

Viking CCS Pipeline

**Environmental  
Statement Volume II -  
Chapter 14: Air Quality**

Document Reference: EN070008/APP/6.2.14

Applicant: Chrysaor Production (U.K.) Limited,  
a Harbour Energy Company  
PINS Reference: EN070008  
Planning Act 2008 (as amended)  
The Infrastructure Planning (Applications: Prescribed Forms  
and Procedure) Regulations 2009 - Regulation 5(2)(a)  
Date: October 2023

<b>PINS Reference</b>	<b>Document Reference</b>	<b>Document Revision</b>	<b>Date</b>
EN070008	EN070008/APP/6.2.14	Revision 1	October 2023

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# 14 Air Quality

## 14.1 Introduction

- 14.1.1 This chapter of the Environmental Statement (ES) presents the assessment of the likely significant effects of the Viking CCS Pipeline (hereafter referred to as the Proposed Development) on air quality during the construction phase. The operational and decommissioning phases have been scoped out of the assessment, in agreement with The Planning Inspectorate. Operational emissions harmful to human health and nature conservation sites will be limited to those associated with infrequent maintenance vehicle movements. Decommissioning emissions are assumed to be similar to and no worse than those associated with and assessed for the construction phase. More details are provided in section 14.3 below.
- 14.1.2 The assessment includes consideration of impacts to amenity and human health sensitive receptors and designated nature conservation sites by combustion and dust emissions from construction activities.
- 14.1.3 Air quality is interrelated with other environmental effects and so this chapter should be read in conjunction with the following chapters within *ES Volume II (Application Document 6.2)*:
  - Chapter 6: Ecology and Biodiversity; and
  - Chapter 12: Traffic and Transport.
- 14.1.4 This chapter is supported by **Figures 14-1** to **Figure 14-5** included within this chapter (higher resolution versions of which are included within *ES Volume III: Figures (Application Document 6.3)*). Additional information contained in the *ES Volume IV: Appendix 14.1: Construction Dust Assessment Methodology (Application Document 6.4.14.1)*

## 14.2 Legislation, Policy and Guidance

### Introduction

- 14.2.1 The Legislation, Policy and Guidance section of this chapter provides an overview of the relevant legislation, planning policy and technical guidance relevant to the air quality assessment.

### Legislation

- 14.2.2 A summary of the relevant legislation is provided 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

Legislation	Legislation Context
	<p>Management (LAQM) is an integral part of delivering the Government's AQOs.</p>
<p>The Environment Act 2021</p>	<p>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<sub>2.5</sub>. 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.</p> <p>The Act also contains amendments to Part 4 of the Environment Act 1995 and amendments of the Clean Air Act 1993.</p>
<p>Environmental Improvement Plan 2023</p>	<p>On the 31<sup>st</sup> January 2023, the Environmental Improvement Plan (the Plan) was published to build upon the Government's 25 Year Environmental Plan and in accordance with the provisions of the Environment Act 2021.</p> <p>A key target of the Plan is to improve environmental quality, including measures to:</p> <p><i>“Cut overall air pollution by tackling the key sources of emissions, including reducing the maximum limits for domestic burning appliances in Smoke Control Areas.</i></p> <p><i>Tackle specific hotspots by challenging councils to improve air quality more quickly, while supporting them with clear guidance, funding, and tools.</i></p> <p><i>Reduce ammonia emissions (crucial for sensitive natural habitats) by using incentives in our new farming schemes”.</i></p> <p>The Plan confirms the legal target to reduce population exposure to PM<sub>2.5</sub> by 35% in 2040 compared to 2018 levels, with a new interim target to reduce by 22% by the end of January 2028, and a legal target to require a maximum annual mean concentration of 10 micrograms of PM<sub>2.5</sub> per cubic metre (µg/m<sup>3</sup>) by 2040, with a new interim target of 12 µg/m<sup>3</sup> by the end of January 2028.</p>
<p>The Environmental Targets (Fine Particulate Matter) Regulations 2023</p>	<p>On 30<sup>th</sup> January 2023, regulations were published regarding the new targets for PM<sub>2.5</sub> concentrations as required by the Environment Act. The regulations set out the following targets:</p> <p><i>“The annual mean concentration target is that by the end of 31st December 2040 the annual mean level of PM<sub>2.5</sub> in ambient air must be equal to or less than 10 µg/m<sup>3</sup> (“the target level”)</i></p> <p><i>The population exposure reduction target is that there is at least a 35% reduction in population exposure by the end of 31st December 2040 (“the target date”), as compared with the average population exposure in the three-year period from 1st January 2016 to 31st December 2018 (“the baseline period”), determined in accordance with regulation 8”.</i></p>

Legislation	Legislation Context
	<p>The relevant air quality standard for PM<sub>2.5</sub> against which the impact of the of the Proposed Development on local air quality is determined is set out in <b>Table 14.2</b>.</p>
<p>The Air Quality Regulations 2000 (Ref 14-2)</p>	<p>Provides Air Quality Objectives (AQOs) for a range of different pollutants, unlike AQSs, there is no statutory obligation to meet the AQOs; 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. It is the AQOs set out in legislation (and relevant amendments since) against which the impact of the of the Proposed Development on local air quality is determined. The relevant AQOs are set out in <b>Table 14.2</b>.</p>
<p>The 2007 Air Quality (England) Strategy 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. 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. 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 (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 sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), benzene, carbon monoxide (CO) and lead. Target values have been set for the concentration of PM<sub>2.5</sub>. A limit value for the concentration of PM<sub>2.5</sub> is also provided. All limit values included in these Regulations should not be exceeded. 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 <sup>3</sup> )
NO <sub>2</sub>	Annual mean	40
	1-hour mean (not to be exceeded more than 18 times per year)	200
Particulate Matter (PM) <sub>10</sub>	Annual mean	40
	24-hour mean (not to be exceeded more than 35 times per year)	50
PM <sub>2.5</sub>	Annual mean	20
	Annual mean (by 2040)	10
	Interim target (by end of January 2028)	12

### National Planning Policy

14.2.3 National Planning Policy relevant to air quality is detailed in **Table 14-3**. An overview of how relevant national planning policy has been complied with is provided within the *Planning Statement (Application Document 7.1)*.

**Table 14-3: National Planning Policy Relevant to Air Quality**

Policy Reference	Policy Context
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 <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: <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 (AQMAs) 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 AQMAs and Clean Air Zones is consistent with the local air quality action plan.”</i></p> <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</p>



Policy Reference	Policy Context
	quality action plans of administrative authorities to bring about improvements in air quality within their AQMAs.
Clean Air Strategy 2023 (Ref 14-8)	<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/m<sup>3</sup> 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<sub>2.5</sub> below the WHO guideline as appropriate mitigation will be implemented where necessary.</p>

### Local Planning Policies

14.2.4 Local Planning Policies relevant to air quality is detailed in **Table 14-4**. An overview of how relevant local planning policy has been complied with is provided within the *Planning Statement (Application Document 7.1)*.

**Table 14-4: Local Planning Policies Relevant to Air Quality**

Policy Reference	Policy Context
North East Lincolnshire Local Plan 2013 – 2032 (Ref 14-9)	<p>The North East Lincolnshire Local Plan was adopted in 2018. A relevant strategic objective outlined is SO<sub>2</sub>: Climate change, this includes the management of air quality in the North East Lincolnshire Council area.</p> <p>One policy within the Local Plan is relevant to air quality: Policy 5: Development boundaries sets out how all proposed developments within the Council must consider noise and air quality, in line with sustainability considerations.</p> <p>This chapter sets out the assessment of impacts on air quality. <i>Chapter 13: Noise and Vibration</i> sets out the impacts on noise and vibration.</p>
North Lincolnshire Local Development Framework 2006 – 2026 (Ref 14-10)	<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: 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.</p>
Central Lincolnshire Local Plan 2012-2036	<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: “<i>The amenities which all existing and future occupants of neighbouring land and buildings may</i></p>

Policy Reference	Policy Context
(West Lindsey) (Ref 14-11)	<p><i>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 “Adverse impact upon air quality from odour, fumes, smoke, dust and other sources” has been considered in relation to both the construction and life of the development.</p>

## Guidance

14.2.5 The air quality assessment has been carried out in accordance with the following:

- Defra Local Air Quality Management (LAQM) Technical Guidance LAQM.TG16 (Ref 14-12);  
Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction v1.1 (2016) (Ref 14-13);
- Environmental Protection UK & IAQM Land-Use Planning and Development Control: Planning for Air Quality (2017) (Ref 14-14);
- IAQM Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites v.1.1 (2020) (Ref 14-15); and
- Highways England Design Manual for Roads and Bridges (DMRB) LA 105 (Ref 14-16).

## 14.3 Scope of Assessment and Consultation

### Scoping Report and Scoping Opinion

- 14.3.1 A scoping exercise was undertaken in 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 Proposed Development on air quality.
- 14.3.3 Following receipt of the Scoping Opinion (*ES Volume IV: Appendix 5.2 (Application Document 6.4.5.2)*), the following requirements shown in **Table 14-5** have been identified by the Planning Inspectorate. In summary, there is agreement from the Planning Inspectorate and North Lincolnshire Council to the approach set out in the Scoping Report.
- 14.3.4 A summary of stakeholder engagement specific to Air Quality has been provided in **Table 14-5**.

**Table 14-5: Air Quality Scoping Opinion**

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, given the scale and nature of the Proposed Development. Construction phase traffic data has been provided by the competent expert for traffic and transport for future baseline and future construction phase scenarios (<i>Chapter 12: Traffic and Transport</i>). The data have been screened using the IAQM screening criteria and the results are presented in this ES Chapter (<i>Section 14.7, Paragraph 14.7.34 to 14.7.39</i>).</p>
<p>Planning Inspectorate Table 6-4 and Chapter 12 (Air Quality</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</p>	<p>Construction phase vehicle movements have been screened using the screening criteria provided by the DMRB and the results are presented in this ES Chapter (<i>Section 14.7, Paragraph 14.7.34 to 14.7.39</i>). It was found that no links within 200m of a designated sensitive</p>

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
Chapter 12)		(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 ecological receptors should be considered in the ES, and subject to assessment where a pathway for significant effects is identified.	ecological receptor exceed the screening criteria provided by DMRB of a change in AADT flows of 1,000 vehicles or 200 HDV, and therefore a detailed assessment of road traffic emissions and their impact on designated sensitive habitat is not required to inform the ES.
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, i.e., 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 Planning Inspectorate agrees that an assessment of air quality effects during operation and decommissioning can be scoped out. This approach has been reviewed as more information has become available and remains valid.</p> <p>This chapter of the ES has provided details on the approach taken, including all relevant supporting evidence of the presence or absence of a pathway(s) for likely significant effects to occur.</p>

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
		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	
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 applied to an assessment of effects on ecological receptors (see Table 3.1 above).	This has been reviewed and corrected within this ES Chapter. An assessment of the effects on ecological receptors has also been included.
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.

## Feedback on the Preliminary Environmental Information Report

14.3.5 A summary of stakeholder feedback specific to the PEIR Air Quality chapter has been provided in **Table 14-6**.

**Table 14-6: Air Quality Feedback on PEIR**

Stakeholder	Feedback on PEIR	Response
Natural England	Natural England notes within Table 14-5 ( <i>of the PEIR</i> ) that air quality effects on sensitive ecological receptors will be considered on the basis that 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.  Natural England agrees with this approach. Natural England through our existing DAS contract will be willing to engage with the applicant should a detailed assessment of road traffic emissions be undertaken in order to determine their impacts on designated sensitive ecological habitats.	Noted
North Lincolnshire Council – Environmental Protection Team	This department agrees with the assessment approach and it is agreed that, due to the nature of the project, the potential air quality impacts are restricted to the construction phase.	Noted

### Additional Consultation

14.3.6 No additional consultation has been undertaken to date with specific regard to local air quality impacts.

### Scope of Assessment

14.3.7 The Proposed Development will lead to various impacts on the environment during its construction, operation and decommission. With regards to impacts on air quality, the various aspects and phases have either been scoped in or out of the assessment, in-line with the Scoping Report (*ES Volume IV: Appendix 5.1 (Application Document 6.4.5.1)*) and subsequent responses.

#### *Aspects scoped into the assessment*

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

- Construction phase dust assessment 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.

### **Aspects scoped out of the assessment**

14.3.9 The following aspects have not been considered within the scope of the assessment in this chapter of the ES:

- All effects relating to the operation of the Proposed Development as emissions would be restricted to those associated with road traffic movements during occasional inspection and maintenance activities. These are likely to be minimal. At the PEIR stage, it was stated that once more was known about the venting, that this would be discussed at the ES stage. More information is now known about the venting system, and this will only comprise of CO<sub>2</sub> emissions which will not directly impact human health. Therefore, the impacts from the emissions from venting the pipeline have not been considered within this assessment; and
- All effects relating to the decommissioning of the Proposed Development as this would not require extensive ground works or vehicle movements of a scale sufficient to trigger a detailed air quality assessment.

## **14.4 Assessment Methodology**

### **Overview**

14.4.1 For the three aspects scoped into this assessment (as listed in section 14.4.8), the assessment methodology for these is outlined below.

### **Construction Dust**

14.4.2 The impacts associated with the construction phase of the Proposed Development 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).

14.4.3 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 PM<sub>10</sub> concentrations resultant of dust generating activities on site; and
- An increase in concentration of airborne particles and NO<sub>2</sub> due to exhaust emissions from diesel powered vehicles and equipment on site and vehicles accessing the site.

14.4.4 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).

14.4.5 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.

14.4.6 The full construction dust assessment methodology is set out in *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1)*. 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.

14.4.7 For amenity effects from coarser dust ( $>PM_{10}$ ), 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 ( $PM_{10}$ ). 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).

### **Receptor Sensitivity**

14.4.8 The sensitivity of receptors falls under three categories: sensitivity to dust soiling effects and harm to amenity, sensitivity to the health effects of  $PM_{10}$ , and sensitivity to the deposition of dust on sensitive habitats. Professional judgement has been used to assign receptors sensitivity as per the IAQM guidance (Ref 14-13).

14.4.9 Examples of types of receptors that have different levels of sensitivity to dust soiling and human health, as outlined in the IAQM guidance (Ref 14-13), have been presented in Table 14-7. Further information is included within *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1)*. Of most relevance to this assessment are high sensitivity dwellings and high sensitivity nature conservations sites with an international designation.



**Table 14-7: Sensitivity to Dust and PM<sub>10</sub> Effects**

Sensitivity	Dust Soiling	Human Health	Sensitive Habitats
<b>High</b>	<ul style="list-style-type: none"> <li>• Dwellings</li> <li>• Museum and other culturally important collections</li> <li>• Medium- and long-term car parks</li> <li>• Car showrooms</li> </ul>	<ul style="list-style-type: none"> <li>• Residential properties</li> <li>• Hospitals</li> <li>• Schools</li> <li>• Residential care homes</li> </ul>	<ul style="list-style-type: none"> <li>• Special Area of Conservation</li> </ul>
<b>Medium</b>	<ul style="list-style-type: none"> <li>• Parks</li> <li>• Places of work</li> </ul>	Office and shop workers, but will generally not include workers occupationally exposed to PM <sub>10</sub> , as protection is covered by Health and Safety at Work legislation	<ul style="list-style-type: none"> <li>• Site of Special Scientific Interest</li> <li>• Priority habitat that is potentially sensitive to dust</li> </ul>
<b>Low</b>	<ul style="list-style-type: none"> <li>• Playing fields</li> <li>• Farmland (unless commercially sensitive horticultural)</li> <li>• Footpaths</li> <li>• Short term car parks</li> <li>• Roads</li> </ul>	<ul style="list-style-type: none"> <li>• Public footpaths</li> <li>• Playing fields</li> <li>• Parks</li> <li>• Shopping streets</li> </ul>	<ul style="list-style-type: none"> <li>• Local Wildlife Site</li> </ul>

**Magnitude of Impacts**

14.4.10 In line with the IAQM guidance (Ref 14-13), the magnitude of emissions impact varies depending on the task/phase of work (i.e., demolition, earthworks, construction or track-out). Professional judgement has been used to identify which magnitude of emissions (large, medium, or small) is relevant, in line with IAQM guidance.

14.4.11 The IAQM criteria for the different magnitudes are outlined in Section 14.3 of the *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1)*.

**Significance Criteria**

14.4.12 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 14-8**.

**Table 14-8: Construction Dust Impact Descriptors and Effects**

Effect	Change in Dust Deposition Rate and Short-term PM <sub>10</sub> Concentrations	Significance
<b>Major</b>	<p>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.</p> <p>Increase in PM<sub>10</sub> concentrations at a location where concentrations are already elevated and to the extent that the short term PM<sub>10</sub> air quality objective is likely to be exceeded.</p> <p>Deposition impact likely to harm habitat within a designated nature conservation area of international importance</p>	<p>A significant effect that is likely to be a material consideration in its own right.</p>
<b>Moderate</b>	<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 PM<sub>10</sub> concentrations at a location where concentrations are already elevated and to the extent that the short term PM<sub>10</sub> 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>	<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.</p>
<b>Minor</b>	<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.</p> <p>Limited increase in PM<sub>10</sub> concentrations. Deposition impact likely to harm habitat within a designated nature conservation area of local importance.</p>	<p>An effect that is not significant but that may be of local concern.</p>
<b>Negligible</b>	<p>Impact is unlikely to be noticed by and/or have an effect on sensitive receptors. Imperceptible increase in PM<sub>10</sub> concentrations and deposition.</p>	<p>An effect that is not significant.</p>

**Site Plant and Non-Road Mobile Machinery**

14.4.13 Emissions from construction-related Non-Road Mobile Machinery (NRMM) and site plant will have the potential to increase NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations at locations close to working areas of the site.

14.4.14 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.”*

14.4.15 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

14.4.16 Traffic data for the roads most affected by the construction of the Proposed Development has been provided by the Project Transport Consultant, including data for road links on the approach to and from the Proposed Development site compounds. The data has been screened against relevant criteria set out in industry-standard guidance. The purpose of the screening criteria is to identify whether detailed assessment of road traffic emissions may be required to determine significance of effect. If traffic movements fall below the screening criteria, it is considered that there is no need to undertake a detailed assessment and there is no potential for a significant effect to occur. If data exceeds the criteria, then further consideration is required to determine if a significant air quality effect is possible, which may require detailed modelling. The screening criteria is set out in **Table 14-9** and Paragraph 14.4.19.

14.4.17 It is important to note that the IAQM state that these criteria are precautionary and should be treated as indicative. They are intended to function as a sensitive ‘trigger’ for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. The IAQM state that this will not be realised in many cases.

14.4.18 As such, the criteria are not to be applied rigidly and, in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality.

**Table 14-9: 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"> <li>• more than 100 Annual Average Daily (AADT) within or adjacent to an AQMA</li> <li>• more than 500 AADT elsewhere.</li> </ul>
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"> <li>• more than 25 AADT within or adjacent to an AQMA; or</li> <li>• more than 100 AADT elsewhere.</li> </ul>
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"> <li>• more than 25 AADT within or adjacent to an AQMA; or</li> </ul>

Nature of Impact	Screening criteria for Detailed Air Quality Assessment
	<ul style="list-style-type: none"> <li>• more than 100 AADT elsewhere.</li> </ul>

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

14.4.19 With regard to sensitive ecological receptors, should the number of traffic movements exceed the screening criteria provided by National Highways DMRB guidance 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.

### Assumptions and Limitations

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

- The traffic data reported in this chapter is subject to the uncertainties inherent in the production of such data, as described in *ES Volume II Chapter 12 Traffic and Transport (Application Document 6.2.12)*;
- The consideration of baseline air quality conditions relies on secondary data gathered and published by the Local Planning Authorities and Defra. It is assumed that the data made available by these sources has been gathered appropriately and reported accurately;
- Defra background data (Ref 14-21) has been used to represent background pollutant concentration data in the Study Area. Such an approach is common practice, particularly for assessments across a larger study area; and
- Receptors have been identified and counted using the AddressBasePlus dataset (Ref 14-22). It is assumed that this database is an accurate reflection of land use within the study area.

## 14.5 Baseline Conditions and Study Area

### Study Area

14.5.1 The Study Area for this assessment is the area over which potential direct and indirect effects of the Proposed Development on local air quality are predicted to occur during the construction period, noting that operational phase and decommissioning phase impacts have been scoped out of the assessment.

14.5.2 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) (Ref 14-13, Ref 14-14 and Ref 14-15). Because of the rural nature of much of the Study Area and sparsity of, existing air quality monitoring data, an area within 10 km of the DCO Site Boundary 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 generated by construction activities is required:

- An amenity or human health sensitive receptor within:
  - 350 m of the limits of construction activity within the DCO Site Boundary; or
  - 50 m of the construction route 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 DCO Site Boundary; or
  - 50 m of the construction route on the public highway, up to 500 m from the site entrance(s).

14.5.3 The Study Area is effectively 350m from the DCO Site Boundary.

14.5.4 **Figure 14-1** illustrates this 350m Study Area around the DCO Site Boundary, along with surrounding air quality constraints. The Study Area has been divided up into five separate sections to aid the reporting of the assessment (see *ES Volume II Chapter 3: Description of the Proposed Development, Table 3.2*).

### Sensitive receptors

#### Dust Soiling Receptors

14.5.5 Dust soiling receptors are land uses that are susceptible to harm to amenity from the deposition of dust to property. 976 receptors have been identified within the Study Area 350m of the DCO Site Boundary which will have sensitivity to dust soiling impacts. Of these receptors, 857 have high sensitivity such as residential properties, car showrooms and long stay car parks, whereas the rest have lower sensitivity such as educational facilities and offices.

#### Receptors sensitive to the human health impact of PM<sub>10</sub>

14.5.6 Receptors sensitive to human health impacts are land uses where members of the public are considered to be present for a period of time comparable to the averaging periods of the short-term PM<sub>10</sub> air quality objective (24-hours). 951 receptors have been identified within the 350m Study Area around the DCO Site Boundary, which will have sensitivity to human health impacts of increased PM<sub>10</sub> caused by the construction dust. Some of these receptors (855) have high sensitivity such as residential properties or primary schools, whereas the rest have lower sensitivity such as offices, shops and bus shelters.

#### Ecological Receptors

14.5.7 Ecological receptors are designated nature conservations sites and priority habitats. Six national designation and an additional 48 priority habitats have been identified within the 50m Study Area around the DCO Site Boundary which will have potential sensitivity to the impacts of dust settling either directly (through smothering or changes in acidity) or indirectly through increased stresses on the plants. Some of these receptors have high sensitivity such as nationally designated ecological sites (e.g., SAC), whereas the rest have lower sensitivity such as Local Nature Reserves.

### Baseline Conditions

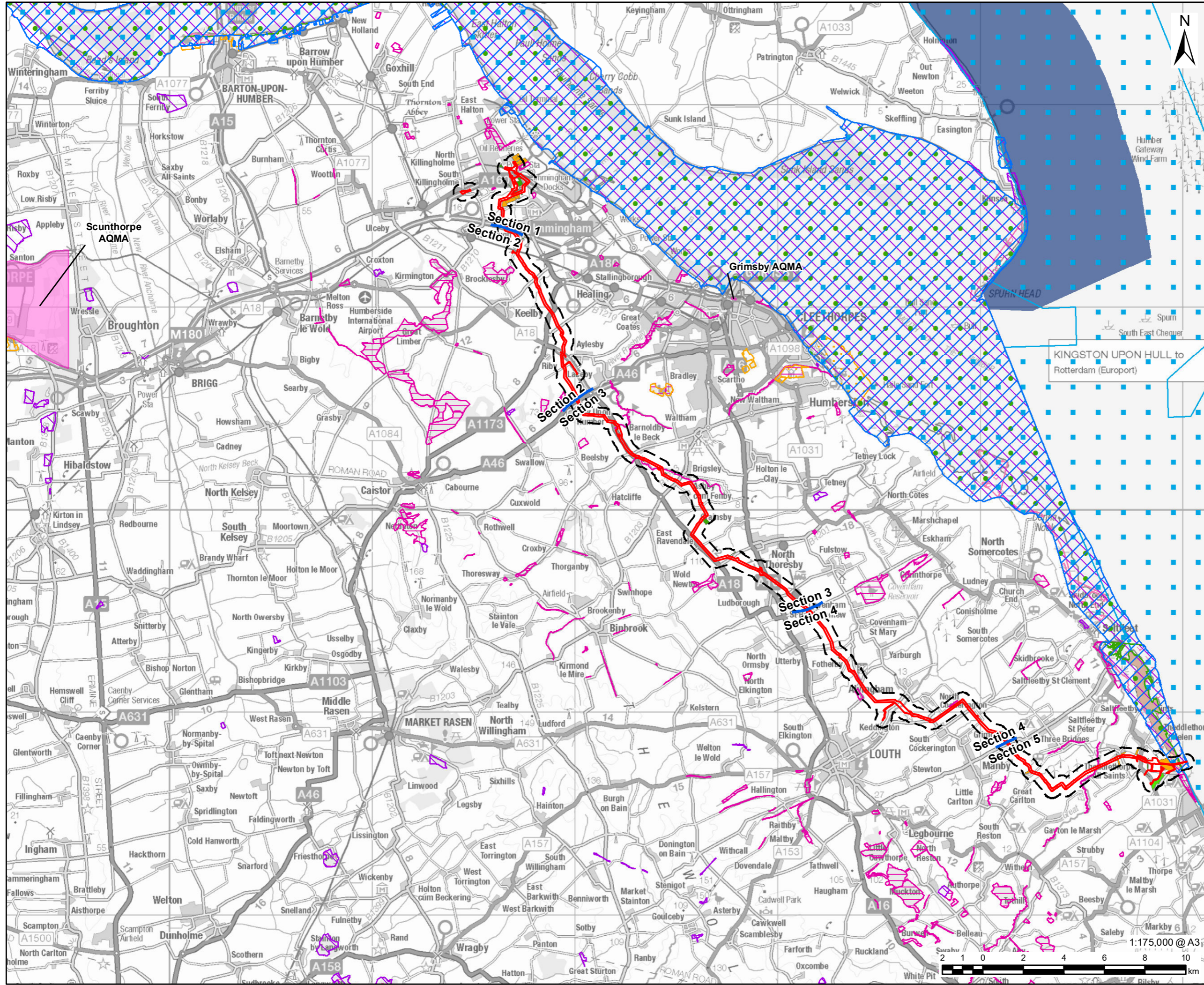
#### Dust Deposition

14.5.8 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.

14.5.9 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.

14.5.10 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. A copy of the relevant buffet distances and identification of nearby receptors is included in **Figure 14-2**.



**LEGEND**

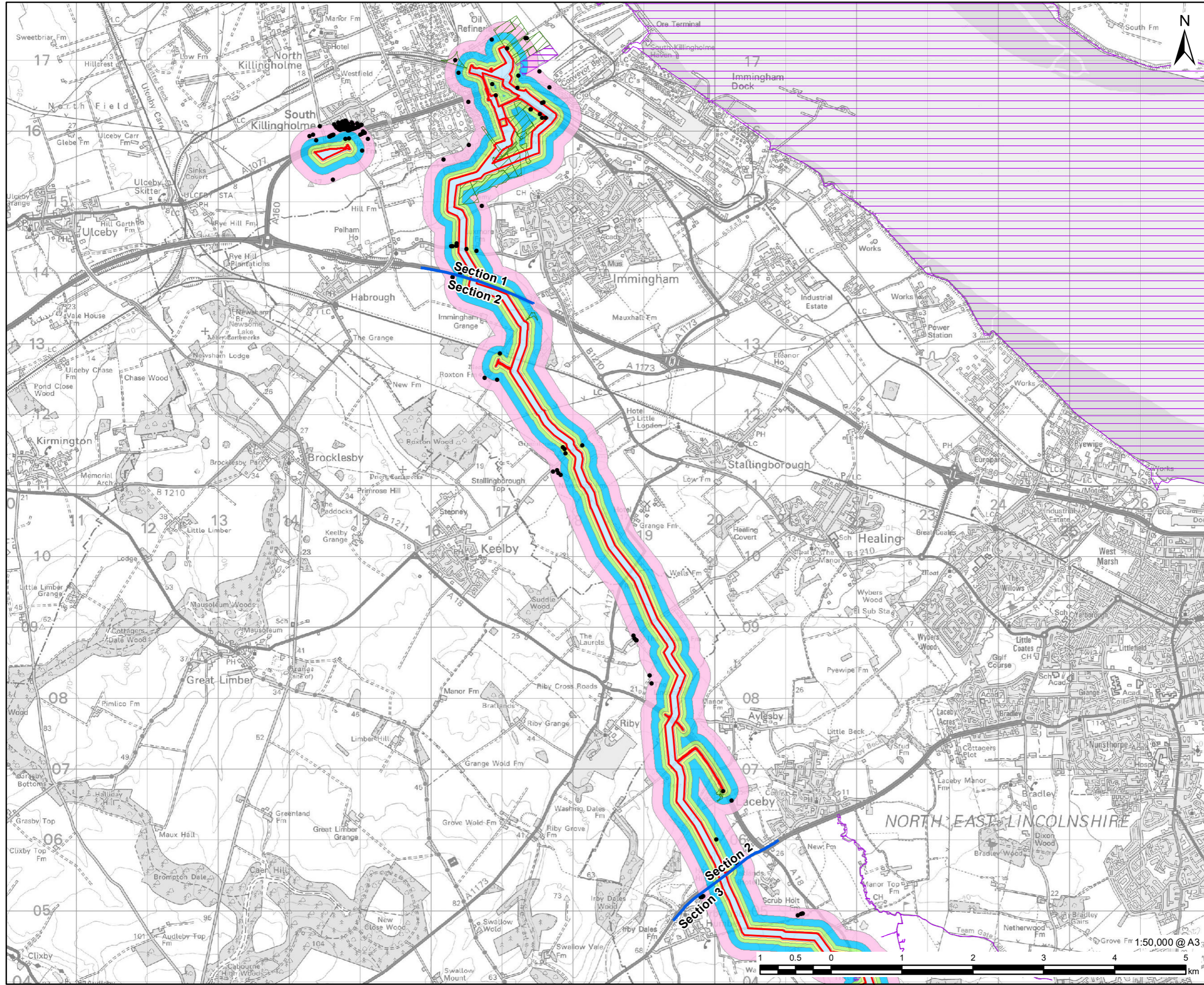
- DCO Site Boundary
- 350m Study Area
- Route Section Break
- Air Quality Management Area (AQMA)
- Ramsar
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Marine Conservation 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 Study Area and Constraints**



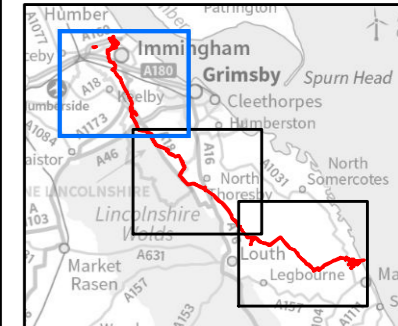
**LEGEND**

- DCO Site Boundary
- Route Section Break
- Receptor Location
- Ecological Designated Site within 50m
- Priority Habitat within 50m

**Construction Dust Assessment**

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

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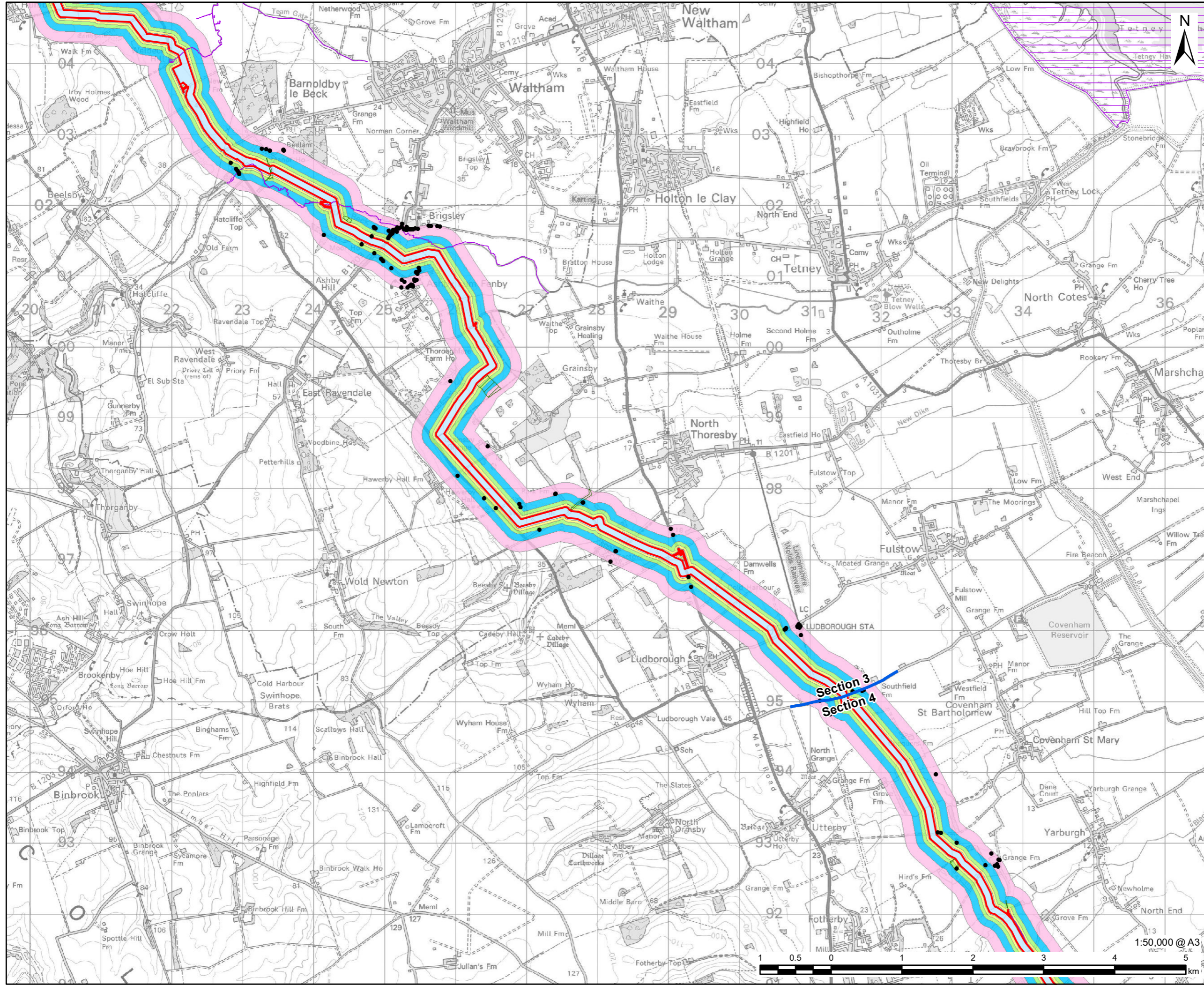


**FIGURE TITLE**

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

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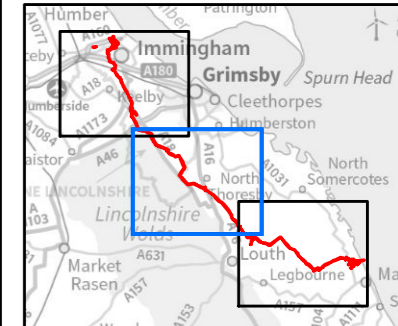
**LEGEND**

- DCO Site Boundary
- Route Section Break
- Receptor Location
- Ecological Designated Site within 50m
- Priority Habitat within 50m

**Construction Dust Assessment**

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

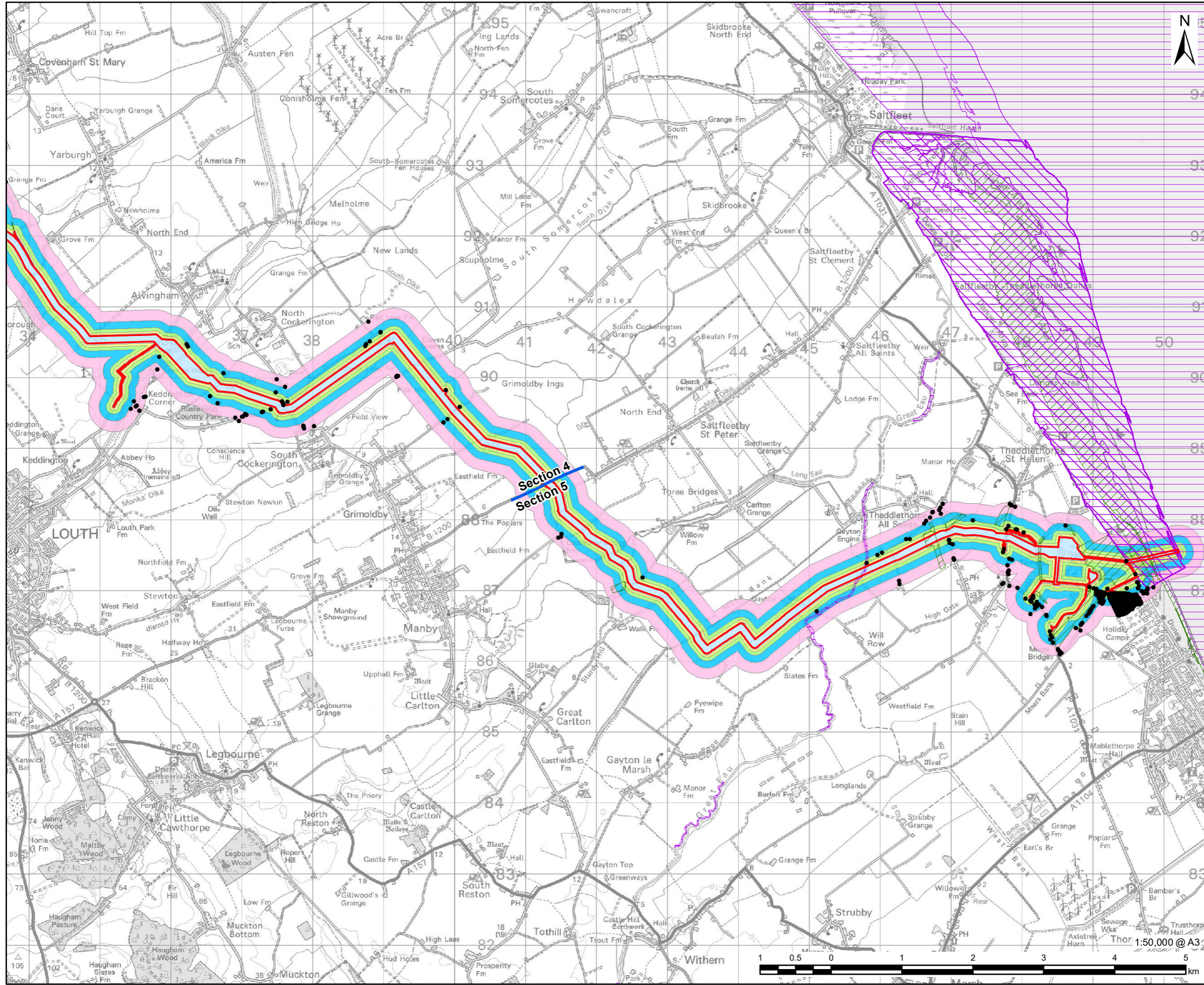
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**FIGURE TITLE**

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

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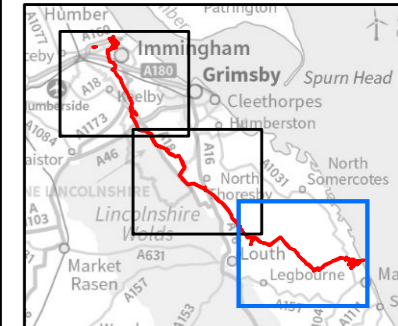
**LEGEND**

- DCO Site Boundary
- Route Section Break
- Receptor Location
- Ecological Designated Site within 50m
- Priority Habitat within 50m

**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 (3 of 3)**

**Construction Dust Assessment**

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## Summary of Data Sources

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

- North Lincolnshire Council (NLC) 2022 Annual Status Report (ASR) (Ref 14-18);
- North East Lincolnshire Council (NELC) 2022 ASR (Ref 14-19);
- West Lindsey District Council (WLDC) 2022 ASR (Ref 14-20);
- East Lindsey District Council (ELDC) Combined Annual Status Report (2016-2020) (Ref 14-25);
- 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 14-23); and
- Designated ecological sites provided by Natural England’s MAGIC maps (Ref 14-24).

## Pollutant Concentrations

14.5.12 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 14-10** details the AQMAs declared by these local authorities, which are also illustrated on **Figure 14-1**.

14.5.13 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 14-10: AQMAs in the Vicinity of the Study Area**

Local Authority	AQMA	Declared for	Distance to DCO Site Boundary
NLC	Scunthorpe AQMA	PM <sub>10</sub> 24 hour mean	19.5 km, W
NELC	Grimsby AQMA	NO <sub>2</sub> annual mean	8.3 km, E
WLDC	None declared	-	-
ELDC	None declared	-	-
Kingston-Upon-Hull City Council	Hull AQMA No.1(A)	NO <sub>2</sub> annual mean	12.9 km, N

14.5.14 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 DCO Site Boundary are presented in **Table 14-11**. Data has been sourced from Local Authority LAQM reports (Ref 14-18, Ref 14-19, Ref 14-20, Ref 14-25). Of the data compiled, annual mean NO<sub>2</sub> 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 14-11: Air Quality Monitoring Data**

Local Authority	Monitoring ID	Grid Ref.		Pollutant <sup>1</sup>	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) <sup>2,3</sup>				
		X	Y		2016	2017	2018	2019	2021
NLC	<b>South Killingholme</b>								
	CM6	514880	416133	NO <sub>2</sub> (O)	17	17	18	15	14
	DT13	514573	415901	NO <sub>2</sub> (RS)	31	20	17	17	17.4
	DT14	514782	415971	NO <sub>2</sub> (RS)	31	27	28	29	28.4
	DT15	515452	416107	NO <sub>2</sub> (BG)	21	19	20	18	17.9
	DT16	515279	416085	NO <sub>2</sub> (RS)	26	25	26	25	22.0
NELC	<b>Immingham</b>								
	AURN	518277	415116	NO <sub>2</sub> (BG)	-	16.9	13.9	12.5	12.1
	NEL 23	519193	415279	NO <sub>2</sub> (RS)	33.3	28.5	26.5	24.5	25.3
	NEL 24	517543	414312	NO <sub>2</sub> (KS)	-	-	-	16.5	15.0
	NEL 25	518108	414533	NO <sub>2</sub> (KS)	-	-	-	19.1	18.2
	<b>Grimsby (Cleethorpe Road AQMA)</b>								
	Cleethorpe Road	527761	410425	NO <sub>2</sub> (RS)	<b>41.6</b>	35.9	-	32.0	33.4
	NEL 11/12/13	527761	410425	NO <sub>2</sub> (RS)	<b>45.2</b>	<b>47.3</b>	38.0	37.8	39.1
	NEL 14	527754	410445	NO <sub>2</sub> (KS)	37.3	34.7	33.3	31.6	34.2
	NEL 15	527789	410438	NO <sub>2</sub> (KS)	35.7	37.3	32.9	31.0	35.8
WLDC	<b>Market Rasen</b>								
	WL11	510681	389675	NO <sub>2</sub> (RS)	-	23.0	17.1	16.3	12.1
	WL12	510840	388610	NO <sub>2</sub> (RS)	-	20.0	17.2	14.8	13.1
	WL13	510851	388475	NO <sub>2</sub> (RS)	-	15.5	12.8	12.3	10.1
	WL14	510866	389106	NO <sub>2</sub> (RS)	-	-	-	28.8	26.2
ELDC	<b>Louth</b>								
	L2-4	533215	387353	NO <sub>2</sub> (RS)	26.1	23.6	25.6	23.8	-
	L5	533459	387475	NO <sub>2</sub> (BG)	15.9	12.8	13.8	12.9	-
	L6	532693	387335	NO <sub>2</sub> (RS)	24.5	27.2	22.3	25.5	-
	L7	533216	387261	NO <sub>2</sub> (RS)	11.9	-	-	-	-
	L8	532659	387121	NO <sub>2</sub> (BG)	27.0	-	-	-	-
<sup>1</sup> “O” = Other; “RS” = Roadside; “BG” = Background; “KS” = Kerbside. <sup>2</sup> Year 2020 not reported due to effect of Covid-19 pandemic on measured concentrations. <sup>3</sup> Values in bold signify an exceedance of the air quality objective.									

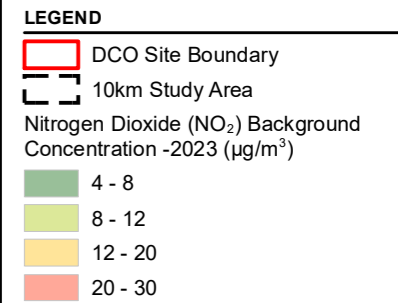
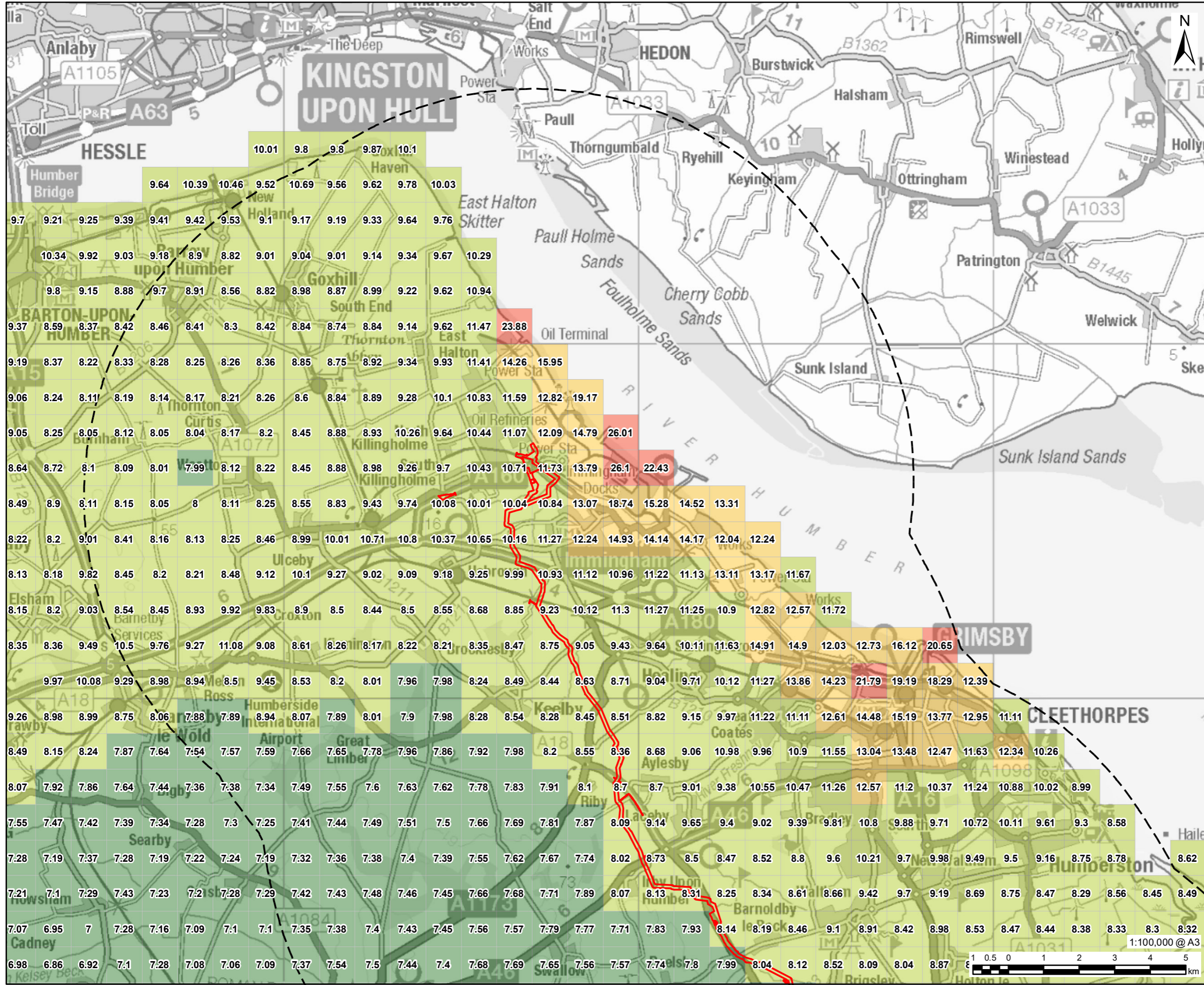
14.5.15 Generally, annual mean concentrations of NO<sub>2</sub> within 10 km of the DCO Site Boundary were below the annual mean Air Quality Objective (AQO) of 40 µg/m<sup>3</sup>, between 2016 and 2021. There were slight exceedances of the AQO at roadside locations within the Grimsby AQMA in 2016 and 2017. However, it is remote from the DCO Site Boundary and construction traffic

will not be using this section of the A180 on journeys to or from the site. Since 2018, annual mean NO<sub>2</sub> concentrations have been below the AQO.

- 14.5.16 There is currently one operational PM<sub>10</sub> monitor within 10 km of the Study Area. This is situated within 350 m of the northern end of the DCO Site Boundary, at Killingholme School. There were no exceedances of the AQOs at this monitoring location. The greatest annual mean PM<sub>10</sub> concentration recorded was 19 µg/m<sup>3</sup> in 2019. The highest number of allowable exceedances of the daily mean 50 µg/m<sup>3</sup> 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 the DCO Site Boundary would be expected to be lower, due to increased distances from PM<sub>10</sub> emissions sources, including the A160.
- 14.5.17 There are no PM<sub>2.5</sub> monitors within 10 km of the DCO Site Boundary. The UK-AIR website provides data for background concentrations of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. These background concentrations represent 1 km<sup>2</sup> grid squares. **Figure 14-3**, **Figure 14-4** and **Figure 14-5** show the estimated background concentrations across the Study Area.
- 14.5.18 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.

### Future Baseline

- 14.5.19 In the years leading up to the Proposed Development's 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 14-26), 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.
- 14.5.20 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 14-27) 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.
- 14.5.21 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 *ES Volume II Chapter 15: Climate Change (Application Document 6.2.15)*.
- 14.5.22 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 **Table 14-11** and background concentration data reported in **Figures 14-3 to 14-5**, would remain representative of conditions in the future baseline.



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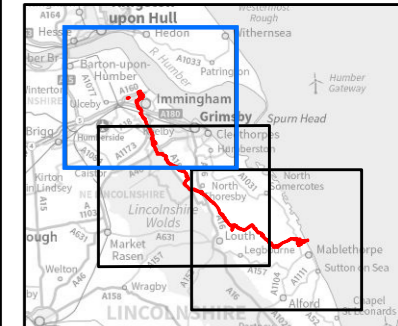
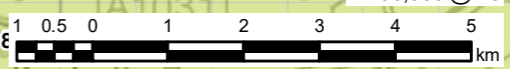


FIGURE TITLE  
**Figure 14-3 (1 of 3)  
 Nitrogen Dioxide (NO<sub>2</sub>) Background Concentrations (µg/m<sup>3</sup>)**



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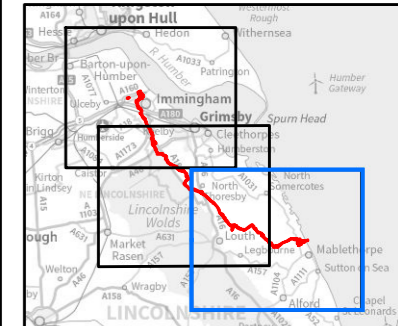
**LEGEND**

- DCO Site Boundary
- 10km Study Area

Nitrogen Dioxide (NO<sub>2</sub>) Background Concentration -2023 (µg/m<sup>3</sup>)

- 4 - 8
- 8 - 12
- 12 - 20
- 20 - 30

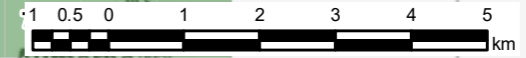
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**FIGURE TITLE**  
**Figure 14-3 (3 of 3)**  
**Nitrogen Dioxide (NO<sub>2</sub>) Background Concentrations (µg/m<sup>3</sup>)**

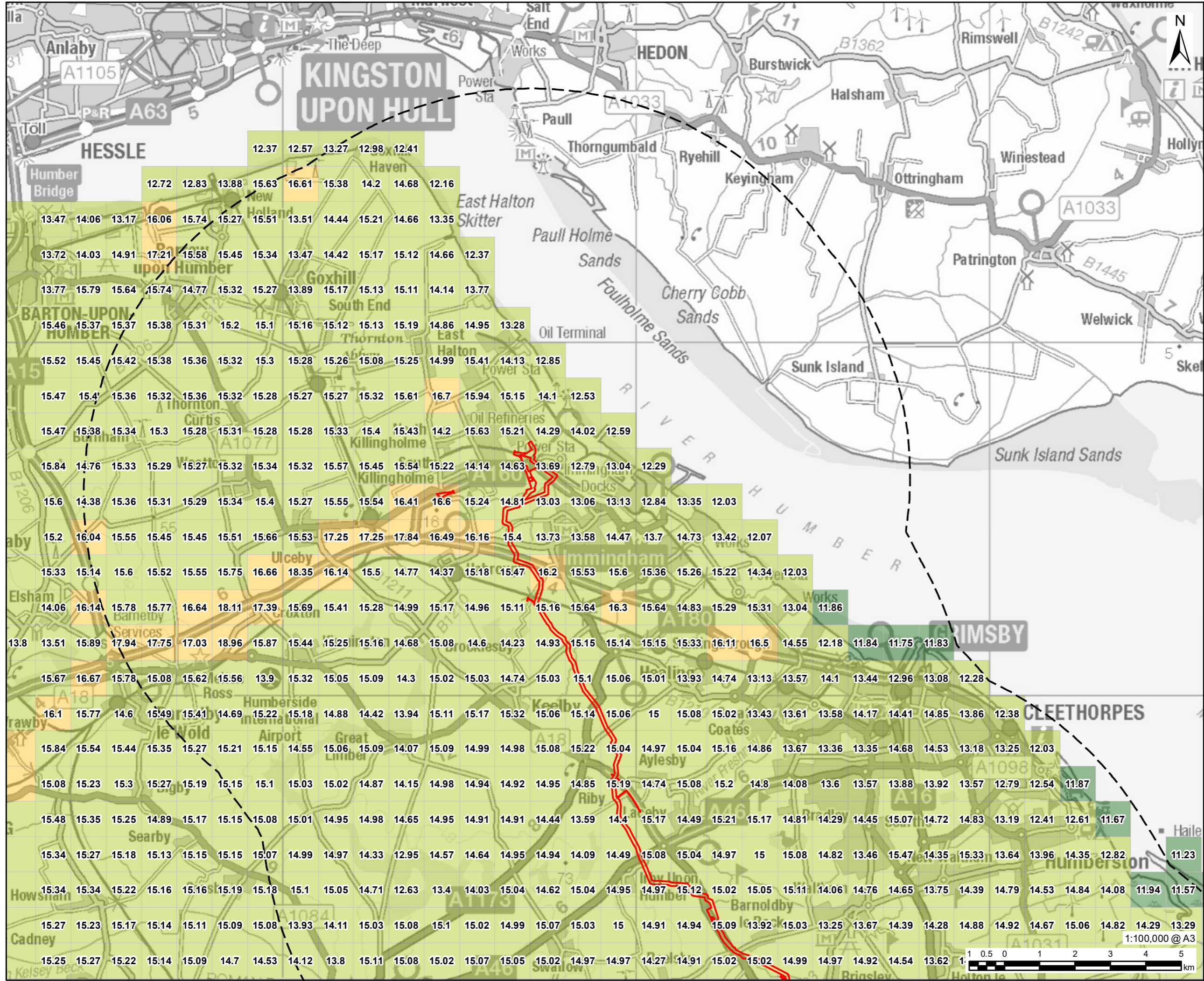
**ISSUE PURPOSE**  
 ENVIRONMENTAL STATEMENT  
 PROJECT NUMBER / REFERENCE  
 60668955 / VCCS\_230914\_ES\_14-3

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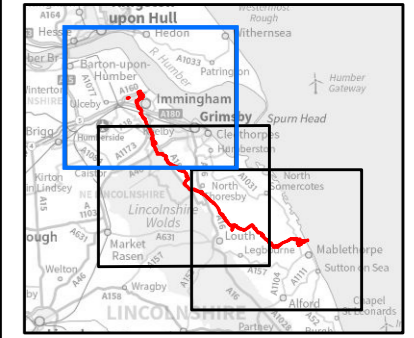




**LEGEND**

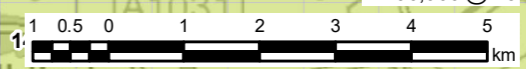
- DCO Site Boundary
- 10km Study
- PM<sub>10</sub> Background Concentration - 2023 (µg/m<sup>3</sup>)
- 8 - 12
- 12 - 16
- 16 - 20
- 20 - 24

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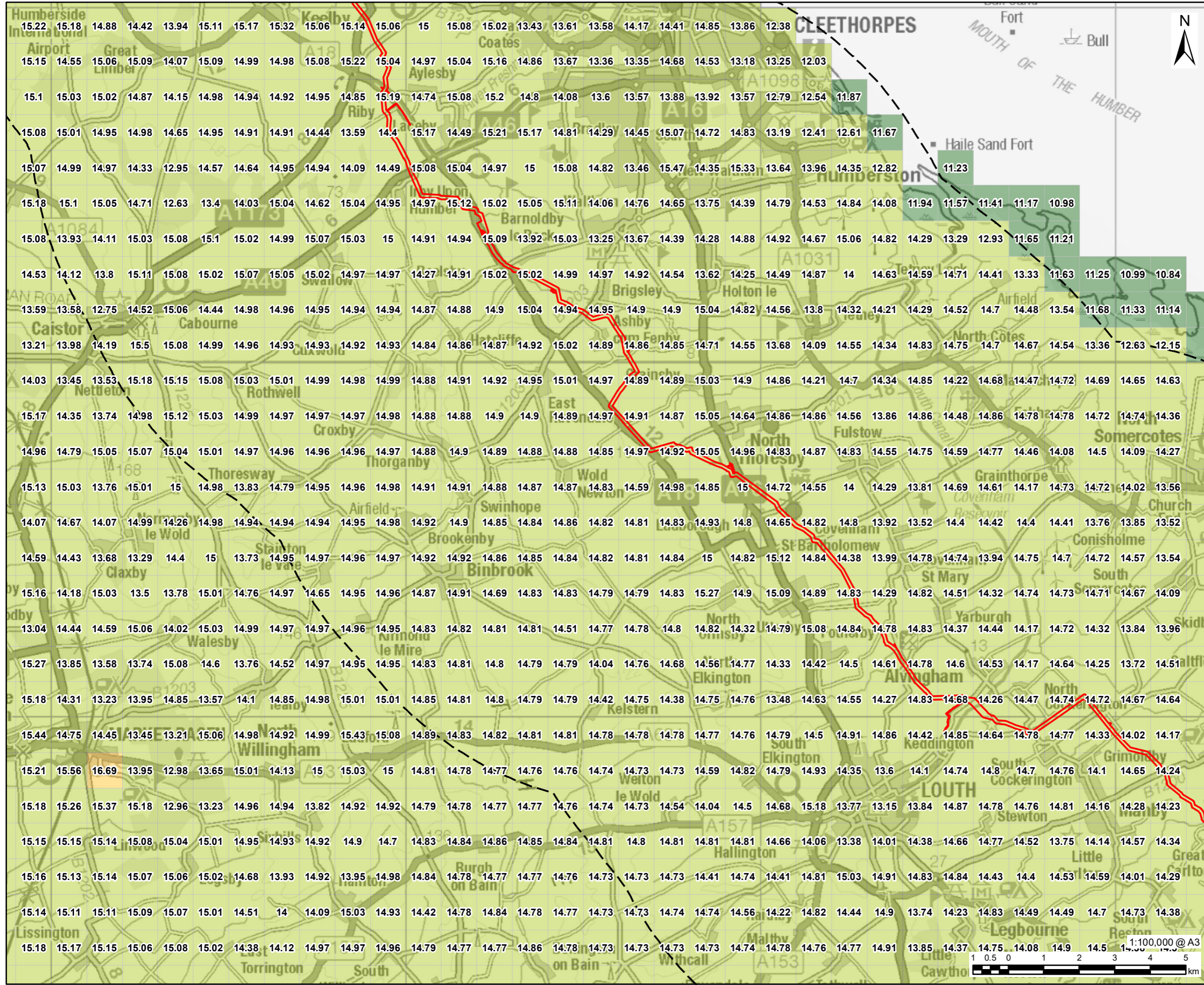


**FIGURE TITLE**  
**Figure 14-4 (1 of 3)**  
**PM<sub>10</sub> Background Concentrations (µg/m<sup>3</sup>)**

**ISSUE PURPOSE**  
 ENVIRONMENTAL STATEMENT  
 PROJECT NUMBER / REFERENCE  
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**PROJECT**  
Viking CCS Pipeline

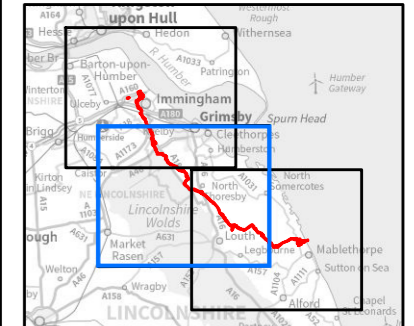
**LEGEND**

- DCO Site Boundary
- 10km Study

PM<sub>10</sub> Background Concentration - 2023 (µg/m<sup>3</sup>)

- 8 - 12
- 12 - 16
- 16 - 20
- 20 - 24

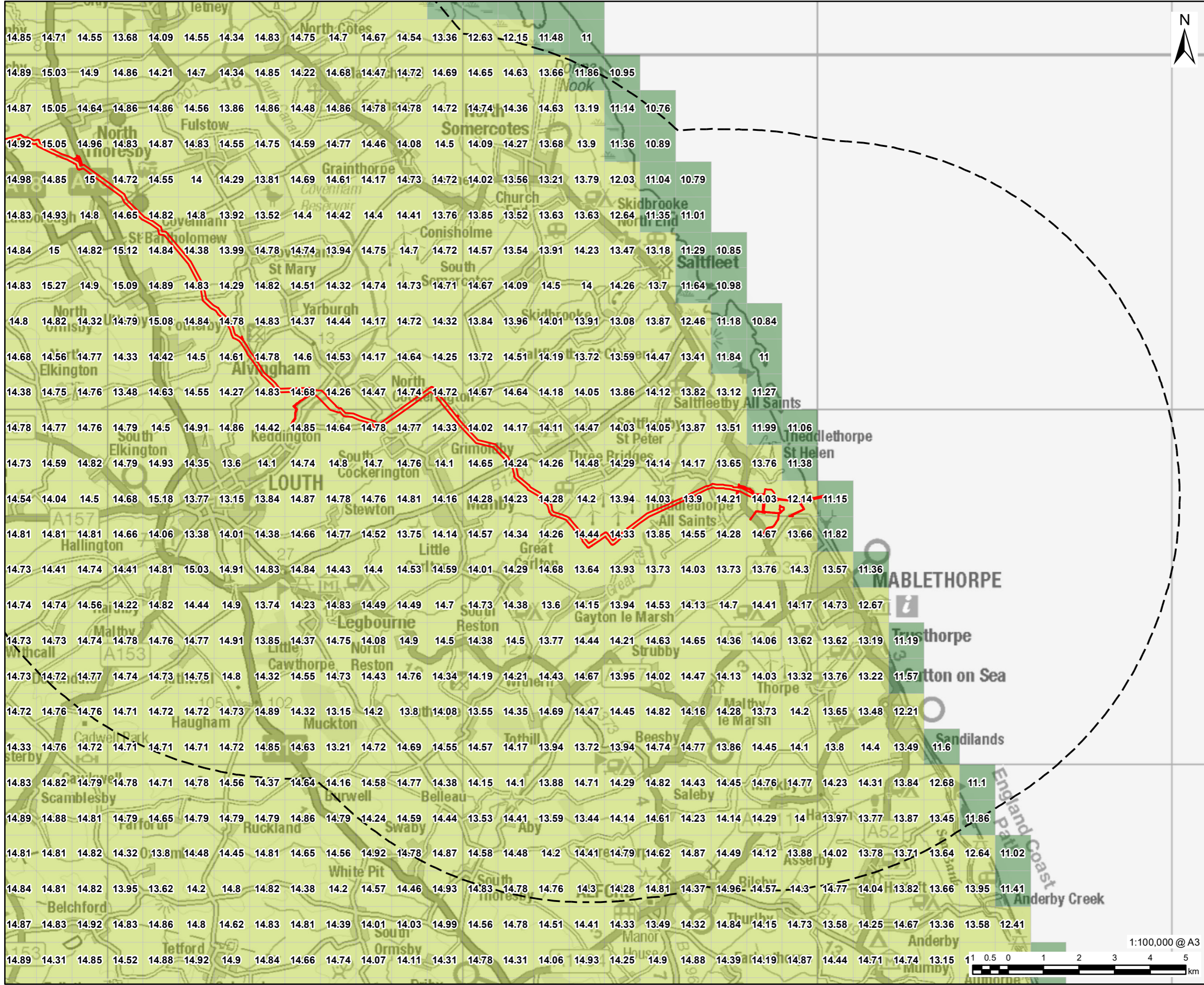
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**FIGURE TITLE**  
 Figure 14-4 (2 of 3)  
 PM<sub>10</sub> Background Concentrations (µg/m<sup>3</sup>)

**ISSUE PURPOSE**  
 ENVIRONMENTAL STATEMENT  
 PROJECT NUMBER / REFERENCE  
 60668955 / VCCS\_230914\_ES\_14-4

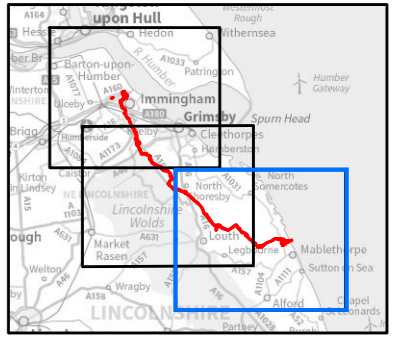
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**LEGEND**

- DCO Site Boundary
- 10km Study
- PM<sub>10</sub> Background Concentration - 2023 (µg/m<sup>3</sup>)
- 8 - 12
- 12 - 16
- 16 - 20
- 20 - 24

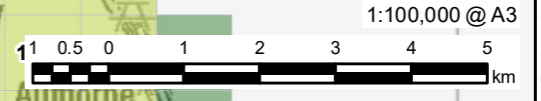
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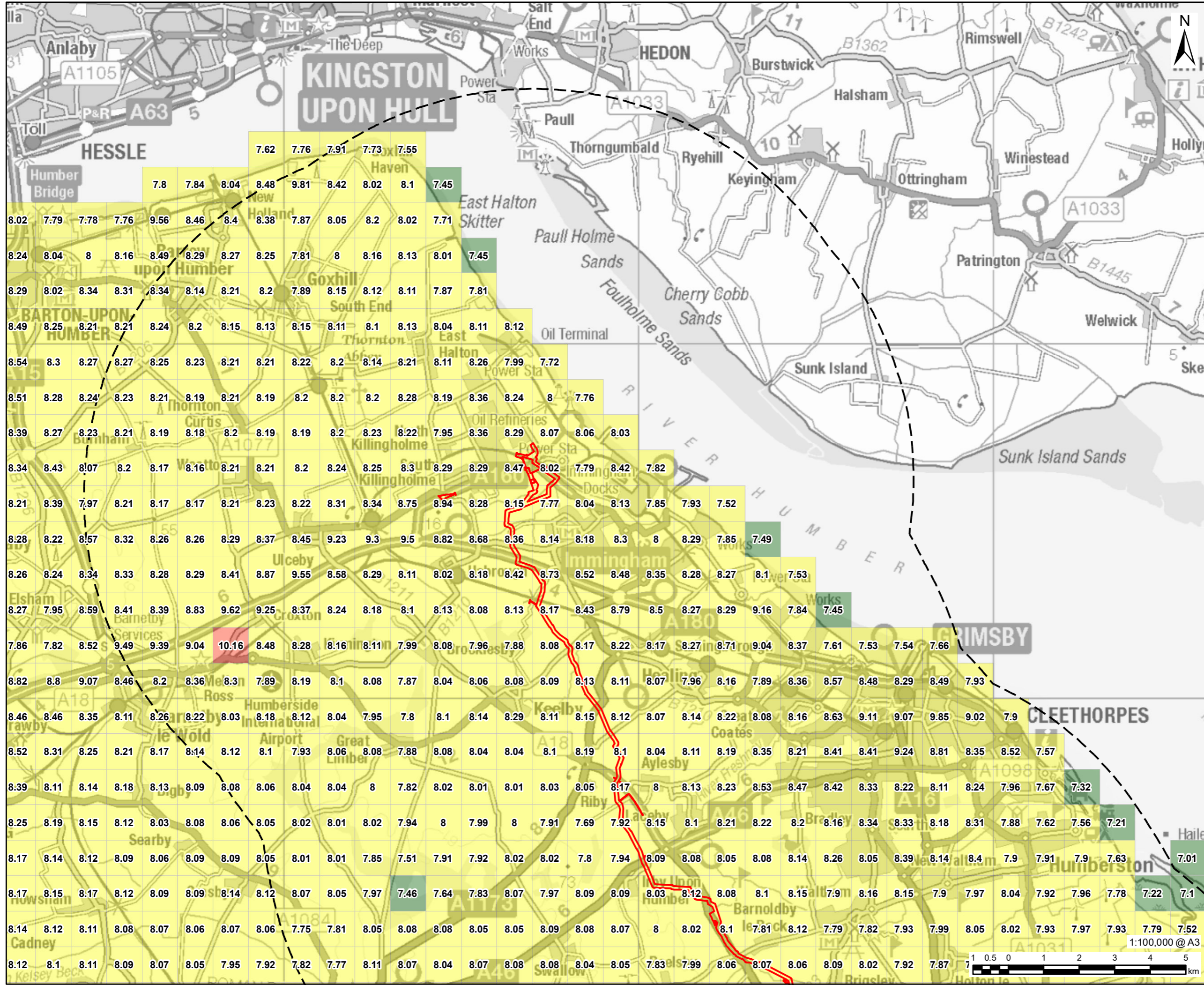
**FIGURE TITLE**  
 Figure 14-4 (3 of 3)  
 PM<sub>10</sub> Background Concentrations (µg/m<sup>3</sup>)

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**ISSUE PURPOSE**  
 ENVIRONMENTAL STATEMENT  
 PROJECT NUMBER / REFERENCE  
 60668955 / VCCS\_230914\_ES\_14-4



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**VikingCCS**

**AECOM**

PROJECT  
**Viking CCS Pipeline**

LEGEND

- DCO Site Boundary
- 10km Study
- PM<sub>2.5</sub> Background Concentration - 2023 (µg/m<sup>3</sup>)
  - 5 - 7.5
  - 7.5 - 10
  - 10 - 12.5

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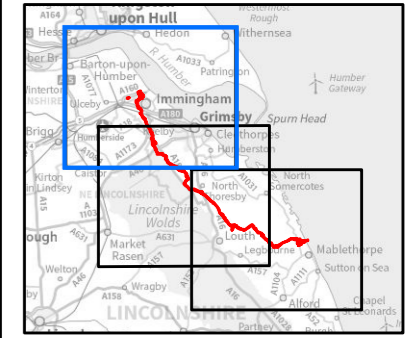
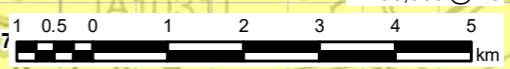
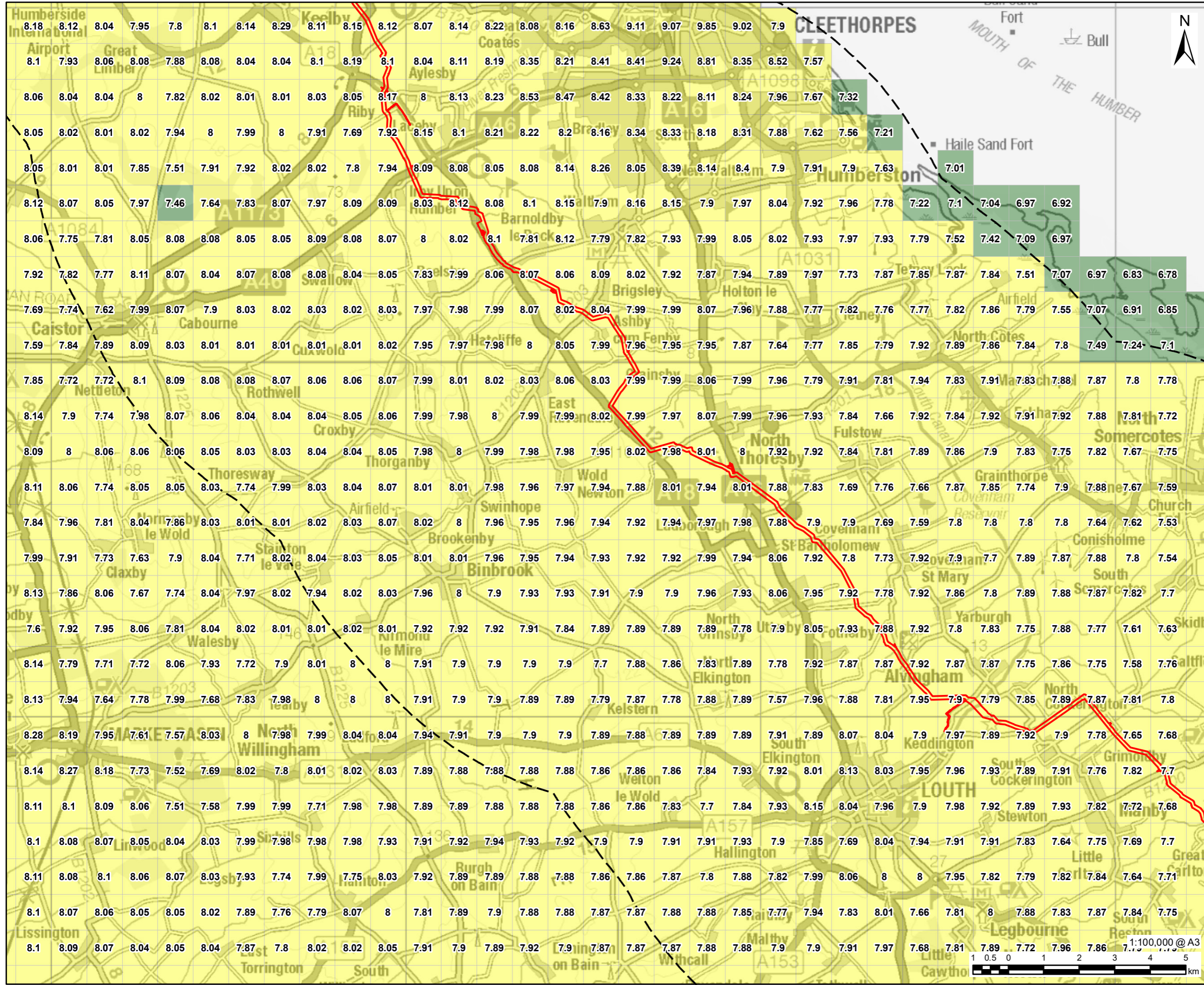


FIGURE TITLE  
**Figure 14-5 (1 of 3)**  
**PM<sub>2.5</sub> Background Concentrations (µg/m<sup>3</sup>)**

ISSUE PURPOSE  
 ENVIRONMENTAL STATEMENT

PROJECT NUMBER / REFERENCE  
 60668955 / VCCS\_230914\_ES\_14-5



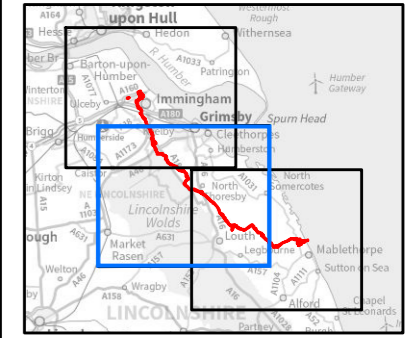


**PROJECT**  
**Viking CCS Pipeline**

**LEGEND**

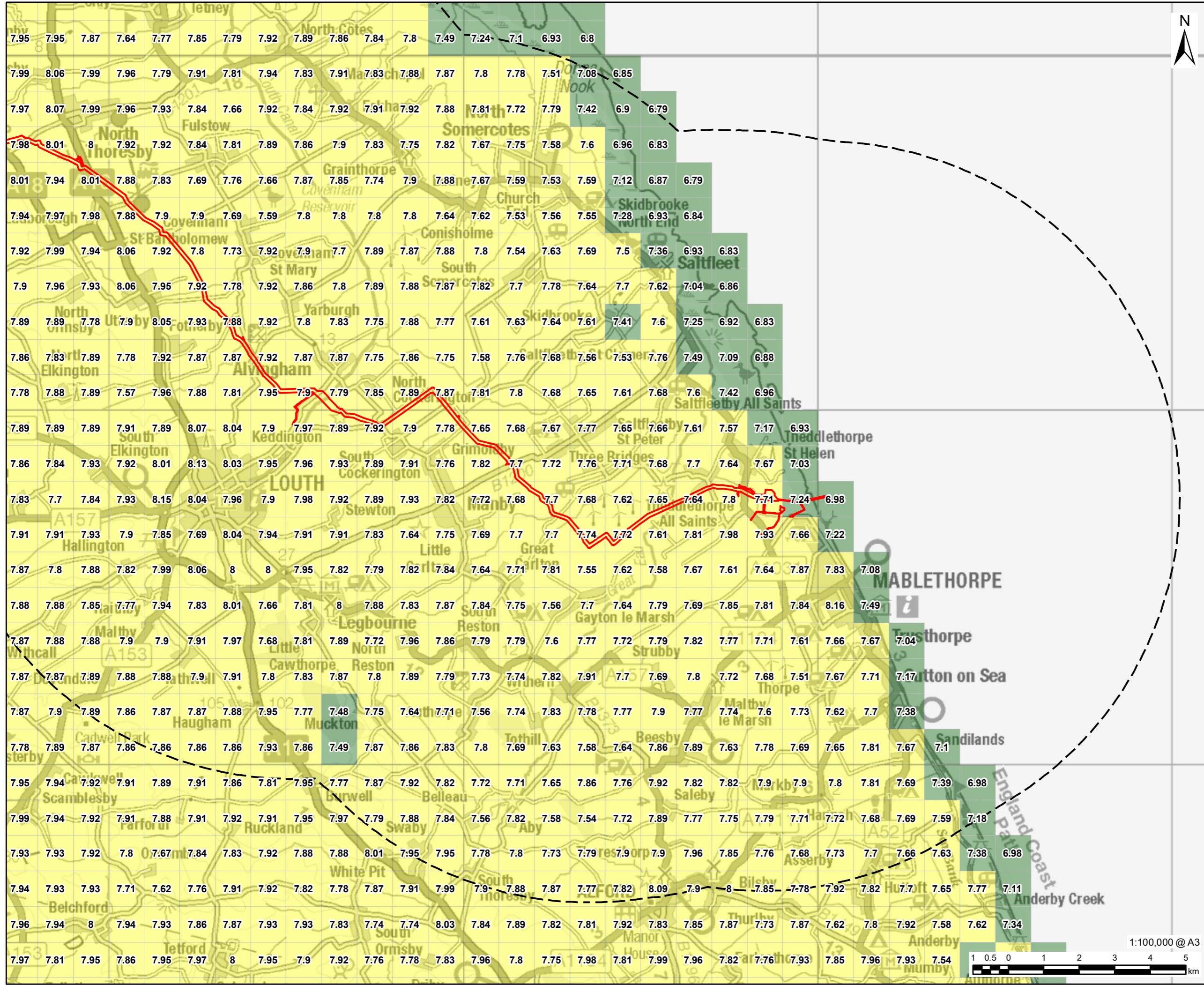
- DCO Site Boundary
- 10km Study
- PM<sub>2.5</sub> Background Concentration - 2023 (µg/m<sup>3</sup>)
- 5 - 7.5
- 7.5 - 10
- 10 - 12.5

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**FIGURE TITLE**  
**Figure 14-5 (2 of 3)**  
**PM<sub>2.5</sub> Background Concentrations (µg/m<sup>3</sup>)**

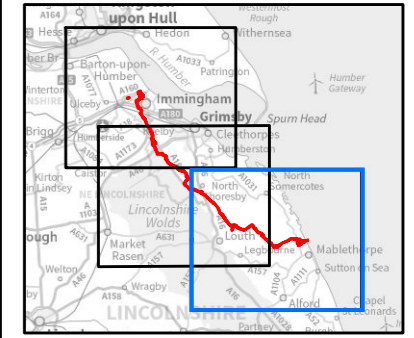
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**LEGEND**

- DCO Site Boundary
- 10km Study
- PM<sub>2.5</sub> Background Concentration - 2023 (µg/m<sup>3</sup>)
  - 5 - 7.5
  - 7.5 - 10
  - 10 - 12.5

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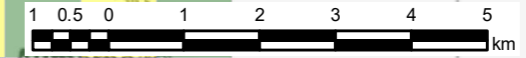


**FIGURE TITLE**  
 Figure 14-5 (3 of 3)  
 PM<sub>2.5</sub> Background Concentrations (µg/m<sup>3</sup>)

**ISSUE PURPOSE**  
 ENVIRONMENTAL STATEMENT

**PROJECT NUMBER / REFERENCE**  
 60668955 / VCCS\_230914\_ES\_14-5

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### **Planned Surveys**

- 14.5.23 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 ES assessment is not deemed necessary.
- 14.5.24 The construction dust assessment has identified the need for some form of dust monitoring to form part of the Draft Construction Environmental Management Plan (CEMP). The monitoring extent and approach has been identified in the Draft CEMP.

## **14.6 Development Design and Embedded Mitigation**

- 14.6.1 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.
- 14.6.2 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).
- 14.6.3 The design of the Proposed Development has been further developed to reflect the findings of ongoing environmental studies, comments raised during the statutory consultation and ongoing engagement with stakeholders. As the design has developed, embedded mitigation measures have been refined as part of an iterative process.
- 14.6.4 With regards to air quality, route planning to avoid areas with high property density and higher value nature conservation sites helps to avoid impacts that may otherwise have occurred (see *Chapter 2: Design Evolution and Alternatives, Section 2.6, Table 2.1*).

## **14.7 Potential Impacts and Assessment of Effects**

### **Introduction**

- 14.7.1 This section identifies the potential likely impact and effects on the identified receptors as a result of the construction of the Proposed Development. The assessment reported here is semi-qualitative and makes use of the data currently available at this stage of the DCO process.
- 14.7.2 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 are considered as necessary as part of the cumulative impacts and in-combination effects assessment, the approach to which is explained further in *ES Volume II Chapter 20 Cumulative Effects Assessment (Application Document 6.2.20)*.

### **Assessment of Potential Impacts and Effects: Construction Phase**

#### **General Overview**

- 14.7.3 This section contains an assessment of the potential impacts to air quality as a result of the construction phase of the Proposed Development. The following impact pathways have been assessed:
- Construction dust emissions;
  - Site plant emissions; and
  - Construction traffic emissions.

## Construction Dust Emissions

- 14.7.4 The assessment considers the potential impact for the five sections of the proposed route as shown in **Figure 14-1**.
- 14.7.5 As described in Section 14.4 and *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1)*, 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.
- 14.7.6 The construction dust and particulate matter assessment has been carried out for each of the five sections of the pipeline, details about each section are provided in *ES Volume II Chapter 3: Description of the Proposed Development (Application Document 6.2.3)*.

### **Step 1: Screen the requirements for a detailed assessment**

- 14.7.7 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.
- 14.7.8 **Figure 14-1** shows a 350 m buffer from the edge of the DCO Site Boundary 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 the Study Area of the DCO Site Boundary, 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 the 350m Study Area from the DCO Site Boundary, which for the purpose of this assessment is taken to represent the construction site boundary.
- 14.7.9 The proximity of Special Area of Conservation (SAC)/Site of Special Scientific Interest (SSSI)/National Nature Reserve (Natural England) at Theddlethorpe (Saltfleetby – Theddlethorpe Dunes) means that there is a high sensitivity nature conservation receptor within 50 m of the DCO Site Boundary (taken to represent the construction site boundary for the purpose of this assessment). In addition to this, within 50m of the DCO Site Boundary, there is the Special Protection Areas (SPA) of the Greater Wash and the SPA/Ramsar site of the Humber Estuary.
- 14.7.10 There are also Priority Habitats located within 50m of the DCO Site Boundary which have been identified due to vegetation species and these are potentially sensitive to construction dust impacts. These include coastal and floodplain rearing marsh, lowland heathland and lowland meadows.
- 14.7.11 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.



## Step 2: Assess the Risk of Dust Impacts

### Step 2A: Determine the Dust Emissions Magnitude

14.7.12 Step 2A requires the determination of the dust emission magnitude, as set out in *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1)*, 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.

14.7.13 Construction activities associated with the Proposed Development 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 *ES Volume II Chapter 3: Description of the Proposed Development (Application Document 6.2.3)*.

#### Demolition

14.7.14 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 (Ref 14-13) summarised in *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1)*, the dust emission magnitude for the proposed demolition works is **Small**.

#### Earthworks

14.7.15 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 the 100,000 m<sup>2</sup> area criteria set by IAQM guidance (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 3*) 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

14.7.16 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 the 25,000 and 100,000 m<sup>3</sup> criteria set by IAQM guidance (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 4*) require the storage and of potentially dusty material. As such, the dust emissions magnitude for construction is **Medium**.

#### Trackout

14.7.17 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 the 50 outward construction related HDV (all vehicles >3.5 tonnes) movements per day criteria set by IAQM guidance (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 5*), and some access road surfaces used by construction vehicles will be unpaved. As such, the dust emission magnitude for trackout is assigned as **Large**.

### Step 2B: Determine the Sensitivity of the Area

14.7.18 Step 2B of the IAQM construction dust guidance, as described in *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1)*, 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 PM<sub>10</sub> concentrations and site-specific factors, such as local terrain, meteorology and natural and existing windbreaks.

14.7.19 The sensitivity of the area varies across sections of the route, due to the number of receptors present within each Section of the Pipeline Route. The IAQM criteria breaks up sensitivity into determining the sensitivity of the area on dust soiling and based on human health sensitivities of PM<sub>10</sub>. **Table 14-12** summarises the distribution of receptors to dust soiling and **Table 14-13** presents the distribution of receptors which are sensitive to the health effects of PM<sub>10</sub>.

14.7.20 Finally, **Table 14-14** demonstrates the distribution of receptors which are sensitive to ecological effects of dust.

**Table 14-12: Receptors sensitive to Dust soiling in each Pipeline Section**

Section	Receptor Sensitivity	Distance from DCO Site Boundary			
		0-20m	20-50m (0-50m)	50-100m (0-100m)	100m-350m (0-350m)
Section 1	High	1	3 (4)	2 (6)	104 (110)
	Medium	2	6 (8)	3 (11)	10 (21)
	Low	2	1 (3)	0 (3)	10 (13)
Section 2	High	1	1 (2)	4 (6)	10 (16)
	Medium	0	0 (0)	1 (1)	9 (10)
	Low	0	0 (0)	0 (0)	1 (1)
Section 3	High	1	0 (1)	7 (8)	87 (95)
	Medium	0	1 (1)	0 (1)	20 (21)
	Low	0	0 (0)	0 (0)	1 (1)
Section 4	High	0	7 (7)	6 (13)	30 (43)
	Medium	0	0 (0)	2 (2)	17 (19)
	Low	2	0 (2)	0 (2)	1 (3)
Section 5	High	2	29 (31)	60 (91)	502 (593)
	Medium	2	4 (6)	1 (7)	10 (17)
	Low	1	2 (3)	3 (6)	7 (13)

**Table 14-13: Receptors sensitive to Human Health effects from PM<sub>10</sub> in each Pipeline Section**

Section	Receptor Sensitivity	Distance from DCO Site Boundary				
		0-20m	20-50m (0-50m)	50-100m (0-100m)	100m-200m (0-200m)	200m-350m (0-350m)
Section 1	High	1	3 (4)	2 (6)	9 (15)	96 (111)
	Medium	2	5 (7)	2 (9)	4 (13)	5 (18)
	Low	1	1 (3)	0 (3)	0 (3)	1 (4)
Section 2	High	1	1 (2)	4 (6)	3 (9)	7 (16)
	Medium	0	0 (0)	0 (0)	0 (0)	9 (9)

Section	Receptor Sensitivity	Distance from DCO Site Boundary				
		0-20m	20-50m (0-50m)	50-100m (0-100m)	100m-200m (0-200m)	200m-350m (0-350m)
	Low	0	0 (0)	0 (0)	0 (0)	0 (0)
Section 3	High	1	0 (1)	7 (8)	31 (39)	54 (93)
	Medium	0	1 (1)	0 (1)	9 (10)	13 (23)
	Low	0	0 (0)	0 (0)	0 (0)	0 (0)
Section 4	High	0	7 (7)	6 (13)	12 (25)	18 (43)
	Medium	0	0 (0)	2 (2)	1 (3)	14 (17)
	Low	0	0 (0)	0 (0)	1 (1)	1 (2)
Section 5	High	2	29 (31)	60 (91)	196 (287)	305 (592)
	Medium	2	4 (6)	1 (7)	7 (14)	3 (17)
	Low	0	0 (0)	0 (0)	0 (0)	3 (3)

**Table 14-14: Receptors sensitive to ecological impacts in each Pipeline Section**

Section	Receptor Sensitivity	Distance from DCO Site Boundary	
		0-20m	20-50m (0-50m)
Section 1	High	0	0 (0)
	Medium	0	0 (0)
	Low	15	15 (30)
Section 2	High	0	0 (0)
	Medium	0	0 (0)
	Low	4	3 (7)
Section 3	High	0	0 (0)
	Medium	0	0 (0)
	Low	4	5 (9)
Section 4	High	0	0 (0)
	Medium	0	0 (0)
	Low	2	2 (4)
Section 5	High	4	4 (8)
	Medium	2	2 (4)
	Low	15	21 (36)

14.7.21 The sensitivity of the area varies across sections of the route, predominantly due to the number of residential properties in close proximity to the DCO Site Boundary in Section 1, Section 2, 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 DCO Site Boundary 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 (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 6*), this equates to an area of **Medium** sensitivity for dust soiling amenity impacts. In Section 4, there are less than 100 high sensitivity amenity and human health

receptors within 350 m of the DCO Site Boundary, 10 – 100 within 100m and less than 10 within 50m. There are no high sensitivity amenity receptors within 20m. In line with IAQM construction dust guidance (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 6*), this equates to an area of **Low** sensitivity for dust soiling amenity impacts.

14.7.22 Background PM<sub>10</sub> concentrations are estimated to be below 24 µg/m<sup>3</sup> from **Figure 14-4** and this, coupled with the limited number of receptors in close proximity to the DCO Site Boundary (<100) (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 7*), means that the sensitivity of the area to health impacts is **Low** for all five sections.

14.7.23 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. Priority habitat is located within 20m of the DCO Site Boundary for all sections. A medium sensitivity receptor within 20 m of the DCO Site Boundary (representing the construction site boundary) means that the sensitivity of the area to ecological impacts is **Medium** (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 8*).

14.7.24 The IAQM guidance does however refer to “international or national designations and the designated features may be affected by dust soiling”. On a precautionary basis, such designations have been classed as having high sensitivity. In Section 5, the Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC, Humber Estuary SAC, Humber Estuary RAMSAR site and the Saltfleetby - Theddlethorpe Dunes SSSI are within 20 m of the DCO Site Boundary (representing the construction site boundary), meaning that the sensitivity of the area to ecological impacts is **High** (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 8*).

14.7.25 The sensitivity to dust impacts for each section are shown in **Table 14-15**.

**Table 14-15: Summary of Dust Assessment Sensitivity**

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

**Step 2C: Determine the Risk of Dust Impacts**

14.7.26 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 (see *ES Volume IV: Appendix 14.1 (Application Document 6.4.14.1), Table 9*).

14.7.27 The risk from dust impacts for dust soil amenity and human health impacts for all five sections are shown in **Table 14-16**.

**Table 14-16: Magnitude of Risk from Dust Impacts**

Section		Section 1	Section 2	Section 3	Section 4	Section 5
<b>Dust Soiling</b>	Demolition	Low Risk	Low Risk	Low Risk	Negligible	Low Risk
	Earthworks	Medium Risk	Medium Risk	Medium Risk	Low Risk	Medium Risk
	Construction	Medium Risk	Medium Risk	Medium Risk	Low Risk	Medium Risk
	Trackout	Medium Risk	Medium Risk	Medium Risk	Low Risk	Medium Risk
<b>Human Health</b>	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
<b>Ecological</b>	Demolition	Low Risk	Low Risk	Low Risk	Low Risk	Medium Risk
	Earthworks	Medium Risk	Medium Risk	Medium Risk	Medium Risk	High Risk
	Construction	Medium Risk	Medium Risk	Medium Risk	Medium Risk	Medium Risk
	Trackout	Medium Risk	Medium Risk	Medium Risk	Medium Risk	High Risk

14.7.28 Without mitigation, negligible to low-risk dust impacts will not cause a significant effect. The medium-risk dust impacts identified have the potential to cause moderate adverse effects at amenity sensitive receptors in Sections 1, 2, 3 and 5, and nature conservation receptors in Sections 1, 2, 3 and 4. The high-risk dust impacts identified have the potential to cause major effects at the nature conservation receptors in Section 5. Such effects could be significant. However, all well managed construction sites across the UK will implement best practice dust control measures as standard and an unmitigated scenario is unlikely to occur. This assessment identifies the level of mitigation required to offset the risk of dust impacts. These measures are set out in Section 14.8

### Construction Site Plant and NRMM Emissions

14.7.29 According to the IAQM guidance (Ref 14-13) 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 Proposed Development, due to the distance between the DCO Site Boundary and the limited number of sensitive 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 DCO Site Boundary and the distance to receptors will either remain the same or increase.

14.7.30 The exact specifics of construction activity within the DCO Site Boundary will only be confirmed with certainty once the construction contractor has been appointed. Before that appointment, the assessment can only be based on reasonably precautionary assumptions. It is anticipated that for each 1km section of pipeline, it is likely that all construction activities, including the return of the land to its original use, will take approximately 7 months. At each location, 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 should not impact on the same location for any prolonged period of time (i.e., months).

14.7.31 A variety of different types of plant and equipment will need to be deployed during the construction of the Proposed Development. The plant and equipment that will be used on each pipeline section includes tipper trucks, low-loader trucks, a bulldozer (type D6), backhoe/excavators, a 24" pipe bender and mandrel, side-boom 583s cranes, a pay-welder, a crawler crane, a cold bending machine, a pipe carrying crawler, and front-end welding equipment. Some limited sections of the pipeline will also require guided auger-boring equipment, standard auger-boring equipment, HDD (horizontal Directional Drill) equipment, NDT (non-destructive testing) equipment and a land drainage trenching/laying unit. Should micro-tunnelling be utilised, additional plant may include a micro tunnel boring machine, jacking system and spoil removal system.

14.7.32 Not all site plant and NRMM listed above will be a notable source of emissions to air, not all will be present in any one area, and not all will be in operation at any one time. Where possible, power will be supplied by connection to existing sources.

14.7.33 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 Proposed Development's energy demand; and
- The effectiveness of standard practice emission control measures, including:
  - Use of plant with low NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> emissions;
  - Prohibiting unnecessary idling;
  - Prohibiting unnecessary NRMM movements; and
  - Keeping plant and NRMM in a good state of repair.

### Construction Traffic Emissions

14.7.34 Construction phase traffic data has been reviewed and compared against the screening criteria set out in IAQM guidance (**Table 14-9**) 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 roads links associated with other construction activities. **Table 14-16** summarises the data on links that exceed one or both of the IAQM and DMRB criteria. All other links experience an increase in traffic flow of less than the screening criteria stated.

**Table 14-17: Construction Phase Traffic Impacts that Exceed Screening Criteria**

Site	Road Description	Pipe Delivery to Pipe Dumps Phase			Construction Phase		
		Increase in 24-hour AADT			Increase in 24-hour AADT		
		Total Vehicles	LDVs	HDVs	Total Vehicles	LDVs	HDVs
2	A1173	+139	+13	<b>+126</b>	<u>+1,157</u>	<b>+697</b>	<u><b>+460</b></u>
3	A160	+411	+22	<u><b>+389</b></u>	+236	+112	<b>+124</b>
6	A18	0	0	0	+594	+452	<b>+142</b>
9	A16	0	0	0	+817	<b>+760</b>	+57
12	A18	0	0	0	+520	+388	<b>+132</b>
13	A16	0	0	0	+632	<b>+588</b>	+44
18	A1173	+139	+13	<b>+126</b>	+884	<b>+528</b>	<u><b>+356</b></u>
19	A18 - Barton Street North	+139	+13	<b>+126</b>	+775	+453	<u><b>+322</b></u>
20	A18 - Barton Street South	+98	+9	+89	+737	<b>+551</b>	<b>+186</b>
21	A16 Peaks Parkway	0	0	0	+817	<b>+760</b>	+57
28	A16	0	0	0	+862	<b>+765</b>	+97
44	A160	+320	+13	<u><b>+308</b></u>	+245	+120	<b>+125</b>
50	Grimsby Road	+41	+4	+37	+178	+59	<b>+119</b>
51	A1031	+41	+4	+37	+178	+59	<b>+119</b>
52	Thoresby Road	+41	+4	+37	+178	+59	<b>+119</b>
53	A1031 Main Road	+41	+4	+37	+178	+59	<b>+119</b>
78	A180	+148	+13	<b>+135</b>	<u>+1,078</u>	<b>+525</b>	<u><b>+553</b></u>

**Notes:**  
**Bold** values denote an exceedance of the IAQM screening criteria.  
Underlined values denote an exceedance of the DMRB screening criteria.  
**Bold and underlined** values denote an exceedance of both IAQM and DMRB screening criteria.

- 14.7.35 During the pipe delivery phase of works, which is programmed to last approximately five months, exceedances of the IAQM screening criteria for HDVs are predicted along the route from Immingham Docks, along the A160, the A180, the A1173, and the A18 as far as the junction with the A46. Exceedances of the DMRB screening criteria are also predicted on the A160. None of these locations are within an Air Quality Management Area. Diffusion tube monitoring along the A160 in Immingham has been carried out by NLC, which has indicated that NO<sub>2</sub> concentrations are well within the annual mean objective value (40 µg/m<sup>3</sup>). Four diffusion tubes in this area measured concentrations of 17 µg/m<sup>3</sup> – 29 µg/m<sup>3</sup> in 2019 and no concentrations higher than 29 µg/m<sup>3</sup> were recorded in the years 2017-2021. The other roads which exceed the IAQM screening criteria are in rural areas, where no monitoring is available, but air quality is likely to be good and there are limited receptors. Due to the short duration and the good baseline air quality, no significant effects are anticipated.
- 14.7.36 The construction phase of works is programmed to last approximately 12 months. Construction traffic data has been generated assuming simultaneous construction works at each access point. Therefore, this data represents a worst-case for the purposes of the transport assessment, whereas for air quality purposes this data is likely to be unrealistic as the relevant objective value applies over an annual period. This level of construction traffic is not expected to be maintained for the whole construction period, indeed it is likely that these maximum levels will not be reached at all. A Construction Traffic Management Plan (CTMP) has been developed to demonstrate responsible use of the public highways. The CTMP states that construction activities will commence in a 'regimented fashion' and the peak months for traffic are August and September and which further indicates that average construction traffic volumes over the year will be considerably lower than those presented in **Table 14-17**.
- 14.7.37 Exceedances of the DMRB screening criteria (for HDVs or for total AADT and HDVs) are predicted in the construction phase on the A180 from the junction with the A160 to the junction with the A1173, the A1173 to the junction with the A18, and the A18 to the junction with the A46. These roads are in rural areas, where no monitoring is available, but air quality is likely to be good. There are no designated ecological receptors within 200m of these roads. Therefore, an assessment of the effect of construction traffic on air quality at ecological receptors is not required.
- 14.7.38 Exceedances of the IAQM screening criteria (for HDVs and/or LDVs) are predicted in the construction phase on seventeen roads. None of these locations are within an Air Quality Management Area. These roads are mostly in rural areas, where no monitoring is available, but air quality is likely to be good. The screening criteria are also predicted to be exceeded in the urban areas of Immingham (the A160, where monitoring indicates good baseline air quality as described in Paragraph 0) and the outskirts of Cleethorpes/Humberston (Grimsby Road). Diffusion tube monitoring close by, on the Humberston Road, has been carried out by NELC, which has indicated that NO<sub>2</sub> concentrations are well within the annual mean objective value (40 µg/m<sup>3</sup>). A diffusion tube in this area measured a concentration of 22.5 µg/m<sup>3</sup> in 2019 and no concentrations higher than 23.2 µg/m<sup>3</sup> were recorded in the years 2017-2021.
- 14.7.39 Due to the temporary nature of works, the good baseline air quality, and the fact that the data represents a worst-case increase in traffic, no significant effects are anticipated.

### **Assessment of Potential Impacts and Effects: Operational Phase**

- 14.7.40 In line with the Scoping Report and subsequent Scoping Response (*ES Volume IV: Appendix 5.2 (Application Document 6.4.5.2)*), all effects relating to the operation of the Proposed Development 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. It should also be noted that routine emissions from the venting system will not be directly harmful to human health or ecologically sensitive receptors and have not been included within this assessment.

### Assessment of Potential Impacts: Decommissioning Phase

14.7.41 In agreement with the Planning Inspectorate’s Scoping Opinion (*ES Volume IV: Appendix 5.2 (Application Document 6.4.5.2)*), all effects relating to the decommissioning of the Project are scoped out from further assessment in the ES. This phase would not require extensive ground works or vehicle movements of a scale sufficient to exceed the IAQM threshold for detailed assessment.

### Sensitivity analysis

14.7.42 Based on the current route of the pipeline, the impacts outlined in the above sections can be considered to be the likely outcome if no additional mitigation measures are put in place. If new receptors were introduced close to the route of the pipeline, then they will be impacted by the construction of the pipeline to a similar extent, and these should be mitigated by the conditions outlined in the Draft CEMP.

14.7.43 As stated in Section 14.5 (baseline) it is widely accepted that air quality will improve over future years as a result of improving emission technologies. It is therefore considered the baseline data reported in this chapter is a precautionary estimate of future baseline conditions.

**Table 14-18: Summary of Potential Construction Phase Significant Effects**

Receptor	Sensitivity	Description of Potential Impact	Magnitude	Significance (without additional mitigation)
Human health and amenity (dust soiling) sensitive receptors	Construction dust and site plant emissions	Dust soiling as a nuisance, elevated NO <sub>2</sub> and PM <sub>10</sub> concentrations	Negligible to Medium	Moderate Adverse, due to the effect on Section 1, 2 and 3.
Nature conservation receptors	Construction dust and site plant emissions	Direct impact on vegetation and indirect impacts on fauna (e.g., foraging habitats).	Low to High	Major Adverse due to the effect on Section 5.

## 14.8 Additional Mitigation Measures

### Additional Mitigation and Enhancement – Construction Phases

#### Step 3: Determine the Level of Mitigation

- 14.8.1 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
- 14.8.2 The Draft CEMP (*ES Volume IV: Appendix 3.1 (Application Document 6.4.3.1)*) sets out the additional mitigation measures identified in this assessment of likely significant effects within the Mitigation Register. The DCO includes a requirement for the CEMP to be submitted to and approved by the planning authority prior to commencement of development. This section summarises the types of mitigation measures that will be considered to mitigate against the effects on construction dust where required. These mitigation measures are based on recommendations by IAQM. Each entry in the Mitigation Register has an alpha-numerical reference e.g., “B1” to provide a cross reference to the secured commitment.
- 14.8.3 These measures will be adopted during the construction phase:
- **A3:** Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
  - **A6:** A separate project specific Safety Health and Environment (SHE) Plan would be produced in accordance with relevant legislation;
  - **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 PM<sub>10</sub> 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 power materials ensure bags are sealed after use and stored appropriately to prevent dust;
- **J41:** Install hard surfaced haul routes, which are regularly 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; and
- **J43:** Access gates to be located at least 10 m from receptors where possible.

14.8.4 A schedule of aforementioned environmental commitments is presented within *ES Volume IV: Appendix 3.1 (Application Document 6.4.3.1)*.

## 14.9 Residual Effects

### Assessment of Residual Effects: Construction Phase

14.9.1 Residual effects are summarised below and in **Table 14-19**.

#### *Construction Dust Emissions and NRMM emissions*

##### *Step 4: Determine Significant Effects*

14.9.2 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’”.*

14.9.3 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 of this scale, it is considered that the residual effects from the Proposed Development are not considered to be significant.

### **Construction Phase Traffic Emissions**

- 14.9.4 Section 14.7 describes how the temporary increase in traffic movements during the construction phase will not contribute to a significant effect on air quality. As such, no residual effects have been identified as part of the construction traffic assessment.
- 14.9.5 It should be noted, however, that the implementation of the measures secured through the CEMP and Construction Traffic Management Plan, the magnitude or risk is reduced to negligible/low and therefore there would be no residual significant effect.

## **14.10 Monitoring**

### **Construction Monitoring**

- 14.10.1 Monitoring commitments are set out in the Draft CEMP (*ES Volume IV: Appendix 3.1 (Application Document 6.4.3.1)*). As a minimum, this will include regular visual inspections of dust deposition at and beyond the construction site boundary (once defined).
- 14.10.2 Visual inspections will be supplemented with quantitative monitoring at locations where the risk of dust impacts is highest, to verify the adequacy of wider dust mitigation measures and to provide an evidence base against which complaints can be substantiated.
- 14.10.3 Should visual inspections identify dust depositing beyond the site boundary or if dust complaints arise, then additional quantitative monitoring may be required.

**Table 14-19: Summary of Construction Phase Residual Effects**

Receptor	Sensitivity	Description of Potential Impact	Potential Effect		Mitigation Measure(s)	Residual Effect	
			Magnitude	Significance		Magnitude	Significance
Human health and amenity (dust soiling) sensitive receptors	Construction dust and site plant emissions	Dust soiling as a nuisance, elevated NO <sub>2</sub> and PM <sub>10</sub> concentrations	Negligible to Medium	Moderate Adverse (Significant) (before additional mitigation)	Standard practice dust mitigation secured in the Draft CEMP ( <i>ES Volume IV: Appendix 3.1 (Application Document 6.4.3.1)</i> ).	Negligible to Low	<b>Negligible (Not Significant)</b>
Nature conservation receptors	Construction dust and site plant emissions	Direct impact on vegetation and indirect impacts on fauna (e.g. foraging habitats).	Low to High	Major Adverse (Significant) (before additional mitigation)	Standard practice dust mitigation secured in the Draft CEMP ( <i>ES Volume IV: Appendix 3.1 (Application Document 6.4.3.1)</i> ).	Negligible to Low	<b>Minor Adverse (Not Significant)</b>

## 14.11 Cumulative Effects

- 14.11.1 Dust emissions from the Proposed Development will be minimised due to mitigation and all site plant and NRMM will be used for intermittent and limited time periods. Other, committed and reasonably foreseeable developments have gone through, or will go through the planning process and will also be required to demonstrate the required level of mitigation to ensure that potential dust emissions and other emissions from site are controlled.
- 14.11.2 In combination with other construction activities including construction traffic movements this has the potential to raise NO<sub>2</sub> and PM<sub>10</sub> concentrations within the local area. However due to the low baseline, this is unlikely to cause a significant effect.
- 14.11.3 Cumulative effects have been captured via the inclusion of thirteen relevant committed developments, including VPI Immingham and Phillips 66, within the traffic data provided for the construction traffic emissions assessment (as well as TEMPro traffic growth) (see *ES Volume II Chapter 12: Traffic and Transport (Application Document 6.2.12)*). This has had the effect of increasing the traffic flows considered in the Do-Minimum Scenario which has the potential to raise NO<sub>2</sub> and PM<sub>10</sub> concentrations within the local area. However, the assessment process considers the difference between the Do-Minimum and the Do-Something scenarios, and this does not change. The potential increase in baseline pollutant effects is not likely to be large enough to result in an exceedance of the relevant air quality objectives. Therefore, consideration of cumulative effects is not anticipated to cause a significant effect.

## 14.12 Summary

- 14.12.1 Existing air quality in the Study Area is of a good standard, with pollutant concentrations well within the objective values set for the protection of human health. Much of the land within and around the DCO Site Boundary 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 Proposed Development.
- 14.12.2 Providing that all construction activities adhere to the mitigation measures listed in this chapter and within the *Draft CEMP (ES Volume IV: Appendix 3.1 (Application Document 6.4.3.1))*, the potential magnitude of impacts will be lowered so the residual significance will be negligible to minor adverse. These are therefore classed as not being significant. It should also be noted that all construction activities in any one place will be temporary any resultant impact will also be temporary.
- 14.12.3 Plant emissions from construction phase site plant, energy generation plant, and NRMM are considered to be not significant. This is due to the good standard of baseline air quality, transient and intermittent nature of emissions as well as the limited duration of time that site plant and NRMM emissions will be present within close proximity of sensitive receptors. Also, by using standard practice control measures such as using low emission plant and prohibiting unnecessary idling and NRMM movements.
- 14.12.4 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 Proposed Development.

## 14.13 References

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