



**Clyde
Shanks**

Chapter 16

Population and
Socio-economic Impacts

16. Population and Human Health

Introduction

- 16.1 On the 19th April 2024, Northern Ireland Environment Agency (NIEA) provided a consultation response to the planning addendum submitted in September 2023, raising the following operational points:
- to apply the latest versions of air dispersion modelling software (AERMOD and ADMS);
 - to apply an up-to-date five-year meteorological dataset (2019 to 2023);
 - to apply the latest background air quality concentrations; and
 - to consider the latest sensitive receptor locations.
- 16.2 A transport review further identified two additional committed developments to be included in the traffic assessment, of which also necessitates the need to provide a noise addendum based on the new traffic data.
- 16.3 It is critical to emphasise that none of these requests represent any gap, error or criticism for anything previously submitted, and solely reflects the need for iterative update as a consequence of the extended decision making process period (now in excess of a decade).
- 16.4 Parallel to this, further assessment had been undertaken following an objection sent to the Minister for Infrastructure from the NoARC21 community group, regarding:
- a lack of quantitative assessment of road traffic emissions and consideration of the potential for combined impacts of stack and road traffic emissions;
 - potential for odours from untreated waste to affect the amenity of local residents; and
 - general risk perceptions regarding Energy Recovery Facility Bottom Ash management.
- 16.5 These concerns formed the basis to the current 2025 ES addendum scope, and while not requested, it seemed appropriate and prudent to provide a Population and Health Addendum.
- 16.6 A summary of the health-related document submissions which have supported the planning application process thus far, and should be considered alongside this Population and Health Addendum includes:
- the original Health Impact Assessment (HIA), voluntarily submitted in 2014 to support the original planning application;
 - a Statement of Case and associated Rebuttal was provided in 2016 to inform the hearing before the Planning Appeals Commission (PAC);
 - a HIA Addendum was submitted in March 2019 which tested the conclusions of the original 2014 HIA;

- a response to third party representations received which raised concerns in relation to impact on human health was provided in October 2020; and
- a Population and Health Addendum was provided in 2023, including an updated baseline and review of the latest supporting health evidence base, structured to current planning requirements.

16.7 The above submissions test and reinforce that the key findings of the original HIA remained valid, were not affected by factors which were identified to have changed since 2014, and did not identify any gaps or error in what was previously assessed.

16.8 This Population and Health Addendum does not seek to cover the approach, process or scope applied, as no gaps, error or conflicting evidence have been raised by any party during the entire life of the application. Instead, the Population and Health Addendum draws from and builds upon the current air quality, transport and noise addendum to communicate what this means for health, and any deviation from the previous conclusion.

16.9 It is intended that this addendum is read alongside the original 2014 ES chapter and addendums prepared in 2014, 2016, 2019 and 2023.

Statement of Authority

16.10 The Director of the Savills Health and Social Impact team, Dr Andrew Buroni, previously of RPS, has been involved in the proposed development since the project's inception, and is the author of this Population and Health Addendum.

16.11 Dr Buroni holds a Biological/Biomedical Science degree with honours, a Masters in Environmental Impact Assessment (EIA) and a PhD on International Health Impact Assessment (HIA) Methods and Best Practice. He has received formal training in Environmental Health Impact Assessment (EHIA) at the Caribbean Environmental Health Institute by the Pan American Health Organisation and Health Canada, and at the International Health Impact Assessment Consortium (IMPACT) at the University of Liverpool.

16.12 Dr Buroni is an internationally recognised expert in health and social impact assessment with over 25 years of experience. He has designed, led and given health and equality evidence at public inquiry and issue-specific hearings, and has a substantial catalogue of project experience ranging in scale from local planning to Developments of National Significance (Wales) (or Nationally Significant Infrastructure Projects in England).

16.13 Dr Buroni and his team sits on the Institute of Environmental Management and Assessment (IEMA) Health in EIA Working Group, further embedding the consideration of health within EIA, he is classed as an IEMA Advanced Expert; he provides Local Authority HIA training for the Office for Health Improvement and Disparities; and he is a technical advisor to, and accredited author for the World Health Organisation on waste and the circular economy.

Health Effect from Changes in Air quality

16.14 As detailed in Chapter 14 (Air Quality), the air quality assessment has been revisited to reflect advances in air quality dispersion software; the remodelled transport data, and to further consider population growth, receptor sensitivity, changes in baseline air quality and assessment significance. The odour assessment has also been updated to reflect new guidance.

Stack Emissions: Particulate Matter and Nitrogen Dioxide

16.15 As detailed in the original 2014 HIA, research into the potential health effects from exposure to air pollution is extensive. The relationship between various air pollutants and a range of health outcomes is well understood, whereby it is possible to reliably quantify health effects at the population level. A comprehensive update to the health evidence base presented in the original HIA was provided in Appendix 12.2 in the 2023 Addendum (Health and Waste Management Evidence Base). Ongoing research has only reinforced the health evidence base, and the position from the UKHSA, that:

“well run and regulated municipal waste incinerators are not a significant risk to public health. UKHSA will continue to review its advice in light of any new substantial research on the health effects of incinerators published in peer-reviewed journals. To date, UKHSA is not aware of any evidence that requires a change in the position statement”.¹

16.16 In order to quantify the health impact associated with changes in exposure to air quality, concentration response functions (CRFs) can be applied with the absolute change in air quality associated with operation of the proposed development, alongside population estimates, and existing burden of poor health.

16.17 The original 2014 HIA applied a hypothetical worst-case scenario to establish the potential impacts on all-cause mortality rate, whereby:

- The entire population of Antrim, Belfast and Newtownabbey (419,529 people at the time) were to live in a single residential property / receptor grid point that would experience the greatest increase in annual average PM_{2.5} exposure – in reality, the changes in air pollution exposure would be much less and would not affect such a wide area.
- The entire PM₁₀ fraction is assumed to be PM_{2.5} – whereby, PM_{2.5} has a higher risk ratio and is a subset of PM₁₀.

16.18 The original 2014 HIA concluded there would be no measurable risk to human health on the basis that the increase in PM concentration predicted at the most-affected residential receptor is 0.026 µg/m³, which would lead to a 0.02% increase in mortality, equating to an additional 0.6 deaths brought forward per year.

16.19 As stated in Chapter 14 (Air Quality) of this Addendum, the design parameters and emissions rates for the proposed development, and associated process contributions predicted by the air

¹ Parliamentary Question (October 2024): <https://questions-statements.parliament.uk/written-questions/detail/2024-10-08/hl1411>

dispersion model are relatively unchanged from the original assessment, will remain well within air quality objectives protective of health, and remain orders of magnitude lower than is required to quantify any measurable risk to health.

16.20 In addition, the assessment detailed in the original 2014 HIA grossly overestimated population exposure due to the hypothetical worst-case scenario applied within the calculations (i.e. using the entire population of Antrim, Belfast and Newtownabbey). As such, while the number of people living in proximity to the proposed development has increased since the original 2014 HIA was submitted, the number of people affected remains much lower than the 419,529 population figure applied demonstrating no measurable risk to health.

Stack Emissions: Pollutants of Concern (dioxins, furans, PAHs and heavy metals)

16.21 The original 2014 HIA drew from the Human Health Risk Assessment (HHRA) to explore the ecotoxicology of known pollutants of concern. This concluded that the worst case potential exposure via inhalation, ingestion and dermal contact over a lifetime of exposure for a worst case hypothetical receptor did not present any appreciable risk to health.

16.22 As detailed in Paragraphs 14.78-14.82, the Air Quality Addendum reinforces this conclusion, where all Environmental Assessment Levels protective of the environment and health continue to be met.

Road traffic emissions

16.23 As detailed in paragraphs 14.60-14.66, when applying current modelling software and the updated transport parameters, air quality remains well within air quality objective thresholds protective of health, and the highest transport emission contribution at any receptor are negligible, remaining orders of magnitude lower than is required to quantify any measurable change in health.

16.24 Such a conclusion is consistent with that drawn in the original 2014 HIA and Chapter 14 (Air Quality).

Cumulative stack and road traffic Emissions

16.25 As further detailed in Table 14.10, the combined process and traffic emissions have been modelled at all receptors, and the worst case cumulative effect explored to account for current baseline and consented developments. The conclusion drawn is that the relative change remains negligible, air quality will continue to remain well within air quality objectives protective of the environment and health, and the absolute change in concentration and exposure remains orders of magnitude lower than is required to quantify any change in health.

Odour

16.26 As detailed in paragraph 14.67-14.75, when applying the new odour assessment guidance, the Air Quality Odour Addendum reinforces the original conclusion, that the potential odour source is internalised, is subject to negative pressure proven effective in preventing fugitive odour

emissions; and the odour would be characterised as moderate with limited credible exposure pathways. When further considering that the facility would divert waste from local open landfill, there is little evidence to suggest any significant adverse effect, only a net benefit.

Health Effects from Changes in Noise Exposure

16.27 As stated in Chapter 13 (Noise), baseline noise levels have not materially changed from those considered in the 2023 Noise Addendum, and when considering the latest traffic modelling outputs and receptors, the current Noise Addendum shows no change from the 2023 Addendum, that concludes the impact would be of a Minor Significance.

16.28 A similar conclusion is drawn for health, where the change in noise magnitude, timing and duration, while noticeable, are not sufficient to quantify any measurable adverse health outcome, and would cease the established use of the site as a quarry with unrestricted planning permission and transport movements.

Health Effects from Changes in Transport Movements

16.29 The transport assessment was remodelled to reflect changes in baseline and subsequently consented developments. The relative changes are negligible, and capacity, road safety and access remain consistent with the conclusions drawn in all previous assessments.

16.30 Traffic movements are unlikely to result in community severance or risk of accident/injury.

Risk perception

16.31 The original 2014 HIA stated that there was community concern regarding:

- nuisance effects (from flies and vermin); and
- exposure to EMF.

16.32 Both were addressed and found not to present any credible risk to public health. Since then, the only new concern raised was in relation to the potential risk of microplastic exposure in the Bottom Ash. It is understood that this originates from a study in China, applying a different technology, and operating to different permitting conditions that would not be permissible in the UK.

16.33 However, for clarity, Bottom Ash is the non-combustible residue of combustion, of which goes through a stabilisation process to address the known hazards before it is entered onto its next use. The proposed facility includes an Incineration Bottom Ash (IBA) processing facility, where IBA will be stored, matured, analysed and then processed to recover remaining metals. The remaining fraction can be used as a sustainable alternative to virgin sand and aggregate in suitable construction applications. The practice is common across Europe and the UK, is in line with circular economy principles and provides significant carbon, transport and cost savings. As with all activities on the proposed site, all regulatory and legislative requirements will be met. Where this is not the case a permit to operate will not be provided and can be withdrawn.

Population and Health Conclusion

16.34 As detailed in the original application, and all the subsequent addendum, the potential hazards of energy recovery facilities are well known, understood, and addressed through planning, with some of the most rigorous permitting requirements of any industry.

16.35 Following a review of the Air Quality, Noise and Transport Addenda, it is clear that the iterative update necessitated through the extended decision making process (exceeding a decade) does not materially alter the original health assessment conclusion, or the current position of the UKHSA, that *“well run and regulated municipal waste incinerators are not a significant risk to public health”*.

16.36 No gaps or errors have been found in the health assessment and no countervailing evidence has been provided by any party that would question the conclusions presented in the original HIA or any of the subsequent addenda.