

8 Human Health

8.1 Introduction

8.1.1 This chapter assesses the likely significant human health effects resulting from the K3 and WKN Proposed Developments.

8.2 Regulatory and Policy Framework

Planning Policies

Health Protection Agency Position Statement

8.2.1 The Health Protection Agency (HPA), now Public Health England (PHE), published a position statement in 2009 on the impact on health of emissions to air from municipal waste-to-energy projects [1]. The position concludes that well managed facilities operating to strict environmental standards would have only a small contribution to local air quality, and no measurable risk to human health.

8.2.2 Since 2009, the health evidence base has not sufficiently changed to warrant any update to this position statement.

National Policy Statements

8.2.3 Planning policy for energy generation Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to human health, is contained within the Overarching National Policy Statement (NPS) for Energy.

8.2.4 Here, NPS EN-1 [2] includes guidance on what matters are to be considered in the assessment:

"As described in the relevant sections of this NPS and in the technology-specific NPSs, where the proposed project has an effect on human beings, the ES should assess these effects for each element of the project, identifying any adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate. The impacts of more than one development may affect people simultaneously, so the applicant and the IPC should consider the cumulative impact on health". (Paragraph 4.13.2)

"The direct impacts on health may include increased traffic, air or water pollution, dust, odour, hazardous waste and substances, noise, exposure to radiation, and increases in pests". (Paragraph 4.13.3)

"New energy infrastructure may also affect the composition, size and proximity of the local population, and in doing so have indirect health impacts, for example if it in some way affects access to key public services, transport or the use of open space for recreation and physical activity". (Paragraph 4.13.4)

- 8.2.5 NPS EN-1 [2] further highlights that the focus of the ES is largely centred on removing and mitigating any significant environmental or socio-economic precursor to a health outcome, but requires further clarity on how community health concerns have been assessed and addressed through the planning process:

"Generally, those aspects of energy infrastructure which are most likely to have a significantly detrimental impact on health are subject to separate regulation (for example for air pollution) which will constitute effective mitigation of them, so that it is unlikely that health concerns will either constitute a reason to refuse consents or require specific mitigation under the Planning Act 2008. However, the IPC will want to take account of health concerns when setting requirements relating to a range of impacts such as noise". (Paragraph 4.13.5)

- 8.2.6 This approach is further reinforced through NPS EN-3, which states:

"Where a proposed waste combustion generating station meets the requirements of WID and will not exceed the local air quality standards, the IPC should not regard the proposed waste generating station as having adverse impacts on health". (Paragraph 2.5.43)

National Planning Policy Framework (NPPF)

- 8.2.7 Promoting healthy and safe communities is a central theme of the National Planning Policy framework (NPPF) [3], which states that *"Planning policies and decisions should aim to achieve healthy, inclusive and safe places which a) promote social interaction [...], b) are safe and accessible [...], and c) enable and support healthy lifestyles [...]"* (paragraph 91).

Kent County Council's Development Plan

- 8.2.8 Policy DM 11 (Health and Amenity) within the Kent Minerals and Waste Local Plan 2013-30 [4] outlines the following planning policy relevant to human health:

"Minerals and waste development will be permitted if it can be demonstrated that they are unlikely to generate unacceptable adverse impacts from noise, dust, vibration, odour, emissions, bioaerosols, illumination, visual intrusion, traffic or exposure to health risks and associated damage to the qualities of life and wellbeing to communities and the environment."

Swale Borough Council's Development Plan

- 8.2.9 Policy CP 5 (Health and wellbeing) within the Swale Borough Local Plan [5] outlines the following planning policy relevant to human health:

"The Council, working in conjunction with relevant organisations, communities and developers, will promote, protect and work to improve the health of Swale's population, and reduce health inequalities. Development proposals will, as appropriate:

1. *Bring forward accessible new community services and facilities, including health facilities;*
2. *Safeguard existing community services and facilities where they are viable or can be made so, or where replacement facilities can be provided without leading to any shortfall in provision, or where the local Clinical Commissioning Group has indicated a need for health facilities;*
3. *Safeguard or provide as appropriate, open space, sport and recreation in accordance with Policy DM 17, additionally enabling access to nature in accordance with the Local Plan Natural Assets and Green Infrastructure Strategy in Policy CP 7;*
4. *Promote healthier options for transport, including cycling and walking;*
5. *Improve or increase access to a healthy food supply such as allotments, markets and farm shops;*
6. *Create social interaction and safe environments through mixed uses and in the design and layout of new development;*
7. *Create a healthy environment that regulates local climate by providing open space and greenery to achieve shading and cooling, particularly within existing urban environments; and*
8. *Undertake and implement a Health Impact Assessment for relevant proposals that are:*
 - a. *required to undertake Environmental Impact Assessments; or*
 - b. *within Swale's most deprived wards; or*
 - c. *identified as required by the Local Plan."*

8.2.10 On the above basis, the protection of public health is an implicit requirement with a consistent message from the national to local policy level, and further reinforced through the recent amendment to the EU EIA Directive [6] and the subsequent transposition into the UK EIA regulations [7]. The approach taken to address the policy requirement has been to imbed the principles of Health Impact Assessment (HIA) within the regulatory assessment process from the outset, drawing from and building upon the wider technical disciplines set to protect health, to further investigate and more effectively communicate any potential health outcome (be it adverse or beneficial).

8.3 Methodology

Scoping and Consultation

8.3.1 As presented in Chapter 3, human health was included within the formal scoping process, and statutory consultee responses returned to test, refine and inform the final scope and focus of the assessment.

- 8.3.2 The potentially relevant health determinants that are to be assessed within this chapter are identified in Table 8.1. These health determinants have been identified through analysis of the K3 Proposed Development and WKN Proposed Development construction, operational and decommissioning activities as defined in Chapter 2: Site Description, Proposed Development and Alternatives, and remain consistent with those raised during scoping with statutory consultees.
- 8.3.3 Identification of a potentially relevant health determinant at this stage does not necessarily indicate that there would be a significant effect through that determinant. A significant effect would depend on the magnitude of change, the sensitivity of receptors and the degree to which they are affected.

Potential Health Determinant	Potential for Impact	Impact Type
Construction (WKN Proposed Development Only)		
Changes in air quality (including dust nuisance, PM ₁₀ , PM _{2.5} and NO ₂ from on-site construction vehicles and associated transport movements)	Adverse	Local
Changes in noise exposure from on-site construction activities and associated transport movements (including annoyance)	Adverse	Local
Changes in local transport nature and flow rates (severance and risk of accident and injury)	Adverse	Local/regional
Direct, indirect and induced income and employment opportunities	Beneficial	Local/regional
Completed Development (K3 and WKN Proposed Developments)		
Changes in air quality (PM ₁₀ , PM _{2.5} and NO ₂ from on-site activities and associated transport movements delivering waste)	Adverse	Local
Changes in noise exposure from on-site operational activities and associated transport movements (including annoyance and sleep disturbance)	Adverse	Local
Changes in local transport nature and flow rates (severance and risk of accident and injury)	Adverse	Local/regional
Direct, indirect and induced income and employment opportunities	Beneficial	Local/regional
Decommissioning (K3 and WKN Proposed Developments)		
Changes in air quality (including dust nuisance, PM ₁₀ , PM _{2.5} and NO ₂ from on-site construction vehicles and associated transport movements)	Adverse	Local
Changes in noise exposure from on-site construction activities and associated transport movements (including annoyance)	Adverse	Local
Changes in local transport nature and flow rates (severance and risk of accident and injury)	Adverse	Local/regional
Direct, indirect and induced income and employment opportunities	Beneficial	Local/regional

Table 8.1 – Health determinants to be assessed

Establishing Baseline Conditions

- 8.3.4 Information relating to existing health and socio-economic circumstance in the locality was collected through a detailed review of third-party data, available online. Any environmental baseline conditions required to provide context for the completion of the human health assessment have been informed by the relevant

technical disciplines, namely Chapter 5: Air Quality, Chapter 7: Noise and Vibration and Chapter 4: Traffic and Transport.

- 8.3.5 The geographical study area for environmental health determinants within the human health assessment is informed by the relevant environmental technical disciplines, namely Chapter 5: Air Quality, Chapter 7: Noise and Vibration and Chapter 4: Traffic and Transport. As such, data collection is confined to Swale Borough Council as it is anticipated that impacts from environmental health determinants would remain local.
- 8.3.6 The study area for socio-economic health determinants is also confined to Swale Borough Council. While it is likely that socio-economic determinants (i.e. income and employment) have a wider sphere of influence (as employment could potentially be sourced from further afield), it is the case that a focus on Swale Borough Council remains an appropriate study area.

Significance Criteria

- 8.3.7 A professional judgement on the significance of an effect is determined based on the magnitude of an impact and the sensitivity of the receptor affected by the impact of that magnitude. This section describes the criteria applied in this chapter to characterise the magnitude of potential impacts and sensitivity of receptors.
- 8.3.8 The criteria for defining magnitude in this chapter are outlined in Table 8.2.

Magnitude of Impact	Definition
Major	Change in environmental and socio-economic circumstance sufficient to result in a major change in baseline population health (adverse or beneficial)
Moderate	Change in environmental and socio-economic circumstance sufficient to result in a moderate change in baseline population health (adverse or beneficial)
Minor	Change in environmental and socio-economic circumstance sufficient to result in a minor change in baseline population health (adverse or beneficial)
Negligible	Change in environmental and socio-economic circumstance below that for which it is possible to result in any manifest health outcome at a population level (adverse or beneficial)
No change	No opportunity for change in health outcome

Table 8.2 – Criteria for magnitude of impact

- 8.3.9 Within a defined population, individuals will range in their level of sensitivity; as such, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied by assuming that the population within Swale are of uniformly high sensitivity.
- 8.3.10 The significance of the effect upon human health is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The particular method employed for this assessment is presented in Table 8.3. Where a range of significance of effect is presented in Table 8.3, the final assessment for each effect is based upon expert judgement.

8.3.11 For the purpose of this assessment, any effects of minor or less are considered to be not significant.

		Magnitude of impact				
		No change	Negligible	Minor	Moderate	Major
Sensitivity of receptor	Negligible	No change	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	No change	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Medium	No change	Negligible or minor	Minor	Moderate	Moderate or major
	High	No change	Minor	Minor or moderate	Moderate or major	Major or substantial
	Very high	No change	Minor	Moderate or major	Major or substantial	Substantial

Table 8.3 – Matrix used for the assessment of the significance of an effect

Assessment of Effects

8.3.12 'Health' is commonly defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (the definition used by the World Health Organisation, WHO, since 1948) [8].

8.3.13 There is a large body of guidance on HIA generally and in the context of development planning, drawing from expert evidence and national government policy regarding the importance of integrating public health into the planning system.

8.3.14 The basis of this assessment is to apply a broad socio-economic model of health that encompasses conventional health impacts such as disease, accidents and risk, along with wider health determinants vital to achieving good health and wellbeing such as employment and local amenity. It considers both physical and mental health, and addresses equality and social impacts where possible. The assessment is therefore based on both 'social' and 'ecological' (environmental) determinants of health, illustrated in Figure 8.1, which are affected through relevant health pathways defined.

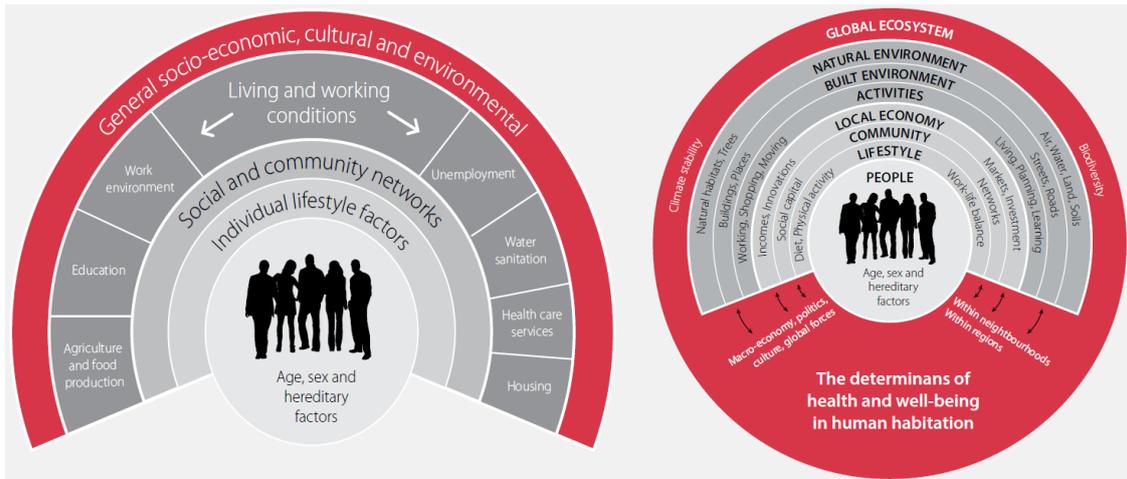


Figure 8.1 – Social (left) and ecological (right) determinants of health – reproduced from [9], citing [10] and [11]

8.3.15 When defining potential health pathways for a development project, it is also useful to consider three broad domains of public health practice:

- Health protection (i.e. environmental pollution and standards set to protect health);
- Health promotion (i.e. healthy lifestyles, socio-economic status and inequalities); and
- Health care (i.e. provision, effectiveness and equity of access to healthcare services).

8.3.16 The assessment follows a source-pathway-receptor approach to identify and assess health impacts that are plausible and directly attributable to the Proposed Development. A hazard source by itself is not necessarily a health risk: it is only when there is a hazard source, a sensitive receptor and a pathway of exposure where there is any potential for risk to health. Where a source-pathway-receptor linkage exists, then the nature of the specific hazard source, the magnitude of impact via the pathway and the sensitivity of the receptor determine what level of health risk is predicted, and its significance.

Limitations and Assumptions

8.3.17 The human health assessment partially draws from and builds upon the technical outputs from the air quality, noise and vibration, transport chapters of the ES, and as a consequence the limitations of those assessments also apply to that information as used in this chapter.

8.3.18 It is however, considered that the information available provides a suitable basis for a robust assessment of human health for EIA purposes.

8.4 Baseline Conditions

- 8.4.1 Evidence suggests that different communities have varying susceptibilities to health impacts and benefits as a result of social and demographic structure, behaviour and relative economic circumstance; the aim of the following information which makes up this health and wellbeing baseline, is to put into context the local health circumstance of the communities within the Borough of Swale, which makes up the study area, drawing from available statistics.
- 8.4.2 The aim of the following information which summarises the human health baseline provided in Appendix 8.1, is to put into context the local socio-economic and health circumstance of the communities within Swale Borough Council, drawing from available statistics.
- 8.4.3 In addition to the statistics referenced below which relate to health and socio-economic circumstance, baseline environmental conditions referenced in the relevant technical disciplines are used within the human health assessment where appropriate. These baseline conditions include K3 as permitted.

Demography and socio-economic

- 8.4.4 The closest community residential receptor is located approximately 670m south-west of the development site, on Recreation Road. Population growth within Swale is higher than that of the county, regional and national averages. The study area shows a relatively large elderly population, with a higher proportion of the population aged 50-79 year olds compared to the national average. Comparatively, the study area has a lower proportion of the population aged 20-44 years when compared to the national average.
- 8.4.5 Employment and economic activity figures within Swale are slightly lower than regional and national averages. In addition, the proportion of the population within Swale claiming job seekers allowance is also higher than the regional and national averages, and continues to increase. Income is consistently lower than the regional average but higher than the national average. Qualification attainment within Swale is also lower than regional and national averages.
- 8.4.6 Overall, there is a larger proportion of Lower Super Output Areas within Swale identified as being in the 20% most deprived areas nationally, compared to the 20% most affluent (indicating both high levels of deprivation and inequality). When considering the individual domains within the combined indices of multiple deprivation, it is the education and crime domains that are particularly prominent, with the highest levels of deprivation in Swale, contrasted against the health domain which has the lowest levels of deprivation in Swale.

Life expectancy and physical health

- 8.4.7 Male life expectancy in Swale has shown a general decreasing trend over the years and is below the regional and national average. Female life expectancy has fluctuated but is again showing a decreasing trend since 2013 and is now also below both the regional and national average life expectancy.

- 8.4.8 Emergency hospital admissions for a variety of respiratory and cardiovascular diseases and conditions are lower in Swale compared to the national average. However, all-age all-cause mortality, cardiovascular disease mortality, respiratory disease mortality and cancer mortality within Swale are higher.
- 8.4.9 Of the data collected for cardiovascular disease mortality and cancer mortality, there is some improvement, with a decreasing trend. However, this is contrasted against an increasing trend for respiratory disease mortality.

Mental health

- 8.4.10 Mental health statistics within Swale are mixed. Dementia recorded prevalence and hospital stays for self-harm are both lower than the regional and national averages. Conversely, suicide rate and depression recorded incidence are both higher than regional and national averages.

Lifestyle

- 8.4.11 The proportion of obese children in Swale is similar to the national average and higher than the regional average, while the proportion of adults with excess weight has been increasing to above the regional and national average.
- 8.4.12 Smoking prevalence has been consistently higher than the regional and national averages and has shown a decreasing trend in recent years. Hospital stays for alcohol related harm (which is used as a proxy for excessive alcohol intake) has fluctuated over the years but has generally remained below regional and national averages.

Conclusion

- 8.4.13 The population within Swale is growing at a faster rate than the county, regional and national average, and the demographic structure includes a large and increasing elderly population.
- 8.4.14 Life expectancy for males and females in Swale is low in comparison to regional and national averages. Physical and mental health statistics are mixed, where some (such as mortality statistics, suicide rate, depression) are worse than the national average and others better (emergency hospital admissions, dementia prevalence, hospital stays for self-harm). All lifestyle factors analysed, except hospital stays for alcohol related harm, are worse than the regional and national averages.
- 8.4.15 Education and crime deprivation domains have the highest levels of deprivation in Swale. Socio-economic indicators such as employment, income and qualification attainment are all lower than geographic comparators, while the proportion of residents claiming job seekers allowance is higher. This suggests that there are higher levels of socio-economic deprivation within Swale than compared to the county, regional and national averages.
- 8.4.16 On the above basis, residents within the study area are considered sensitive to changes in environmental and socio-economic circumstance (both adverse and

beneficial), and statistics indicate that a number of barriers to socio-economic benefit uptake exist, compounding inequality and burdens of poor health. Such factors have been applied to inform the assessment, planning features and mitigation tailored to local circumstance, priority and need.

Sensitive Receptors

- 8.4.17 For the purpose of assessment, particularly sensitive receptors considered within the assessment are listed in Table 8.4. The assessment in this Chapter has considered the effects listed in the table upon the identified sensitive receptors.

Receptor	Importance/sensitivity/vulnerability to change
Residential Receptors	High
Schools	High
Nursing Homes	High

Table 8.4 – Potentially affected sensitive receptors

8.5 Future Baseline

- 8.5.1 As it is challenging to predict the future human health baseline with high confidence, trends are analysed as part of the current baseline to provide insight into likely future local community circumstance. For the purpose of this assessment, the present-day baseline human health data have been used.

8.6 K3 Predicted Effects

- 8.6.1 The K3 Proposed Development requires completed development and decommissioning effects to be assessed. The health determinants to be assessed comprise changes to air quality and transport during operation. For decommissioning, the health determinants to be assessed comprise changes in air quality, noise, transport and employment opportunities.

Completed Development Effects

Health Effects from Changes to Air Quality

- 8.6.2 The changes associated with the operation of the K3 Proposed Development have the potential to influence human health by changing community exposure to a range of pollutants generated by the stack and additional vehicle movements. The relative risk however, is a function of the change in concentration, exposure, individual pollutant hazard characteristics and the existing burden of poor health.
- 8.6.3 The hazard associated with changes in exposure to heavy metals, dioxins and furans detailed in Chapter 5: Air Quality, are well known, understood and addressed through the permitting regime such that they remain within objective thresholds set to be protective of the environment and health. As such, the human

health chapter does not include a detailed assessment of these pollutants and instead focusses on the potential impact on human health from changes in long-term exposure to PM₁₀ and NO₂.

- 8.6.4 As stated in Chapter 5: Air Quality, the maximum change in PM₁₀ and NO₂ associated with the increased throughput and associated vehicle movements is predicted to be 0.01 µg/m³ and 0.09 µg/m³, respectively. This change is not considered to be significant by air quality standards and remains within the relevant air quality objectives set to be protective of the environment and health.
- 8.6.5 Neither the change in concentration or exposure to PM₁₀ or NO₂ would be sufficient to quantify any change in health outcome at a population level. On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes in Noise Exposure

- 8.6.6 As stated in Chapter 7: Noise and Vibration, there would be no increase in on-site noise from the K3 Proposed Development itself. However, the K3 Proposed Development has the potential to influence human health from an increase in ambient noise exposure from HGV movements on the existing road network.
- 8.6.7 The maximum change in ambient noise exposure from the K3 Proposed Development on the existing road network is estimated to be <1 dB. As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a timing, duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level.
- 8.6.8 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes to Transport Nature and Flow Rate

- 8.6.9 It is anticipated that an additional 68 HGVs would be generated per day as a result of the increased throughput, waste delivery, incinerator bottom ash (IBA) removal and process outputs. There would be no additional staff vehicle movements associated with the K3 Proposed Development.
- 8.6.10 As stated in Chapter 4: Traffic and Transport, the largest percentage increase in total traffic movements on any road link is predicted to be 3.5% while the largest increase in HGV movements is predicted to be 9.9%. These changes to transport nature and flow rate are expected to be imperceptible and therefore would not materially increase the risk of accident and injury or severance.
- 8.6.11 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Decommissioning Effects

Health Effects from Changes to Air Quality

- 8.6.12 As stated in Chapter 5: Air Quality, the air quality effects from decommissioning activities are expected to be the same or lower than during the construction phase.
- 8.6.13 The construction dust assessment undertaken as part of the original planning application for the now permitted K3 provided a list of recommended mitigation measures to ensure that the effect from construction would be not significant. Assuming that these mitigation measures were implemented during the decommissioning phase, the effect is expected to be not significant.
- 8.6.14 The air quality assessment for the permitted K3 did not quantitatively assess the effects of construction traffic on air quality as construction traffic flows were expected to be lower than operational traffic flows. During the decommissioning phase the traffic generated is likely to be the same or lower than during the construction phase.
- 8.6.15 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes in Noise Exposure

- 8.6.16 As stated in Chapter 7: Noise and Vibration, noise generation from decommissioning activities are expected to be no worse than, but are likely to be similar to or less than, those that occurred during the construction phase.
- 8.6.17 The construction noise assessment undertaken as part of the original planning application for the now permitted K3 facility concluded that daytime construction activities are not expected to exceed 65 dB $L_{Aeq,12h}$ at sensitive receptors and night time construction activities (from concrete pouring) are not expected to exceed 45 dB $L_{Aeq,8h}$.
- 8.6.18 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a timing, duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes to Transport Nature and Flow Rate

- 8.6.19 As stated in Chapter 4: Traffic and Transport, there will be lower traffic flows during decommissioning of the K3 Proposed Development when compared to the construction phase. In addition, a Decommissioning Traffic Management Plan (DTMP), similar to the Construction Traffic Management Plan (CTMP), will be prepared and agreed with Highway Officers prior to decommissioning commencing and the works will be undertaken in accordance with this.

- 8.6.20 As the decommissioning of the K3 Proposed Development would be temporary and any associated traffic flows considered to be intermittent, the potential magnitude of impact on human health (from increasing intimidation, pedestrian delay or severance) would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Income and Employment Generation

- 8.6.21 It is widely accepted that income and employment generation, which are directly associated with socio-economic circumstance, are two of the most important precursors to good health and wellbeing.
- 8.6.22 At this stage, the number of workers or length of time required to complete the decommissioning of the K3 Proposed Development is unclear. On the basis that the duration of the decommissioning period would be either short-term or medium-term, the potential human health effects are only likely to improve socio-economic circumstance, and thus health and wellbeing, at the individual level rather than at the population level.
- 8.6.23 As such, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor beneficial significance of effect, which is considered not significant.

Summary of Effects

Effect Identified	Receptor Sensitivity	Impact Magnitude	Nature	Duration	Degree of Effect	Level of certainty
Completed Development Effects						
Health effects from changes to air quality	High	Negligible	Adverse	Long term	Minor, not significant	Absolute
Health effects from changes in noise exposure	High	Negligible	Adverse	Long term	Minor, not significant	Absolute
Health Effects from changes to transport nature and flow rate	High	Negligible	Adverse	Long term	Minor, not significant	Absolute
Decommissioning Effects						
Health effects from changes to air quality	High	Negligible	Adverse	Short-term/medium-term	Minor, not significant	Absolute
Health effects from changes in noise exposure	High	Negligible	Adverse	Short-term/medium-term	Minor, not significant	Absolute
Health Effects from changes to transport nature and flow rate	High	Negligible	Adverse	Short-term/medium-term	Minor, not significant	Absolute
Health effects from income and employment generation	High	Negligible	Beneficial	Short-term/medium-term	Minor, not significant	Absolute

Table 8.5 – Summary of effects prior to mitigation

8.7 Mitigation

Mitigation for Completed Development Effects

- 8.7.1 Mitigation measures already proposed as part of the K3 permitted development and any additional mitigation measures relating to K3 Proposed Development would focus on environmental precursors to adverse health outcomes, thereby providing the opportunity for intervention to prevent any manifest health outcome.
- 8.7.2 The above assessment of human health effects has taken into account any proposed mitigation measures which are already part of the K3 permitted

development as well as any additional mitigation outlined within the relevant environmental technical disciplines associated with the K3 Proposed Development, namely Chapter 5: Air Quality and Chapter 4: Traffic and Transport. On this basis, no additional mitigation measures relevant to human health are considered necessary.

8.8 Residual Effects

- 8.8.1 As there are no mitigation measures proposed, the residual effects remain the same as those set out in Table 8.5.

8.9 WKN Predicted Effects

- 8.9.1 The WKN Proposed Development requires construction, completed development and decommissioning effects to be assessed. The health determinants to be assessed for both phases comprise changes in air quality, noise, transport and employment opportunities.

Construction Effects

Health Effects from Changes to Air Quality

- 8.9.2 The construction of the WKN Proposed Development has the potential to influence human health by contributing to nuisance dust from general on-site construction activities and through track out, and by changing community exposure to PM₁₀ and NO₂ levels due to associated transport movements. The relative risk however, is a function of the change in concentration, exposure and existing burden of poor health.
- 8.9.3 As stated in Chapter 5: Air Quality, the potential impact from nuisance dust would be limited to annoyance and is not considered to be significant. In addition, potential dust emissions would be managed through the implementation of a CEMP. As such, neither the change in concentration or exposure to construction dust emissions are sufficient to quantify any change in health outcome at a population level.
- 8.9.4 As stated in Chapter 5: Air Quality, the maximum change in PM₁₀ and NO₂ associated with construction traffic movements is predicted to be <0.1 µg/m³ and 0.2 µg/m³, respectively. This change would be temporary in nature, is not considered to be significant by air quality standards and remains within the relevant air quality objectives set to be protective of the environment and health.
- 8.9.5 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes in Noise Exposure

- 8.9.6 There is the potential for intermittent noise generation during the construction of the WKN Proposed Development. This will be largely limited during standard working hours, with the exception for essential works such as prolonged concrete

pours. Where this is required, it will only occur following agreement by Swale Borough Council. Overall, site preparation and construction works are anticipated to take approximately 40 months to complete.

- 8.9.7 The potential health effects from changes in noise exposure associated with the construction of the WKN Proposed Development is therefore limited to annoyance on the basis that construction activities (other than concrete pouring) would generally take place during day time hours only. On this basis, any health assessment relating to the potential for sleep disturbance is not included.
- 8.9.8 As stated in Chapter 7: Noise and Vibration, the maximum noise level at any sensitive receptor from on-site construction activities is predicted to be 29 dB L_{Aeq} at any receptor (during the day, evening and night time periods). In addition, the maximum change in ambient noise exposure at any sensitive receptor associated with construction transport movements on the existing road network is estimated to be <1 dB.
- 8.9.9 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a timing, duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes to Transport Nature and Flow Rate

- 8.9.10 As stated in Chapter 4: Traffic and Transport, it is estimated that there would be a maximum of 45 HGV deliveries per day (maximum of 90 HGV movements per day) during the peak construction period and an average of 27 HGV deliveries per day (54 HGV movements per day). This includes all associated construction deliveries (including abnormal indivisible loads) and all removal of material and waste. In addition, it is estimated there would be a maximum of 409 construction staff arriving and departing as a car driver per day to the WKN Proposed Development during the construction peak period.
- 8.9.11 The largest percentage increase in total traffic movements on any road link is predicted to be 60.5% while the largest increase in HGV movements is predicted to be 13.3%. While these percentage increases appear high, this is largely as a result of the low baseline traffic flows in the local area.
- 8.9.12 As stated in Chapter 4: Traffic and Transport, the change in traffic flows would be similar to those which are already on the network and would not and would not significantly change the character of the network. As a result, the WKN Proposed Development is not anticipated to alter risk of accident or injury during the construction phase. Furthermore, the potential change in road safety during the movement of abnormal indivisible loads, will be managed through the presence of a police escort.
- 8.9.13 In addition, the only potential impact on severance or pedestrian amenity would be limited to the presence of abnormal indivisible loads. However, abnormal indivisible loads, which could result in severance or pedestrian intimidation would be infrequent.

- 8.9.14 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Income and Employment Generation

- 8.9.15 It is widely accepted that income and employment generation, which are directly associated with socio-economic circumstance, are two of the most important precursors to good health and wellbeing.
- 8.9.16 At this stage, the peak number of workers required to complete the construction of the WKN Proposed Development is estimated to be 480. On the basis that the duration of the construction period is anticipated to be approximately 40 months, and is therefore only considered medium-term, the potential human health effects are only likely to improve socio-economic circumstance, and thus health and wellbeing, at the individual level rather than at the population level.
- 8.9.17 As such, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor beneficial significance of effect, which is considered not significant.

Completed Development Effects

Health Effects from Changes to Air Quality

- 8.9.18 The changes associated with the operation of the WKN Proposed Development have the potential to influence human health by changing community exposure to a range of pollutants generated by the stack and additional vehicle movements. The relative risk however, is a function of the change in concentration, exposure, individual pollutant hazard characteristics and the existing burden of poor health.
- 8.9.19 The hazard associated with changes in exposure to heavy metals, dioxins and furans detailed in Chapter 5: Air Quality, are well known, understood and addressed through the permitting regime such that they remain within objective thresholds set to be protective of the environment and health. As such, the human health chapter does not include a detailed assessment of these pollutants and instead focusses on the potential impact on human health from changes in long-term exposure to PM₁₀ and NO₂.
- 8.9.20 As stated in Chapter 5: Air Quality, the maximum change in PM₁₀ and NO₂ associated with stack emissions and associated vehicle movements at any receptor is predicted to be 0.08 µg/m³ for PM₁₀ and 0.12 µg/m³, respectively. This change is not considered to be significant by air quality standards and remains within the relevant air quality objectives set to be protective of the environment and health.
- 8.9.21 As shown in Table 8.6, in this worst-case hypothetical scenario, the change in concentration and exposure are orders of magnitude lower than what is required to quantify any measurable adverse mortality effect on local communities.

- 8.9.22 To set potential risk into context, the human health assessment applied a worst-case hypothetical scenario where half of the population within Swale Borough Council would reside in the maximum increase in PM₁₀ and NO₂ at any receptor.
- 8.9.23 The results from the air quality assessment and baseline health data from all-cause mortality and emergency hospital admissions collected for Swale Borough Council (detailed within Appendix 8.1), were applied using the World Health Organisation (WHO) Health Risks of Air Pollution in Europe (HRAPIE) guidance to quantitatively assess the potential human health impacts from the operation of the WKN Proposed Development.

Health Outcome	Worst-case Additional Health Outcome	Proportion of Baseline Rate
All-cause mortality	0.3	<1%
Hospital admissions (respiratory and cardiovascular disease)	0.5	<1%

Table 8.6 – Health outcome effects associated with changes in air quality

- 8.9.24 As shown above, even when grossly overestimating population exposure, the relative change in concentration is insufficient to quantify any measurable change in mortality rate or hospital admissions. On this basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes in Noise Exposure

- 8.9.25 The WKN Proposed Development will be operational 24 hours per day, 7 days per week. As a result, there is the potential for annoyance and sleep disturbance effects to occur.
- 8.9.26 As stated in Chapter 7: Noise and Vibration, the maximum change in ambient noise exposure during the operation of the WKN Proposed Development from on-site activities or transport movements on the existing road network is estimated to be <1 dB during the day or night time periods.
- 8.9.27 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes to Transport Nature and Flow Rate

- 8.9.28 The WKN Proposed Development would process approximately 390,000 tonnes of waste per annum which would be delivered to the WKN site by HGVs and RCVs. In addition, there would be additional vehicle movements associated with staff movements.
- 8.9.29 As stated in Chapter 4: Traffic and Transport, the WKN Proposed Development would generate an additional 250 daily HGV movements and 75 daily staff

movements. The largest percentage increase in total traffic movements on any road link is predicted to be 18.0% while the largest increase in HGV movements is predicted to be 36.2%.

- 8.9.30 As stated in Chapter 4: Traffic and Transport, the change in traffic flows would be similar to those which are already on the network and would not significantly change the character of the network. As a result, the WKN Proposed Development is not anticipated to alter risk of accident or injury during operation.
- 8.9.31 There is no potential for severance effects as the existing community is not bisected by the traffic route (on Swale Way). In addition, the change in total traffic movements is below the threshold for there to be a significant effect on pedestrian amenity.
- 8.9.32 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Income and Employment Generation

- 8.9.33 It is anticipated that during the operational phase, the WKN Proposed Development will generate 50 full-time direct job opportunities.
- 8.9.34 In addition, to the direct job opportunities provided, there would be indirect and induced employment opportunities generated not only at the local level but also at the regional and national level, further down the supply chain and through local spending. Any employment opportunities provided to the local population would support the uptake of socio-economic related health benefits locally.
- 8.9.35 At this stage, it is unclear where workers would be sourced from. In addition, the number of job opportunities generated by the WKN Proposed Development are only likely to improve socio-economic circumstance, and thus health and wellbeing, at the individual level rather than at the population level. As such, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor beneficial significance of effect, which is considered not significant.

Decommissioning Effects

- 8.9.36 The nature of the decommissioning phase would remain similar to the construction phase. As such, it can be concluded that the potential effects on human health would remain the same.

Summary of Effects

Effect Identified	Receptor Sensitivity	Impact Magnitude	Nature	Duration	Degree of Effect	Level of certainty
Construction Effects						
Health effects from changes to air quality	High	Negligible	Adverse	Short term	Minor, not significant	Absolute

Wheelabrator Technologies Inc
 Wheelabrator Kemsley Generating Station (K3) and Wheelabrator Kemsley North (WKN) Waste to Energy Facility DCO

Effect Identified	Receptor Sensitivity	Impact Magnitude	Nature	Duration	Degree of Effect	Level of certainty
Health effects from changes in noise exposure	High	Negligible	Adverse	Short term	Minor, not significant	Absolute
Health effects from changes to transport nature and flow rate	High	Negligible	Adverse	Short term	Minor, not significant	Reasonable
Health effects from income and employment generation	High	Negligible	Beneficial	Short term	Minor, not significant	Absolute
Completed Development Effects						
Health effects from changes to air quality	High	Negligible	Adverse	Long term	Minor, not significant	Absolute
Health effects from changes in noise exposure	High	Negligible	Adverse	Long term	Minor, not significant	Absolute
Health effects from changes to transport nature and flow rate	High	Negligible	Adverse	Long term	Minor, not significant	Reasonable
Health effects from income and employment generation	High	Negligible	Beneficial	Long term	Minor, not significant	Absolute
Decommissioning Effects						
Health effects from changes to air quality	High	Negligible	Adverse	Short term	Minor, not significant	Absolute
Health effects from changes in noise exposure	High	Negligible	Adverse	Short term	Minor, not significant	Absolute
Health effects from changes to transport nature and flow rate	High	Negligible	Adverse	Short term	Minor, not significant	Reasonable
Health effects from income and employment generation	High	Negligible	Beneficial	Short term	Minor, not significant	Absolute

Table 8.7 – Summary of effects prior to mitigation

8.10 Mitigation

Mitigation for Construction and Completed Development Effects

- 8.10.1 Mitigation measures relating to the WKN Proposed Development construction and completed development effects would focus on environmental precursors to adverse health outcomes, thereby providing the opportunity for intervention to prevent any manifest health outcome.
- 8.10.2 The above assessment of human health effects has taken into account any proposed mitigation measures which are outlined within the relevant environmental technical disciplines, namely Chapter 5: Air Quality, Chapter 7: Noise and Vibration and Chapter 4: Traffic and Transport. On this basis, no additional mitigation measures relevant to human health are considered necessary.

8.11 Residual Effects

- 8.11.1 As there are no mitigation measures proposed, the residual effects remain the same as those set out in Table 8.7.

8.12 Cumulative Effects

- 8.12.1 The human health cumulative assessment is based on the following scenarios:
- K3 Proposed Development + other cumulative developments;
 - WKN Proposed Development + permitted K3 development + other cumulative developments; and
 - K3 Proposed Development + WKN Proposed Development + other cumulative developments.
- 8.12.2 The relevant “other” cumulative developments assessed in combination with the K3 and WKN Proposed Developments remain consistent with the technical disciplines which inform the Human Health chapter, namely Chapter 5: Air Quality, Chapter 7: Noise and Vibration and Chapter 4: Traffic and Transport.

K3 Proposed Development + other cumulative developments

Health Effects from Changes to Air Quality

Operation

- 8.12.3 In a scenario where the K3 Proposed Development and all other relevant cumulative developments were operational, the annual mean ambient concentrations of PM₁₀ and NO₂ would remain below the relevant objective thresholds set to be protective of the environment and health.

- 8.12.4 Based on the approach to the cumulative assessment applied in Chapter 5: Air Quality, it is not possible to quantitatively assess potential human health impacts at any given sensitive receptor. However, taking into account the results from the human health assessment detailed in Section 8.6 and Section 8.9 and on the basis that ambient concentrations of PM₁₀ and NO₂ would remain below the relevant objective thresholds set to be protective of the environment and health in a worst-case scenario, it is anticipated that the relative change in concentration is insufficient to quantify any measurable change in mortality rate or hospital admissions.
- 8.12.5 On this basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Decommissioning

- 8.12.6 During decommissioning of the K3 Proposed Development + other relevant cumulative developments, there is the potential for cumulative impacts on human health associated with the generation of nuisance dust. However, it is anticipated that there would be effective implementation of appropriate mitigation measures on other sites to control this.
- 8.12.7 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes in Noise Exposure

Operation

- 8.12.8 As stated in Section 8.6, the operation of the K3 Proposed Development would not result in any increase in on-site noise generation from what is already permitted. However, there is the potential for an increase in noise exposure associated with traffic flows.
- 8.12.9 The predicted increase in traffic noise associated with the operation phase of the K3 Proposed Development and other relevant cumulative developments on the existing road network is estimated to be approximately <1 dB.
- 8.12.10 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a timing, duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be minor, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Decommissioning

- 8.12.11 As stated in Chapter 7: Noise and Vibration, noise generation from decommissioning activities are expected to be no worse than, but are likely to be similar to or less than, those that would occur during the construction phase.

- 8.12.12 Due to the variable nature of construction noise, any cumulative effects are generally no greater than what arises for individual projects. Consequently, the cumulative effects on human health due to on-site decommissioning works overlapping with other projects would be unlikely to be greater than for the project alone where daytime construction activities are not expected to exceed 65 dB $L_{Aeq,12h}$ at sensitive receptors and night time construction activities are not expected to exceed 45 dB $L_{Aeq,8h}$.
- 8.12.13 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a timing, duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Health Effects from Changes in Transport Nature and Flow Rate

- 8.12.14 Within Chapter 4: Traffic and Transport, three cumulative assessment years have been assessed for 2020, 2023 and 2031. In all assessment years, the projected increase in traffic flows during operation and decommissioning is not anticipated to materially change the flow rate or nature of traffic on the existing road network, therefore not increasing intimidation, pedestrian delay or severance.
- 8.12.15 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

WKN Proposed Development + permitted K3 development + other cumulative developments

Health Effects from Changes to Air Quality

Construction

- 8.12.16 During construction of the WKN Proposed Development + other relevant cumulative developments, there is the potential for cumulative impacts on human health associated with the generation of nuisance dust. However, it is anticipated that there would be effective implementation of appropriate mitigation measures on other construction sites to control this.
- 8.12.17 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Operation

- 8.12.18 In a scenario where the WKN Proposed Development, permitted K3 development and all other relevant cumulative developments were operational, the annual mean ambient concentrations of PM_{10} and NO_2 would remain below the relevant objective thresholds set to be protective of the environment and health.

- 8.12.19 Based on the approach to the cumulative assessment applied in Chapter 5: Air Quality, it is not possible to quantitatively assess potential human health impacts at any given sensitive receptor. However, taking into account the results from the human health assessment detailed in Section 8.6 and Section 8.9 and on the basis that ambient concentrations of PM₁₀ and NO₂ would remain below the relevant objective thresholds set to be protective of the environment and health in a worst-case scenario, it is anticipated that the relative change in concentration is insufficient to quantify any measurable change in mortality rate or hospital admissions.
- 8.12.20 On this basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Decommissioning

- 8.12.21 On the basis that decommissioning activities would remain similar to those during construction, the potential for cumulative impacts on human health conclusion remains the same as for the construction phase.

Health Effects from Changes in Noise Exposure

Construction

- 8.12.22 As stated in Chapter 7: Noise and Vibration, due to the variable nature of construction noise, the cumulative effects of construction are generally no greater than arise for individual projects. Consequently, the cumulative effects on human health due to on-site construction works overlapping with other projects would be unlikely to be greater than for the project alone.
- 8.12.23 However, the worst-case increase in traffic noise associated with the construction of the WKN Proposed Development and other relevant cumulative developments on the existing road network is estimated to be approximately <1 dB.
- 8.12.24 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a timing, duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Operation

- 8.12.25 As stated in Chapter 7: Noise and Vibration, the only identified scheme with the potential to result in cumulative on-site operational effects is Scheme 16 is for the decommissioning of the existing K1 'combined heat and power plant' (CHP) on the site and build, commission and operation of a new CHP plant. These effects are not considered significant.
- 8.12.26 The worst-case increase in traffic noise associated with the operation phase of the WKN Proposed Development, K3 permitted development and other relevant

cumulative developments on the existing road network is estimated to be approximately <1 dB.

8.12.27 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be minor, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Decommissioning

8.12.28 On the basis that decommissioning activities would remain similar to those during construction, the potential for cumulative impacts on human health conclusion remains the same as for the construction phase.

Health Effects from Changes in Transport Nature and Flow Rate

8.12.29 Within Chapter 4: Traffic and Transport, three cumulative assessment years have been assessed for 2020, 2023 and 2031. In all assessment years, the projected increase in traffic flows during operation and decommissioning is not anticipated to materially change the flow rate or nature of traffic on the existing road network, therefore not increasing intimidation, pedestrian delay or severance.

8.12.30 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

K3 Proposed Development + WKN Proposed Development + other cumulative developments

Health Effects from Changes to Air Quality

Construction

8.12.31 As stated in Section 8.6, there is no construction associated with the K3 Proposed Development. Therefore, the potential human health effects from changes in air quality remains the same as for the WKN Proposed Development + K3 permitted development + other cumulative developments scenario.

Operation

8.12.32 In a scenario where the K3 Proposed Development, WKN Proposed Development and all other relevant cumulative developments were operational, the annual mean ambient concentrations of PM₁₀ and NO₂ would remain below the relevant objective thresholds set to be protective of the environment and health.

8.12.33 Based on the approach to the cumulative assessment applied in Chapter 5: Air Quality, it is not possible to quantitatively assess potential human health impacts at any given sensitive receptor. However, taking into account the results from the human health assessment detailed in Section 8.6 and Section 8.9 and on the basis

that ambient concentrations of PM₁₀ and NO₂ would remain below the relevant objective thresholds set to be protective of the environment and health in a worst-case scenario, it is anticipated that the relative change in concentration is insufficient to quantify any measurable change in mortality rate or hospital admissions.

- 8.12.34 On this basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Decommissioning

- 8.12.35 On the basis that decommissioning activities would remain similar to those during construction, the potential for cumulative impacts on human health conclusion remains the same as for the construction phase.

Health Effects from Changes in Noise Exposure

Construction

- 8.12.36 As stated in Chapter 7: Noise and Vibration, due to the variable nature of construction noise, the cumulative effects of construction are generally no greater than arise for individual projects. Consequently, the cumulative effects on human health due to on-site construction works overlapping with other projects would be unlikely to be greater than for the project alone.
- 8.12.37 However, the worst-case increase in traffic noise associated with the construction of the WKN Proposed Development and other relevant cumulative developments on the existing road network is estimated to be approximately <1 dB.
- 8.12.38 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a timing, duration or magnitude sufficient to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Operation

- 8.12.39 As stated in Chapter 7: Noise and Vibration, the only identified scheme with the potential to result in cumulative on-site operational effects is Scheme 16 is for the decommissioning of the existing K1 'combined heat and power plant' (CHP) on the site and build, commission and operation of a new CHP plant. These effects are not considered significant.
- 8.12.40 The worst-case increase in traffic noise associated with the operation phase of the K3 Proposed Development, WKN Proposed Development and other relevant cumulative developments on the existing road network is estimated to be approximately <1 dB.
- 8.12.41 As such, the potential change in noise exposure is below what is generally considered intrusive or perceptible and is not of a duration or magnitude sufficient

to result in sleep disturbance or quantify any manifest health outcome at a population level. On the above basis, the magnitude of impact on human health would be minor, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

Decommissioning

- 8.12.42 On the basis that decommissioning activities would remain similar to those during construction, the potential for cumulative impacts on human health conclusion remains the same as for the construction phase.

Health Effects from Changes in Transport Nature and Flow Rate

- 8.12.43 Within Chapter 4: Traffic and Transport, three cumulative assessment years have been assessed for 2020, 2023 and 2031. In all assessment years, the projected increase in traffic flows during operation and decommissioning is not anticipated to materially change the flow rate or nature of traffic on the existing road network, therefore not increasing intimidation, pedestrian delay or severance.
- 8.12.44 On the above basis, the magnitude of impact on human health would be negligible, where in an area of high sensitivity, would result in a minor adverse significance of effect, which is considered not significant.

8.13 Summary

Overall, it is not anticipated that there would be any significant human health effects resulting from the construction of the WKN Proposed Development, operation of the K3 and WKN Proposed Developments, or through worst-case cumulative interactions with other relevant proposed developments in the locality. This has been concluded on the basis that any change in health determinant would not be sufficient to quantify any change in baseline health outcomes within the surrounding community.

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