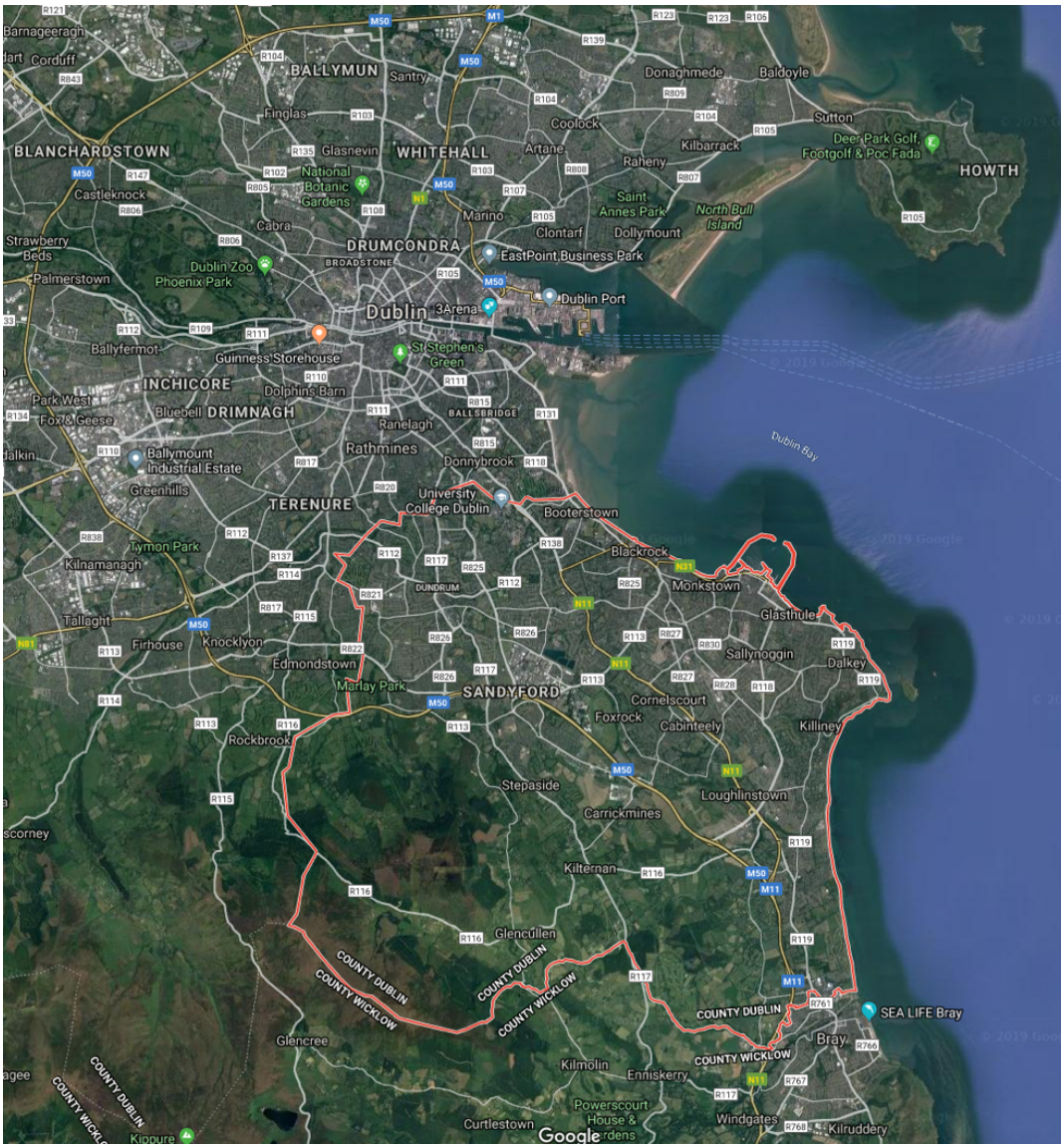

Figure 5.1: Dun Laoghaire-Rathdown County Council Administrative Boundary Outlined in Red (Source: Google Maps)

5.3.2 Local Area

The overall development lands at Woodbrook, Shankill, Co. Dublin are zoned Objective A1 "*to provide for new residential communities in accordance with approved local area plans.*"

The overall development lands at Woodbrook, Shankill are generally delineated by the Old Dublin Road (R119) to the west, the DART line and Woodbrook Golf Course to the east; Shanganagh Public Park and Cemetery to the north and; mixed woodlands containing residential estates to the south. As such, the subject site represents a distinct 'parcel' of zoned land located in a green belt area with existing access routes (road and DART) generally running along its western and eastern boundaries. The site has frontage facing onto the Old Dublin Road amounting to approximately 300m.

The site itself comprises of four large open fields surrounded by mature hedgerows and trees and also part of the Woodbrook Golf Course, namely that part occupied by the 2nd hole green and fairway. There are no structures on site, but a number of sites in the neighbouring vicinity are 'protected structures' including an ecclesiastical structure adjacent to the northwest of the site, namely St. James' Church.

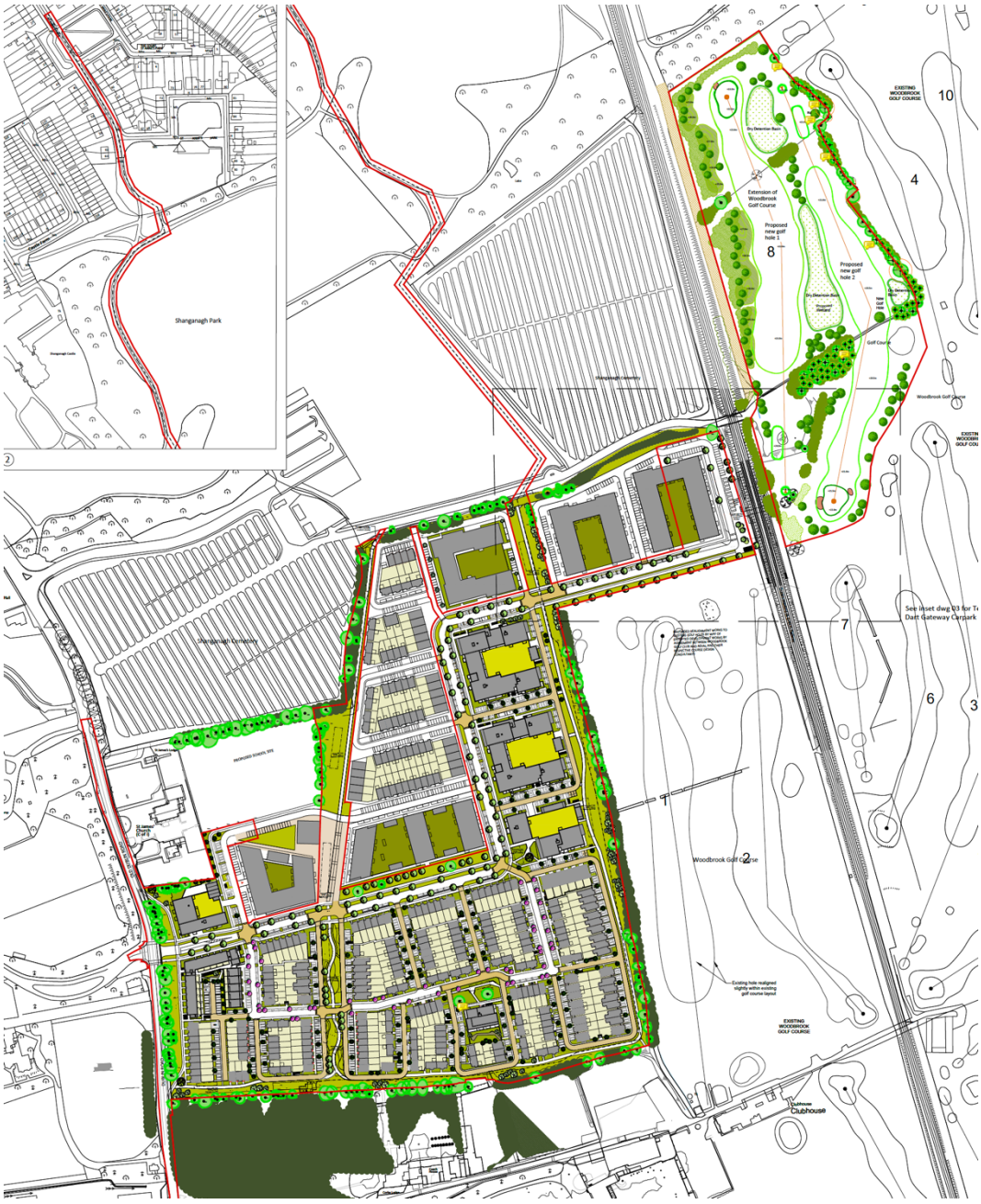

Figure 5.2: Proposed Woodbrook Masterplan.

The immediate surrounding area is currently characterised by open fields with dispersed large dwellings situated on large plots, sandwiched between two expansive urban areas. There are a number of golf courses and links in the area reflecting the open nature of the area, including Woodbrook Golf Course located directly to the east of the site along the coastline of the Irish Sea.

As regards public transport, the DART line passes along the eastern boundary of the site, with Shankill and Bray DART stations located 1.75km equidistant from the site to the north and south respectively. It is proposed in the SHD Planning Application to support the future provision of a new DART station by delivering 'Woodbrook Avenue', which will be the main route through the development. The future DART Station will be subject to a separate Planning Application by Irish Rail / National Transport Authority. The Number 45, 45A, 58X and 84 buses currently connect the site with Shankill and Bray.

5.3.3 Existing Health Status in Ireland

The Department of Health's report 'Health in Ireland Key Trends 2018' (Department of Health, 2018) provides statistical analysis on health in Ireland over the last 10no. years. Chapters 1 and 2 of the report deal specifically with Life Expectancy and Health.

Life expectancy data shows that there has been a continual upward trend for women since 1996 currently standing at 83.6 years. Male life expectancy has shown a continual rise since 2006. It is also noted in the report that the gap between male and female life expectancy has continued to narrow over the last decade (see Figure 5.3). Overall life expectancy has increased by c. 27.2% at age 75 since 1996. An upward trend is evident in the life expectancy of older age groups reflecting decreasing mortality rates from major diseases. Older Irish people's life expectancy (65 years of age) to be lived in good health, is higher for both men and women compared with the EU average.

Overall improvements in mortality rates and relatively high levels of self-rated health can mask variations between religions, age groups and other population subgroups.

The report also states that "Ireland has the highest self-perceived status in the EU, with 83% of people rating their health as good or very good". Overall population health at the national level shows decreasing mortality and a rise in life expectancy over the last ten years. The health in Ireland report also goes on to state;

Age-standardised death rates for cancers and circulatory system diseases, the major causes of deaths in Ireland, have declined by 11% and 32% respectively over the past ten years" (Ref Figure 5.3 below).

The number of transport accident mortality have fallen by 43.4%, infant mortality by 38.7% and suicide rates by 22.5% nationally between the years of 2007-2017.

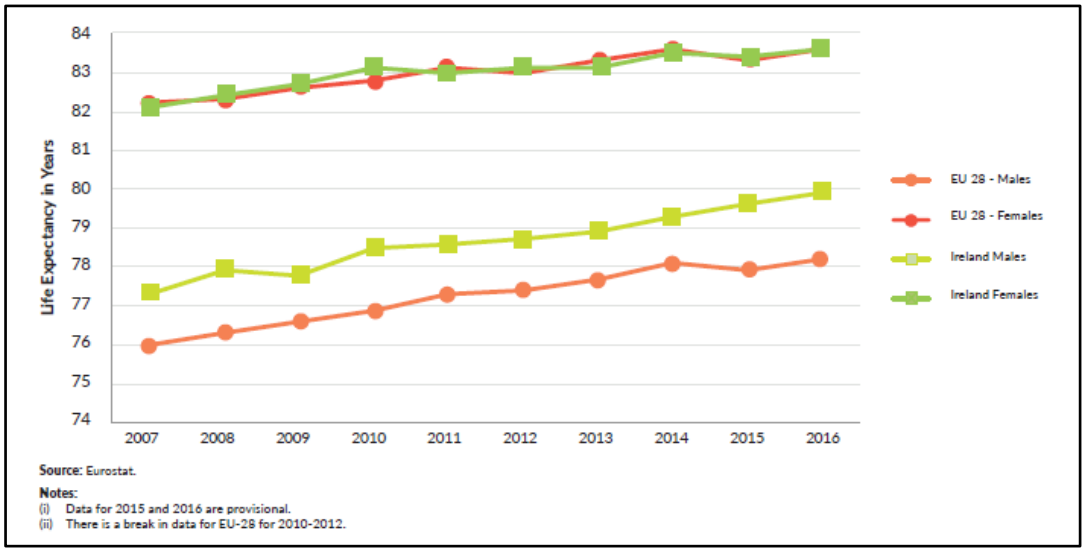

Figure 5.3: Life Expectancy at Birth, Ireland and EU-28 by Gender (Department of Health, 2018).

Figure 5.4 shows the principal causes of death and infant mortality rate: number and age standardised death rates per 100,000 population, 2008-2017.

		2008	2012	2016	2017(p)	% change 2008-2017	% change 2016-2017
All Causes	Number	28,274	29,186	30,667	30,484	7.8	-0.6
	Rate	1125.0	1048.5	994.3	957.3	-14.9	-3.7
Diseases of the circulatory system							
All Circulatory System Diseases:	Number	9,956	9,480	9,237	8,927	-10.3	-3.4
	Rate	426.8	360.5	313.6	292.3	-31.5	-6.8
Ischaemic Heart Disease:	Number	5,185	4,758	4,449	4,238	-18.3	-4.7
	Rate	218.9	178.2	148.0	135.9	-37.9	-8.2
Stroke:	Number	2,142	1,935	1,830	1,710	-20.2	-6.6
	Rate	93.5	75.2	63.2	56.7	-39.4	-10.3
Cancer							
All Malignant Neoplasms:	Number	8,199	8,571	9,171	9,175	11.9	0.0
	Rate	306.2	290.1	279.7	271.7	-11.3	-2.9
Cancer of the Trachea, Bronchus and Lung:	Number	1,681	1,801	1,911	1,926	14.6	0.8
	Rate	62.2	60.6	57.6	56.7	-8.8	-1.6
Cancer of the Female Breast:	Number	736	689	755	752	2.2	-0.4
	Rate	46.8	40.2	40.7	39.3	-15.9	-3.4
Diseases of the Respiratory system*							
All Respiratory System Diseases:	Number	3,522	3,497	3,935	4,079	15.8	3.7
	Rate	156.4	137.6	135.8	136.7	-12.6	0.7
Chronic Lower Respiratory Disease	Number	1,365	1,587	1,712	1,610	17.9	-6.0
	Rate	57.3	59.8	57.3	52.3	-8.7	-8.6
Pneumonia	Number	1,356	1,086	1,086	1,109	-18.2	2.1
	Rate	63.9	45.8	39.9	39.1	-38.7	-1.8
External causes of injury and poisoning							
All Deaths from External Causes:	Number	1,721	1,577	1,323	1,315	-23.6	-0.6
	Rate	46.6	40.9	33.0	32.5	-30.1	-1.4
Transport Accidents:	Number	256	162	145	145	-43.4	0.0
	Rate	6.2	3.9	3.5	3.4	-44.5	-1.7
Suicide:	Number	506	541	437	392	-22.5	-10.3
	Rate	11.3	12.1	9.5	8.4	-26.0	-11.2
Infant deaths							
Infant Mortality Rate (per 1,000 live births)	Number	284	237	194	174	-38.7	-10.3
	Rate	3.8	3.3	3.0	2.8	-25.9	-6.7

Source: Central Statistics Office, Public Health Information System (PHIS) - Department of Health.

Notes:

(i) (p) The figures for 2017 are provisional. They should be treated with caution as they refer to deaths registered in these years and may be incomplete.

(ii) The rates provided in the table are age-standardised to the European standard population and are presented as rates per 100,000 population except for infant mortality rates which are expressed as deaths per 1,000 live births

(iii) *Excludes cancer of the trachea, bronchus and lung.

Figure 5.4: Principal Causes of Death and Infant Mortality Rate: Numbers and Age Standardised Death Rates Per 100,000 population 2008 to 2017 (Department of Health, 2017).

5.3.4 Existing Health Status – Local

Table 5.1 below shows the percentage of population who stated their health was bad or very bad for Shankill-Shanganagh DED.

District Electoral Division	Code	% of the population who stated their health was bad or very bad - 2016
Shankill – Shanganagh	05062	1.0%

Table 5.1: Percentage of Population Stating Health Bad or Very Bad 2016.

The results of the Census in 2016 reported that the vast majority of people in Dun Laoghaire-Rathdown (89.9%) reported that their health was good and very good, 1.2% reported bad or very bad health.

5.3.5 Population

The resident population is described as the population who would live in a given area. While the proposed facility and associated public realm, works will be accessible to the general public, the local population is likely to be most acutely affected by the proposed development. The likely effects on population beyond the local study area are likely to be less acute or tangible.

Dun Laoghaire-Rathdown is situated entirely within Dublin County and by extension, Dublin City. Dublin City is the Capital of the Republic of Ireland and has been the focus of economic expansion and consequential growth in residential population for the past two decades.

Table 5.2 below shows the population changes between the overall period from 2002 to 2016 at local, county and state level. This period is considered appropriate for this study as it covers an era of national economic growth, decline and recovery.

	2002	2006	% Change 02 – 06	2011	% Change 06 – 11	2016	% Change 11 – 16	% change 02 – 16
State	3,917,203	4,239,848	8.2	4,588,252	8.2	4,761,865	3.8	21.6
DLRC	191,792	194,038	1.2	206,262	6.3	218,018	5.7	13.7
Shankill-Shanganagh (ED)	5,322	5,295	-0.5	5,334	0.7	5,488	2.9	3.1

Table 5.2: Population changes at State, County and Local Level.

Table 5.2 above shows that the Dun Laoghaire Rathdown population grew by approximately 13.7% overall between 2002 and 2016, which is well below the growth rate experienced by the state of 21.6% for the same period.

The largest increase in population in Dun Laoghaire-Rathdown was from 2002 – 2006, where the population increased by 12%. Growth slowed between 2006 – 2011 to 6.3% and 5.7% between 2011 – 2016. This could be attributed to the huge economic expansion from 2002 to 2006 where the economy expanded at unprecedented levels. During this period Dublin experienced a large population growth and a subsequent construction boom related to the buoyant property market. During this time Dublin expanded outwards into Dun Laoghaire Rathdown and other neighbouring jurisdictions associated with Dublin City.

Current national planning policy in the National Planning Framework – Ireland 2040 promotes the progression of sustainable development of greenfield site, particularly those along public transport corridors. The Woodbrook site offers a unique opportunity for the sustainable development of a strategically located greenfield site that is situated on a high frequency transport corridor via the future DART Station.

Table 5.2 shows that at a local level, the population change for the period 2002 – 2016 was much less than that at state and county level.

The Shankill – Shanganagh ED actually decreased in population from 2002 -2006 by -0.5%, thereafter recovering with increases of 0.7% from 2006 – 2011 and 2.9% from 2011 – 2016.

When compared to national and county level population changes from the same period, the disparity at a local level doesn't come as a surprise given the quantum of undeveloped land which has remained over the same period. The Shankill – Shanganagh ED still remains relatively undeveloped.

The proposed development with consist of 685no. units (i.e. Phase 1). The masterplan developed for the Woodbrook lands (i.e. Phase 1 and 2) will see the addition of c. 1,488 no. units to the area. According to the CSO Ireland, the average household size in Ireland is approximately 2.75 persons per household. This would give the proposed development (i.e. Phase 1) an approximate population of 1,884no. people and the Woodbrook lands (i.e. Phase 1 and 2) an approximate population of c. 4,092no. people. This represents a significant increase in the areas population.

In the immediate vicinity of the subject lands there appear to be very few residences. Any houses in the area are predominantly one off houses or houses that have historically been in the area. The closest planned residential developments near the site are Crinken Glen to the north west and Woodbrook Glen to the south.

5.4 Characteristics of the Proposed Development

It is proposed to locate the development on a 21.9 Ha greenfield site in Woodbrook, Shankill. The proposed development will consist of a mix of high-density residential buildings in a mix of 3 – 5 bed houses and 1 – 3 bed apartment / duplex units with heights ranging from 2 – 8 storeys. The total proposed is 685no. residential units.

Ancillary uses (childcare facility) and all associated ancillary site development works including road and water services infrastructure, green infrastructure networks and amenity open spaces are also proposed (See Chapter 3: Description of Proposed Development for a full development description).

5.5 Potential Impact of the Proposed Development

This section provides an assessment of the predicted impacts of the proposed development in accordance with the Draft EPA Guidelines. The predicted/residual impacts from the construction and operational phases are set out in the other Chapters of this EIAR.

5.5.1 Population

5.5.1.1 Construction Phase

The construction phase is considered unlikely to result in a significant increase or decrease to the local population. Construction workers would be anticipated to travel from their existing residence as opposed to using temporary accommodation in the local area. There will, however, be a short-term increase in the local working population during the construction phase of development.

The impact on the local population is considered to be *neutral, imperceptible and temporary* in nature, therefore the impact is ***not*** *considered to be significant*.

5.5.1.2 Operational Phase

The operational phase of the proposed development will result in a development of 685no. residential units alongside ancillary units. The proposed development will provide accommodation for approximately 1,884no. Persons in the area. The proposed development will accommodate a portion of the planned population growth of the City. The proposed development will therefore have a *positive, significant and permanent impact* on the local population. The associated additional local spending will likely have a *positive, moderate and long-term impact* on the economic activity in the area.

5.5.2 Air Quality

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. The limit values are set for the protection of human health including the most vulnerable to health impacts due to poor air quality i.e. the infirm, elderly and children. These limit values provide short term (i.e. 24 hour or 1 hour) and long term (annual mean) limit values below which EU member states must keep the specified pollutants. Air Pollution is the single largest Environmental health risk in Europe. Heart disease and stroke are the most common reasons for early death and are responsible for 80% of cases. Health effects also include asthma, acute bronchitis, lung cancer, damage to nasal passages and respiratory tract inflammation. Links to cancers of the bladder, kidney, stomach, oral cavity, pharynx and larynx, multiple myeloma, leukaemia, Hodgkin's disease, and non-Hodgkin's lymphoma have also been linked to urban air pollutants. The pollutants of most concern in Dublin with respect to human health are NO_2 and PM_{10} as they are the two pollutants most likely to exceed the annual mean limit values (40 $\mu g/m^3$).

Air quality monitoring programs have been undertaken in recent years by the EPA at a number of locations in Dublin city centre. The most recent annual report on air quality "*Air Quality in Ireland 2017 – Indicators of Air Quality*" (EPA 2018), details the range and scope of monitoring undertaken throughout Ireland. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.). Long term averages for NO_2, PM_{10}, $PM_{2.5}$, CO and benzene indicate that concentrations in Dublin are below the limit values set for the protection of human health.

5.5.2.1 Construction Phase

As detailed in Chapter 9: Climate (Air Quality and Climate Change), best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be negative, short-term and imperceptible with respect to human health.

Construction phase impacts on human health due to construction phase vehicles are predicted to be imperceptible as volumes fall below the scoping levels for impact, as discussed in Chapter 9: Climate (Air Quality and Climate Change).

5.5.2.2 Operational Phase

As outlined under Chapter 9: Climate (Air Quality & Climate Change), air dispersion modelling of operational traffic emissions was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the modelling results, emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health.

5.5.3 Air (Noise & Vibration)

Exposure to Excessive noise is becoming recognised as a large environmental health concern. According to the 2015 European Commission report 'Noise Impacts on Health', (European Commission, 2015), the most common effects of noise on the vulnerable include;

- Annoyance.
- Sleep Disturbance.
- Heart and circulation problems.
- Quality of Life.
- Cognitive Process.
- Hearing.

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes.

5.5.3.1 Construction Phase

It is predicted that the construction programme will create typical construction activity related noise on site. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators. A number of avoidance, remedial and reduction measures are included in of Chapter 12: Air (Noise & Vibration).

The closest neighbouring residential properties to the proposed development are the dwellings to the west of the site along the Old Dublin Road and St James Church, located within 20m to 50m of the Phase 1 boundary.

To the south of the site development boundary, Corke Lodge is located within approximately 70m and Woodbrook Glen residential area the, some 380m from the Phase 1 boundary. To the north of the site, the Castle Farm / St Anne's park residential areas area at distances of approximately 650m from the northern boundary of Phase 1.

An assessment of the noise and vibration impacts associated with the proposed development during the construction phase is presented in Chapter 12: Air (Noise and Vibration).

5.5.3.2 Operational Phase

Once operational, the predicted change noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall contribution of induced traffic is considered to be of neutral, imperceptible and long-term impact to nearby residential locations.

Noise levels associated with any mechanical and electrical plant required to service the development buildings will operate well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, distance to nearest off site noise sensitive locations and the development type which is largely residential. Any plant associated with retail units or apartment buildings units will be controlled to ensure a neutral noise impact. Assuming the operational noise levels do not exceed the adopted design goals included within the EIAR, the resultant residual noise impact from this source will be of neutral, minor, long term impact. Chapter 12: Air (Noise and Vibration) outlines all Operational Phase noise and vibration impacts.

5.5.4 Traffic

The World Health Organisation Report 'Health Effects and Risks of Transport Systems: The Hearts Project' (World Health Organisation, 2006) states that road traffic is a major cause of adverse health effects – ranking with smoking and diet as one of the most important determinants of health in Europe. The report states: -

> *"Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians."*

In the Department of Communications, Climate Action & Environment document *Cleaning Our Air – Public Consultation to Inform the Development of a National Clean Air Strategy* vehicle emissions are included as a key source of health impacts in Ireland (DOCCA&E, 2017).

An assessment of the additional traffic movements associated with the proposed development during the construction and operational phases is presented in Chapter 14: Material Assets (Transportation).

5.5.5 Townscape & Visual

The report *'Health Impacts on the Built Environment: A Review'* (The Institute of Public Health in Ireland, 2006) states that deteriorating physical features of the urban environment can harm health. Architecture Ireland have also shown the link between the Built Environment and Mental Health (Architecture Ireland, 2015). The World Health Organisation (WHO) has undertaken research that show urban environments that are aesthetically pleasing and landscaped encourage people to explore and access their local community by foot or bicycle when compared to the same urban space prior to renovations (WHO, 2016).

5.5.5.1 Construction Phase

There will be moderate negative townscape impacts during the construction stage of the proposed development due to the use of scaffolding, construction cranes, hoardings etc, however these will be short term in duration. Visual impact on the local area will also be considered to be negative but similar to above will be short term in duration.

5.5.5.2 Operational Phase

Once operational, the new development will contribute positively to the form and function of the local area. The improved town scape and visual settings will result in a positive impact on population and human health in area. Works to facilitate easier pedestrian and bicycle access should result in increased physical activity of the local population and visitors alike. This will result in a positive, significant and long-term effect on human health in the local area.

5.5.6 Health & Safety

The proposed development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (S.I. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. 299 of 2007) as amended and associated regulations. The proposed development has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience based on a number of similar existing facilities operated by the operator.

The proposed development has the potential for an impact on the health and safety of workers employed on the site, particularly during the construction phase. The activities of contractors during the construction phase will carried out in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) to minimize the likelihood of any impacts on worker's health and safety.

5.5.7 Do-Nothing Scenario

If the proposed development were not to go ahead at the Woodbrook site there would be no change to its greenfield nature and no potential impact to the current background air quality, traffic and noise & vibration levels. The landscape would stay in its current suburban condition.

5.6 Avoidance, Remedial or Reduction Measures

There are no specific mitigation measures proposed for Human Health. Mitigation measures proposed to minimise the potential impacts on human health in terms of air quality, landscape & visual impact and noise & vibration are discussed in the relevant sections of Chapters 9: Climate (Air Quality and Climate Change), Chapter 12: Air (Noise & Vibration) and Chapter 13: Landscape & Visual Impact respectively.

Chapter 14: Material Assets (Transportation), addresses mitigation measures proposed to reduce the impact of additional traffic movements to and from the development.

5.7 Residual Impact on the Proposed Development

It is expected that the proposed development will have a ***positive***, ***long-term*** & **imperceptible** impact on the human health of the local population.

There are no predicted adverse impacts with respect to health factors primarily due to the location of the proposed development and is residential characteristics.

All other environmental aspects relating to the human environment which have the potential to impact on the local population such as air quality and climate, noise and vibration, material assets and traffic are addressed in more detail in the relevant Chapters of this EIAR.

The cumulative impact of the development on the health of the surrounding area will be ***positive, long-term & imperceptible.***

Interactions are fully addressed in Chapter 21: Summary of Cumulative Impacts and Interactions of this EIAR.

5.8 Monitoring

There is no specific monitoring required for Human Health during the construction or operational phase of the proposed development. Where monitoring is required for any environmental aspect, this is addressed in the individual Chapters of the EIAR, as appropriate.

5.9 Reinstatement

This is not applicable to this Chapter of the EIAR.

5.10 Difficulties Encountered

No difficulties were encountered during the compilation of this chapter.