A585 Windy Harbour to Skippool Improvement Scheme

TR010035

6.6 Environmental Statement Chapter 6: Air Quality

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009

A585 Windy Harbour to Skippool Improvement Scheme

Development Consent Order 201[ ]

ENVIRONMENTAL STATEMENT CHAPTER 6: AIR QUALITY

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6 AIR QUALITY

6.1 Introduction

6.1.1 This Chapter presents the assessment of the air quality impacts associated with the Scheme, and covers the regulatory framework, assessment methodology, study area, existing and future baseline, mitigation measures and residual effects.

6.1.2 This Chapter should be read in conjunction with Figure 6.1 – Air Quality Study Area, Figure 6.2 – Air Quality Management Areas and Local Authority Air Quality Monitoring, Figure 6.3 – Highways England Air Quality Monitoring Locations, Figure 6.4 – Air Quality Representative Receptor Locations, Appendix 6.1 – Air Quality Model Verification (document reference TR010035/APP/6.6.1), Appendix 6.2 – Air Quality Model Parameters (document reference TR010035/APP/6.6.2) and Appendix 6.3 – Air Quality Monitoring Data (document reference TR010035/APP/6.6.3).

6.2 Regulatory Framework / National Networks National Policy Statement (NN NPS) Requirements

6.2.1 This assessment has been undertaken considering current legislation, together with national, regional and local plans and policies. A list of plans is provided within Table 6-1 and further detail can be found in the Planning Statement and National Policy Statement Accordance (document reference TR010035/APP/7.1).

Table 6-1: Air Quality – Regulatory Framework and NN NPS Requirements

Policy / Legislation
European
Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe 2008/50/EC
National Legislation
Part IV of The Environment Act 1995
Air Quality (Standards) Regulations 2010
Air Quality (England) Regulations 2000/2002
National Policy
NN NPS (2014)
The National Planning Policy Framework (NPPF) (2018)
The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007)
Environmental Protection Act 1990 (as amended)
Local Planning Policy
Adopted Wyre Local Plan (1999)
Wyre Council Air Quality Strategy
Adopted Fylde Borough Local Plan (2005)

Policy / Legislation
Policy EP26
Fylde Local Plan to 2032 (emerging document – due to be adopted 2018)
Wyre Local Plan to 2031 (emerging document – due to be adopted 2018)

6.3 Methodology

Construction

6.3.1 In accordance with DMRB HA207/07, receptors which are located within 200m of the construction activities are identified.

6.3.2 Construction activities have the potential to give rise to adverse impacts from fugitive emissions of dust due to the construction of the proposed scheme. These are likely to be temporary in nature and would be localised. There may also be increases in PM_{10} and NO_2 concentrations at sensitive receptors due to emissions from traffic and plant (non-road mobile machinery) and from traffic management measures during the construction phase. The change expected in traffic flows due to the construction phase is reviewed to identify if any roads are likely to have changes above the DMRB criteria (as detailed in Paragraph 6.3.14) and therefore classified as affected road links, and so require assessment.

Operational

6.3.3 This section describes how the likely operational impacts of the Scheme have been assessed.

6.3.4 The air quality assessment of the operational phase has been completed in accordance with guidance HA207/07 Volume 11, Section 3, Part 1 of the Design Manual for Roads and Bridges (DMRB) (Highway Agency (now Highways England), 2007) and the associated Interim Advice Notes (IAN).

The relevant guidance documents are listed below:

- HA207/07 DMRB Volume 11, Section 3, Part 1, May 2007
- Local Air Quality Management Technical Guidance LAQM.TG(16) issued by the Department for the Environment, Food and Rural Affairs (Defra)
- IAN 170/12v3 Updated air quality advice on the assessment of future NOx and NO2 projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality, November 2013, the document is accompanied by an Excel-based tool as (available on request from Highways England)
- IAN 174/13 Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07), June 2013
- IAN 175/13 Updated advice on risk assessment related to compliance with the EU Directive on ambient air quality and on the production of Scheme Air Quality Action Plans for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07), June 2013 (or latest update available at the time of the assessment)
- IAN 185/15, Updated traffic, air quality and noise advice on the assessment of

link speeds and generation of vehicle data into 'speed-bands' for users of DMRB Volume 11, Section 3, Part 1 'Air Quality and Volume 11.

6.3.5 The guidance (specifically the DMRB) requires a number of different assessments to be undertaken including:

- Local air quality assessment (predicting concentrations of pollutants for comparison against the AQS Objectives at sensitive receptors e.g. residential, schools and ecological sites, with and without the Scheme), this assessment is used to inform whether the scheme impacts are Significant;
- Regional assessment (change in emissions as a result of the Scheme including carbon);
- Transport Analysis Guidance (TAG) assessment (overall change in exposure as a result of the Scheme);
- Assessment of the risk of the Scheme impacting on the UK's ability to comply with the EU Air Quality Directive;
- Construction dust assessment.

6.3.6 The local air quality assessment compares current and predicted air quality concentrations against the AQS Objectives as presented in Table 6-2. To determine whether the Scheme would have a significant impact on air quality, the local assessment results are utilised in accordance with IAN 174/13.

Table 6-2: Air Quality - Air Quality Objectives and EU Limit Values

Pollutant	Averaging Period	Objective and EU limit Value
Nitrogen dioxide (NO_2) for the protection of human health	Annual Average	40µg/m^3
	1-hour average not to be exceeded more than 19 times a year which is equal to the 99.8th percentile of hourly values	200µg/m^3
Particulate matter (PM_{10}) for the protection of human health	Annual Average	40µg/m^3
	24-hour average not to be exceeded more than 35 times a year which is equal to the 90.4th percentile of daily values	50µg/m^3

6.3.7 The air quality assessment considers the impacts on both AQS Objectives (i.e. does the Scheme lead to a significant impact on air quality at individual properties?) and EU Limit Values (would the Scheme impact on Defra's plans to achieve compliance with the Limit Values?).

6.3.8 AQS Objectives and EU Limit Values are identical in relation to the concentrations of pollutant. There are differences on how they are assessed. Local authorities are required to demonstrate best efforts to achieve the AQS Objectives whereas the UK Government is legally required to achieve the EU Limit Values in the shortest timescales possible.

6.3.9 Reporting against compliance with EU Limit Values is undertaken by Defra and reported at a zonal/agglomeration level. Zones/agglomerations only comply when everywhere in the zone is below the EU Limit Value. This is the basis of Defra's reporting, which is designed to determine what the maximum concentration is within the zone and determine the date by which the zone would comply with the Limit Value. A compliance risk assessment as required by IAN 175/13 has been undertaken to determine whether the Scheme would have an impact on the UKs reported ability to comply with the EU Air Quality Directive.

6.3.10 AQS Objectives are assessed at a more local level where an AQMA can be designated as a result of exceedance at individual properties. The local air quality assessment is undertaken to determine the Scheme's impacts on AQS Objectives.

Local Air Quality Assessment

6.3.11 To undertake the local air quality assessment concentrations of NO_2 and PM_{10} have been predicted using the Atmospheric Dispersion Modelling System (ADMS)-Roads detailed dispersion model for the following scenarios:

- **Base Year (2015)** – the base year scenario is modelled to characterise the baseline air quality environment (identify the areas where there are current exceedances of the AQS Objectives) and for the purposes of model verification (the comparison of observed 2015 concentrations with modelled 2015 concentrations), the verification approach is explained in Appendix 6.1 (document reference TR010035/APP/6.6.1)
- **Do-Minimum (2022)** - predicted future air quality environment in Scheme opening year 2022 without the Scheme
- **Do-Something (2022)** – predicted future air quality environment in Scheme opening year 2022 with the Scheme

6.3.12 In order to undertake the air quality modelling, traffic data was obtained for the Base Year, Do-Minimum and Do-Something scenarios.

6.3.13 The study area for the local air quality assessment is defined using the traffic change-based criteria defined in the DMRB. The Do-Minimum (2022) traffic scenario has been compared to the Do-Something (2022) traffic scenario. Roads that meet the criteria are defined as 'affected roads', all of which together comprise the affected road network (ARN). Concentrations of NO_2 and PM_{10} have been predicted at those sensitive receptors located within 200m of these roads. This comprises the operational air quality study area. Concentrations have been modelled in the Base Year (2015, existing baseline), Do-Minimum (2022 future baseline) and Do-Something (2022 opening year) to determine the Scheme's likely impacts.

6.3.14 The traffic change criteria set out in the DMRB have been used to define the ARN for the local air quality assessment. The DMRB traffic change criteria are as follows:

- Road alignment will change by 5m or more
- Daily traffic flows will change by 1,000 Annual Average Daily Traffic (AADT) or more
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more

- Daily average speed will change by 10 km/hr or more
- Peak hour speed will change by 20 km/hr or more

6.3.15 Roads which do not meet any of the local DMRB criteria as a result of the Scheme are scoped out of the assessment.

6.3.16 The impacts on a selection of representative receptors (which include: residential, schools, hospitals, future committed developments etc.) within 200m of the ARN have been assessed. The receptors are selected to ensure that the receptors with both the highest absolute and change in concentrations are modelled. Following the advice in IAN174/13 the results have been used to evaluate whether the Scheme is likely to have a significant impact on local air quality in the opening year. The results have also been used in accordance with IAN 175/13 to determine whether the Scheme is likely to affect compliance with the EU Directive.

Determining Significance

6.3.17 The NN NPS requires that likely air quality effects that are both significant in relation to meeting Environmental Impact Assessment (EIA) requirements and / or in terms of compliance with the EU Air Quality Directive are assessed. This assessment determines whether the likely significant effects require mitigation beyond that which is embedded in the design of the Scheme. It also guides the decision-maker in relation to whether the Scheme should be granted development consent. The key test is described in paragraphs 5.12 and 5.13 of the NN NPS, set out below:

5.12 'The Secretary of State must give air quality considerations substantial weight where, after taking into account mitigation, a project would lead to a significant air quality impact in relation to EIA and / or where they lead to a deterioration in air quality in a zone/agglomeration'.

5.13 'The Secretary of State should refuse consent where, after taking into account mitigation, the air quality impacts of the Scheme will:

- result in a zone/agglomeration which is currently reported as being compliant with the Air Quality Directive becoming non-compliant; or
- affect the ability of a non-compliant area to achieve compliance within the most recent timescales reported to the European Commission at the time of the decision.'

6.3.18 IAN 174/13 provides the framework and methodology for using the DMRB to determine whether an impact is significant. Should a significant impact be assessed that cannot be mitigated, the NN NPS directs the decision-maker to give substantial weight to air quality impacts when determining whether a scheme should be granted consent. The IAN was prepared in order to determine the significance of air quality effects and establish whether a significant impact is triggered for the purposes of paragraph 5.12 of the NN NPS.

6.3.19 The air quality assessment presented in this chapter uses the modelled results from the local air quality assessment to inform the evaluation on significance. Those receptors which are predicted to exceed the AQS Objectives in the opening year either with or without the Scheme (i.e. in the Do-Minimum or Do-Something scenarios) are used to inform the evaluation of significance. The change in air pollutant concentrations predicted at these receptors (either an improvement or

deterioration), is relevant to the determination of whether the Scheme impacts are significant.

6.3.20 Table 6-3 presents the magnitude of change criteria presented in the IAN and can be applied to annual average NO_2 and PM_{10} concentrations.

Table 6-3: Air Quality - Magnitude of Change Criteria (Highways England IAN 174/13)

Magnitude of Change in Concentration (µg/m³).	Value of Change in Annual Average NO_2 and PM_{10}
Large (>4)	Greater than full Measure of Uncertainty (MoU) value of 10% of the air quality objective (4µg/m³).
Medium (>2)	Greater than half of the MoU (2µg/m³), but less than the full MoU (4µg/m³) of 10% of the air quality objective.
Small (>0.4)	More than 1% of objective (0.4µg/m³) and less than half of the MoU i.e. 5% (2µg/m³). The full MoU is 10% of the air quality objective (4µg/m³).
Imperceptible (≤ 0.4)	Less than or equal to 1% of objective (0.4µg/m³).

6.3.21 The results from the air quality dispersion model at receptors are used to populate Table 6-4 to inform the overall significance of the Scheme's impacts on air quality. Only receptors which exceed the AQS Objective (annual mean of 40µg/m³ for NO_2 and PM_{10}) in either the Do-Minimum or Do-Something scenarios are used to inform the evaluation of significance. The greater the change, the more certainty there is that there would be an impact on air quality attributable to the Scheme in operation. Following the DMRB methodology, there remain residual uncertainties as to the impact of the Scheme on air quality, referred to in the IAN as the MoU. This is due to the inherent uncertainty in air quality monitoring, modelling and in the modelled traffic data used in the air quality assessment.

6.3.22 Where the differences in concentrations are less than 1% of the air quality threshold (e.g. less than or equal to 0.4µg/m³ for annual average NO_2), the changes at these receptors are considered to be imperceptible as defined in the IAN and are scoped out of the evaluation on significance.

6.3.23 Any changes in concentrations above the threshold of imperceptibility are assigned to one of the 6 categories presented in Table 6-4. The total number of receptors are then aggregated, in order to calculate the number of receptors in each of the 6 categories.

6.3.24 The IAN provides guidelines on the number of receptors for each of the magnitude of change categories that might result in a significant effect, as presented in Table 6-4. These are guideline values only and are to be used to inform professional judgement in determining whether the Scheme would generate significant air quality effects.

Table 6-4: Air Quality - Guideline to Number of Properties Constituting a Significant Effect (Highways England IAN 174/13)

Magnitude of Change in Annual Average NO_2 or PM_{10} ($\mu g/m^3$)	Number of Receptors with:	
	Worsening of air quality objective already above objective or creation of a new exceedance	Improvement of an air quality objective already above objective or the removal of an existing exceedance
Large (>4)	1 to 10	1 to 10
Medium (>2)	10 to 30	10 to 30
Small (>0.4)	30 to 60	30 to 60

6.3.25 Where the number of receptors falls below the lower guideline bands to inform significance, the Scheme is deemed to unlikely to have a significant impact. For example, 20 small worsenings would unlikely be classed as significant. If the number of receptors affected is greater than the upper guideline bands (>60 Small, >30 Medium and >10 Large) then the Scheme is more likely to have a significant impact on air quality. Schemes which affect receptors within the guideline bands require justification based on professional judgement to determine whether the impact is significant.

Compliance with the EU Directive on ambient air quality

6.3.26 IAN 175/13 provides the guidance that should be followed to determine whether the test in paragraph 5.13 of the NN NPS is met.

6.3.27 It is important to note that Defra assesses and reports to the European Commission on the status of air quality in the UK, by reference to the Limit Values for each pollutant, in accordance with EU Directive (2008/50/EC). For the purposes of Defra assessment and reporting, the UK is divided in to 43 zones and agglomerations (hereafter referred to as zones). The main pollutant of concern with respect to compliance is NO_2.

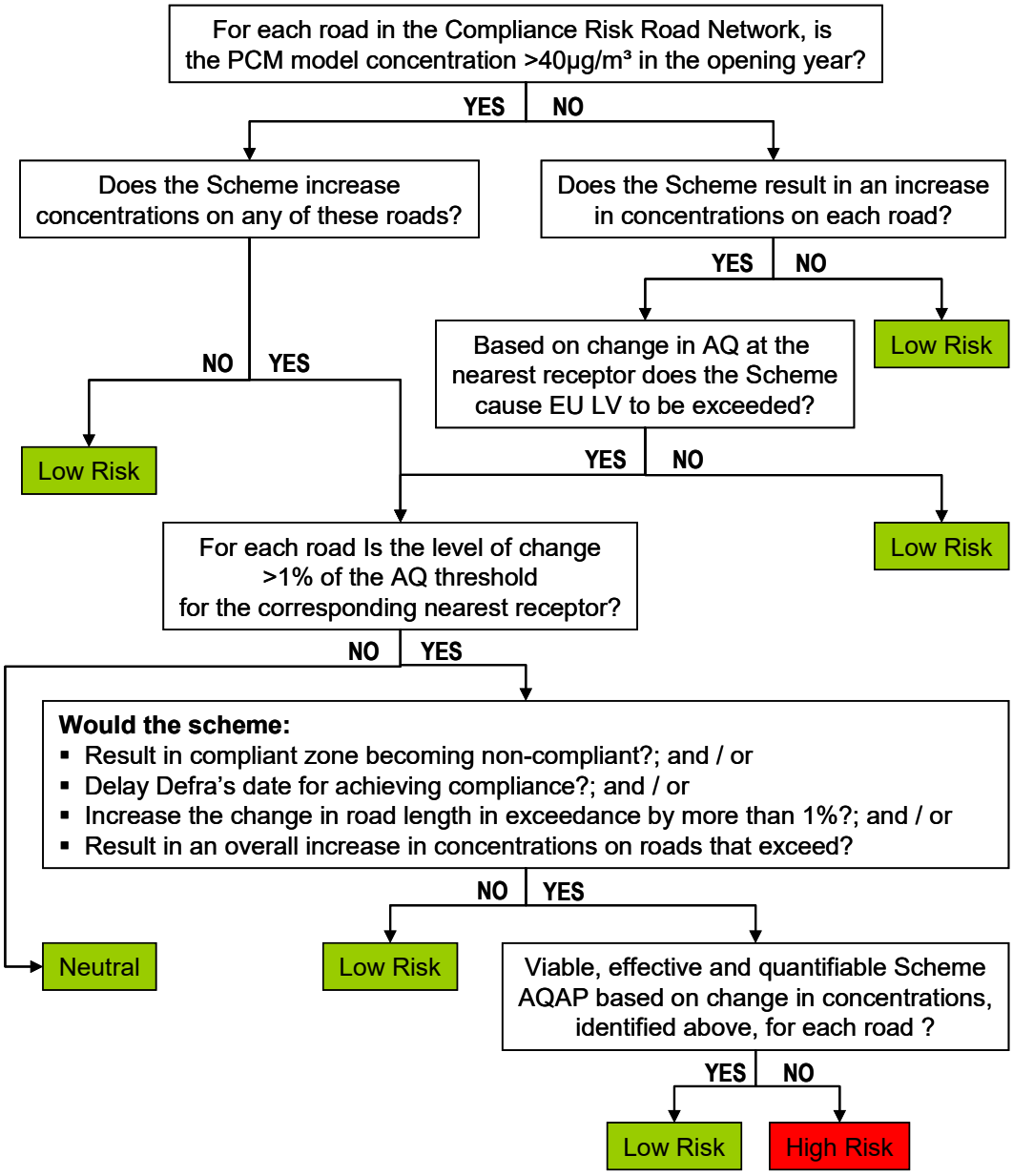
6.3.28 The assessment of compliance with the Directive is undertaken using both monitoring (Defra Automatic Urban and Rural Network (AURN)) and modelling from Defra's Pollution Climate Mapping (PCM) model. To determine the study area for the compliance risk assessment, the ARN for the local air quality assessment is compared with the PCM model network as modelled by Defra. Where the two networks overlap, this is known as the compliance risk road network (CRRN) and forms the basis of the assessment of compliance risk. The Defra PCM modelling is at a much larger scale than the Scheme modelling given that roads are modelled nationally within it. The Scheme modelling is much more locally focused and, as such, is verified at a local level rather than a national level. Consequently, there are differences in the results. However, as the Defra PCM modelling is used to inform compliance, it has to be used in this Chapter as the basis to determine whether the Scheme is a risk to compliance.

6.3.29 Defra uses the PCM model to report for the purposes of compliance with the EU Directive 2008/50/EC. The model provides predicted concentrations for each link in a number of years at 5-year intervals. The most recent iteration of the PCM model has been used in this Chapter.

6.3.30 The impact of the Scheme (i.e. the change in concentrations at receptors) on compliance is undertaken in accordance with IAN 175/13, whereby the concentrations in the Defra PCM model for the opening year of the Scheme are used to determine which roads exceed the EU Limit Value.

6.3.31 IAN 175/13 provides the flow chart reproduced in Insert 6-1 to help determine the compliance risk of the Scheme.

Insert 6-1: Air Quality - Compliance Risk Assessment Flow Chart



6.3.32 A zone can only become compliant when locations throughout the zone meet the relevant EU Limit Value. IAN175/13, however, considers the impact of a scheme on the individual links in the PCM model within the zone. Mitigation is required where a scheme results in an overall worsening on links that exceed the EU limit Value (i.e. a greater number of links which are projected to be above the EU Limit Value (40µg/m³ for annual mean NO2) and experience a deterioration in air quality as a result of the Scheme). In those circumstances, mitigation is required in the form of a Scheme Air Quality Action Plan (SAQAP).

6.3.33 Therefore, an SAQAP may be required even if a scheme does not affect the worst link in the zone.

6.3.34 If a scheme is assessed as having a high risk of non-compliance, the IAN provides guidance on the production of an SAQAP containing actions designed to further mitigate impacts and so reduce the risk of the scheme impacting on compliance.

Regional Assessment

6.3.35 The regional assessment is a requirement of DMRB and is undertaken to determine the change in emissions as a result of the Scheme. The regional emissions of oxides of nitrogen (NO_x) are also used in the WebTAG appraisal to determine the economic value of changes in air quality as a result of the Scheme for the purposes of the Scheme's business case.

6.3.36 The assessment of the contribution of the Scheme to regional air quality is based on the total annual emission of pollutants over the road network. The pollutants considered are:

- NOx
- PM10
- Carbon Dioxide (CO2)

6.3.37 The regional impacts have been calculated using the same links as assessed within the Local Air Quality Assessment.

6.3.38 The speed banded emission factors (in accordance with IAN 185/15) based on the Emission Factor Toolkit (EFT) (v8) has been used in the regional assessment calculations and uses the traffic characteristics (flows, speed band and percentage HDVs) and road length for each affected road in the study area. Total annual emissions for the Base Year (2015), Do-Minimum and Do-Something scenarios for both the Opening Year (2022) and Design Year (2037) have been calculated. As emission factors are not available for 2037, the traffic data for 2037 has been processed using the emission factors available for 2030. This is likely to result in an overestimation of emissions in the design year as it is likely that there would be more Ultra Low Emission Vehicles (ULEV) in the fleet in 2037 than assumed in 2030.

TAG Appraisal (plan level)

6.3.39 The DMRB states that the assessment of air quality in relation to highways schemes should also report the results of local air quality WebTAG appraisal (plan level), as completed in line with the guidance set out by The Air Quality Sub Objective, Transport Analysis Guidance (TAG) Unit A3.

6.3.40 The plan level methodology within the WebTAG guidance aims to quantify the change in exposure at properties in the opening year as a result of schemes. This is done by calculating the change in concentrations at receptors adjacent to all roads included in the ARN as determined for the local air quality assessment. The methodology follows a number of steps including:

- Identification of the ARN, which is the same as the DMRB local air quality affected road network
- Calculation of an overall assessment score for NO2 and PM10; this has been undertaken using the air quality modelling results from the ADMS-Roads

modelling, as all receptors within 200m of affected roads have been included in the assessment

6.3.41 The results of the WebTAG assessment are presented in the Scheme's Business Case.

Air Quality Dispersion Modelling

6.3.42 The ADMS-Roads model (version 4) has been used to predict the Scheme impacts in the Base Year and Scheme opening assessed year (both for the Do-Minimum and Do-Something). The following inputs and tools are required to undertake the air quality dispersion modelling:

- Traffic data
- Emission factors
- NOx to NO2 conversion
- Meteorological data
- Background pollutant concentrations
- Future assumptions based on trends

6.3.43 Details of the model input parameters are shown in Appendix 6.2 (document reference TR010035/APP/6.6.2).

Traffic Data

6.3.44 Traffic data used in the assessment was provided by the traffic model developed by Arcadis Traffic Team. The raw traffic data derived from the model was converted into the format required for the air quality assessment.

6.3.45 Given that the Scheme is unlikely to lead to exceedances of the AQS Objectives (based on previous assessment work during the options phases) the 24-hour AADT flows (average 24-hour total traffic flow in a year) were used for each scenario. Speed Bands and percentage HDVs were also supplied for each of the modelled road links.

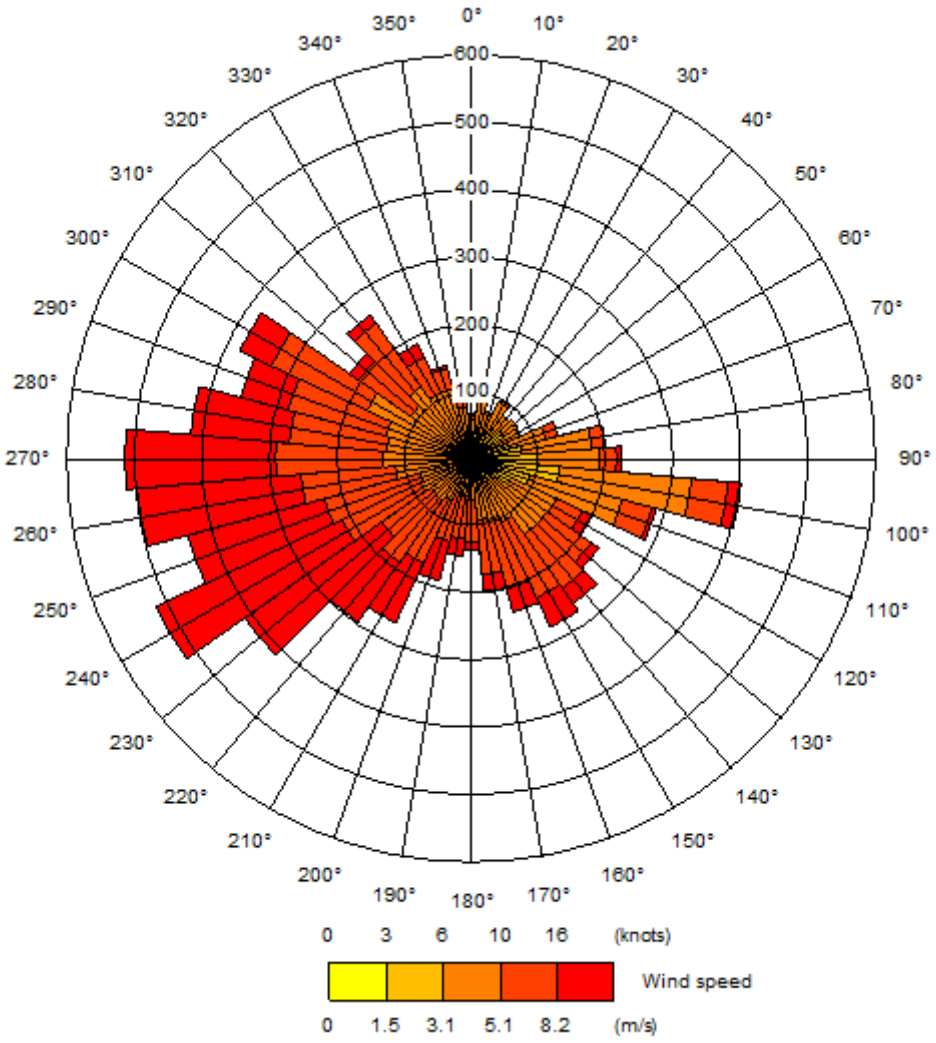
NO_x to NO_2 Conversion

6.3.46 In accordance with LAQM.TG(16) all modelled road-based concentrations of NO_x have been converted to annual mean NO_2 using the 'NO_x to NO_2' calculator (Version 6.1, released October 2017). The traffic mix and local authority used for the conversion from NO_x to NO_2 were selected depending on the modelled receptor and diffusion tube locations.

Meteorological Data

6.3.47 Meteorological data is from Blackpool, which is the nearest and most suitable site for the assessment. The site is the most suitable due to its locality to the study area which is approximately 5km from the study area. The data from the meteorological station for 2015, has been used in the assessment. This year corresponds to the availability of traffic data and actual monitoring data and allows for verification of modelled outputs with the meteorological data for 2015. The wind rose for Blackpool is presented in Insert 6-2. The predominant wind direction is from the west and is associated with the highest wind speeds.

Insert 6-2: Air Quality - Wind Rose for Blackpool 2015



Background Pollutant Concentrations

6.3.48 Predictions of total pollutant concentrations include contributions from local emissions sources (such as roads, chimney-stacks, etc.) and local background concentrations. In many situations, the background contribution may represent a significant or dominant proportion of these concentrations. Background concentrations for regulated pollutants are expected to decline in future years as a result of Government and EU policies/legislation to reduce pollution emissions.

6.3.49 In order to establish a prediction of total concentrations of pollutants, road source contributions are combined with a background concentration. It is therefore important that background air pollution contributions from sites which are selected have not been influenced by the road sources under consideration.

6.3.50 Defra Technical Guidance LAQM.TG(16) recommends the use of empirically-derived national background estimates available from the Defra website, which provide estimated background pollutant concentrations for each 1km x 1km grid square in the UK.

6.3.51 As the background NO_x and PM_{10} maps provide data for the individual pollutant sectors (e.g. motorway, trunk A-roads, primary A-roads, minor roads and industry), the components relating to in-grid square road traffic were removed for those road types being explicitly modelled. This was done to avoid double counting of road emissions. The NO_x contributions of the in-grid road sectors were removed from the total NO_x background concentrations. The adjusted total NO_x background concentrations were then converted to NO_2 for use in the assessment using the NO_2 Adjustment for NO_x Sector Removal tool (v6.1, October 2017). This calculator was used to adjust the 2015 and 2022 background NO_2 concentrations. Background NO_2 concentrations used in the assessment ranged between 6.8 and 13.2µg/m³ in 2015. In 2022, the background NO_2 concentrations ranged between 5.3 and 8.7 µg/m³ in 2022.

Assumptions on Future Trends in Emissions

6.3.52 Highways England issued advice in IAN 170/12v3 to be followed when undertaking assessments in accordance with DMRB. This advice has been followed in undertaking the Scheme assessment.

6.3.53 The long-term trend (LTT) NO_2 gap analysis is based on adjustment of 2022 NO_2 modelled concentrations for both the Do-Minimum (without Scheme) and the Do-Something (with Scheme) scenarios using 2015 modelled Base Year NO_2 concentrations and an alternative projection factor (based on a projected Base Year, which is the Base Year traffic data with opening year 2022 emissions and backgrounds) as outlined in IAN 170/12v3. Highways England has provided a gap analysis tool (LTTv1.1) to assist with the calculation. This calculator is available on request from Highways England.

6.3.54 There is evidence showing that emissions from vehicles, particularly diesels, do not perform to their prescribed European standards (up to Euro 5/V) on the road. There is limited evidence on Euro 6/VI performance in the real world. The use of the approach advocated by IAN 170/12v3 in undertaking the air quality assessment for the Scheme ensures that the modelling is not overly optimistic.

6.3.55 Whilst there is an expectation that there would be a substantial improvement in real world emissions from Euro 6/VI vehicles compared to previous Euro Standards, the IAN makes allowance for potential under-estimates in the emissions from the latest Euro 6/VI vehicles currently entering the UK fleet.

Items Scoped in and out of the Assessment

6.3.56 The air quality assessment has assessed the impacts of the Scheme during both construction and operation in accordance with DMRB and associated IANs. Nothing has been scoped out of the assessment.

Baseline Information

6.3.57 The baseline air quality information is gathered from the local authorities which are located within the air quality study area. The local authority review and assessment reports have been obtained which are published as part of their responsibilities under the Part IV of The Environment Act 1995, these include details of any AQMAs and local monitoring data. Highways England also undertook baseline air quality monitoring which has also been used as part of the baseline information.

Post-Scoping and Preliminary Environmental Information Consultation

6.3.58 No further consultation has been undertaken since the receipt of the responses to the EIA Scoping Report and the Preliminary Environmental Information Report (PEIR).

Identifying Mitigation and Enhancement Measures and Assessing Residual Effects

Construction

6.3.59 Mitigation measures are recorded in the Outline Construction Environmental Management Plan (CEMP) (document reference TR010035/APP/7.2) and the Record of Environmental Actions and Commitments (REAC) (document reference TR010035/APP/7.3) to ensure avoidance of any significant impacts. These mitigation measures are based on good industry practice such as no idling vehicles, wheel washing and avoidance of bonfires etc.

Operation

6.3.60 To determine whether the Scheme requires mitigation, the impacts of the Scheme are assessed to determine whether it is significant, in accordance with IAN 174/13 and IAN 175/13 as described in paragraphs 6.3.17 to 6.3.25.

Assumptions and Limitations

6.3.61 The local operational air quality assessment has used detailed modelling techniques (ADMS-Roads), a comprehensive traffic dataset, Defra local air quality management tools and guidance, Highways England tools and guidance, and predictions have been checked against local recent air quality monitoring data. Although there is uncertainty in air quality modelling, the adopted approach has minimised the assumptions and limitations of the local operational air quality assessment as far as practicable and the assessment is considered robust on this basis.

6.3.62 The latest year for which emission factors are available is 2030, therefore these were used for the 2037 calculations. This is the worst-case assumption, given that emissions would improve with time as a result of cleaner vehicles entering the fleet.

6.3.63 The construction assessment assumes the worst case that all required deficit material would be brought to site via the local road network and that borrowpits would not be used. If the Contractor decides to utilise borrowpits prior to construction then assessment using construction vehicles in this Chapter would be less. Any dust arising from using the borrowpits if used would be mitigated though the measures outlined in Section

6.4 Study Area

6.4.1 The study area is based on the change in traffic as a result of the Scheme. The links that trigger the DMRB criteria outlined in paragraph 6.3.14 are used to determine the study area, the extent of the study area is presented on Figure 6.1.

6.4.2 The major roads that form the affected road network that determine the study area include:

- A585 Amounderness Way between Norcross Roundabout and Skippool Roundabout (as a result of >1,000 change in AADT)

- A585 Mains Lane (as a result of >1,000 change in AADT and >200 change in HDV)
- A585 Garstang New Road (as a result of road closure)
- A585 Fleetwood Road (as a result of >1,000 change in AADT)
- A586 Garstang Road (as a result of >1,000 change in AADT, >200 change in HDV and >10kph change in speed).
- A586 Garstang Road East (as a result of >1,000 change in AADT)
- A586 Garstang Road West (as a result of >1,000 change in AADT)
- A588 Breck Road (as a result of >1,000 change in AADT)
- A588 Station Road (as a result of >1,000 change in AADT)
- A588 Hardhorn Road, Higher Green and Lower Green (as a result of >1,000 change in AADT)
- A583 between M55 junction 4 and A587 (as a result of >1,000 change in AADT)
- M55 between junction 3 and 4 (as a result of >1,000 change in AADT)
- B5412 between Skippool Roundabout and Tarn Road (as a result of >10kph change in Speed)
- B5260 between Garstang Road and B5266 (as a result of >10kph change in Speed).

6.5 Existing and Future Baseline

6.5.1 The Scheme is located within the administrative boundaries of Fylde Borough Council and Wyre Council. As required by the Environment Act 1995, the local authorities have undertaken review and assessment of air quality within their boroughs – all local authority monitoring locations within the air quality study area are presented on Figure 6.2. The monitoring results are presented in Appendix 6.3 (document reference TR010035/APP/6.6.3).

Fylde Borough Council

6.5.2 A review of the information held on Defra's website, and the Fylde Borough Council website indicates that no AQMAs have been designated within Fylde.

6.5.3 Fylde Borough Council undertakes air quality monitoring for NO_2 using diffusion tubes at multiple locations across the Borough. Recent air quality monitoring data contained within the Fylde 2017 Air Quality Annual Status Report do not report any exceedances of the AQS Objectives from the monitoring results.

6.5.4 The maximum recorded concentration in 2015 (the year used in the assessment to represent existing base year concentrations) was 25.6µg/m^3 which is well below the annual mean NO_2 AQS Objective of 40µg/m^3. This monitoring site is located on Clifton Street in Fylde over 12km from the Scheme.

Wyre Council

6.5.5 A review of the information held on Defra's website, and the Wyre Council website indicates that there is 1 AQMA (Chapel Street AQMA) designated within the air

quality study area, approximately 1.2km south-west of Skippool Junction (refer to Figure 6.2). The Chapel Street AQMA in Poulton-le-Fylde was declared by Wyre Council in 2009 for the exceedance of the annual mean NO_2 AQS Objective as a result of traffic emissions, congestion and the locality of buildings preventing dispersion of air pollutants.

6.5.6 Wyre Council undertakes air quality monitoring for NO_2 using diffusion tubes at multiple locations across the borough. Recent air quality monitoring results contained within the Wyre Air Quality Progress Reports and the Updating and Screening Assessments do not report any exceedances of the AQS Objectives (including the monitoring within the AQMA).

6.5.7 The maximum recorded NO_2 concentration in 2015 (the year used in the assessment to represent existing base year concentrations) was 32.9µg/m^3 which is well below the AQS Objective. This monitoring site is located in Chapel Street and is located within the designated AQMA.

Highways England Air Quality Monitoring

6.5.8 Highways England undertook air quality monitoring for a 6-month period between December 2013 and June 2014 along Fleetwood Road / Garstang New Road close to the Windy Harbour Junction (refer to Figure 6.3). The 6 months of monitoring indicated that measured concentrations of NO_2 were well below the AQS Objective of 40µg/m^3, with the maximum concentration recorded being 26µg/m^3 on Fleetwood Road approximately 250m south of the Windy Harbour Junction.

6.5.9 The air quality monitoring data from the local authorities and Highways England illustrates that air quality concentrations do not exceed the AQS Objectives for the main traffic related pollutant, NO_2.

Receptors Potentially Affected (including value / sensitivity)

6.5.10 All relevant receptors that have been selected to represent locations where people are likely to be present are based on potential impacts on human health. The air quality objective values have been set at concentrations that provide protection to all members of society, including more vulnerable groups such as the very young, elderly or unwell. As such, the sensitivity of receptors was considered in the definition of the air quality objective values. Therefore, no additional subdivision of human health receptors on the basis of building or location type is necessary because the receptor sensitivity already takes account of a worst case for effects on human receptors.

6.5.11 A selection of 41 representative receptors potentially sensitive to changes in air quality, as defined in DMRB HA207/07, have been identified throughout the study area of 200m from the ARN. These receptors have been chosen as they would experience the largest changes in pollutant concentrations as a result of the scheme and experience the highest predicted pollutant concentrations (as they would be located closest to roads/junctions and next to roads with the largest change in traffic flows). The location of these receptors is outlined in Table 6-5 and shown on Figure 6.4.

Table 6-5: Air Quality - Receptor Locations

Receptor ID	Receptor Location	NGR (m)	
		X	Y
R1	Residential property on Fleetwood Road	339471	439470
R2	Bankfield Manor Care Home on Pool Foot Lane	338507	439609
R3	Residential property on Lodge Lane	337676	439210
R4	Residential property at junction of Garstang Road and Lodge Lane	337628	439449
R5	Residential property on Garstang Road	337366	439488
R6	Residential property at junction of Mains Lane Pool Foot Lane	337639	439546
R7	Residential property at junction of Station Road and Lodge Lane	338013	438310
R8	Residential property on Mains Lane	337114	439819
R9	Residential property on Mains Lane	336497	440110
R10	Residential property on Garstang Road West	333188	438153
R11	Residential property on Breck Road near Skippool roundabout	335523	440522
R12	Residential property on Skippool Road near roundabout	335416	440594
R13	Residential property on corner of Breck Road and Parrys Way	335071	439888
R14	Residential property on corner of Station Road and Lower Green	335124	439270
R15	Residential property on junction of Lower Green and Garstang Road East	335296	439115
R16	Residential property on Garstang Road East	335823	439220
R17	Residential property on junction of Vicarage Road and Chapel Street	334896	439482
R18	Residential property on Fleetwood Road	340018	437615
R19	Residential property on Fleetwood Road	340619	436745
R20	Residential property on junction of Hardhorn Road and Garstang Road East	334836	439068
R21	Residential property on junction of Chapel Street and Higher Green	334902	439359
R22	Residential property on Skippool Road	335408	441150
R23	Residential property on Garstang Road	336507	439339
R24	Residential property off Lodge Lane	337731	439095
R25	Residential property on Fleetwood Old Road	341448	435013
R26	Residential property on the corner of Riversway and Breck Road	335445	440320

Receptor ID	Receptor Location	NGR (m)	
		X	Y
R27	Residential property on Newton Grove	333752	441339
R28	Residential property on Elderwood Avenue	333750	441398
R29	Residential property on Mains Lane	335958	440423
R30	Residential property off Garstang Road	341767	440345
R31	Residential property on Old Mains Lane	335833	440561
R32	Residential property on Mains Lane	336935	439807
R33	Residential property on Mains Lane	336734	439925
R34	Residential property on Mains Lane	337344	439635
R35	Residential property on Mains Lane	335710	440560
R36	Residential property off Garstang Road	343297	440392
R37	Residential property on Back Lane	339299	434602
R38	Residential property on Fleetwood Road	341538	434664
R39	Residential property at corner of Mythop Road and Preston New Road	334673	434432
R40	Future residential property at Moorfield Park Development Site	336412	439554
R41	Future residential property at Moorfield Park Development Site	336500	439386

6.6 Mitigation and Enhancement Measures

6.6.1 During construction industry best practice mitigation measures would be implemented to ensure that no significant impacts occur during construction.

6.6.2 Standard dust mitigation measures included in the REAC (document reference TR010035/APP/7.3) appended to the Outline CEMP (document reference TR010035/APP/7.2) and are summarised in Table 6-6.

Table 6-6: Air Quality - Standard Dust Mitigation Measures

Mitigation	Mitigation Measures
Mitigation for all of the site	Monitoring
	Undertake daily on-site and off-site inspections, where receptors are nearby, to monitor dust, record inspection results.
	Preparing and Maintaining the Site
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have the potential to produce dust from site.

Mitigation	Mitigation Measures
	Cover, seed or fence stockpiles to prevent wind whipping.
	Operating Vehicle/ Machinery and Sustainable Travel
	Impose and signpost a maximum-speed-limits.
	Ensure all vehicles switch off engines when stationary.
	All construction plant would use fuel equivalent to ultra-low sulphur diesel (ULSD) where possible.
	Operations
	Ensure equipment is readily available on site to clean any dry spillages.
Measures specific to construction	Avoid scabbling if possible.
	Ensure sand and other aggregates are stored in bunded areas.
Measures specific to trackout	Use water-assisted dust sweeper(s) on access and local roads.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered.
	Record all inspections of haul routes.
	Implement a wheel washing system.

6.6.3 No mitigation measures are required during the operation of the Scheme as the Scheme does not result in a significant impact on air quality.

6.7 Residual Effects

Construction

6.7.1 Temporary effects due to fugitive emissions of dust during construction are not considered to be significant, with appropriate mitigation detailed within the Outline CEMP (document reference TR010035/APP/7.2), a summary is presented in Table 6-6.

6.7.2 Review of estimated construction vehicle numbers during the peak construction year (2021) indicated that there would be 176 HDV per day (assuming the borrowpits would not be used and all required material would be brought to site via the road). As this falls below the criteria of 200 HDV, no further assessment has been undertaken and construction vehicle emissions as a result of the Scheme are not considered to be significant.

Operation

6.7.3 An operational phase assessment has been completed in accordance with DMRB. Pollutant concentrations have been predicted for the Base Year and Opening Year scenarios and compared against the AQS Objectives.

6.7.4 The Base year (2015), Do-Minimum and Do-Something (2022) NO_2 concentrations at the selected representative receptors (outlined in Table 6-5) are presented in

Table 6-7. The annual mean NO_2 concentrations reported for the Do-Minimum and Do-Something (2022) have been adjusted in accordance with the advice in IAN 170/12v3. This is to ensure that the Opening Year modelled predictions are not too optimistic.

Table 6-7: Air Quality - Predicted Annual Mean NO_2 Concentrations at Receptors

Receptor	Base Year 2015 Annual Mean NO_2 Concentrations ($\mu g/m^3$)	LTT Adjusted 2022 Annual Mean NO_2 Concentrations ($\mu g/m^3$)		Difference between Projected Do Minimum and Do Something ($\mu g/m^3$)
		Do-Minimum	Do-Something	
R1	27.4	22.4	23.9	1.5
R2	9.9	7.7	7.9	0.2
R3	11.5	8.8	12.5	3.7
R4	18.1	14.2	9.7	-4.5
R5	14.3	11.1	8.7	-2.4
R6	24.5	19.8	9.5	-10.3
R7	11.4	8.7	8.6	-0.1
R8	12.4	9.8	7.9	-1.9
R9	19.6	15.6	9.8	-5.8
R10	17.7	13.7	14.2	0.5
R11	21.7	17.0	13.3	-3.7
R12	28.5	22.7	16.8	-5.9
R13	19.4	14.7	13.5	-1.2
R14	19.4	13.7	12.9	-0.8
R15	18.3	14.7	14.9	0.2
R16	17.9	14.7	17.2	2.5
R17	33.2	28.8	26.9	-1.9
R18	18.8	15.2	15.9	0.7
R19	18.2	14.7	15.4	0.7
R20	21.6	17.3	18.0	0.7
R21	40.1	30.0	29.6	-0.4
R22	20.7	17.2	15.2	-2.0
R23	13.6	10.7	12.6	1.9
R24	9.5	7.3	10.0	2.7
R25	18.0	14.8	15.0	0.2

Receptor	Base Year 2015 Annual Mean NO_2 Concentrations ($\mu g/m^3$)	LTT Adjusted 2022 Annual Mean NO_2 Concentrations ($\mu g/m^3$)		Difference between Projected Do Minimum and Do Something ($\mu g/m^3$)
		Do-Minimum	Do-Something	
R26	17.3	13.3	12.0	-1.3
R27	28.4	22.3	22.7	0.4
R28	32.6	25.7	26.2	0.5
R29	28.7	23.0	15.8	-7.2
R30	11.6	9.4	9.8	0.4
R31	16.5	13.0	13.4	0.4
R32	17.3	13.8	9.2	-4.6
R33	18.2	14.5	9.3	-5.2
R34	16.6	13.3	8.7	-4.6
R35	24.9	19.9	19.8	-0.1
R36	11.5	9.3	9.6	0.3
R37	18.1	15.7	15.4	-0.3
R38	28.5	22.3	22.8	0.5
R39	20.8	17.0	16.6	-0.4
R40	10.1	7.8	8.8	1.0
R41	12.3	9.6	11.1	1.5
LTT=Long Term Trend. Predicted NO_2 concentrations were adjusted using a Gap Factor based on the long-term adjustment factor calculated by the Highways Agency's "Interim Highways Agency Alternative Long-Term Gap Analysis Calculator v1.1". All values for predicted concentrations for the Opening Year 2022 and have been verified using local authority monitoring data.				

6.7.5 Table 6-7 shows that in the Scheme Opening Year there are no exceedances of the AQS Objectives for annual mean NO_2.

6.7.6 The largest improvement in air quality is predicted at R6, located on Mains Lane close to the junction of Garstang Road East and Garstang New Road which is to be altered to a roundabout as part of the Scheme. This is due to a reduction of traffic flows along Mains Lane due to re-routing of approximately 22,000 vehicles per day (including 6% HDVs).

6.7.7 The largest adverse impact in air quality is predicted at receptors R3 and R24 (increases of 3.7$\mu g/m^3$ and 2.7 $\mu g/m^3$, respectively) due to their close proximity (approximately 50m) to a new bypass being constructed in an area where there was previously no road near Lodge Lane, hence an increase in traffic emissions at these locations. The predicted NO_2 concentrations at these receptors in the Opening Year with the Scheme are however well below the AQS Objective of

40µg/m^3.

6.7.8 The highest predicted annual mean NO_2 concentration in the opening year with the Scheme is at R21 (29.6µg/m^3) which is located within the Chapel Street AQMA. The modelled NO_2 concentrations at this location show an exceedance of the AQS Objective in the Base Year but fall below the AQS Objective concentration in the Opening Year, with a small decrease as a result of the Scheme.

6.7.9 PM_{10} concentrations were also modelled for each scenario. The Base Year (2015), Do-Minimum and Do-Something (2022) PM_{10} concentrations at the selected representative receptors (outlined in Table 6-5) are presented in Table 6-8.

Table 6-8: Air Quality - Predicted Annual Mean PM_{10} Concentrations at Receptors

Receptor	Base Year 2015 Annual Mean PM_{10} Concentrations (µg/m^3)	2022 Annual Mean PM_{10} Concentrations (µg/m^3)		Difference between Do Minimum and Do Something (µg/m^3)
		Do Minimum	Do Something	
R1	15.2	14.7	15	0.3
R2	12.6	12.2	12.2	0
R3	12.1	11.7	12.5	0.8
R4	13.0	12.5	11.7	-0.8
R5	12.5	12.1	11.6	-0.5
R6	13.6	13	11.6	-1.4
R7	11.8	11.3	11.3	0
R8	12.3	11.9	11.4	-0.5
R9	13.8	13.3	12.2	-1.1
R10	14.2	13.6	13.7	0.1
R11	13.0	12.5	12.2	-0.3
R12	13.8	13.2	12.9	-0.3
R13	13.4	12.7	12.5	-0.2
R14	13.3	12.5	12.4	-0.1
R15	13.1	12.6	12.7	0.1
R16	13.0	12.7	13.1	0.4
R17	15.4	15	14.6	-0.4
R18	13.3	12.9	13	0.1
R19	13.5	13.1	13.2	0.1
R20	13.9	13.3	13.4	0.1
R21	16.9	15.7	15.6	-0.1
R22	12.1	11.6	11.5	-0.1

Receptor	Base Year 2015 Annual Mean PM_{10} Concentrations ($\mu g/m^3$)	2022 Annual Mean PM_{10} Concentrations ($\mu g/m^3$)		Difference between Do Minimum and Do Something ($\mu g/m^3$)
		Do Minimum	Do Something	
R23	11.9	11.5	11.9	0.4
R24	11.8	11.4	12	0.6
R25	13.8	13.4	13.4	0
R26	12.6	12.1	11.9	-0.2
R27	13.8	13.1	13.2	0.1
R28	14.2	13.5	13.6	0.1
R29	14.4	13.9	12.6	-1.3
R30	12.3	12	12.1	0.1
R31	12.5	12	12.2	0.2
R32	12.5	12.1	11	-1.1
R33	12.7	12.2	11	-1.2
R34	13.0	12.5	11.5	-1
R35	14.0	13.5	13.6	0.1
R36	11.6	11.2	11.3	0.1
R37	13.1	12.6	12.6	0
R38	16.7	16	16.1	0.1
R39	16.0	15.5	15.4	-0.1
R40	11.3	10.9	11.1	0.2
R41	11.7	11.2	11.6	0.4
All values for predicted concentrations for the Opening Year 2022 and have been verified using local authority monitoring data.				

6.7.10 PM_{10} concentrations at each receptor are predicted to be well below the AQS Objective of 40µg/m^3 for the Base Year and Opening Year both with and without the Scheme, with the highest predicted Do-Something concentration being 16.1µg/m^3.

6.7.11 The receptor concentrations in the Scheme Opening Year are all predicted to be below the AQS Objectives for both NO_2 and PM_{10}. As a result, the Scheme impacts are not considered to be significant in accordance with IAN 174/13 (as only receptors which exceed the AQS Objectives are considered in the judgement as to whether the Scheme impacts are significant).

6.7.12 The assessment shows there are no exceedances of the AQS Objectives therefore the Scheme does not result in a significant impact on air quality and as such no mitigation measures would be required.

6.7.13 Although $PM_{2.5}$ has not been specifically modelled in accordance with DMRB, the PM_{10} results illustrate that there would be no exceedances of the $PM_{2.5}$ of the EU Limit Value of 25µg/m³. The maximum PM_{10} concentration being 16.1µg/m³, the $PM_{2.5}$ fraction would therefore be much lower, well below the 25µg/m³ EU Limit Value.

Compliance Risk Assessment

6.7.14 Defra is responsible for reporting on the UK's compliance with the EU Directive on ambient air quality (2008/60/EC). The UK is split into a number of zones / agglomerations for the purpose of the reporting. A zone is deemed compliant with the Directive when pollutants are predicted or measured to be below the EU Limit Values. Defra currently undertakes modelling using their Pollution Climate Mapping (PCM) model. The affected road network is located in two of these areas; the North West and Merseyside zone and the Blackpool Urban area. There are PCM modelled links on the following roads within the air quality study area:

- The A585 from its junction with Shard Road to its junction with the B5412 (Skippool junction)
- The A588 Breck Road from Skippool junction to the A586 Garstang Road East
- A586 Garstang Road West and Garstang Road East
- A583 Preston New Road

6.7.15 The highest NO_2 concentration predicted by Defra for the opening year 2022 for any of the links in the PCM Model is 24.6µg/m³, and the highest increase in NO_2 concentration with the Scheme is predicted to be 3.7µg/m³, therefore the limit value of 40µg/m³ would not be exceeded. As such, the Scheme is would not impact on the UK's ability to comply with the Directive in the opening year.

Regional Assessment

6.7.16 The DMRB requires a regional assessment to be undertaken for the opening year and the design year. The regional assessment is based on the change in emissions over the modelled road network. The results are not used to inform the evaluation of significance, as the change in total emissions is not directly related to a change in concentrations at receptors. Table 6-9 shows the estimated NO_x, PM_{10} and CO_2 emissions from the roads that are included in the regional assessment The Do-Minimum and Do-Something emissions in both the Opening (2022) and Design (2037) years, and emissions in the Base Year (2015) have been calculated. The EFT does not allow calculation of emissions beyond 2030 and therefore the results for 2030 were used as an estimate of the 2037 emissions. This is likely to provide a pessimistic total emissions as it would not account for the fleet being replaced by Ultra Low Emission Vehicles (such as electric vehicles).

6.7.17 A significant reduction in annual NO_x and PM_{10} emissions occurs between 2015 and 2022, with and without the Scheme. This is due to improvements in vehicle emissions technology, stricter emissions standards, and projected vehicle fleet information encompassing the introduction of newer vehicles over time, which offset the increases in traffic flows between 2015 and 2022.

6.7.18 The regional assessment shows that CO_2 emissions do not reduce from the base year and opening year, with and without the Scheme. Unlike NO_x and PM_{10}, emissions of CO_2 are directly linked to fuel use. As such, while advances in vehicle emissions technology result in an improvement in NO_x and PM_{10} emissions, which offset the increase in traffic between the Base Year and Opening Year, overall fuel use tends to increase across the network due to the additional number of vehicles anticipated between 2015 and 2022. Therefore, there is little difference between the CO_2 emissions for the Base Year and Opening Year.

6.7.19 When compared to the Do Minimum in the Opening Year, calculations show that NO_x, PM_{10} and CO_2 would increase with the Scheme. In the Design Year, emissions of PM_{10} would increase, but emissions of NO_x and CO_2 would decrease with the Scheme.

Table 6-9: Air Quality - Annual NO_x and PM_{10} Emissions (T/year) and CO_2 Emissions (in kilo tonnes/year) for the Modelled Network

Pollutant	Base Year 2015	Do Minimum 2022	Do Something 2022	Change in Emissions in Opening Year	Percentage Change Opening Year	Do Minimum 2037	Do Something 2037	Change in Emissions in Design Year	Percentage Change Design Year
NOx (T/yr)	190.3	128.0	131.7	3.7	2.9	76.7	81.9	5.1	6.7
PM_{10} (T/yr)	13.6	12.8	13.4	0.6	4.7	12.3	15.2	2.9	23.2
CO_2 (kT/yr)	67.2	69.5	71.5	1.9	2.8	77.6	81.1	3.5	4.5

Population and Human Health Assessment

6.7.20 As set out in DMRB HA 207/07, the pollutants of concern for roads when considering potential air quality effects on population and human health are NO_2 and PM_{10}. Baseline figures for deaths caused by respiratory diseases were significantly higher in Singleton and Greenhalgh in comparison to the national average. Furthermore, Elswisk and Little Eccleston figures were also slightly above national average. This may indicate that there is a pre-existing issue of respiratory diseases within the Fylde area. However, given that both NO_2 and PM_{10} are predicted to be below the respective AQS Objectives for both the Base Year and Opening Year of the Scheme, it is considered that there would be no significant effects on human health as a result of the Scheme.

6.8 Monitoring

6.8.1 The Outline CEMP (document reference TR010035/APP/7.2) contains information relating to the monitoring that would be undertaken during construction. The monitoring involves visual checks and monitoring of the works to ensure compliance with the CEMP.

6.8.2 Specific air quality mitigation measures for the operational phase are not proposed as significant effects are not anticipated because of the Scheme. As a result, no monitoring of air quality is recommended during operation.

6.9 Summary

6.9.1 The operational impact of the proposed Scheme on local air quality has been assessed by undertaking air quality modelling of the Do-Minimum and Do-Something Scenarios. The traffic data has been screened against the assessment criteria detailed in DMRB HA207/07 Volume 11 Section 3 Part 1. The study area incorporates the A585, A586, A588 and M55 between junction 3 and 4 as detailed in section 6.4 and presented on Figure 6.1.

6.9.2 Base year (2015) monitored and modelled concentrations indicated that air quality concentrations do not exceed the AQS Objectives.

6.9.3 The implementation of the Scheme is predicted to result in both improvements and deterioration in air quality at the receptors modelled. Of the receptors modelled, 20 were predicted to experience a deterioration in NO_2 concentrations and 21 were predicted to experience an improvement. For PM_{10}, 19 of the modelled receptors were predicted to experience a deterioration, 18 were predicted to experience an improvement, and no change in PM_{10} concentrations was predicted at 4 receptors. None of the receptors modelled are predicted to exceed the AQS Objectives for the key traffic related pollutants NO_2 and PM_{10}.

6.9.4 The evaluation of the operational significance of effects for air quality (following guidance in Highways England IAN 174/13) is that the Scheme does not have a significant effect on local air quality.

6.9.5 The assessment demonstrates that in terms of impact on compliance with the EU Directive (following guidance in Highways England IAN 175/13), the Scheme is Low Risk in relation to affecting the UKs reported ability to comply with the EU Directive in the shortest timescales possible, as exceedances of the EU limit values are not predicted.

6.9.6 Construction phase impacts from dust and emissions would be negligible with the implementation of mitigation measures embedded in the Outline CEMP (document reference TR010035/APP/7.2).

6.9.7 As a result of the above, the Scheme is not predicted to result in significant air quality effects and the Scheme complies with the requirements of the NN NPS.

6.10 References

Defra (2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*

Defra (2016) *Local Air Quality Management Technical Guidance LAQM.TG(16)*

Defra (2017) *Emission Factor Toolkit v8*

Defra (2017) *NO_2 Adjustment for NO_x Sector Removal Tool*

Defra, *Defra UK Air Quality website* http://uk-air.defra.gov.uk/, Accessed 2017.

Department for Communities and Local Government (2018) *The National Planning Policy Framework*

Department for Transport (2014) *National Policy Statement for National Networks*

Department for Transport (2017) *Transport Analysis Guidance Unit A3*

European Commission (2008) *Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe*

Fylde Borough Council (2005) *The Fylde Borough Local Plan*

Fylde Borough Council (2017) *Fylde Council 2017 Air Quality Annual Status Report*

Fylde Borough Council, *Fylde Council website* http://www.fylde.gov.uk/council/planning-policy--local-plan-/fylde-borough-local-plan-altered-october-2005, Accessed 2018.

Fylde Council, (2018) *Fylde Local Plan to 2032* [Online] Available at: http://www.fylde.gov.uk/council/planning-policy--local-plan-/local-development-framework/www-fylde-gov-uk-submission/ [last accessed August 2018].

Highways Agency (2007) *HA207/07 Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 1*

Highways Agency (2013) *IAN 170/12v3 Updated air quality advice on the assessment of future NO_x and NO_2 projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality*

Highways Agency (2013) *IAN 174/13 Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07)*

Highways Agency (2013) *IAN 175/13 Updated advice on risk assessment related to compliance with the EU Directive on ambient air quality and on the production of Scheme Air Quality Action Plans for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07)*

Highways Agency (2015) *IAN 185/15, Updated traffic, air quality and noise advice on the assessment of link speeds and generation of vehicle data into 'speed-bands' for users of DMRB Volume 11, Section 3, Part 1 'Air Quality and Volume 11*

Highways England (2012) *Long Term Gap Analysis Calculator v1.1*

Secretary of State (2000) *Air Quality (England) Regulations 2000*

Secretary of State (2010) *Air Quality (Standards) Regulations 2010*

The Stationary Office (1995) *Part IV of The Environment Act 1995*

Wyre Council (1999) *The Wyre Council Adopted Local Plan*

Wyre Council (2009) *Wyre Council Air Quality Strategy*

Wyre Council (2016) *Wyre Council 2016 Air Quality Annual Status Report*

Wyre Borough Council, *Wyre Council website* http://www.wyre.gov.uk/info/200384/pollution/342/air_quality, Accessed 2018.

Wyre Council, (2018) *Wyre Local Plan to 2031* [Online] Available at: http://www.wyre.gov.uk/info/200319/wyres_emerging_new_local_plan (last accessed August 2018).

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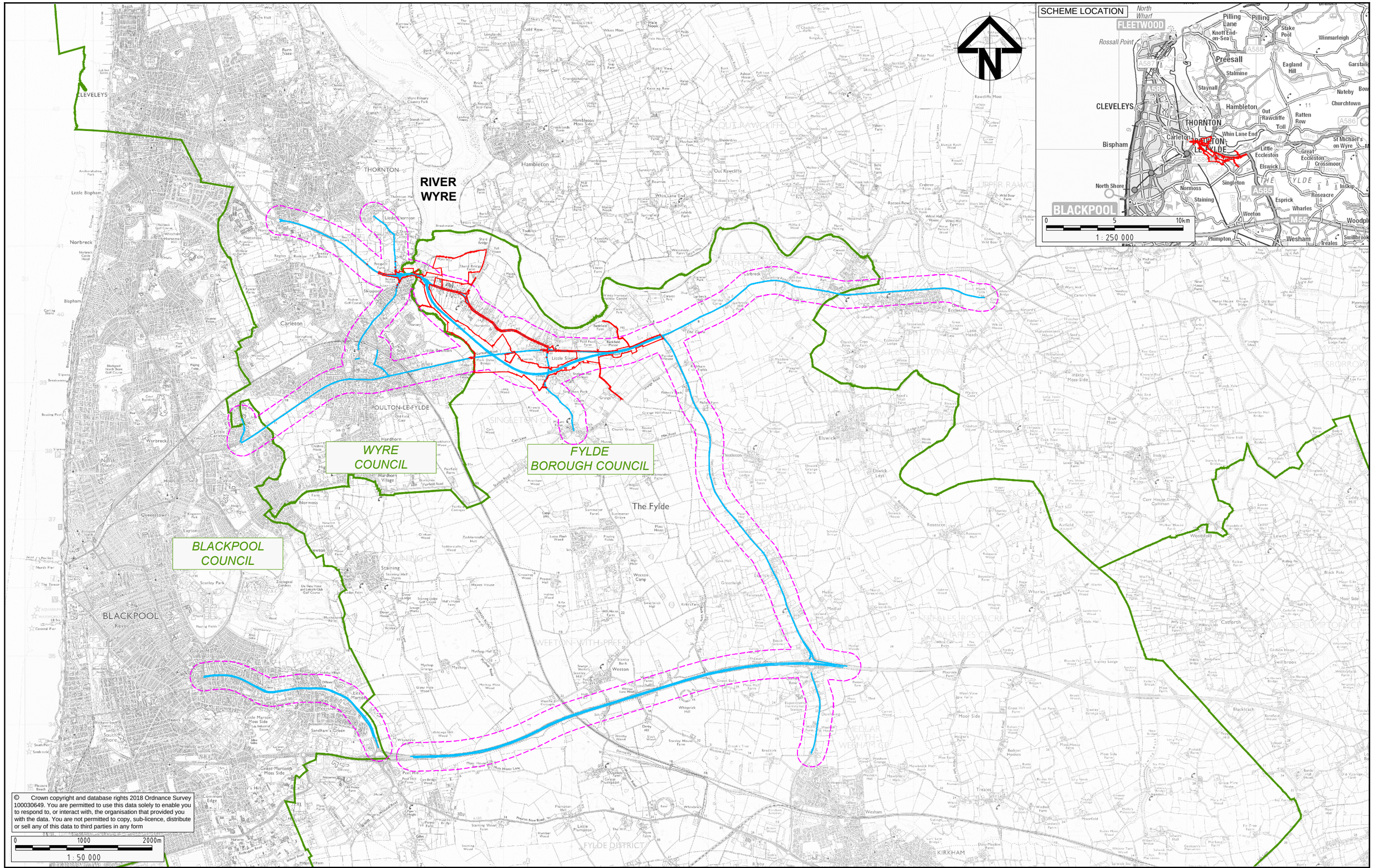
6.11 Figures



KEY:

- Draft Order Limits
- Local Authority Boundary
- Affected Road Network 200m Buffer Area
- Affected Road Network

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P00	S8	OCT18	FINAL	JN	KB	NH

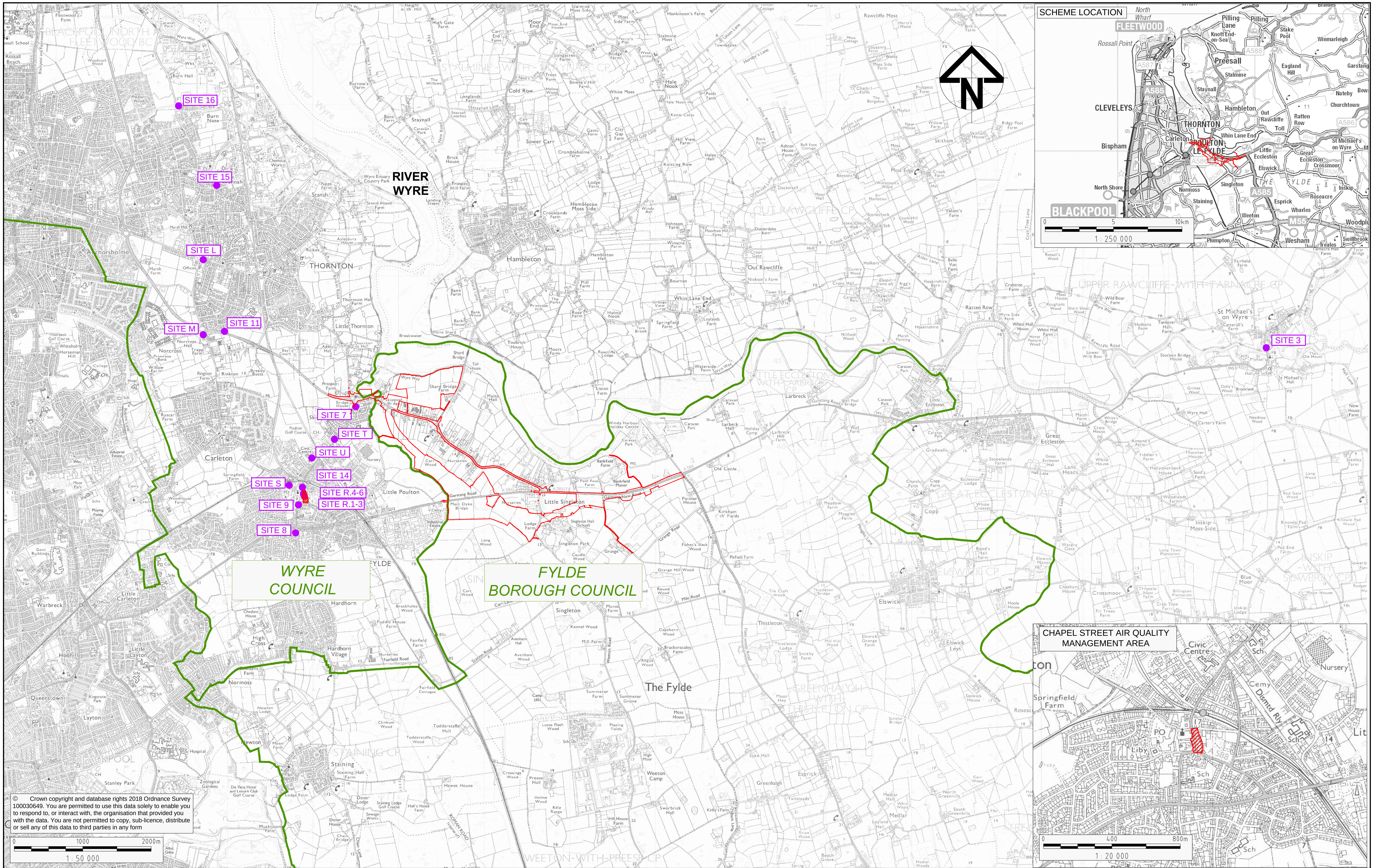
Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
REGULATION 5(2)(a)
AIR QUALITY:
AIR QUALITY STUDY AREA

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:50 000 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 6.1

Drawing number: HE548643-A585-EAC-SZ_GN_000-DR-L-3007
(HE PIN | Originator | Volume | Location | Type | Role | Number)



KEY:

- Draft Order Limits
- Local Authority Boundary
- Air Quality Management Area
- Wyre Borough Council Diffusion Tube Location

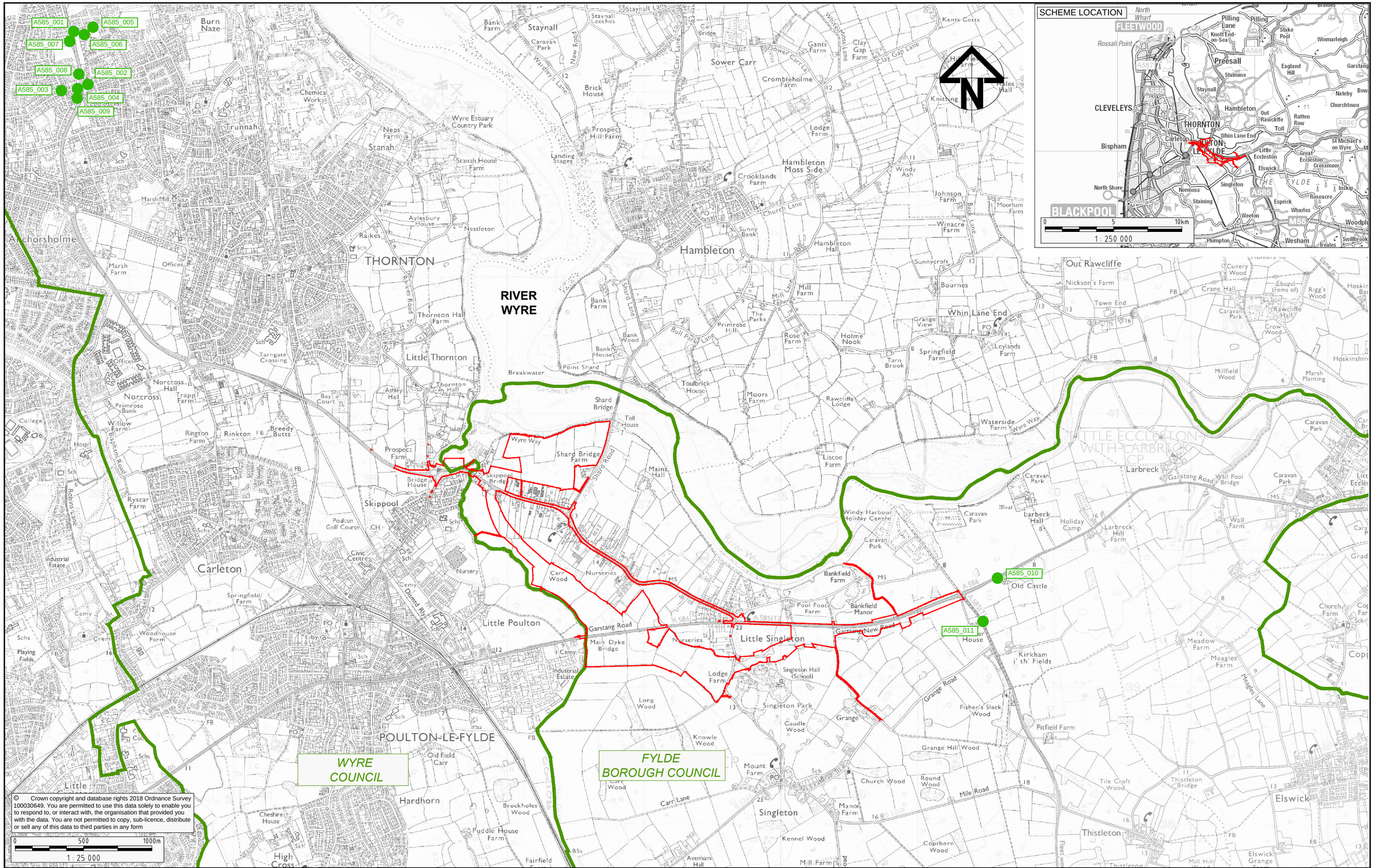
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P00	S8	OCT18	FINAL	JN	KB	NH

Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT REGULATION 5(2)(a) AIR QUALITY: AIR QUALITY MANAGEMENT AREAS AND MONITORING LOCATIONS

Status	S8 - DCO SUBMISSION
Revision	0
Scale	1:50 000 @ A3
Date	OCT 2018
Drawn By	J.NORMAN
Checked By	K.BURROWS
Approved By	N.HENDERSON
PINS No.	TR010035
	FIGURE 6.2
Drawing number	HE548643-A585-EAC-SZ_GN_000-DR-L-3008



KEY:

- Draft Order Limits
- Local Authority Boundary
- Highways England Diffusion Tube Locations

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P00	S8	OCT18	FINAL	JN	KB	NH

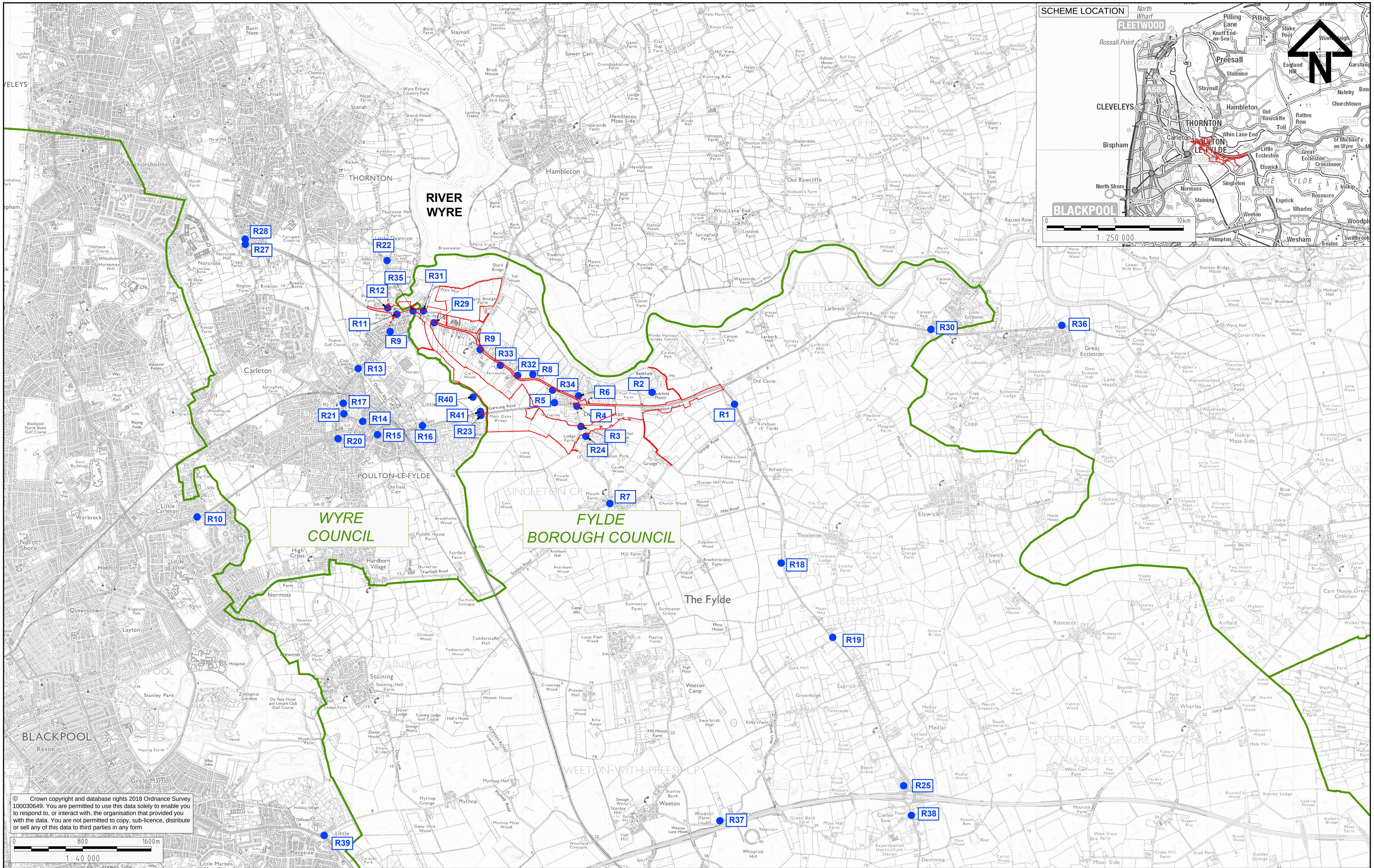
Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT REGULATION 5(2)(a) AIR QUALITY: HIGHWAYS ENGLAND AIR QUALITY MONITORING LOCATIONS

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:25 000 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 6.3

Drawing number (HE PIN | Originator | Volume | Location | Type | Role | Number): HE548643-A585-EAC-SZ_GN_000-DR-L-3009



KEY:

- Draft Order Limits
- Local Authority Boundary
- Representative Sensitive Receptor Locations

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P00	S8	OCT18	FINAL	JN	KB	NH

Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT REGULATION 5(2)(a) AIR QUALITY: AIR QUALITY REPRESENTATIVE SENSITIVE RECEPTOR LOCATIONS

Status	S8 - DCO SUBMISSION
Revision	0
Scale	1:40 000 @ A3
Date	OCT 2018
Drawn By	J.NORMAN
Checked By	K.BURROWS
Approved By	N.HENDERSON
PINS No.	TR010035
	FIGURE 6.4
Drawing number	HE548643-A585-EAC-SZ_GN_000-DR-L-3010