

Viking CCS pipeline

Preliminary Environmental Information Report Volume II

Main PEIR

Applicant: Chrysoar Production (U.K.) Limited,
a Harbour Energy Company

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Chapter 14

Air Quality



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14 Air Quality

14.1 Introduction

- 14.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) provides a preliminary assessment of the effects on local air quality that could result from the proposed Viking CCS Pipeline (hereafter referred to as ‘the Project’).
- 14.1.2 The potential effects on air quality are considered with respect to existing national and local planning policy and with reference to industry standard guidance.
- 14.1.3 This chapter should be read in conjunction with Chapter 12: Traffic and Transport, Chapter 13: Noise and Vibration and Chapter 17: Health and Wellbeing.
- 14.1.4 This chapter is supported by a series of figures (**Figure 14-1** to **Figure 14-4**) which provide an overview of air quality constraints, background concentrations for various pollutants and the construction dust assessment. It is also supported by *PEIR Volume IV - Appendix 14.1: Construction Dust Methodology*, which provides a detailed methodology of the construction dust assessment.

14.2 Legislation, Policy and Guidance

Legislation

- 14.2.1 A summary of the relevant legislation is given in **Table 14-1**. **Table 14-2** provides the Air Quality Standards (AQS) and Air Quality Objectives (AQO) relevant to this assessment.

Table 14-1: Legislation Relevant to Air Quality

Legislation	Legislation Context
The Environment Act 1995 (Ref 14-1)	The Environment Act 1995 and subsequent amendments relate to a wide range of environmental issues. The Act covers the control of pollution and lays out the responsibility of the governing bodies in the UK responsible for the enforcement of environmental laws. Part IV of the Environment Act 1995 requires that Local Authorities periodically review air quality within their individual areas. This process of Local Air Quality Management (LAQM) is an integral part of delivering the Government's AQOs.
The Environment Act 2021	The Environment Act 2021 is made up of eight parts relating to a wide range of environmental issues including air quality. The Act requires the Secretary of State to make Regulations setting a target of the annual level of PM _{2.5} . Section 4(9) requires draft Regulations to be laid before Parliament on or before 31 October 2022, although this has now been deferred to a later date. The Act also contains amendments to Part 4 of the Environment Act 1995 and amendments of the Clean Air Act 1993.
The Air Quality Regulations 2000, United Kingdom (Ref 14-2)	Provides Air Quality Objectives (AQOs) for a range of different pollutants, unlike AQSs, there is no statutory obligation to meet AQOs; AQOs are policy targets often expressed as a maximum ambient concentration not to be exceeded, either without

Legislation	Legislation Context
	<p>exception or with a permitted number of exceedances, over a specified averaging period.</p>
<p>The 2007 Air Quality (England) Strategy for England, Scotland, Wales and Northern Ireland (Ref 14-3)</p>	<p>The Environment Act 1995 required the adoption of an Air Quality Strategy containing standards, objectives and measures for improving ambient air quality.</p> <p>Although not legislation, The 2007 Air Quality Strategy is designed to meet the requirement in the Environment Act 1995 and so has been included in this table. The Strategy provides a framework for improving air quality at a national and local level and supersedes the previous strategy published in 2000. It imposes a number of obligations on local authorities to manage air quality.</p> <p>Central to the Air Quality Strategy are health-based criteria for certain air pollutants; these criteria are based on medical and scientific reports on how and at what concentration each pollutant affects human health and mirror the Air Quality Objectives (AQOs) set out in the Air Quality (England) Regulations 2000. The AQOs are policy targets often expressed as a maximum ambient concentration not to be exceeded, either without exception or with a permitted number of exceedances, over a specified averaging period.</p>
<p>The Air Quality Standards Regulations 2010 , as amended (Ref 14-4)</p>	<p>The Air Quality Standards (AQS) Regulations report limit values at differing averaging periods for certain pollutants. There are limits provided for the protection of human health for SO₂, NO₂, Benzene, CO and Pb. Target values have been set for the concentration of PM_{2.5}.</p> <p>A limit value for the concentration of PM_{2.5} is also provided. All limit values included in these Regulations should not be exceeded.</p> <p>This regulation transposes the European Directive 2008/50/EC (as amended) (Ref 12-19) into UK law.</p>
<p>The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018 (Ref 14-5)</p>	<p>The Non-Road Mobile Machinery (NRMM) Regulations provide the requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery. This regulation transposes the European Directive 97/68/EC (as amended) (Ref 12-21) into UK law.</p>

Table 14-2: Relevant Air Quality Standards and Objectives

Pollutant	Averaging Period	Value (µg/m ³)
NO ₂	Annual mean	40
	1-hour mean (not to be exceeded more than 18 times per year)	200
Particulate Matter (PM) ₁₀	Annual mean	40
	24-hour mean (not to be exceeded more than 35 times per year)	50
PM _{2.5}	Annual mean	25

Policy

14.2.2 A summary of the relevant planning policy is given in **Table 14-3**.

Table 14-3: Planning Policy Relevant to Air Quality

Policy Reference	Policy Context
National Policy	
Overarching National Policy Statement for Energy (EN-1) (Ref 14-6)	<p>Paragraph 5.2.6 in Section 5.2 Air Quality and Emissions states</p> <p><i>“Where the project is likely to have adverse effects on air quality, the applicant should undertake an assessment of the impacts of the proposed project as part of the Environmental Statement (ES).”</i></p> <p>Paragraph 5.2.7 further states that the ES should describe:</p> <p><i>any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project; the predicted absolute emission levels of the proposed project, after mitigation methods have been applied; existing air quality levels and the relative change in air quality from existing levels; and any potential eutrophication impacts.”</i></p>
National Planning Policy Framework (NPPF) (Ref 14-7)	<p>Paragraph 186 states:</p> <p><i>“Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas (AQMA) and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in AQMA and Clean Air Zones is consistent with the local air quality action plan.”</i></p>

Policy Reference	Policy Context
	<p>The assessment will carefully consider the potential impact of the Project and establish whether it might constitute an obstacle to the achievement of strategic objectives that are set out within the air quality action plans of administrative authorities to bring about improvements in air quality within their AQMAs.</p>
<p>Clean Air Strategy 2019 (Ref 14-8)</p>	<p>Defra’s Clean Air Strategy outlines the Government’s proposed ambitions relating to reducing air pollution in order to protect health and nature, whilst boosting the economy. The strategy sits alongside three other UK government strategies: the Industrial Strategy, the Clean Growth Strategy and the 25 Year Environment Plan. Amongst others, the Clean Air Strategy proposes to halve the number of people living in locations where concentrations of particulate matter are above the World Health Organization (WHO) guideline limit of 10 µg/m³ by 2025 and work in close collaboration with industry to explore further opportunities for industrial emissions reductions by developing a series of sector roadmaps to set standards aimed at making UK industry world leaders in clean technology.</p> <p>The Project will not conflict with Government’s aims of reducing exposure to PM_{2.5} below the WHO guideline as appropriate mitigation will be implemented where necessary.</p>
<p>Local Policies</p>	
<p>North East Lincolnshire Local Plan 2013 – 2032 (Ref 14-9)</p>	<p>The North East Lincolnshire Local Plan was adopted in 2018. A relevant strategic objective outlined is SO2: Climate change, this includes the management of air quality in the North East Lincolnshire Council area. One policy within the Local Plan is relevant to air quality:</p> <p><i>Policy 5: Development boundaries sets out how all proposed developments within the Council must consider noise and air quality, in line with sustainability considerations.</i></p>
<p>North Lincolnshire Local Development Framework 2006 – 2026 (Ref 14-10)</p>	<p>The Local Development Framework consists of a Core Strategy which states that a key goal of the Framework is to reduce pollution levels and frame North Lincolnshire local environmental needs within the wider global picture. A relevant objective to the Project is:</p> <p><i>Spatial Objective 7: Effective Use and Management of Resources. This aims to support measures to minimise pollution and improve air quality and ensure adequate infrastructure is in place to serve new developments.</i></p>
<p>Central Lincolnshire Local Plan 2012-2036 (West Lindsey) (Ref 14-11)</p>	<p>The Central Lincolnshire Plan was adopted in 2017 by WLDC, along with Lincoln City and North Kesteven. Policy LP26: Design and Amenity states that:</p> <p><i>“The amenities which all existing and future occupants of neighbouring land and buildings may reasonably expect to enjoy must not be unduly harmed by or as a result of development.”</i></p> <p>The policy goes on to say that proposals should demonstrate that <i>“Adverse impact upon air quality from odour, fumes, smoke, dust and</i></p>

Policy Reference	Policy Context
	<i>other sources</i> ” has been considered in relation to both the construction and life of the development.

Guidance

14.2.3 A summary of relevant technical guidance is provided in **Table 14-4**.

Table 14-4: Technical Guidance Relevant to Air Quality

Technical Guidance Document	Context
Defra Local Air Quality Management (LAQM) Technical Guidance LAQM.TG16 (Ref 14-12)	Provides guidance for governmental and private sectors to discharge their obligations under the LAQM regime. It contains guidance on numerous areas including, for example, screening tools and methodologies, air quality monitoring, estimating emissions and dispersion modelling.
Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction v1.1 (2016) (Ref 14-13)	Provides a four-step process for evaluating the risk associated with dust emissions from construction and demolition sites on different types of receptor with respect to dust soiling, health effects and ecological effects.
Environmental Protection UK & IAQM Land-Use Planning and Development Control: Planning for Air Quality (2017) (Ref 14-14)	Provides a procedure for screening potential air quality effects of new development and a procedure for assessing the significance of air quality effects in planning applications.
IAQM Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites v.1.1 (2020) (Ref 14-15)	Provides guidance on the air quality impacts of development on designated nature conservation sites but establishes that the assessment of the effects that air quality impacts may have on habitats and species should be the responsibility of a suitability qualified and experienced ecologist.
Highways England Design Manual for Roads and Bridges (DMRB) LA 105 (Ref 14-16)	Provides guidance on the assessment of air quality from highways infrastructure schemes, including means to determine significant effects based on the potential for harm to human health, nature conservation and the UK’s ability to comply with the Air Quality Directive, as well and the risk of dust arising from the construction activities. This guidance is specific to the delivery of motorway and trunk-road projects but it contains relevant screening criteria for changes in traffic numbers.

14.3 Scoping Opinion and Consultation

14.3.1 A scoping exercise was undertaken in early 2022 to establish the content of the air quality assessment and the approach and methods to be followed.

- 14.3.2 The Scoping Report records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Project on air quality.
- 14.3.3 Following receipt of the Scoping Opinion (*PEIR Volume IV - Appendix 5.2*), the following requirements shown in **Table 14-5** have been identified by the Planning Inspectorate.

Table 14-5: Summary of the EIA Scoping Opinion in relation to Air Quality

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
<p>Planning Inspectorate Paragraph 12.4.1, Paragraph 12.6.7</p>	<p>Air quality survey and detailed assessment of construction vehicle impacts</p>	<p>The Scoping Report states that based on similar projects and known Air Quality Management Area (AQMA) locations, detailed assessment of construction vehicle impacts is unlikely to be required. Detailed assessment is proposed to be scoped out unless modelling of construction phase vehicle movements is identified as required through consultation, or through further information becoming available regarding construction traffic and routing. Based on the scale and nature of the proposals, and given the information provided in the Scoping Report on the receiving environment and the screening criteria applied, the Inspectorate is content with this approach. The description of development provided in the ES should set out the anticipated vehicle movements in construction to demonstrate that relevant thresholds for further assessment would not be exceeded. The Inspectorate also advises that the rationale and justification for the approach taken is fully explained in the ES.</p>	<p>The Planning Inspectorate agrees that a detailed assessment of construction vehicle impacts is not required, as given the nature of the Project, the IAQM screening criteria will not be met or exceeded (shown in Table 14-7). Unless modelling of construction phase vehicle movements is identified as required through consultation, or through further information becoming available regarding construction traffic and routing.</p>
<p>Planning Inspectorate Table 6-4 and Chapter 12 (Air Quality Chapter 12)</p>	<p>Air quality effects on sensitive ecological receptors</p>	<p>Table 6-4 (of the Scoping Report) does not identify Nitrogen deposition or acid deposition as potential impacts which could affect sensitive ecological receptors, however these matters are not explicitly proposed as scoped out. It is noted that Chapter 12 of the Scoping Report (Air Quality) considers these potential impacts as a possibility and sets out the approach to modelling relevant emissions from construction traffic if detailed assessment is deemed necessary (see Table 3.7 below). For the avoidance of doubt, the potential for Nitrogen deposition and/or acid deposition to arise and result in effects on</p>	<p>With regard to sensitive ecological receptors, should the number of traffic movements exceed the screening criteria provided by DMRB of a change in AADT flows of 1,000 vehicles or 200 HDV, then a detailed assessment of road traffic emissions and their impact on designated sensitive habitat will be required to inform the ES</p>

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
		ecological receptors should be considered in the ES, and subject to assessment where a pathway for significant effects is identified.	
Planning Inspectorate Paragraph 12.7.9, Table 12-7	Air quality effects during operation and decommissioning	<p>The rationale provided in the Scoping Report in relation to scoping these matters out is essentially the same as the rationale for scoping out the need for detailed assessment of air quality effects during construction, ie that given the nature of the Proposed Development the screening criteria provided in Table 12-7 (of the Scoping Report) will not be met/exceeded.</p> <p>The Inspectorate has considered the information provided, and accepts this approach, however, advises that a periodic review is made as further information becomes available about the Proposed Development and in response to the outcomes of consultation with stakeholders.</p> <p>The ES should include account of the approach taken, including all relevant supporting evidence of the absence of a pathway(s) for likely significant effects to occur</p>	<p>The Planning Inspectorate agrees that an assessment of air quality effects during operation and decommissioning can be scoped out, though a periodic review would be made as more information becomes available.</p> <p>The ES will include account of the approach taken, including all relevant supporting evidence of the absence of a pathway(s) for likely significant effects to occur</p>
Paragraph 12.3.5, 12.7.8	Sensitive ecological receptors	Paragraph 12.6.5 of the Scoping Report states that there are no sensitive statutory ecological receptors within 50m of the scoping boundary, however this does not accord with Figure 12-1 which indicates that the scoping boundary at the coast lies within some of the designated sites depicted. This must be clarified in the ES and if necessary, the relevant air quality information (as identified in the Scoping Report should be	Since the Scoping Opinion (PEIR Volume IV – Appendix 5-2) has been received, anticipated construction phase vehicle movements have been confirmed. The screening of this data, as described in section 14.8, confirms the approach set out at the scoping stage is appropriate. It is also noted that the applicant will keep

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
		applied to an assessment of effects on ecological receptors (see Table 3.1 above).	the potential for traffic impacts with regards to local air quality under review until after the Statutory Consultation and further consultation with Local Planning Authorities.
North Lincolnshire Council	Scope	This Council's Environmental Protection Department agrees with the proposal to include a robust assessment of impacts upon air quality within the Environmental Statement. The proposed approach to this assessment set out within the Scoping Report is considered to be acceptable and it is agreed that, due to the nature of the project, the potential air quality impacts are restricted to the construction phase.	It is noted that North Lincolnshire Council's Environmental Protection Department agrees with the approach to the air quality assessment.

Consultation

14.3.4 No additional consultation has been undertaken to date with specific regard to local air quality impacts. Consultation may be required with relevant Local Planning Authority Environmental Health Officers at the ES stage, subject to the findings reported in this chapter of the PEIR.

Scope of the Assessment

14.3.5 Following the scoping process that has been undertaken, the scope of the assessment considered in this chapter of the PEIR is as follows:

- Construction phase dust assessment (including site plant and non-road mobile machinery (NRMM) emissions) in line with Institute of Air Quality Management (IAQM) guidance (Ref 14-13);
- Construction phase site plant and non-road mobile machinery (NRMM) emissions assessment in line with IAQM guidance (Ref 14-13); and
- Screening of construction phase road traffic emissions assessment in line with IAQM and Environmental Protection UK guidance (Ref 14-14), to confirm conclusions of the Scoping Report.

14.4 Assessment Method

Construction Dust

14.4.1 The impacts associated with the construction phase of the Project have been qualitatively assessed following the approach set out in the IAQM guidance on the Assessment of Dust from Demolition and Construction (Ref 14-13).

14.4.2 According to the IAQM, the main air quality impacts that may arise during demolition and construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM₁₀ concentrations resultant of dust generating activities on site; and
- An increase in concentration of airborne particles and NO₂ due to exhaust emissions from diesel powered vehicles and equipment on site and vehicles accessing the site.

14.4.3 Activities on construction sites are classified into four types to reflect their different potential impacts:

- Demolition;
- Earthworks;
- Construction (erection of buildings and structures); and
- Track-out (the deposition of material onto the public road network by construction vehicles leaving site).

14.4.4 The following steps, as defined by the IAQM, were followed as part of the construction dust assessment:

- Step 1: Screen the need for a detailed assessment. Human and ecological receptors were identified and distance to the Project and construction routes were determined;

- Step 2: Assess the risk of dust impacts arising. The potential risk of dust impacts occurring for each activity was determined, based on the magnitude of the potential dust emissions and the sensitivity of the area;
- Step 3: Identify the need for site-specific mitigation. Based on the risk of impacts occurring, site specific mitigation measures were determined; and
- Step 4: Define impacts and their significance. The significance of the potential residual dust impacts (taking mitigation into account) for each activity was determined.

14.4.5 The full construction dust assessment methodology is set out in *PEIR Volume IV - Appendix 14.1*. This includes the determination of sensitive receptors, which comprise of locations sensitive to harm to amenity from dust deposition and soiling, harm to human health from increased exposure to finer particulates, and harm to ecology at designated nature conservation sites.

14.4.6 For amenity effects from coarser dust (>PM₁₀), the aim of the IAQM guidance method is to bring forward a scheme, including mitigation measures where necessary, that would control impacts so that they give rise to negligible or minor effects (at worst) at the closest sensitive receptors. Measures that reduce dust emissions will also reduce emissions of finer particles (PM₁₀). Determination of whether an effect is likely to be significant or not is based on professional judgement (based on experience of similar projects), taking account of whether effects are permanent or temporary, direct or indirect, constant or intermittent and whether any secondary effects are caused (in this instance, ‘secondary effects’ refers to dust that is generated and deposited (primary impact) and then re-suspended and deposited again by further activity).

14.4.7 The classification of dust soiling (amenity) and health effects on receptors exposed to impacts has been assessed using the relationship between the magnitude of impact identified, in combination with receptor sensitivity and other related factors where appropriate (as described in the IAQM guidance (Ref 14-13), which results in a classification of effects as defined in **Table 14-6**.

Table 14-6: Construction Dust Impact Descriptors and Effect

Effect	Change in Dust Deposition Rate and Short-term PM ₁₀ Concentrations	Significance
Major	Impact is likely to be intolerable for any more than a very brief period of time and is very likely to cause complaints from local people. Increase in PM ₁₀ concentrations at a location where concentrations are already elevated and to the extent that the short term PM ₁₀ air quality objective is likely to be exceeded. Deposition impact likely to harm habitat within a designated nature conservation	A significant effect that is likely to be a material consideration in its own right.

Effect	Change in Dust Deposition Rate and Short-term PM ₁₀ Concentrations	Significance
	area of international importance.	
Moderate	<p>Impact is likely to cause annoyance and might cause complaints, but may be tolerated if short-term and prior warning and explanation has been given.</p> <p>Increase in PM₁₀ concentrations at a location where concentrations are already elevated and to the extent that the short term PM₁₀ air quality objective is at risk of being exceeded.</p> <p>Deposition impact likely to harm habitat within a designated nature conservation area of national importance.</p>	A significant effect that may be a material consideration in combination with other significant effects, but is unlikely to be a material consideration in its own right.
Minor	<p>Impact may be perceptible, but of a magnitude or frequency that is unlikely to cause annoyance to a reasonable person or to cause complaints. Limited increase in PM₁₀ concentrations.</p> <p>Deposition impact likely to harm habitat within a designated nature conservation area of local importance.</p>	An effect that is not significant but that may be of local concern.
Negligible	Impact is unlikely to be noticed by and/or have an effect on sensitive receptors. Negligible increase in PM ₁₀ concentrations and deposition.	An effect that is not significant.

Site Plant and Non-Road Mobile Machinery

14.4.8 Emissions from construction-related Non-Road Mobile Machinery (NRMM) and site plant will have the potential to increase NO₂, PM₁₀ and PM_{2.5} concentrations at locations close to working areas of the site.

14.4.9 IAQM guidance (Ref 14-13) states that:

“Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed.”

14.4.10 The assessment of potential emissions from NRMM and site plant is, therefore, qualitative in nature and focuses on the justification as to why impacts from this source can be mitigated to ensure any effect is not significant.

Construction Traffic Emissions

14.4.11 At the time of the PEIR, only preliminary information about construction vehicle movements is available. This preliminary data has been compared against the screening criteria provided by IAQM and shown in **Table 14-7**. These thresholds are intended to suggest when there is a need for the detailed modelling of air quality impacts from vehicle movement emissions. Should the number of traffic movements exceed the criteria set out in **Table 14-7**, then a detailed assessment of road traffic emissions and their effect on human health will be required to inform the ES.

Table 14-7: Screening Criteria for Detailed Air Quality Assessment of Road Traffic Emissions

Nature of Impact	Screening criteria for Detailed Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: <ul style="list-style-type: none"> • more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA; or • more than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: <ul style="list-style-type: none"> • more than 25 AADT within or adjacent to an AQMA; or • more than 100 AADT elsewhere.
Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	The introduction of a new junction or removal of a junction will lead to a detailed air quality assessment when this addition or removal causes traffic to significantly change vehicle acceleration or deceleration, for example, traffic lights, or roundabouts.
Introduce or change a bus station.	Where bus flows will change by: <ul style="list-style-type: none"> • more than 25 AADT within or adjacent to an AQMA; or • more than 100 AADT elsewhere.

Note: Taken from IAQM guidance Land-Use Planning and Development Control: Planning for Air Quality.

14.4.12 With regard to sensitive ecological receptors, should the number of traffic movements exceed the screening criteria provided by DMRB of a change in AADT flows of 1,000 vehicles or 200 HDV, then a detailed assessment of road traffic emissions and their impact on designated sensitive habitat will be required to inform the ES.

Limitations

14.4.13 The assessment has been undertaken based on the following assumptions:

- Data that is currently available at the time of writing, including the preliminary traffic data provided to date and the current description of Project construction activity;
- Monitoring data gathered by Local Authorities is used to represent existing baseline air quality within the Study Area. This data will be used to inform the air quality assessment reported in the ES; and
- Defra background data (Ref 14-21) has been used to represent background pollutant concentration data in the Study Area. Such an approach is not considered unreasonable and is common practice.

14.4.14 All assumptions will be reviewed with relevant stakeholders and justified in air quality chapter of the ES.

14.4.15 A summary of the key impact pathways that have been assessed, the identified residual effects and level of confidence is presented in **Table 14-13**.

Additional Mitigation

Step 3: Determine the Level of Mitigation

14.4.16 As discussed in section 14.4 the construction dust assessment follows a step-by-step approach to determine the level of mitigation required to ensure that a significant effect will not occur. Step 3 of the IAQM guidance relates to the level of mitigation required following consideration of the risk of impacts identified during Step 1 and Step 2, which are described in Section 14.7.

14.4.17 The Preliminary Draft Construction Environmental Management Plan (CEMP) (*PEIR Volume IV Appendix 3.1*) sets out the preliminary additional mitigation measures identified in this preliminary assessment of significant effects. This section summarises these measures. These measures are based on recommendations by IAQM. The mitigation presented in the Draft CEMP will be secured through a requirement within the DCO, which requires a CEMP to be submitted for approval after the grant of development consent.

14.4.18 These measures will be refined and be developed as part of the construction assessment for the ES:

- *A3: Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;*
- *H2: Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials;*
- *H3: Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing);*
- *J1: Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;*
- *J2: Develop a Dust Management Plan (DMP), which includes measures to control other emissions. This will form part of the Final CEMP;*
- *J3: Display the name and contact details of person(s) accountable for air quality and dust issues on the construction compound fence. This may be the environment manager/engineer or the site manager;*

- *J4: Display the head or regional office contact information of the main contractor on site;*
- *J5: Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;*
- *J6: Make the complaints log available to the local authorities when asked;*
- *J7: Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book;*
- *J8: Undertake daily on-site and off-site inspection (including roads), where receptors are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority when asked;*
- *J9: Carry out regular site inspections to monitor compliance with the DMP commitments, record inspection results, and make an inspection log available to the Local Authorities when asked;*
- *J10: Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions;*
- *J11: Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site, cover;*
- *J12: Ensure all vehicles switch off engines when stationary - no idling vehicles;*
- *J13: Sustainable power sources (solar panels etc) to be used where practicable. Where available, generators are to be low emission with hybrid battery systems (or to current best practice);*
- *J14: Impose and signpost a maximum-speed-limit on surfaced roads and in work areas;*
- *J15: Use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;*
- *J16: Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;*
- *J17: Use enclosed chutes and conveyors (if used) and covered skips;*
- *J18: Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods;*
- *J19: No bonfires and burning of waste materials;*
- *J20: Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;*
- *J21: Avoid dry sweeping of large areas;*
- *J22: Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;*
- *J23: Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;*
- *J24: Record all inspections of haul routes and any subsequent action in a site logbook;*

- *J25: Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);*
- *J26: Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences;*
- *J27: Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;*
- *J28: Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;*
- *J29: Avoid site runoff of water or mud;*
- *J30: Keep site fencing, barriers and scaffolding clean using wet methods;*
- *J31: Cover, seed or fence stockpiles to prevent wind whipping;*
- *J32: Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable;*
- *J33: Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;*
- *J34: Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;*
- *J35: Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable;*
- *J36: Only remove the cover in small areas during work and not all at once;*
- *J37: Avoid scabbling (roughening of concrete surfaces) if possible;*
- *J38: Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;*
- *J39: Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;*
- *J40: For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust;*
- *J41: Haul routes, damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;*
- *J42: Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits;*
- *J43: Access gates to be located at least 10 m from receptors where possible; and*
- *J44: Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.*

14.5 Residual Effects

14.5.1 Residual effects are summarised below and in Table 14-13.

Step 4: Determine Significant Effects

14.5.2 Step 4 of the IAQM construction dust guidance is to determine whether or not the effects, after the application of the identified level of mitigation (Step 3 – Section 14.6), are significant or not. The IAQM guidance states that:

“For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be ‘not significant’”.

14.5.3 Therefore, providing a sufficient level of dust mitigation is implemented on site throughout the works, with reference to those presented in section 14.7, which are considered standard practice on all well managed construction sites, it is considered that the residual effects from the Project are not significant.

14.6 Baseline Environment and Study Area

Study Area

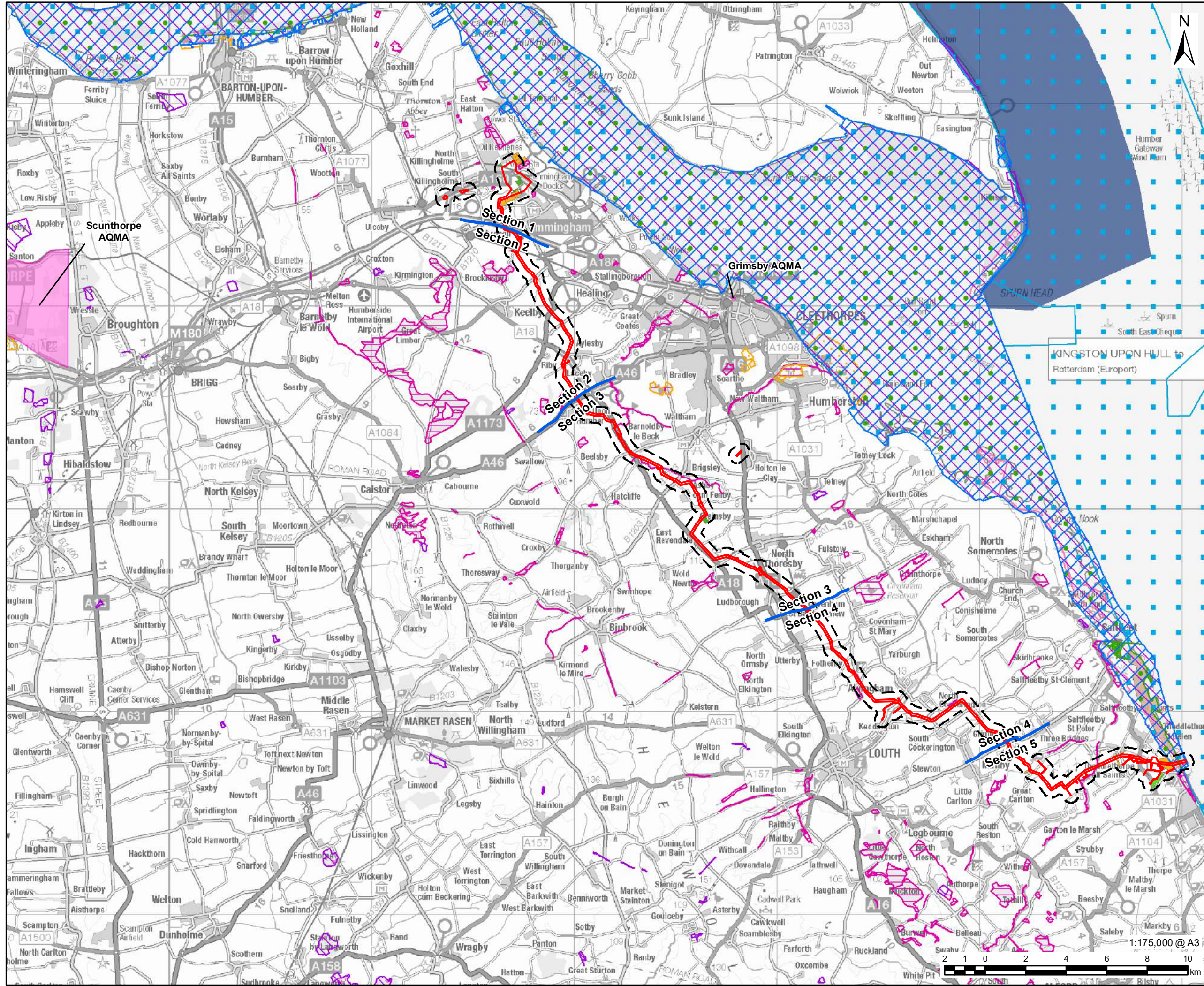
14.6.1 The Study Area for this assessment is the area over which potential direct and indirect effects of the Project on local air quality are predicted to occur during the construction period, noting that operational phase impacts have been scoped out of the assessment. This will be reviewed as further details on the venting system are developed, and if required, an assessment will be included within the ES.

14.6.2 The methodological approach to defining the spatial extent of the Study Area for air quality has been informed by the Institute of Air Quality Management (IAQM) (2014, 2017 and 2019) guidance documents (Ref 14-13, Ref 14-14 and Ref 14-15). An area within 10 km of the Draft Order Limits has been considered with respect to published baseline information on existing air quality. The following Study Areas have been used where an assessment of dust emissions produced by construction activities is required:

- A human receptor (sensitive for harm to human health and amenity) within:
 - 350 m of the limits of construction activity within the Draft Order Limits; or
 - 50 m of site access points (in relation to trackout); and
 - Vehicles on the public highway, up to 500 m from the site entrance(s).
- An ecological receptor within:
 - 50 m of the limits of construction activity within the Draft Order Limits; or
 - 50 m of the route(s) used by construction vehicles; and
 - On the public highway, up to 500 m from the site entrance(s).

14.6.3 The Study Area is 350m from the Draft Order Limits. For the full EIA, the Study Area may need to be refined as the Project evolves, following the IAQM guidance.

14.6.4 **Figure 14-1** illustrates the 350m buffer from the Draft Order Limits, along with surrounding air quality constraints. The Study Area has been divided up into five separate sections to aid the reporting of the assessment.



- LEGEND**
- Draft Order Limits
 - 350m Study Area
 - Route Section Break
 - Air Quality Management Area (AQMA)
 - Ramsar
 - Special Protection Area (SPA)
 - Special Area of Conservation (SAC)
 - Site of Special Scientific Interest (SSSI)
 - Local Nature Reserve (LNR)
 - National Nature Reserve (NNR)
 - Marine Conservation Zone (MCZ)
 - Local Wildlife Site
 - Priority Habitat within 50m
 - Coastal and floodplain grazing marsh
 - Coastal sand dunes
 - Deciduous woodland
 - Good quality semi-improved grassland
 - No main habitat but additional habitats present

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FIGURE TITLE

Figure 14-1
Air Quality Constraints



Summary of Data Sources

14.6.5 The following data sources have been used to inform the air quality baseline:

- North Lincolnshire Council (NLC) 2020 Annual Status Report (ASR) (Ref 14-18);
- North East Lincolnshire Council (NELC) 2021 ASR (Ref 14-19);
- West Lindsey District Council (WLDC) 2021 ASR (Ref 14-20);
- Mapped estimates of background concentrations provided by Defra's UK Air Information Resource (UK-air) (Ref 14-21);
- Air Quality Management Area (AQMA) boundaries provided by Defra's UK Air Information Resource (UK-Air) (Ref 14-22); and
- Designated ecological sites provided by Natural England's MAGIC maps (Ref 14-23).

14.6.6 East Lindsey District Council have not published their ASRs on the council website. The council's air quality officer will be contacted during collation of the air quality assessment for the ES in order to obtain information on monitoring undertaken within the district and to confirm there are no air quality sensitive locations not otherwise identified in close proximity to the Draft Order Limits. Given the rural nature of East Lindsey District, it is anticipated that the Council's ASRs and monitoring data will not disclose any additional locations of air quality concern.

Current baseline

Dust Deposition

14.6.7 A background level of dust exists in all urban and rural locations in the UK. Dust can be generated on a local scale from vehicle movements and from the action of wind on exposed soils and surfaces. Dust levels can be affected by long range transport of dust from distant sources into the local vicinity. The concentrations of dust can vary depending on a range of parameters, such as meteorological conditions and time of year.

14.6.8 Existing background dust levels are likely to be variable across the Study Area. Closer to the Port of Immingham and surrounding industrial/ commercial areas, there are likely to be a number of dust generating activities already present and baseline levels of dust deposition and dust soiling are potentially elevated. Away from the Port and the industrial areas, where most dust sensitive receptors are present, including the residential areas, dust deposition rates and dust soiling are likely to be typical of most urban, suburban, and semi-rural locations.

14.6.9 Ambient dust deposition rates are not monitored extensively in the UK. Monitoring that is undertaken is usually connected with specific activities such as mining and mineral extraction operations or specific large-scale construction programmes. Dust monitoring may also be undertaken to investigate specific complaints received by local authorities, who are then required to investigate dust nuisance under the Environmental Protection Act 1990 (Ref 11-13). Therefore, there is currently no quantitative baseline information for dust deposition available in the Study Area.

Pollutant Concentrations

14.6.10 The proposed Study Area for the air quality assessment covers areas within the local authority areas of North Lincolnshire Council (NLC), North East Lincolnshire Council (NELC), West Lindsey District Council (WLDC) and East Lindsey District Council (ELDC). **Table 14-8** details the AQMAs declared by these local authorities, which are also illustrated on **Figure 14-1**.

14.6.11 Based on the location of the AQMAs in relation to the Study Area, it is not expected that construction traffic would be routed through any of the existing AQMAs. Construction traffic passing Scunthorpe would do so on the M180 which is some distance from the AQMA centred around the steelworks, while the Grimsby AQMA covers a small stretch of road within the urban centre.

Table 14-8: AQMAs in the Vicinity of the Study Area

Local Authority	AQMA	Declared for	Distance to Scoping Boundary (km)
NLC	Scunthorpe AQMA	PM ₁₀ 24 hour mean	21.5 km, W
NELC	Grimsby AQMA	NO ₂ annual mean	7.8 km, E
WLDC	None declared	-	-
ELDC	None declared	-	-

14.6.12 As part of Local Air Quality Management (LAQM) duties, local authorities are required to monitor pollutant concentrations. Pollutant concentrations recorded at monitoring locations within 10 km of the Draft Order Limits are presented in **Table 14-8**. Data has been sourced from Local Authority LAQM reports, although it is noted that ELDC do not make their reports available via their website. These will be requested from ELDC for the full EIA. Of the data compiled, annual mean NO₂ concentration data compiled is generally below the air quality objective. The exception to this being the AQMA at Grimsby, where an exceedance of the air quality objective was reported in 2016 and 2017.

Table 14-9: Air Quality Monitoring Data

Local Authority	Monitoring ID	Grid Ref.		Pollutant ¹	Annual Mean NO ₂ Concentration (µg/m ³) ^{2,3}				
		x	y		2016	2017	2018	2019	2021
NLC	South Killingholme								
	CM6	514880	416133	NO ₂ (O)	17	17	18	15	-
	DT13	514573	415901	NO ₂ (RS)	31	20	17	17	-
	DT14	514782	415971	NO ₂ (RS)	31	27	28	29	-
	DT15	515452	416107	NO ₂ (BG)	21	19	20	18	-
	DT16	515279	416085	NO ₂ (RS)	26	25	26	25	-
NELC	Immingham								
	AURN	518277	415116	NO ₂ (BG)	-	16.9	13.9	12.5	12.1
	NEL 23	519193	415279	NO ₂ (RS)	33.3	28.5	26.5	24.5	25.3
	NEL 24	517543	414312	NO ₂ (KS)	-	-	-	16.5	15.0
	NEL 25	518108	414533	NO ₂ (KS)	-	-	-	19.1	18.2
	Grimsby (Cleethorpe Road AQMA)								
	Cleethorpe Road	527761	410425	NO ₂ (RS)	41.6	35.9	-	32.0	33.4
	NEL 11/12/13	527761	410425	NO ₂ (RS)	45.2	47.3	38.0	37.8	39.1
	NEL 14	527754	410445	NO ₂ (KS)	37.3	34.7	33.3	31.6	34.2
	NEL 15	527789	410438	NO ₂ (KS)	35.7	37.3	32.9	31.0	35.8

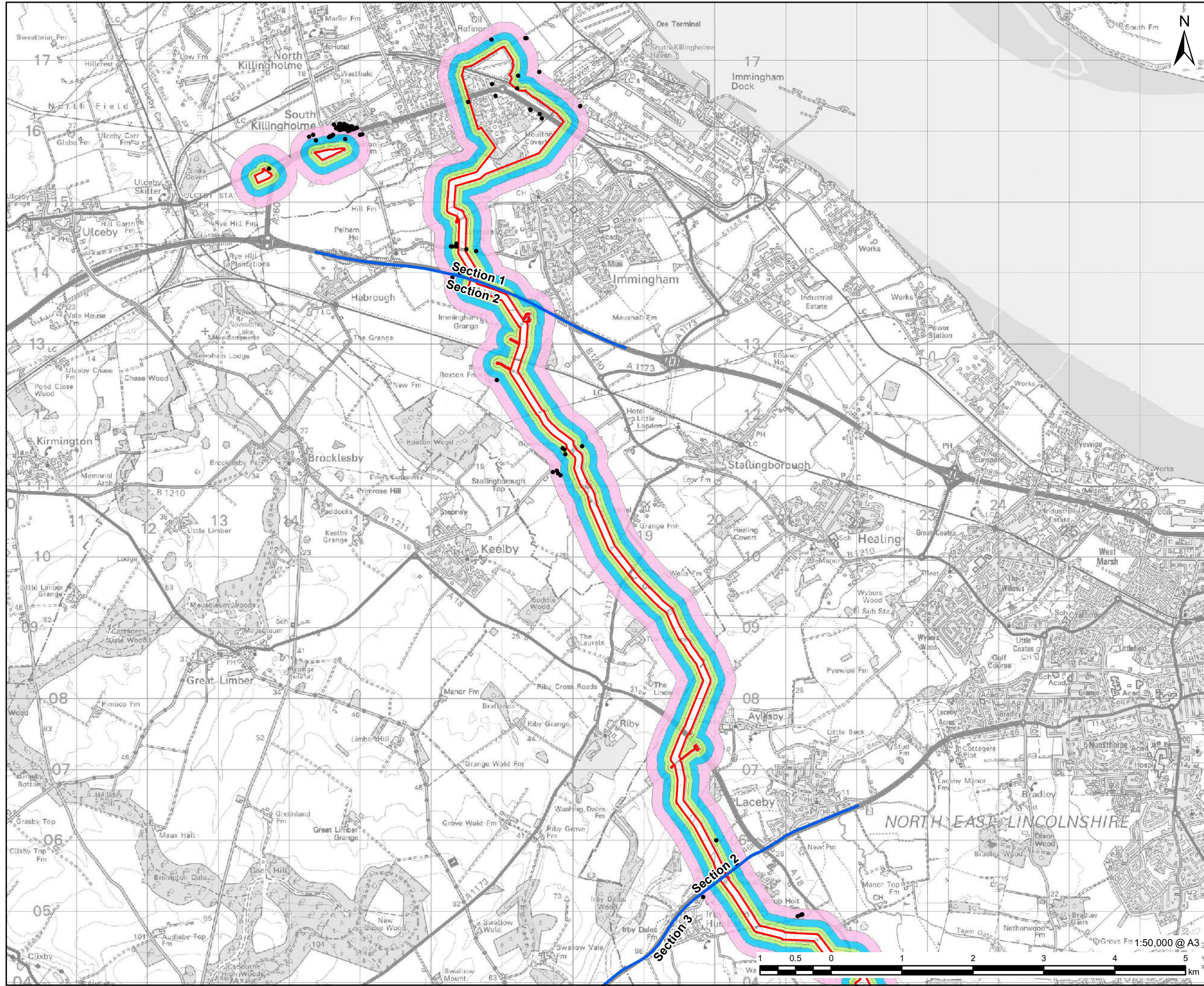
Local Authority	Monitoring ID	Grid Ref.		Pollutant ¹	Annual Mean NO ₂ Concentration (µg/m ³) ^{2,3}				
		x	y		2016	2017	2018	2019	2021
WLDC	Market Rasen								
	WL11	510681	389675	NO ₂ (RS)	-	23.0	17.1	16.3	12.1
	WL12	510840	388610	NO ₂ (RS)	-	20.0	17.2	14.8	13.1
	WL13	510851	388475	NO ₂ (RS)	-	15.5	12.8	12.3	10.1
	WL14	510866	389106	NO ₂ (RS)	-	-	-	28.8	26.2
¹ "O" = Other; "RS" = Roadside; "BG" = Background; "KS" = Kerbside. ² Year 2020 not reported due to effect of Covid-19 pandemic on concentrations reported. ³ Values in bold signify an exceedance of the air quality objective.									

14.6.13 Generally, annual mean concentrations of NO₂ within 10 km of the Draft Order Limits were below the annual mean Air Quality Objective (AQO) of 40 µg/m³, between 2016 and 2020. There were slight exceedances of the AQO at one roadside diffusion tube location within the Grimsby AQMA in 2016 and 2017, however it is remote from the Draft Order Limits and it is not expected that much construction traffic would be routed through this area. Since 2018, annual mean NO₂ concentrations have been below the AQO.

14.6.14 There is currently one operational PM₁₀ monitor within 10 km of the Draft Order Limits, situated within 1.5 km of the northern end of the Draft Order Limits, at Killingholme School. There were no exceedances of the AQOs at this monitoring location. The greatest annual mean PM₁₀ concentration recorded was 19 µg/m³ in 2019. The highest number of allowable exceedances of the daily mean 50 µg/m³ AQO was five, which was well below the 35 days that demonstrate an overall exceedance of that AQO. This continuous monitor is considered to be representative of conditions within Killingholme, although concentrations within Draft Order Limits would be expected to be lower, due to increases distance from PM₁₀ emissions sources, including the A160.

14.6.15 There are no PM_{2.5} monitors within 10 km of the Draft Order Limits.

14.6.16 The UK-AIR website provides data for background concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5}. These background concentrations represent 1 km² grid squares. **Figure 14-2 to Figure 14-4** show the estimated background concentrations across the Study Area. As expected for all pollutants, background concentrations in the Study Area are low, due to the predominantly rural nature of the area, when compared to larger urban centres.



LEGEND

- Draft Order Limits
- Route Section Break
- Receptor Location

Construction Dust Assessment

- 0m - 20m Buffer
- 20m - 50m Buffer
- 50m - 100m Buffer
- 100m - 200m Buffer
- 200m - 350m Buffer

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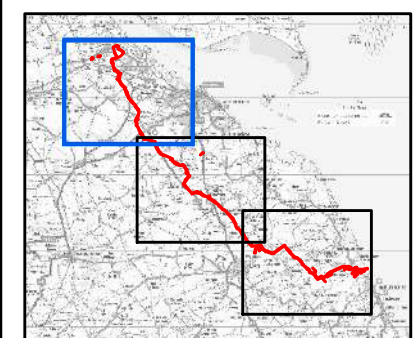
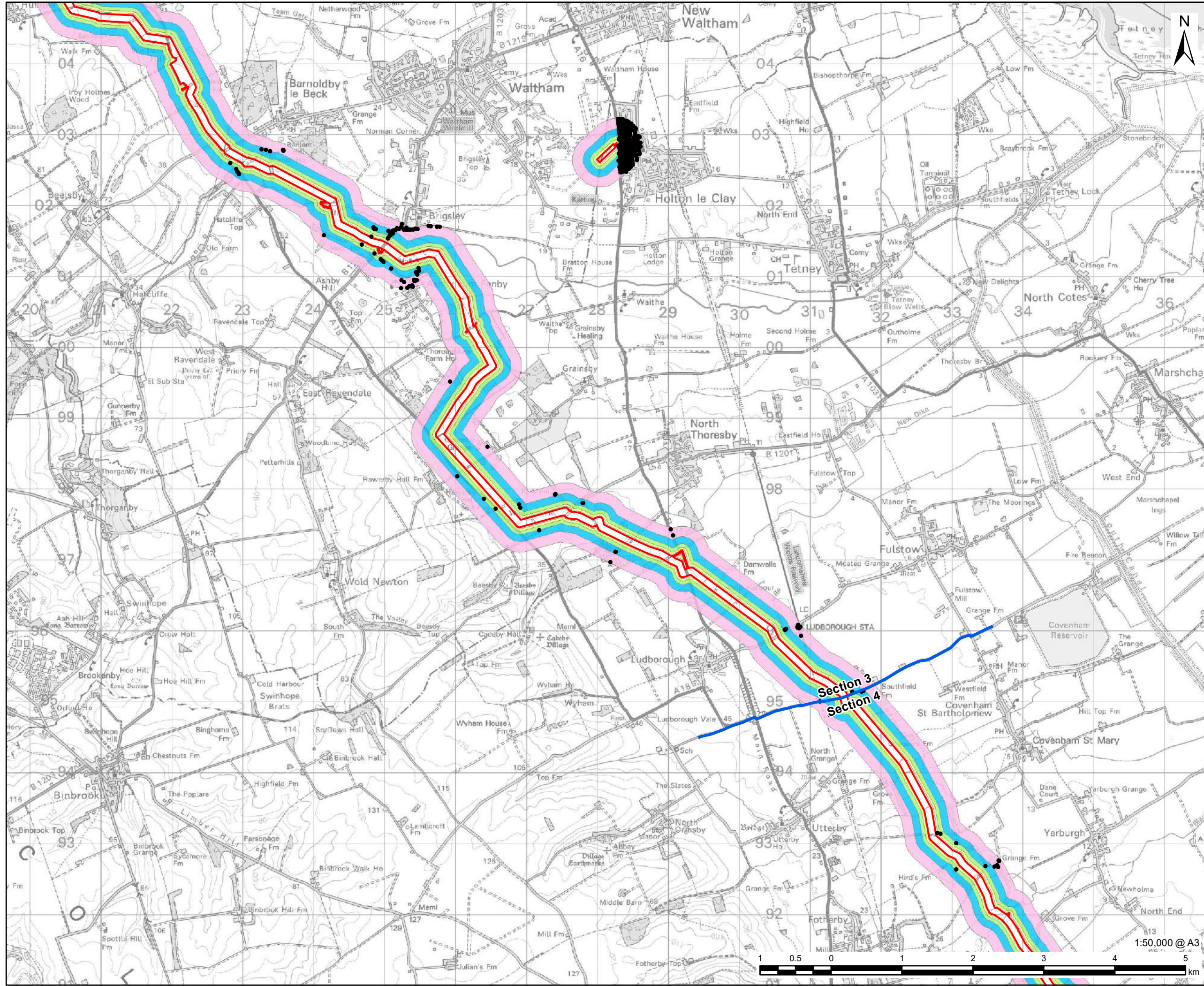


FIGURE TITLE

Figure 14-2 (1 of 3)
Construction Dust Assessment

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LEGEND

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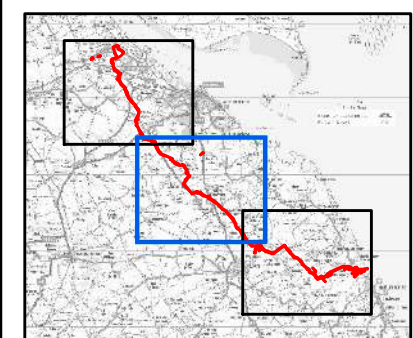
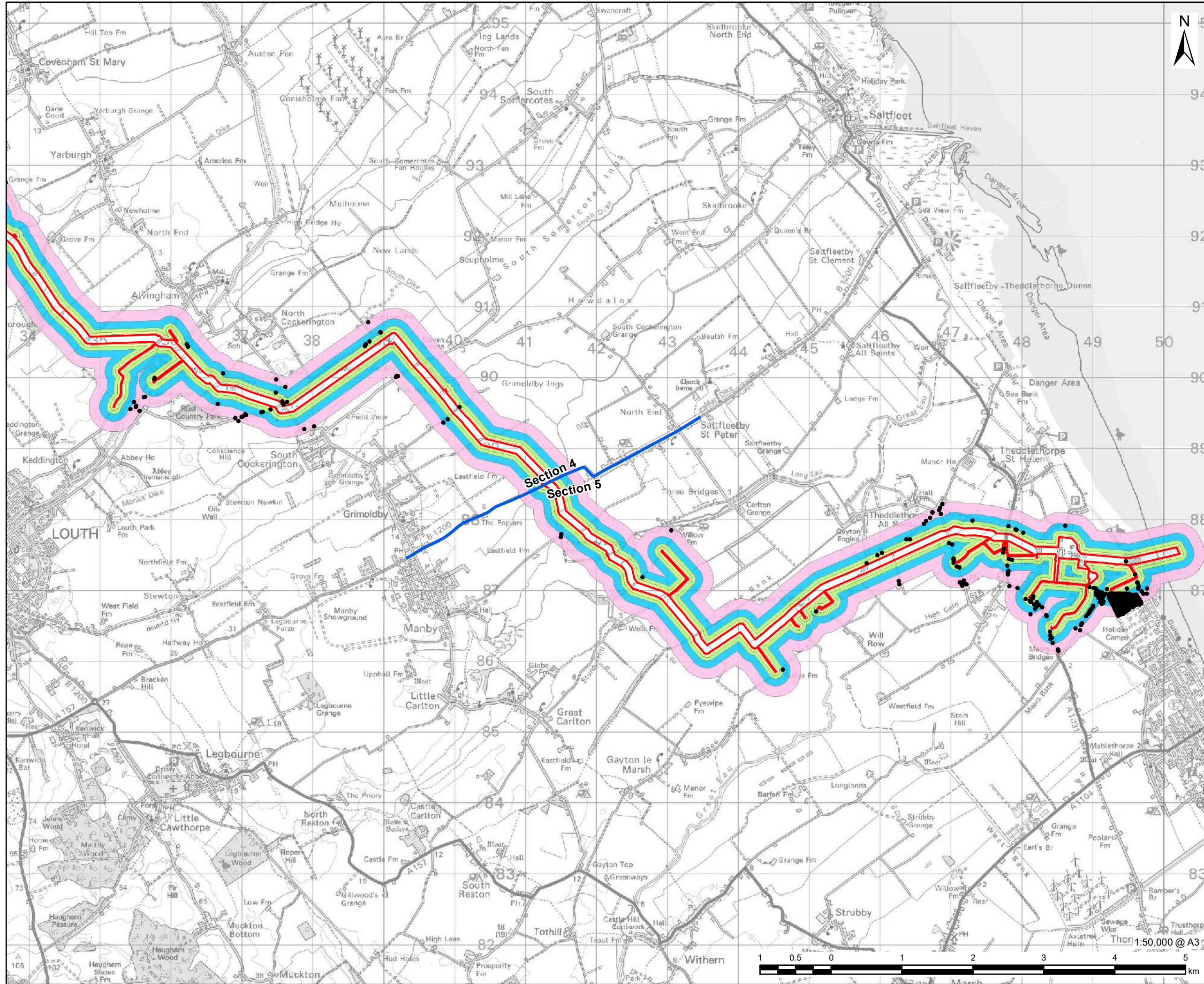


FIGURE TITLE
Figure 14-2 (2 of 3)
Construction Dust Assessment

ISSUE PURPOSE
PEIR
PROJECT NUMBER / REFERENCE
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LEGEND

- Draft Order Limits
 - Route Section Break
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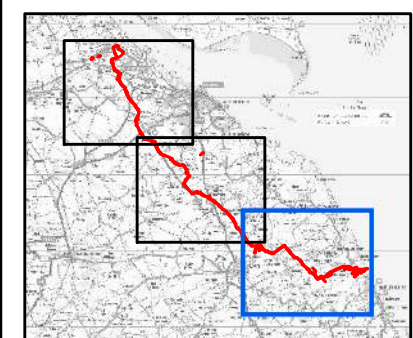
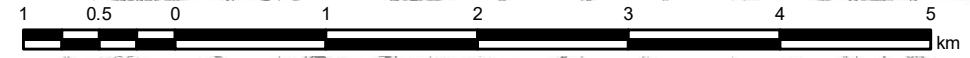


FIGURE TITLE
Figure 14-2 (3 of 3)
Construction Dust Assessment



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VikingCCS

AECOM

PROJECT
Viking CCS Pipeline

LEGEND

- Draft Order Limits
- 10km Study Area

Values represent Nitrogen Dioxide (NO₂) Background Concentration within 1km OS Grid Square

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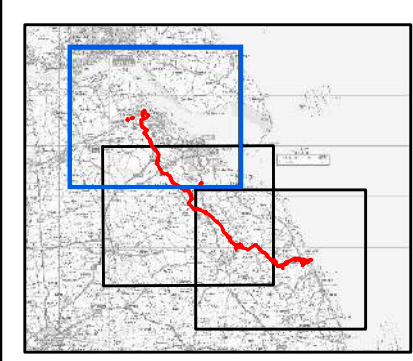
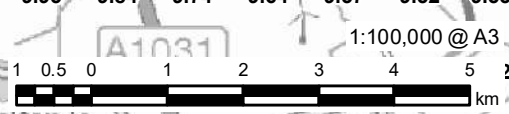


FIGURE TITLE
**Figure 14-3 (1 of 3)
 Nitrogen Dioxide (NO₂) Background Concentrations**

ISSUE PURPOSE
 PEIR

PROJECT NUMBER / REFERENCE
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VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- Draft Order Limits
- 10km Study Area

Values represent Nitrogen Dioxide (NO₂) Background Concentration within 1km OS Grid Square

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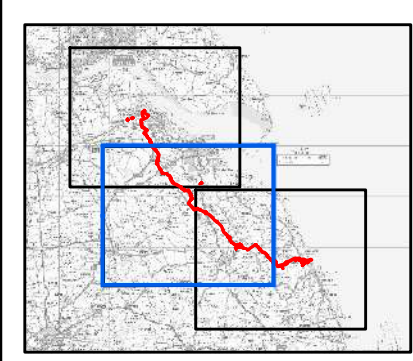


FIGURE TITLE

Figure 14-3 (2 of 3)
Nitrogen Dioxide (NO₂) Background Concentrations

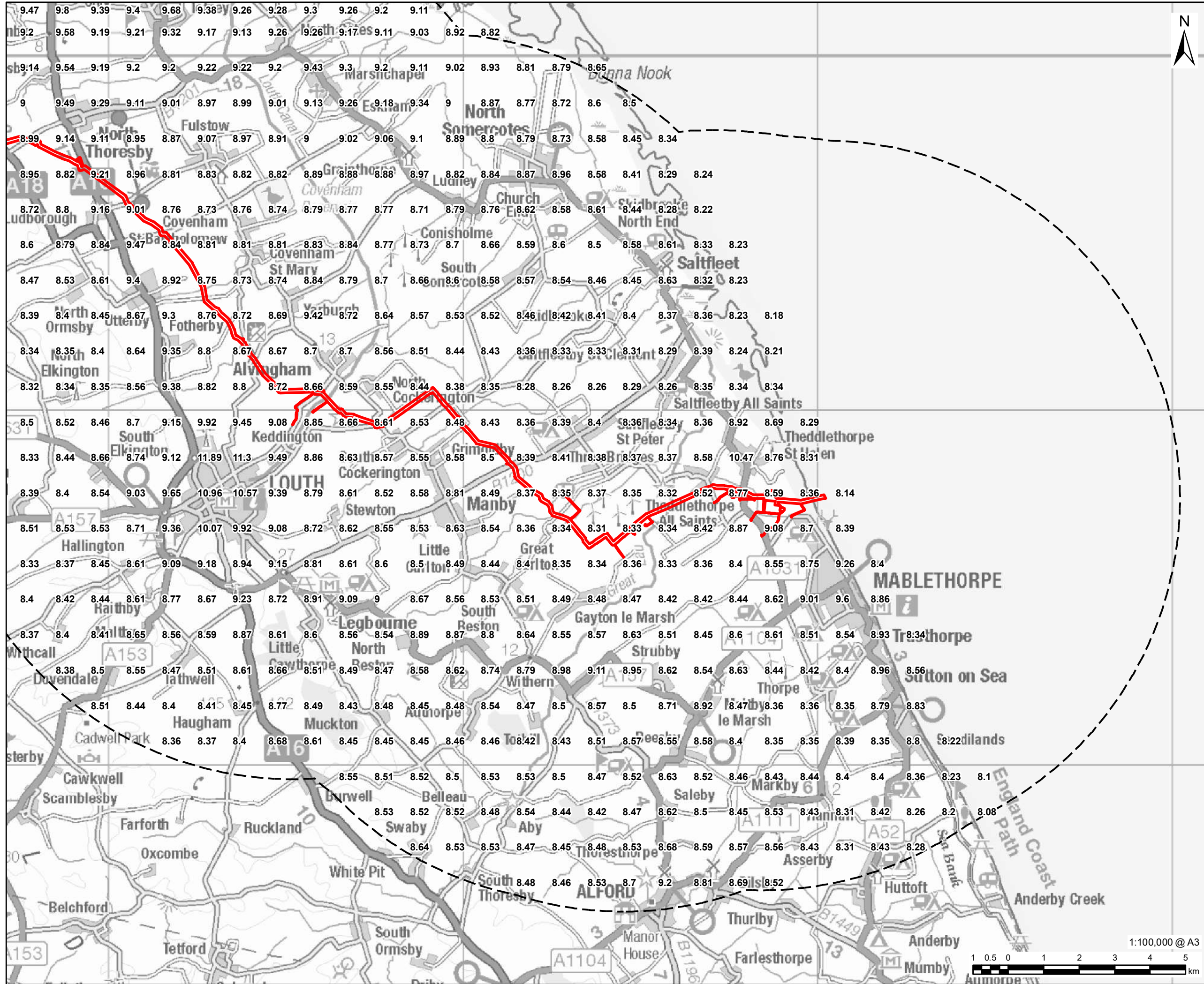
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PROJECT NUMBER / REFERENCE

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AECOM

PROJECT
Viking CCS Pipeline

LEGEND

- Draft Order Limits
- 10km Study Area

Values represent Nitrogen Dioxide (NO₂) Background Concentration within 1km OS Grid Square

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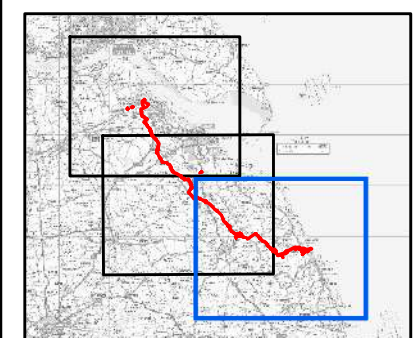
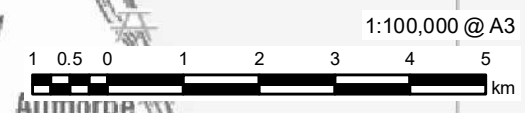


FIGURE TITLE
**Figure 14-3 (3 of 3)
 Nitrogen Dioxide (NO₂) Background Concentrations**

ISSUE PURPOSE
 PEIR
 PROJECT NUMBER / REFERENCE
 60668955 / VCCS_221101_PEIR_14-3



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Values represent PM10 Background Concentration within 1km OS Grid Square

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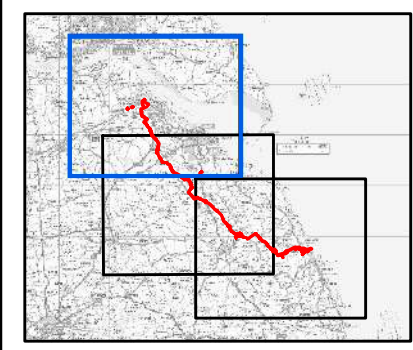
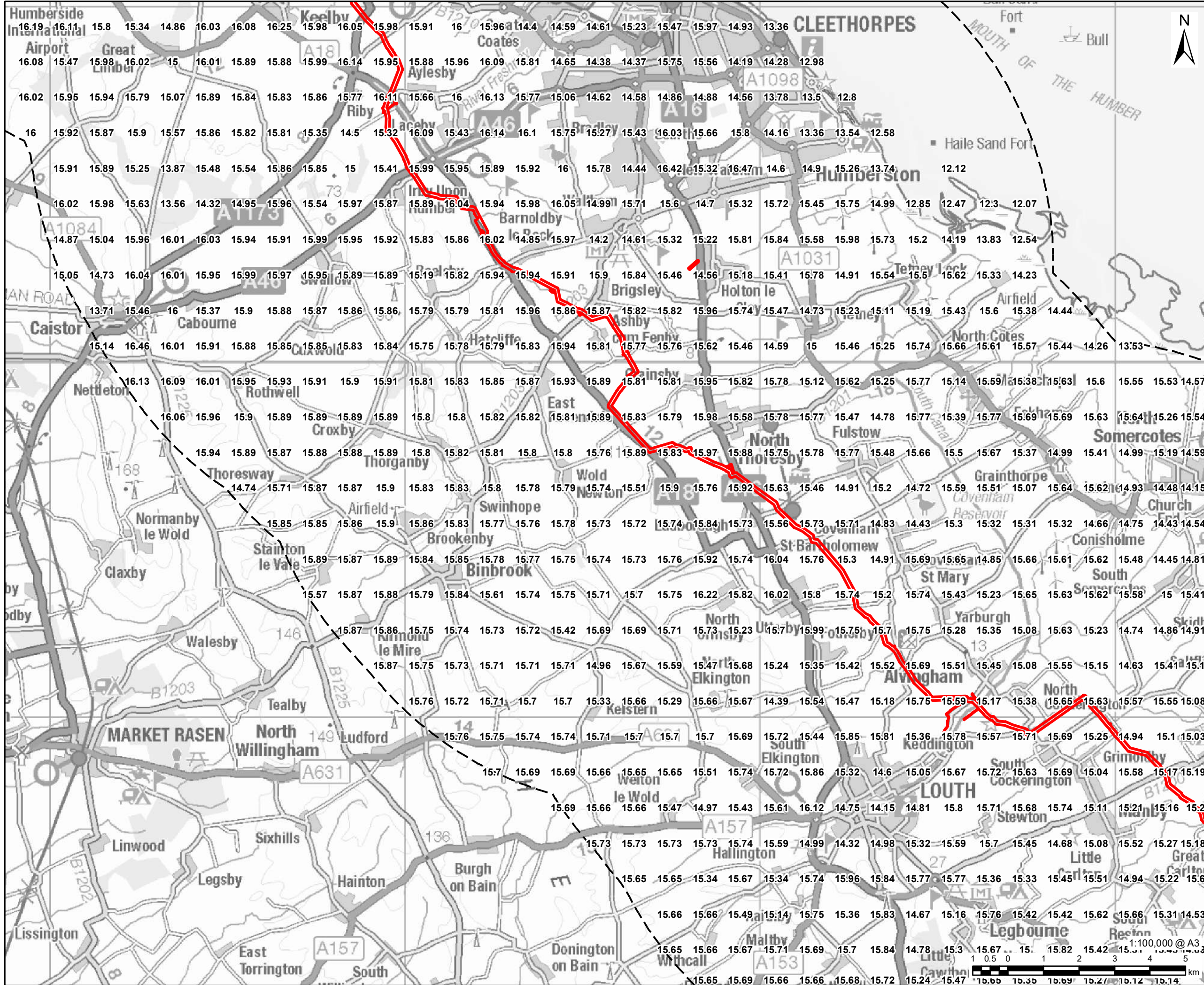


FIGURE TITLE

**Figure 14-4 (1 of 3)
 PM10 Background Concentrations**

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PROJECT
Viking CCS Pipeline

- LEGEND**
- Draft Order Limits
 - 10km Study Area

Values represent PM10 Background Concentration within 1km OS Grid Square

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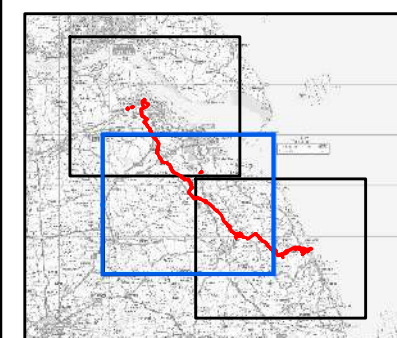
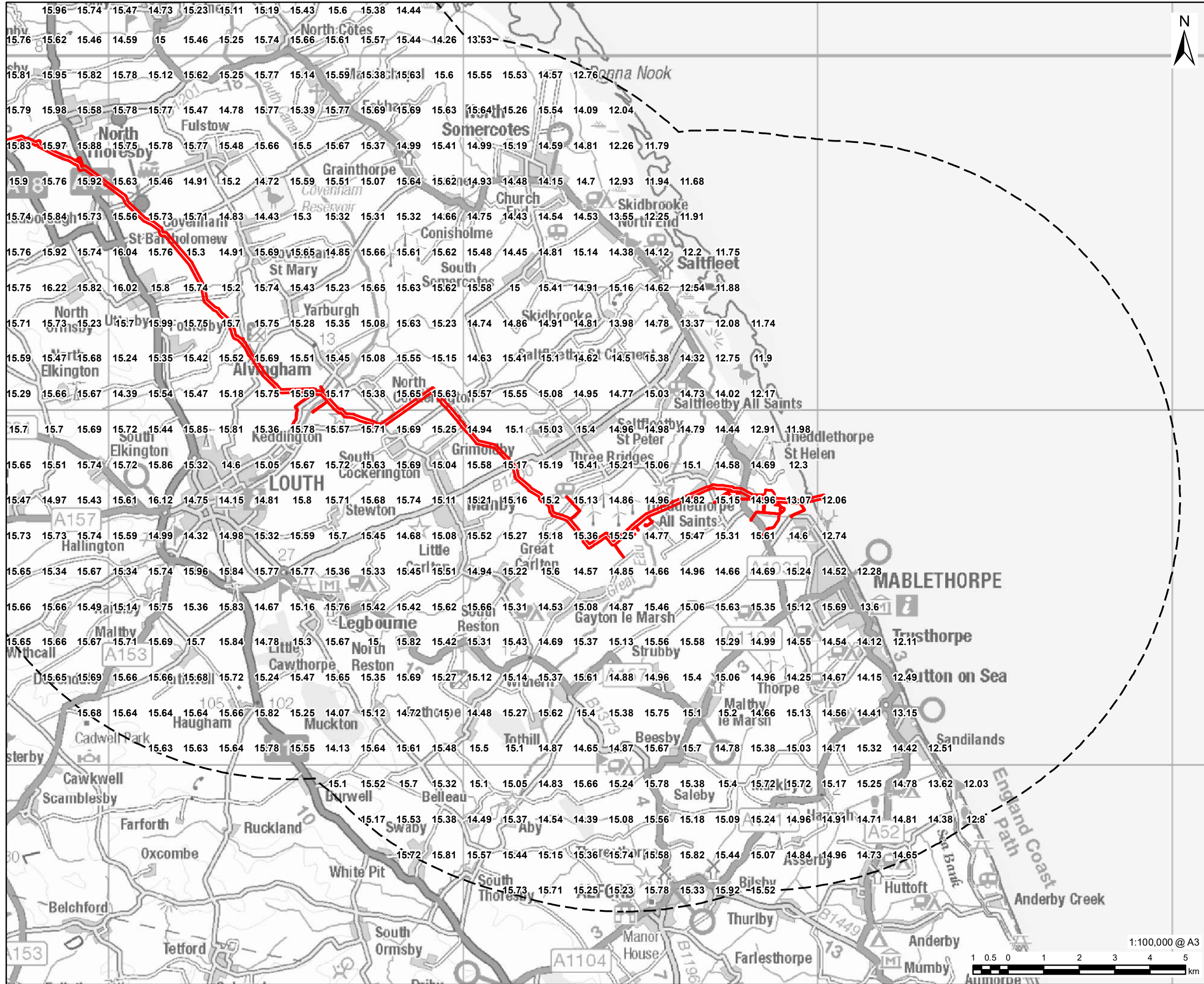


FIGURE TITLE
Figure 14-4 (2 of 3)
PM10 Background Concentrations

ISSUE PURPOSE
PEIR
PROJECT NUMBER / REFERENCE
60668955 / VCCS_221101_PEIR_14-4

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LEGEND

- Draft Order Limits
- 10km Study Area

Values represent PM10 Background Concentration within 1km OS Grid Square

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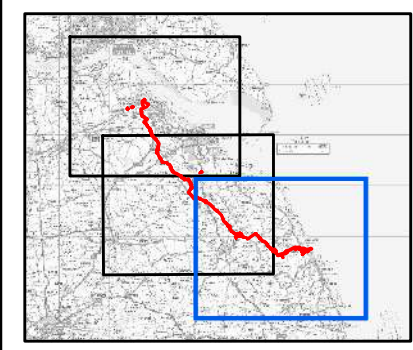
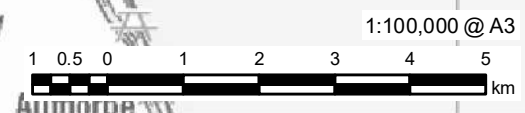


FIGURE TITLE
**Figure 14-4 (3 of 3)
PM10 Background Concentrations**



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Future Baseline

- 14.6.17 In the years leading up to the Project construction phase, it is expected there will be a gradual reduction in pollutant concentrations as a result of expected improvements in air quality. These improvements are expected as a result from measures such as the implementation of the U.K. Government's Clean Air Strategy (Ref 14-24), its commitment to become net zero by 2050, improvements in real world emissions performance of road vehicles and more stringent emission limits for industrial sources in line with the requirements of the Industrial Emissions Directive.
- 14.6.18 With regard to the potential effects of climate change on the future air quality baseline, the 2007 report produced by the Air Quality Expert Group (AQEG) (Ref 14-25) indicated that the winter season may become windier with fewer less stable weather conditions by the end of the century, whilst summer seasons are anticipated to become hotter and sunnier, with an increase in unstable weather conditions by the 2040s.
- 14.6.19 The net effect of these anticipated changes on the baseline air quality is difficult to establish but is unlikely to significantly alter the baseline air quality to an extent that it would affect the outcome of any assessment. Other factors such as changes in technology and the move away from combusting fossil fuels, driven by climate change mitigation, would potentially lead to decreases in emissions of the key pollutants considered in this assessment and a corresponding decrease in background concentrations of air pollutants into the future. Further details on climate change are included in *Chapter 15: Climate Change*.
- 14.6.20 However, it is often considered suitably precautionary to assume no improvement in future baseline conditions, particularly in locations where there are limited sections of Strategic Road Network and/or heavily congested urban areas. In such a case, the baseline values reported in Tables 14.7 and 14.8, and background concentration data reported in Figures 14.3 to 14.5, would remain representative of conditions in the future baseline.

Planned Surveys

- 14.6.21 Given the existing baseline pollutant concentrations in the Study Area, likely future concentrations and the anticipated limited impact on local air quality following the Scoping stage, an air quality survey to inform the assessment is not currently proposed.
- 14.6.22 The construction dust assessment has identified the need for some form of dust monitoring to form part of the Construction Environmental Management Plan. The monitoring extent and approach will be identified in the ES.

14.7 Mitigation

Embedded Design Mitigation

- 14.7.1 EIA is an iterative process which informs the development of the project design. Where the outputs of the preliminary assessment identify likely significant effects changes to the design can be made or mitigation measures can be built-in to the proposal to reduce these effects.
- 14.7.2 This type of mitigation is defined as embedded mitigation, as mitigation measures which have been identified and adopted as part of the evolution of the project design ("embedded" into the project design).
- 14.7.3 The design of the Project will be further developed to reflect the findings of ongoing environmental studies, comments raised during this statutory consultation and ongoing engagement with stakeholders. As the design develops, the embedded mitigation measures will also be refined as part of an iterative process.

14.8 Preliminary Assessment of Effects

- 14.8.1 This section identifies the potential likely impact and effects on the identified receptors as a result of the construction of the Project which have been identified at this preliminary stage.
- 14.8.2 The assessment reported here is semi-qualitative and makes use of the data currently available at this stage of the DCO process. It is anticipated that additional data will be available to inform further assessment of potential likely impact and effects to be reported in the ES.
- 14.8.3 Cumulative impacts on surrounding sensitive human and nature conservation receptors could arise as a result of other coastal and marine developments and activities in the Humber Estuary. These will be considered as necessary as part of the cumulative impacts and in-combination effects assessment, the approach to which is explained further in *Chapter 19: Cumulative Impact Assessment* of this PEIR.

Construction Phase

- 14.8.4 This section contains an assessment of the potential impacts to air quality as a result of the construction phase of the Project. The following impact pathways have been assessed:
- Construction dust emissions;
 - Site plant emissions; and
 - Construction traffic emissions.
- 14.8.5 The preliminary assessment is undertaken with the assumption that the embedded and additional mitigation measures are in place.

Construction Dust Emissions

- 14.8.6 The assessment considers the potential impact for the five sections of the proposed route as shown in **Figure 14-1**.
- 14.8.7 As described in Section 14.4 and *Volume IV Appendix 14.1*, the construction dust and particulate matter assessment follows the step-by-step approach set out in relevant IAQM guidance (Ref 14-13). This process is summarised in the sub-sections below.
- 14.8.8 The construction dust and particulate matter assessment has been carried out for each of the five Sections of the pipeline, details about each Section is provided in *Chapter 3: The Viking CCS Pipeline* of this PEIR.

Step 1: Screen the requirements for a detailed assessment

- 14.8.9 Step 1 of the IAQM construction dust guidance is to screen the requirement for a more detailed assessment. According to the guidance, no further assessment is required if there are no receptors within a specified distance of the works. The screening distances set by the IAQM guidance are:
- Receptors sensitive to amenity and human health impacts within 350 m of the construction site boundary and/or within 50 m of a public road used by construction traffic that is within 500 m of the site entrance; and
 - Nature conservation receptors located within 50 m of the construction site boundary and/or within 50 m of a public road used by construction traffic that is within 500 m of the site entrance.
- 14.8.10 **Figure 14-1** shows a 350 m buffer from the edge of the Draft Order Limits in which human health and amenity receptors may be impacted by construction activities. The pipeline route is predominantly rural, however there are some inhabited areas within 350 m of the Draft

Order Limits, including the outskirts of Immingham, Laceby, Irby upon Humber, Barnoldby le Beck, Brigsley, Ashby cum Fenby, Grainsby, North Thoresby, Ludborough, Covenham St Mary, Yarborough, Newholme, Alvingham, North Cockerington and South Cockerington, as well as isolated groups of properties or farms along the route. As such, there are a number of high sensitivity amenity and human health sensitive receptors within 350 m of the Draft Order Limits, which for the purpose of this assessment is taken to represent the construction site boundary.

14.8.11 The proximity of Special Area of Conservation (SAC)/Special Protection Area (SPA) at Theddlethorpe means that there is a high sensitivity nature conservation receptor within 50 m of the Draft Order Limits (taken to represent the construction site boundary for the purpose of this assessment). There are also Priority Habitats located adjacent to the trailer park and container yard which have been identified due to vegetation species and these are potentially sensitive to construction dust impacts. These include coastal and floodplain grazing marsh, lowland heathland and lowland meadows.

14.8.12 Due to the presence of the high sensitivity amenity, human health and receptors and the ecologically sensitive Priority Habitats within the screening distances set by the guidance, the more detailed assessment of construction dust impacts is required and is set out below.

14.8.13 The distribution of receptors for each Section is summarised in **Table 14-10**.

Table 14-10: Receptors in each Section

Section	Receptor Sensitivity	Distance from Draft Order Limits (m)				
		0 – 20 m	20 – 50 m	50 – 100 m	100 – 200 m	200 – 350 m
Section 1	High	1	3	1	11	71
	Medium	7	2	0	2	3
	Low	0	0	0	0	1
Section 2	High	0	1	4	1	4
	Medium	0	0	0	0	2
	Low	0	0	0	0	0
Section 3	High	1	4	31	121	293
	Medium	0	0	0	8	17
	Low	0	0	0	0	4
Section 4	High	1	8	5	12	19
	Medium	0	0	1	0	5
	Low	0	0	1	1	4
Section 5	High	3	19	58	187	308
	Medium	2	2	1	4	4
	Low	0	2	2	2	1

Step 2: Assess the Risk of Dust Impacts

Step 2A: Determine the Dust Emissions Magnitude

14.8.14 Step 2A requires the determination of the dust emission magnitude, as set out in *PEIR Volume IV Appendix 14-1*, which the guidance states is based on the scale of the anticipated works with the following activities: demolition; earthworks; construction (i.e. the building and erection of structures); and trackout (the deposition of dust and particulate matter onto public roads by construction vehicles), and should be classified as Small, Medium, or Large.

14.8.15 Construction activities associated with the Project would include temporary establishment and operation of construction compounds, construction of The Immingham Facility, Block Valve Stations and Theddlethorpe Facility, trench works and earth works associated with the installation of the underground pipeline and access road construction, as appropriate. A description of the construction works is provided in *Chapter 3: The Viking CCS Pipeline*.

Demolition

14.8.16 No significant demolition work is anticipated, with only the removal of walls and fences likely required. In light of the above, and in line with the IAQM guidance criteria (2014) summarised in *Volume IV Appendix 14.1*, the dust emission magnitude for the proposed demolition works is **Small**.

Earthworks

14.8.17 The site is anticipated to require earthworks associated with soil-stripping, ground levelling and excavation works. For the purpose of this assessment, the area of earthworks is considered to exceed 10,000 m² and require the handling of a large mass of materials and multiple earth-moving vehicles of material. As such, the dust emissions magnitude of effect for earthworks is **Large**.

Construction

14.8.18 Potentially dusty materials that may be in use during construction works are concrete (if delivered dry), sand and hard core, which will be stored and handled at the site throughout the construction phase. Other construction materials are likely to be prefabricated with little dust emissions potential. For the purpose of this assessment, the volume of construction work is considered to be between 25,000 and 100,000 m³ and require the storage and handling of potentially dusty material. As such, the dust emissions magnitude for construction is **Medium**.

Trackout

14.8.19 Trackout is associated with the deposition of mud and potentially dusty material onto the public network from construction vehicles leaving site. On average there is anticipated to be more than 50 outward construction related HDV (all vehicles >3.5 tonnes) movements per day, although the access road surface used by these vehicles will be unpaved. To be precautionary, the dust emission magnitude for trackout is assigned as **Large**.

Step 2B: Determine the Sensitivity of the Area

14.8.20 Step 2B of the IAQM construction dust guidance, as described in *PEIR Volume IV Appendix 14-1*, requires the determination of the sensitivity of the area to construction dust impacts. According to the guidance, this is based on the sensitivity of individual receptors, the proximity and number of those receptors, background PM₁₀ concentrations and site-specific factors, such as local terrain, meteorology and natural and existing windbreaks.

14.8.21 The sensitivity of the area varies across sections of the route, predominantly due to the number of residential properties in close proximity to the Draft Order Limits in Section 1,

Section 3 and Section 5. In these sections there are between 1 – 10 high sensitivity amenity and human health receptors within 20 m of the Draft Order Limits and/or 10 – 100 high sensitivity amenity and human health receptors within 50 m and a number of medium and low sensitivity receptors within 20 m. In line with the IAQM construction dust guidance, this equates to an area of medium sensitivity for dust soiling amenity impacts. In Section 2 and Section 4, there are less than 100 high sensitivity amenity and human health receptors within 350 m of the Draft Order Limits, 10 – 100 within 100m and less than 10 within 50m. In line with IAQM construction dust guidance, this equates to an area of low sensitivity for dust soiling amenity impacts

14.8.22 Background PM₁₀ concentrations are estimated to be below 24 µg/m³ from **Figure 14-3** and this, coupled with the limited number of receptors in close proximity to the Draft Order Limits, means that the sensitivity of the area to health impacts is low for all five sections.

14.8.23 The IAQM guidance does not specifically refer to Priority Habitats when describing the sensitivity of nature conservation sites, but does state that habitat where “*there is a particularly important plant species, where its dust sensitivity is uncertain or unknown*” should be classed as having medium sensitivity. A medium sensitivity receptor within 20 m of the Draft Order Limits (representing the construction site boundary) means that the sensitivity of the area to ecological impacts is **Medium**.

14.8.24 The sensitivity to dust impacts for each section are shown in **Table 14-12**.

Table 14-11: Dust Soiling Sensitivity

Section	Dust Soiling Sensitivity	Human Health Sensitivity	Ecological Sensitivity
1	Medium	Low	Medium
2	Low	Low	Medium
3	Medium	Low	Medium
4	Low	Low	Medium
5	Medium	Low	Medium

Step 2C: Determine the Risk of Dust Impacts

14.8.25 Step 2C of the IAQM construction guidance concerns the determination of the risk of dust impacts, which is informed by the dust emission magnitude identified in Step 2A and the sensitivity of the area identified in Step 2B.

14.8.26 The risk from dust impacts for dust soil amenity and human health impacts for all five sections are shown in **Table 14-12**.

Table 14-12: Magnitude of Risk from Dust Impacts

		Section 1	Section 2	Section 3	Section 4	Section 5
Dust Soiling	Demolition	Low Risk	Negligible	Low Risk	Negligible	Low Risk
	Earthworks	Medium Risk	Low Risk	Medium Risk	Low Risk	Medium Risk
	Construction	Medium Risk	Low Risk	Medium Risk	Low Risk	Medium Risk

		Section 1	Section 2	Section 3	Section 4	Section 5
	Trackout	Medium Risk	Low Risk	Medium Risk	Low Risk	Medium Risk
Human Health	Demolition	Negligible	Negligible	Negligible	Negligible	Negligible
	Earthworks	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk
	Construction	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk
	Trackout	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk
Ecological	Demolition	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk
	Earthworks	Medium Risk	Medium Risk	Medium Risk	Medium Risk	Medium Risk
	Construction	Medium Risk	Medium Risk	Medium Risk	Medium Risk	Medium Risk
	Trackout	Medium Risk	Medium Risk	Medium Risk	Medium Risk	Medium Risk

Construction Site Plant and NRMM Emissions

14.8.27 According to the IAQM guidance (2014) exhaust emissions from on-site plant (and NRMM) and site traffic are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. This is considered to be the case for the construction of the Project, due to the distance between the Draft Order Limits and the limited number of sensitivity human health and nature conservation receptors in close proximity. As the detailed design of the project evolves, the actual construction site boundary will be defined within the Draft Order Limits and the distance to receptors will either remain the same or increase.

14.8.28 At this stage of the Project design, the exact number, location and duration of operation at any specific location is unknown. What is known is that emissions from site plant and NRMM will be transient and intermittent in nature, operating as and when and where required. Due to the nature of linear infrastructure scheme, site plant and NRMM at the majority of work areas will be present for a number of days or weeks, before moving on, and therefore do not impact on the same location for any prolonged period of time.

14.8.29 A variety of different types of plant and equipment would need to be deployed during the construction of the Project. The plant and equipment that would be used on the pipeline spread includes tipper trucks, low-loader trucks, dozer D6, backhoe/excavators, 24” pipe bender and mandrel, side-boom 583s, pay-welder, crawler crane, cold bending machine, pipe carrying crawler, front-end welding equipment, guided auger-boring equipment (where required), standard auger-boring equipment (where required), HDD (horizontal Directional Drill) equipment (where required), NDT Testing equipment and land drainage trenching/laying unit.

14.8.30 Not all site plant and NRMM listed above will be present in all areas and those that are will not often be in operation at any one time. Where possible, power will be supplied by connection to existing sources.

14.8.31 A review of site plant and NRMM machines has deemed that impacts are unlikely to be significant, in line with the IAQM guidance, for the following reasons:

- The good standard of baseline air quality;
- The transient and intermittent nature of emissions;
- The limited duration of time in which site plant and NRMM emissions on the pipeline route will be present within close proximity of sensitive receptors;
- The distance between emission sources and the nearest high sensitivity receptors at the majority of locations;
- The use of existing sources to meet some of the Project's energy demand; and
- The effectiveness of standard practice emission control measures, including:
 - Use of plant with low NO_x, PM₁₀ and PM_{2.5} emissions;
 - Prohibiting unnecessary idling;
 - Prohibiting unnecessary NRMM movements; and
 - Keeping plant and NRMM in a good state of repair

Construction traffic emissions

14.8.32 The preliminary traffic data has been reviewed and compared against the screening criteria set out in IAQM guidance (**Table 14-7**) and DMRB guidance (paragraph 14.5.14). Data has been provided as two-way 24-hour AADT for road links affected by additional traffic movements generated by the pipe delivery to the compound at Immingham, and construction traffic movements on other road links associated with other construction activities.

14.8.33 There are anticipated to be 28 pipe deliveries per day during this phase of the works which would generate 56 two-way HDV movements to and from the northern construction compound west of South Killingholme. There are also anticipated to be up to 71 trips to site per day associated with the main compound at Holton le Clay, which equates to 142 two-way movements, of which 76 will be HDV. Once dispersed onto the public road network, the maximum traffic impact on any given link will be less than the values given here.

14.8.34 The data suggests that the magnitude of construction phase traffic impact will fall well below the criteria set out in **Table 14-7** and paragraph 14.5.14, considering that no road link will experience an increase in two-way traffic flow of 500 LDV or 100 HDV or more, nor 100 LDV or 25 HDV or more on any road link within an AQMA. Based on the currently anticipated traffic impact of the Project and the standard of existing air quality, it is considered that the impact of construction traffic emissions would unlikely have the potential to cause a significant effect on local air quality. However, an updated assessment will be included within the ES following final confirmation of construction traffic volumes and movements.

Operational phase

14.8.35 In agreement with the Planning Inspectorate's Scoping Opinion (*PEIR Volume IV - Appendix 5.2*), all effects relating to the operation of the Project are scoped out from further assessment in the ES. Emissions during this phase would be restricted to occasional maintenance activities with little traffic generated and it is unlikely that these traffic volumes will exceed the IAQM threshold for detailed assessment. This will be reviewed as further details on the venting system are developed, and if required, an assessment will be included within the ES.

14.9 Additional Mitigation

Step 3: Determine the Level of Mitigation

- 14.9.1 As discussed in section 14.4 the construction dust assessment follows a step-by-step approach to determine the level of mitigation required to ensure that a significant effect will not occur. Step 3 of the IAQM guidance relates to the level of mitigation required following consideration of the risk of impacts identified during Step 1 and Step 2, which are described in Section 14.7.
- 14.9.2 The Preliminary Draft Construction Environmental Management Plan (CEMP) (*PEIR Volume IV Appendix 3.1*) sets out the preliminary additional mitigation measures identified in this preliminary assessment of significant effects. This section summarises these measures. These measures are based on recommendations by IAQM. The mitigation presented in the Draft CEMP will be secured through a requirement within the DCO, which requires a CEMP to be submitted for approval after the grant of development consent.
- 14.9.3 These measures will be refined and be developed as part of the construction assessment for the ES:
- *A3: Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;*
 - *H2: Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials;*
 - *H3: Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing);*
 - *J1: Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;*
 - *J2: Develop a Dust Management Plan (DMP), which includes measures to control other emissions. This will form part of the Final CEMP;*
 - *J3: Display the name and contact details of person(s) accountable for air quality and dust issues on the construction compound fence. This may be the environment manager/engineer or the site manager;*
 - *J4: Display the head or regional office contact information of the main contractor on site;*
 - *J5: Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;*
 - *J6: Make the complaints log available to the local authorities when asked;*
 - *J7: Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book;*
 - *J8: Undertake daily on-site and off-site inspection (including roads), where receptors are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority when asked;*
 - *J9: Carry out regular site inspections to monitor compliance with the DMP commitments, record inspection results, and make an inspection log available to the Local Authorities when asked;*
 - *J10: Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions;*

- *J11: Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site, cover;*
- *J12: Ensure all vehicles switch off engines when stationary - no idling vehicles;*
- *J13: Sustainable power sources (solar panels etc) to be used where practicable. Where available, generators are to be low emission with hybrid battery systems (or to current best practice);*
- *J14: Impose and signpost a maximum-speed-limit on surfaced roads and in work areas;*
- *J15: Use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;*
- *J16: Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;*
- *J17: Use enclosed chutes and conveyors (if used) and covered skips;*
- *J18: Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods;*
- *J19: No bonfires and burning of waste materials;*
- *J20: Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;*
- *J21: Avoid dry sweeping of large areas;*
- *J22: Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;*
- *J23: Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;*
- *J24: Record all inspections of haul routes and any subsequent action in a site logbook;*
- *J25: Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);*
- *J26: Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences;*
- *J27: Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;*
- *J28: Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;*
- *J29: Avoid site runoff of water or mud;*
- *J30: Keep site fencing, barriers and scaffolding clean using wet methods;*
- *J31: Cover, seed or fence stockpiles to prevent wind whipping;*
- *J32: Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable;*

- *J33: Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;*
- *J34: Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;*
- *J35: Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable;*
- *J36: Only remove the cover in small areas during work and not all at once;*
- *J37: Avoid scabbling (roughening of concrete surfaces) if possible;*
- *J38: Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;*
- *J39: Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;*
- *J40: For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust;*
- *J41: Haul routes, damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;*
- *J42: Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits;*
- *J43: Access gates to be located at least 10 m from receptors where possible; and*
- *J44: Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.*

14.10 Residual Effects

14.10.1 Residual effects are summarised below and in Table 14-12.

Step 4: Determine Significant Effects

14.10.2 Step 4 of the IAQM construction dust guidance is to determine whether or not the effects, after the application of the identified level of mitigation (Step 3 – Section 14.6), are significant or not. The IAQM guidance states that:

“For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be ‘not significant’”.

14.10.3 Therefore, providing a sufficient level of dust mitigation is implemented on site throughout the works, with reference to those presented in section 14.7, which are considered standard practice on all well managed construction sites, it is considered that the residual effects from the Project are not significant.

Table 14-13: Summary of Potential Impacts, Mitigation Measures and Residual Impacts

Receptor	Impact pathway	Impact significance	Mitigation measure	Residual impact	Confidence
Construction phase					
Human health and amenity (dust soiling) sensitive receptors	Construction dust and site plant emissions	Negligible to Medium Adverse	Standard practice dust mitigation secured in the CEMP.	Negligible to Slight Adverse	High based on use of industry standard assessment guidance
Nature conservation receptors	Construction dust and site plant emissions	Negligible to Slight Adverse	Standard practice dust mitigation secured in the CEMP	Negligible	High based on use of industry standard assessment guidance

14.11 Summary and Next Steps

14.11.1 Existing air quality within the Draft Order Limits is of a good standard, with pollutant concentrations well within the limit values set for the protection of human health. Much of the land within and around the Draft Order Limits is rural in nature and the alignment currently avoids close proximity to the more densely populated communities and nature conservation sites in the area. Inevitably, however, there are some dust and air quality sensitive receptors close enough to the route corridor that could be adversely impacted by the construction of the Project.

14.11.2 The key air quality constraints that will require further attention within the ES are:

- Construction dust associated with any refinements to the construction of the pipeline route and associated construction compounds accounted for;
- Further review and consideration of plant emissions from construction phase site plant, energy generation plant, and non-road mobile machinery; and
- Further review of potential construction traffic emissions associated with the movement of construction materials, particularly on the approach to and from construction compounds, where the number of vehicle movements are likely to be greatest.

14.11.3 The above subjects will be further assessed in the ES, using an appropriate methodology as described within the Scoping Report. The assessment will confirm the level of control measures required to mitigate impacts to the extent that any effect would be not significant.

14.11.4 It is not expected that there will be any significant adverse effects on local air quality as a result of construction traffic movements associated with the Project.

14.12 References

Ref 14-1 Parliament of the United Kingdom, The Environment Act 1995 (London, 1995).

Ref 14-2 Parliament of the United Kingdom, The Air Quality (England) Regulations 2000 (London, 2000).

Ref 14-3 Department for Environment Food and Rural Affairs (Defra). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. London: The Stationary Office, 2007.

Ref 14-4 Parliament of the United Kingdom, The Air Quality Standards Regulations 2010 (London, 2010).

Ref 14-5 Parliament of the United Kingdom, The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018. (London: 2018).

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Ref 14-7 Ministry of Housing, Communities and Local Government. National Planning Policy Framework. London: The Stationary Office, 2019.

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<https://www.northlincs.gov.uk/planning-and-environment/planning-policy-local-development-framework/>

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<https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf>

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