7 HUMAN HEALTH

7.1 Introduction

As per the amended EIA Directive and EIA Regulations, this chapter considers the potential impacts upon local communities and their health and provides a proportionate evaluation as to the magnitude and significance of any likely health impact on local communities directly attributable to the proposed development. Where appropriate, the appraisal builds upon and complements the wider environmental mitigation set to protect health, to reduce and remedy any significant adverse effects on local population and their health.

The primary objective of this chapter is to further investigate how local communities may be affected by the proposed application during construction, operation and restoration, and address potential issues through design and embedded mitigation.

7.2 Methodology

To inform this assessment, a number of desk top exercises were undertaken. The desktop analysis included a review of health demographic characteristics of the area as ascertained from Census of Population data and other statistics released by the Central Statistics Office (CSO). In addition, interaction with the hydrogeology, transport, air and noise analyses undertaken within this EIAR have also been considered.

7.3 Baseline Conditions

The results of the 2016 Census have been collated to identify the broad health baseline for the State, Dublin and the Fingal area and these are summarised in **Table 7-1**. Note that health data from the 2022 Census is not yet available.

The CSO reports that life expectancy at birth in Ireland is 78.4 years for males and 82.8 years for females (2011 average). Within County Dublin mortality rate from cancer has fluctuated over the years, and indicates an increasing trend, but still remains below the national average. Between the years of 2010 and 2013, mortality rate from respiratory diseases within County Dublin has increased but remains consistently below the national average. Mortality rate from circulatory diseases within County Dublin has decreased over the same time period and remains consistently below the national average. This is contrary to the national trend which continues to increase.

Between the years of 2010 and 2015, hospital admission rate for diseases of the circulatory system in Fingal follows, but remains consistently below, the national average. Hospital admissions for diseases of the respiratory system are also lower than the national average and show a decreasing trend within Fingal compared to national figures.

When considering mental health, hospital admissions for anxiety and depression have increased in Fingal over the years, from 1.4 per 1,000 population in 2014 to 24.9 per 1,000 population in 2015. Nationally, these have remained at 1.8 per 1,000 population within the same time period.

Dublin has the highest number of fatal collisions compared to other counties in Ireland. This figure has increased from 21 in 2016 to 23 in 2017. However, greater increases can be seen in other counties. Overall, the number of fatal collisions on Irish roads has decreased within this period.

Table 7-1 Summary of health baseline conditions in Fingal, County Dublin and Ireland

Indicator	Fingal	County Dublin	Ireland	Source and Date
Life expectancy (males)	N/A	N/A	78.4	CSO, 2011
Life expectancy (females)	N/A	N/A	82.8	CSO, 2011
Hospital admissions for circulatory disease (per 100,000 population)	3,425.8	N/A	3,794.9	IPH Community Profiles, 2015

Indicator	Fingal	County Dublin	Ireland	Source and Date
Hospital admissions for respiratory disease (per 100,000 population)	2,597.9	N/A	2,712.5	IPH Community Profiles, 2015
Cancer Mortality (per 100,000 population)	N/A	189.40	191.90	CSO,2013
Respiratory disease mortality (per 100,000 population)	N/A	71.21	77.96	CSO,2013
Circulatory disease mortality (per 100,000 population)	N/A	177.99	210.18	CSO,2013
All age all-cause mortality (per 100,000 population)	N/A	609.32	653.55	CSO,2013
Hospital admissions for anxiety or depression (per 1,000 population)	24.9	N/A	1.8	IPH Community Profiles, 2015

7.4 Impact Assessment

The main aspects with the potential to influence local communities and their health, comprises activities that extend beyond the site boundary, namely:

- Construction phase impacts including dust, noise and traffic;
- Operation Phase potential changes in vehicular nature, number and haul routes with potential for impact on other traffic on the route, vulnerable road users and properties along the route;
- Operation Phase potential fugitive emissions (noise and dust generation/resuspension); and
- Operation Phase potential impacts to drinking water supplies through groundwater impact.

7.4.1 'Do-Nothing' Impact

The 'Do-Nothing' scenario refers to a scenario whereby the facility would remain operating under the current permissions and licence as an inert landfill. Infilling using inert wastes would continue for at least a 15 year period to restore the lands after which the site would be restored to natural ground levels. In addition, the circular treatment of materials on site would also continue.

Existing potential sources of health impact such as road haulage, dust and noise would continue on site. However, these are regulated by the Waste Licence to ensure no adverse impact and no significant health effect to the local community.

7.4.2 Construction Phase

The construction phase of the proposed development is restricted to the installation of the leachate holding tanks and the surface water attenuation pond. Both of these areas are located at significant distances from sensitive properties (i.e. circa 350 metres) thereby reducing the potential impact from construction nuisances such as dust and noise. These impacts are not considered significant with the prescribed mitigation as per the details presented in **Chapter 11** (Air Quality) and **Chapter 12** (Noise).

In terms of traffic safety, existing operational traffic at the site has planning and licensing consent to accept 500,000 tonnes per annum and this limit will be retained for the operation phase. All materials are delivered to the site via HGV by road via the LP-1080 along the southern boundary of the site.

Much of the materials required for construction of the pond and leachate area will be site won with minimal need for importation other than specialist materials. Anticipated construction traffic volumes are expected to be less than 5% of the operational volumes which will run concurrently. In this regard, the potential for potential safety impact to the community and vulnerable road users from construction traffic over the operational traffic is negligible.

Existing dust, noise and traffic management regimes in the site's EMS will be supplemented with the mitigation prescribed in the EIAR in order to minimise the effects on the environment during construction and the contractor will be bound by these procedures. As such, the mitigation measures prescribed for air (**Chapter 11**), noise (**Chapter 12**) and traffic (**Chapter 13**) will ensure that there will be no residual impact for human health so no further mitigation is prescribed.

7.4.3 Operational Phase

7.4.3.1 Road Traffic and Safety

Any change to the existing traffic regime on the road network has the potential to impact the health of other road users including vehicular traffic and vulnerable road users (pedestrians, cyclists, etc.).

The Road Safety Authority's (RSA's) Road Collision Database contains information on all reported collisions by severity of injury and year of collision. A review of the database for the period 2005 to 2014 inclusive (no recent data available from the RSA) concluded that no accidents occurred in the vicinity of the Hollywood site in this period indicating a high level of safety on the existing road network.

The existing operation has consent to import up to 500,000 tonnes of waste material per annum and this planning application will retain that limit of annual input. Therefore, for the purpose of this assessment the scale of traffic for the site when operating at full capacity is the relevant scenario to be assessed. The site operating at full operational capacity will result in circa 120 trucks arriving to the site on a typical full working day. This corresponds to a total daily movement of circa 240 trucks generated onto the local road network (120 trucks arriving and 120 trucks leaving).

Some minor increases are anticipated in relation to one additional operation, i.e. leachate transport which will generate up to an additional four HGVs per day maximum. This additional traffic on top of the existing 240 movements is not considered significant (less than 5% increase).

However, the introduction of the site entrance on the LP-1080 (permitted under the current permission F19A/0077) will improve the alignments, layout and sight lines of the site traffic. As a consequence, the road safety aspects of traffic on the local road network will improve for the wider community.

In particular, the two residential properties on the LP-1080 to the south of the site will likely experience a net improvement in terms of traffic safety and nuisance. These two properties are currently on the haul route for the existing operation through the site entrance to the west of the site. The relocation of the site entrance to the south on the LP-1080 east of these properties will remove the existing circa 240 truck movements that pass these properties on a daily basis.

For the remaining residential properties which are located along the LP-1080 corridor between the site entrance and the R132, there will be no significant change in traffic volumes with the proposed development.

As such the proposed development will have a net zero impact on traffic volumes along the haul route for the majority of properties.

7.4.3.2 Air Quality

The potential for dusts (such as general silicon/carbon based dusts from soil wastes or metals from incinerator bottom ash, IBA) associated with the proposed development have been considered in greater detail in **Chapter 11** Air Quality and Climate. These air quality impacts have the potential for significant health implications if not adequately managed at source.

General Dusts

General dusts refer to the non-hazardous silicon/carbon based dusts that are typically associated with construction, farming, forestry or general activities. These dusts are typically associated with a nuisance impact rather than any adverse health impact.

It is noted that mixing, cutting, drilling and demolition of silica containing materials can generate Respirable Crystalline Silica (RCS) which can cause lung damage through inhalation. Quartz is the most common form of crystalline silica and in 2012 the International Agency for Research on Cancer (IARC) confirmed that '*Crystalline silica in the form of quartz or cristobalite dust is carcinogenic to humans*'. The site of the proposed development is a former limestone quarry and limestone has very

low (less than 2%) crystalline silica levels and, as such, disturbance of natural ground in the area for cell or pond development does not pose a significant RCS health risk.

Similarly, the proposed infilling of materials at the site will not include any significant quartz levels. In short, there is negligible risk of RCS exposure to the general population from the proposed operation and with the mitigation and good working practices outlined in **Chapter 11**.

Schedule D of Waste Licence W0129-02 requires the biannual monitoring of dust emissions to be undertaken at the site. This dust monitoring assesses the ongoing levels of dust generation at the site with respect to the existing operations including cell construction, waste infilling, capping as well as other activities such as the concrete recovery (end of waste) activities undertaken. The test covers general silica and carbon based dusts in line with the inert wastes currently infilled at the site.

The results of all monitoring events are below the EPA licence limit (which is based on a best practice German guideline - TA Luft Guideline) for dust nuisance which indicates that general dust levels are not causing an adverse impact. This is directly as a result of the good dust management practices employed on site (use of a water bowser, stockpile layout, etc.) and the significant distances to the nearest sensitive receptors.

These practices and procedures will continue for the proposed operation which will ensure that general dusts are affectively managed through the operation phase of the development with no significant adverse impact on human health predicted.

Metal Dusts

The health implications of metal dusts are varied with some metals posing a significant health risk (e.g. Cadmium, Arsenic, Mercury) while others posing a low health risk (e.g. Aluminium, Iron, Zinc). The potential for adverse impact is based on the types of metals, the volumes generated and the potential pathway (distance) to sensitive receptors.

The potential for the generation and dispersion of metal dusts at the Hollywood site is dependent on the nature of the wastes being infilled, the activities being undertaken and the weather conditions at the time of infilling. In much the same was as general dusts, dispersion of metal dusts can be actively controlled at source by good working practices.

Incinerator bottom ash (IBA) is the primary source of potential metal dust at the proposed development and typically contains circa 10-12% ferrous metals and 2-5% non-ferrous metals (predominately Aluminium but also Copper, Lead and Zinc). The potential for these metals to cause adverse impact through various environmental pathways is presented in **Table 7-2**. This data illustrates that the main metal constituents of IBA (Iron and Aluminium) pose a low risk to human health while some of the trace compounds (Copper and in particular Lead) pose a higher risk through inhalation of metal dusts.

Table 7-2 Health Risk of main IBA constituents

Metal	R Phrase
Aluminium	None
Copper	R36 Irritating to eyes. R37 Irritating to respiratory system. R38 Irritating to skin
Iron	None
Lead	R23 Toxic by inhalation. R25 Toxic if swallowed.
Zinc	None

Based on the transport and handling procedures presented for IBA in **Chapter 5**, the risk of dust generation from this operation is low and the scale of the IBA operation is moderate.

IBA will be delivered to the site in enclosed or covered vehicles to prevent the generation and dispersion of dusts along the haul route. All IBA delivered to the site will be tipped and temporarily stored for aging within an enclosed structure located within the non-hazardous cess void space, to prevent dust generation from stockpiles. IBA stockpiles will be artificially moistened within the

building to further mitigate dust. On completion of aging, the moistened IBA will be infilled to the non-hazardous cells and a daily cap installed to prevent fugitive dust emissions.

The distance between the non-hazardous cells and the nearest sensitive residential receptor is 60 metres at the nearest point. This distance is such that this operation would pose a negligible risk to sensitive receptors in the area with the controls presented. As such, there is no significant health impact predicted from the proposed IBA handling and infilling on site.

7.4.3.3 Noise

Noise from industrial or waste operations can cause annoyance and disturbance to people at work or during leisure activities. It can also cause sleep disturbance and have a deleterious effect on general physical and mental wellbeing. Elevated environmental noise can cause hearing impairment, tinnitus, hypertension, ischemic heart disease, annoyance, and sleep disturbance. The factors that influence noise impact include the magnitude of the source (i.e. how loud is the source), the duration (continuous or intermittent sources) or timing (day or night time) as well as the distance to the nearest sensitive receptors.

Potential noise impact may also be caused to the existing communities in the area from operational noise during the operation phase. Potential impacts in respect of noise are examined further in **Chapter 12** of this EIAR.

The proposed development is largely identical to the existing operations on the site. The scale and nature of the proposed operations include material haulage, cell construction, infilling, earth moving, cell capping, restoration, etc. Each of these operations is currently undertaken on the site for inert waste and as a result, the noise impact of the proposed development is likely to result in no net change from the baseline operation. The proposed operation and noise impact is assessed in greater detail in **Chapter 12**.

Furthermore, the hours of operation for the proposed development will not change and there will be no night time operations as per the existing operation.

Ambient noise surveys are undertaken annually at the site as per the requirements of Schedule 6.12 of the Waste Licence (W0129-02) which states:

> *The licensee shall carry out a noise survey of the site operations annually. The survey programme shall be undertaken in accordance with the methodology specified in the 'Environmental Noise Survey Guidance Document' as published by the Agency.*

The main sources of noise noted during the annual surveys are typically road traffic along the local road network, occasional overhead aircraft noise and rustling foliage. The reports typically indicate that site operations at the facility were not subjectively audible at any of the monitoring locations.

The nearest residential properties to the site are the residential properties along the southern boundary (both in the ownership of IMS). Noise levels at these properties are low and indicate that the site is not currently having a significant noise impact on residential properties in the area.

The limits expressed in the EPA licence are aligned with those specified in the World Health Organisations publication '*Guidelines for Community Noise*' (2000) and '*Night noise guidelines for Europe'* (2009). These limits will be retained by the EPA in any IE Licence that may be granted for the site and annual surveys will be required to demonstrate compliance.

Based on the low impact of the existing operation, the absence of night time operations, the similarity for the proposed development and the significant level of regulation imposed by the EPA through the licence, there is no predicted change in the baseline noise at the site. Furthermore, the nature of the proposed development is not considered to be of a magnitude, duration or timing to give rise to any significant adverse impact on health from operational noise (i.e. sleep, cognitive function, hypertension).

7.4.3.4 Drinking Water

The Source Protection Area for the Bog of the Ring collection of groundwater wells to the north east of the site lies approximately 1km from the site with the actual wells used for drinking water circa 2.5 km north east of the site. The Bog of the Ring water supply scheme is operated by abstraction of groundwater from four production boreholes.

The wellfield supplies up to 4,000 m^3/day to Balbriggan and surrounding area. Assuming an average daily domestic consumption of 250L/d/household the abstraction rate could supply well in excess up to 10,000 domestic households. Any potential for ground contamination at the site presents a potential risk to human health through drinking water contamination for these homes.

Chapter 9 on Soils, Geology and Hydrogeology and associated information in **Volume IV** of this EIAR, provides detailed analysis that illustrates that there is no hydrogeological pathway between the site and the drinking water supply at the Bog of the Ring. The significant evidence base demonstrates that the Hollywood site is situated in groundwater catchment area that is clearly separated from the Bog of the Ring wellfield by a groundwater divide located approximately beneath the Knockbrack Hill high ground. In short, there is no pathway for contamination from the site to the Bog of the Ring wellfield.

As such, any potential for groundwater impact at the site would not result in any adverse impact to the drinking water from the Bog of the Ring wellfield. Therefore the operation of the proposed development will not result in any significant adverse impact on the residents served by the Bog of the Ring wellfield.

7.5 Mitigation Measures

7.5.1 Construction Phase

As noted, existing dust, noise and traffic management regimes in the site's EMS will be supplemented with the mitigation prescribed in the EIAR in order to minimise the effects on the environment during construction and the contractor will be bound by these procedures. As such, the mitigation measures prescribed for air (**Chapter 11**), noise (**Chapter 12**) and traffic (**Chapter 13**) will ensure that there will be no residual impact for human health so no further mitigation is prescribed.

7.5.2 Operational Phase

No adverse impacts are identified during the operation phase. Therefore, no mitigation measures are required.

7.6 Residual Impact

There are no predicted residual impacts to human health anticipated with the construction and operation phases of the proposed development.

7.7 Monitoring

No monitoring of human health proposed.

7.8 References

1. Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
2. The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).
3. The European Union (Waste Management) (Environmental Impact Assessment) Regulations 2020 (S.I. No. 130 of 2020).
4. Census of Population 2011 and 2016, available at: http://airomaps.nuim.ie/id/Census2016/ , Central Statistics Office.
5. IPH Community Profiles Tool (CPT) http://www.thehealthwell.info/community-profiles/?utm_source=IPH+Contacts+July+2015&utm_campaign=f4b43aa506-IPH_Newsletter_December_2015_copy_02_9_29_2015&utm_medium=email&utm_term=0_8f6e547325-f4b43aa506-83973317

6. Guidelines for Community Noise, WHO (2000).
7. Night noise guidelines for Europe, WHO (2009).