

VIRIDOR

**Proposed Development of a Waste
Treatment Plant, Lostock Gralam**

**Appendix 13.2
Assessment of Road Traffic
Emissions**

September 2009

DATE ISSUED: September 2009
JOB NUMBER: LE10104
REPORT NUMBER: 001

CLIENT'S REFERENCE:

Proposed Development of a Waste Treatment Plant, Lostock Gralam

Appendix 13.2 - Assessment of Road Traffic Emissions

PREPARED BY:

L Faulkner Environmental Scientist

C Meddings Environmental Scientist

APPROVED BY:

C M Dawson Technical Director

This report has been prepared by Wardell Armstrong LLP with all reasonable skill, care and diligence, within the terms of the Contract with the Client. The report is confidential to the Client and Wardell Armstrong LLP accept no responsibility of whatever nature to third parties to whom this report may be made known.

No part of this document may be reproduced without the prior written approval of Wardell Armstrong LLP.

CONTENTS

1. INTRODUCTION	1
2. ASSESSMENT METHODOLOGY.....	2
3. THE AIR QUALITY ASSESSMENT	7
4. RESULTS AND INTERPRETATION	14
5. CONCLUSIONS.....	17

APPENDICES

Appendix A	Results of the DMRB Assessment
Appendix B	Model Verification Procedure

DRAWINGS

LE10104/EIA/021A	DMRB Road Traffic Assessment Receptor Locations
------------------	---

1. INTRODUCTION

- 1.1 This report provides an assessment of the potential air quality impact of emissions from vehicle movements associated with the proposed development of a Waste Treatment Plant in Lostock Gralam, Cheshire.
- 1.2 This report has been prepared by Wardell Armstrong, on behalf of Viridor, as an appendix to the Environmental Statement, and should therefore be read in conjunction with the Environmental Statement (Volume 2), which will be submitted as part of the planning application together with a Supporting Statement (Volume 1) and a Design and Access Statement (Volume 3). Details of the proposed development are described in Chapter 4 of the Environmental Statement, Volume 2.
- 1.3 A separate report (Appendix 13.1, Volume 2) has been prepared to consider the generation of odour, ammonia, bioaerosols and dust from the site. Chapter 13 of the Environmental Statement assesses the potential impacts on air quality of the development proposals.

2. ASSESSMENT METHODOLOGY

Consultation and Proposed Scope

2.1.1 A Scoping Report was submitted to Cheshire West and Chester on 21st May 2009. A response was provided by the Environmental Health Officer and the following was requested as part of the air quality and odour assessments:

- Consideration be given to the inclusion of a housing development at the Old Wade Works Site;
- The air quality assessment should include current air pollution levels around the development site, details of potential sources of air pollutants as a result of the development activities, measurable changes (increase and/or decrease) to air pollution concentrations as a result of development activities, comparison of predicted changes in air pollution concentrations to current air quality standards; details of methodology/guidance used in the assessment of air quality impact and measures to address potential air quality issues where appropriate.

2.2 This air quality assessment addresses the possible changes in air pollutant concentrations which may be caused by additional vehicle movements to and from the proposed facility. Traffic data provided by Waterman Boreham Ltd confirms that changes in traffic flow will potentially occur on the routes surrounding the proposed site, including the A559 and the A530, as these routes will be used by vehicles to access the site.

2.3 The changes in emissions from traffic travelling along these routes are assessed at potentially sensitive locations using the method described in the Design Manual for Roads and Bridges (DMRB), Volume II, Section 3, Part 1, HA207/07, May 2007. Any changes in concentrations of the assessed pollutants are compared against a set of significance criteria and the air pollutant concentrations are also assessed against the relevant National Air Quality Objectives.

The UK National Air Quality Strategy and Air Quality Objectives

- 2.4 The objectives for the eight pollutants set out in the UK National Air Quality Strategy (1997 and amended in 2000) provide the basis of the implementation of Part IV of the Environment Act 1995. The Air Quality Strategy objectives for each pollutant, except ozone, have been given statutory status in the Air Quality (England) Regulations, 2000¹. The objectives have been amended by the Air Quality (England) (Amendment) Regulations 2002² ('the Regulations').
- 2.5 In 2007 the Air Quality Strategy was revised. This latest strategy³ does not remove any of the objectives set out in the previous strategy or its addendum, apart from replacing the provisional 2010 objective for PM₁₀ in England, Wales and Northern Ireland with the exposure reduction approach for PM_{2.5}.
- 2.6 The current Air Quality Standards and objectives as set out in the Air Quality (England) Regulations 2000 and Air Quality (England) (Amendment) Regulations 2002 are detailed in Table 13.1.

Table 13.1: Air Quality (England) Regulations 2000 and Air Quality (England) (Amended) Regulations 2002. Summary of Current Air Quality Standards and Objectives		
Substance	Air quality objective levels	Date to be achieved and maintained thereafter
Benzene	16.25 micrograms per cubic metre or less, when expressed as a running annual mean	31 December 2003
	5 micrograms per cubic metre or less, when expressed as an annual mean	31 December 2010
Polycyclic aromatic hydrocarbons	0.25 nanograms per cubic metre (ng/m ³) (B[a]P) as an annual average	31 December 2010
1,3 – Butadiene	2.25 micrograms per cubic metre or less, when expressed as a running annual mean	31 December 2003
Carbon monoxide	10 milligrams per cubic metre or less, when expressed as a maximum daily running 8	31 December 2003

¹ The Air Quality (England) Regulations 2000. SI No 928.

² The Air Quality (Amendment) Regulations 2002.

³ Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. July 2007.

	hour mean	
Lead	0.5 micrograms per cubic metre or less, when expressed as an annual mean	31 December 2004
	0.25 micrograms per cubic metre or less, when expressed as an annual mean	31 December 2008
Nitrogen dioxide	200 micrograms per cubic metre, when expressed as an hourly mean, not to be exceeded more than 18 times a year	31 December 2005
	40 micrograms per cubic metre, when expressed as an annual mean	31 December 2005
PM ₁₀	50 micrograms per cubic metre, when expressed as a 24 hour mean, not to be exceeded more than 35 times a year	31 December 2004
	40 micrograms per cubic metre or less, when expressed as an annual mean	31 December 2004
Sulphur dioxide	125 micrograms per cubic metre or less, when expressed as a 24 hour mean, not to be exceeded more than 3 times a year	31 December 2004
	350 micrograms per cubic metre or less, when expressed as an hourly mean, not to be exceeded more than 24 times a year	31 December 2004
	266 micrograms per cubic metre or less, when expressed as a 15 minute mean, not to be exceeded more than 35 times a year	31 December 2005

2.7 Examples of where the Air Quality Objectives should/should not apply are included in Table 13.2. This table is taken from Local Air Quality Management Technical Guidance document LAQM.TG (09)⁴.

Table 13.2: Examples of where the Air Quality Objectives should/should not apply		
Averaging Period	Objectives should apply at	Objectives should generally not apply at

⁴ Part IV of the Environment Act 1995: Local Air Quality Management Technical Guidance 2003.

Annual Mean	All background locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, libraries, etc.	Building facades of offices or other places of work where members of the public do not have regular access. Gardens of residential properties. Kerbside sites or any other location where public exposure is expected to be short term.
24 hour (daily) mean 8 hour mean	All locations where the annual mean objectives would apply Gardens of residential properties ¹	Kerbside sites, or any other location where public exposure is expected to be short term.
1 hour mean	All locations where the annual mean and 24 and 8-hour objectives apply. Kerbside sites (e.g. pavements of busy shopping streets) Those parts of car parks and railway stations etc. which are not fully enclosed. Any outdoor locations to which the public might reasonably be expected to have access.	Kerbside sites where public would not be expected to have regular access.
15 min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	
<p>¹ Such locations should represent parts of the garden where relevant public exposure is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure would occur at the extremities of the garden boundary, or in front gardens although local judgement should always be applied.</p>		

Local Air Quality Management Guidance

2.8 The Local Air Quality Management (LAQM) legislation in the Environment Act 1995 requires local authorities to conduct periodic reviews and assessments of air quality. Where a Detailed Assessment, undertaken as part of LAQM, indicates that any of the air quality objectives are likely to be exceeded, an Air Quality Management Area (AQMA) must be designated, or the geographical boundaries of an existing AQMA must be confirmed.

2.9 A rolling programme of Updating and Screening Assessment and Detailed Assessment based on a three-year cycle, with interim annual progress reporting, has been laid down by Defra in its TG/03 policy guidance (Defra 2003). For local authorities that identified the need for a more detailed assessment this needed to be completed by April 2007.

Chester West and Chester Council – Local Air Quality Review and Assessment.

2.10 Lostock Gralam originally fell under the jurisdiction of Vale Royal Borough Council which merged with Chester City Council and Ellesmere Port and Neston Borough Council in 2009 to form Chester West and Chester Council. Vale Royal Borough Council's 2007 progress report confirmed that no air quality management areas have been declared in the vicinity of the proposed site.

3. THE AIR QUALITY ASSESSMENT

- 3.1 This air quality assessment follows guidance contained in the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 HA 207/07, May 2007. DMRB contains a spreadsheet identified as “The Local Impacts Screening Method”. This spreadsheet has been used to predict air pollutant concentrations at the identified representative sensitive locations.
- 3.2 The DMRB Screening Method is not intended to provide an accurate forecast of air quality in the vicinity of a road. The method has been developed to indicate whether or not accurate forecasts are necessary, by determining approximate concentrations, in a simple and relatively straightforward way.
- 3.3 Existing sensitive receptor locations within 200m of the affected routes have been identified. The locations have been chosen due to their close proximity to the site and to the road links that are likely to experience the greatest change in traffic with the proposed development in place. At each receptor the change in air pollutant concentrations as a result of the proposed WTP have been assessed. Details of the existing sensitive receptor locations are given in Table 13.3. These thirteen locations are considered representative of those receptors likely to be most affected. The locations of the thirteen receptors are shown on Drawing Number LE10104EIA 021A.

Receptor	Details	Grid Reference of Receptor		Assessed Route	Distance from Receptor to Centre of Affected Route
		X	Y		
ESR1 (residential)	321 Manchester Road	368240	374610	Manchester Road West	12m
ESR2 (residential)	387 Manchester Road	368680	374780	Manchester Road East	2m
ESR3 (residential)	13 Griffiths Road	368620	374670	Griffiths Road	12m
ESR4 (residential)	1 Cottage Close	368290	373510	Griffiths Road South of Access	11m

ESR5 (residential)	323 Middlewich Road	368120	373310	Middlewich Road	12m
ESR6 (school)	Rudheath Community High School	367930	373340	Middlewich Road	25m
ESR7 (school)	Rudheath Community Primary School	368000	372750	A556 West	44m
ESR8 (residential)	25 Penny's Lane	368610	372940	Penny's Lane	7m

- 3.4 The traffic data required for the DMRB assessment (including HGV numbers and vehicle speeds) have been obtained from Waterman Boreham Ltd who have undertaken the traffic assessment works for the site. The roads considered in the assessment are A556, A559 Manchester Road, A530 Griffiths Road, Middlewich Road and Penny's Lane.
- 3.5 24 hour AADT traffic flows have been provided based on PM peak flow traffic vehicle movements, for the years 2007 (verification year), 2009 (base year) and 2019 (future assessment year). HGV percentages and vehicle speed limits have also been provided.
- 3.6 A traffic impact assessment has been carried out for the proposed development site, and air pollutant concentrations have been predicted for 'without development' and 'with development' for the future assessment year (2019). Predictions have been made for a total of four scenarios:
- Scenario 1: 2007 "Verification Year"
 - Scenario 2: 2009 "Base Year"
 - Scenario 3: 2019 "Without Development"
 - Scenario 4: 2019 "With Development"
- 3.7 The traffic flow information used in the DMRB assessment is included in Table 13.4. The percentage of heavy goods vehicles and speed limit information used in the DMRB assessment is also included in Table 13.4.

Table 13.4: Summary of Traffic Flow Information Provided by Waterman-Boreham Traffic Consultants. (Percentage of HGVs shown in brackets)

Road	Speed Limit (km/h)	Annual Average Daily Traffic Flows (based on PM Peak Vehicle Movements)			
		2007 (Verification Year)	2009 (Base Year)	2019 (Without Dev)	2019 (With Dev)
Manchester Road West	48	14903 (0.54)	15194 (0.54)	16557 (0.53)	16644 (0.53)
Manchester Road East	48	15703 (1.36)	16010 (1.36)	17476 (1.34)	17532 (1.34)
Griffiths Road at junction with Manchester Road	64	10647 (2.26)	10855 (2.26)	12072 (2.19)	12216 (1.34)
Griffiths Road north of access	64	10407 (1.92)	10610 (1.92)	11574 (1.9)	11718 (1.88)
Griffiths Road south of access	64	10500 (2.67)	10705 (2.67)	12066 (5.43)	12258 (6.04)
Kings Street	64	17238 (1.78)	17574 (1.78)	20409 (3.05)	20578 (3.39)
Middlewich Road	48	10100 (1.45)	10297 (1.45)	11841 (1.63)	11864 (1.7)
Penny's Lane	48	173 (7.69)	177 (7.69)	212 (16.04)	213 (15.97)
West of A556 roundabout	96	37010 (2.70)	37732 (2.70)	41218 (2.83)	41287 (2.89)
East of the A556 roundabout	96	36850 (3.55)	37569 (3.55)	41003 (3.74)	41051 (3.8)
A530	96	14436 (5.36)	14718 (5.36)	16371 (5.97)	16422 (6.1)

3.8 The 24 hour annual average daily traffic (AADT) flows shown in Table 13.4 have been growthed from PM peak hour flows. An increase in vehicle movements between without development and with development scenarios is shown along Manchester Road east and Manchester Road west. This increase in vehicle movements along Manchester Road will be mainly associated with staff movements. HGV movements associated with the proposed development will be routed to the south of the development and will not travel along Manchester Road. The procedure used to factor PM peak hour flows to 24 hour AADT flows provides an overestimation of the increases in traffic flows. This allows a robust assessment to be made of any potential impacts to air quality associated with road traffic emissions.

3.9 The predicted air pollutant concentrations are assessed against the air quality objectives shown in Table 13.1. The changes in the concentrations of NO₂ and PM₁₀ are also evaluated against the air quality significance criteria contained in Tables

13.7 and 13.8. Only NO₂ and PM₁₀ have been assessed as these are the pollutants most likely to exceed the objectives.

Model Verification

- 3.10 Where possible model verification is undertaken because models will contain a degree of error. DMRB requires verification of predicted results using monitoring data to reduce the potential for errors.
- 3.11 The local authority is currently monitoring NO₂ using diffusion tubes in Lostock Gralam. The most representative of these tubes (local authority reference 20) has been used to verify the DMRB model for NO₂ as it is situated on Manchester Road and is therefore considered representative of the receptor locations considered. The diffusion tube information used in the verification procedure is shown in Table 13.5. Full details of the model verification procedure can be found in Appendix B.

Tube Reference	Site	Type of Site	2007 Annual Mean NO₂ Concentration (Bias Adjusted) (µgm⁻³)
20	321 Manchester Road	Roadside	38.2

- 3.12 PM₁₀ has not been verified as there is no representative monitoring data available for the area of the assessment. Therefore all PM₁₀ concentrations are uncorrected.

Background Air Pollutant Concentrations

- 3.13 DMRB states that for local impact assessments it is necessary to specify background concentrations upon which the local, traffic-derived pollution is superimposed. These may be through local long term, ambient measurements at background sites, remote from immediate sources of pollution. As an alternative to measured background levels, DMRB recommends the use of background concentrations obtained from default concentration maps, which have been prepared for use with the revised LAQM. TG(09) guidance.
- 3.14 Background pollutant data has been obtained for the most representative 1km grid square for each receptor. These backgrounds have been corrected for future years in accordance with the revised guidance in LAQM. TG(09) using the associated air quality tools available from the Air Quality Archive (<http://www.airquality.co.uk>) as

shown in Table 13.6. No local authority background concentration data was available for this location for use in the air quality assessment.

Receptors	2007 (μgm^{-3})			2009 (μgm^{-3})			2019 (μgm^{-3})		
	NO _x	NO ₂	PM ₁₀	NO _x	NO ₂	PM ₁₀	NO _x	NO ₂	PM ₁₀
ESR 1-3	24.65	18.64	14.90	22.92	17.54	14.55	17.76	14.12	13.80
ESR 4-5	21.15	16.44	14.72	19.23	15.16	14.35	13.49	11.10	13.56
ESR 6	21.25	16.48	14.89	19.21	15.12	14.52	13.57	11.14	13.83
ESR 7-8	21.77	16.87	14.54	19.69	15.48	14.17	13.12	10.83	13.26

- 3.15 In accordance with information provided by the UK National Air Quality Archive⁵ the background NO_x and NO₂ values have been entered as zero in the DMRB model provide road concentrations of the pollutants. These values along with the background concentrations were then inputted into the updated⁶ NO_x to NO₂ calculator provided by the UK National Air Quality Archive.

Air Quality Significance Criteria

- 3.16 The detailed significance criteria for assessing the air quality impacts for nitrogen dioxide and fine particulates (PM₁₀) are shown in Tables 13.7 and 13.8 respectively. The criteria relate to NO₂ and PM₁₀ only as these are the pollutants most likely to exceed the air quality objectives.

Air Quality Significance Criteria	Annual Mean Nitrogen Dioxide (NO₂)
Major Adverse	WITH development results in an <i>increase</i> in concentrations over WITHOUT development concentrations of greater than 1 μgm^{-3} or 2.5%; where WITHOUT development concentrations are predicted to exceed the 40 μgm^{-3} objective limit value; Or WITH development results in <i>increases</i> in concentrations greater than 1 μgm^{-3} or

⁵ Guidance on Running the DMRB Screening Model – Air Quality Archive Website www.airquality.co.uk 15th April 2009

⁶ Based on the report 'Deriving NO₂ from NO_x for Air Quality Assessment of Roads – Updated to 2006,' Air Quality Consultants.

	<p>2.5% that are predicted to cause exceedance of the 40 μgm^{-3} objective limit value; where WITHOUT development concentrations are NOT predicted to exceed 40 μgm^{-3} objective limit value;</p> <p>Or</p> <p>WITH development results in an <i>increase</i> in concentrations over WITHOUT development greater than 25%</p>
Moderate Adverse	<p>WITH development results in <i>increases</i> in concentrations greater than 1 μgm^{-3} or 2.5% that are predicted to cause exceedance of the 34 μgm^{-3} confidence level, but actual concentration is less than 40 μgm^{-3} objective limit value, where WITHOUT development concentrations are NOT predicted to exceed the 34 μgm^{-3} confidence level;</p> <p>Or</p> <p>WITH development results in an <i>increase</i> in concentrations over WITHOUT development concentrations of less than 1 μgm^{-3} or 2.5%; where WITHOUT development concentrations are predicted to exceed the 40 μgm^{-3} objective limit value;</p> <p>Or</p> <p>WITH development results in an <i>increase</i> in concentrations over WITHOUT development of greater than 10% but less than 25%</p>
Minor Adverse	WITH development results in an <i>increase</i> in concentrations over WITHOUT development concentrations of greater than 1 μgm^{-3} or 2.5% but less than 10%
No significance/ insignificant	WITH development results in a <i>change</i> in concentrations over WITHOUT development concentrations of less than 1 μgm^{-3} or 2.5%
Minor beneficial	WITH development results in a <i>decrease</i> in concentrations over WITHOUT development concentrations of greater than 1 μgm^{-3} or 2.5% but less than 10%
Moderate beneficial	WITH development results in a <i>decrease</i> in concentrations over WITHOUT development concentrations of greater than 10% but less than 25%
Major beneficial	WITH development results in a <i>decrease</i> in concentrations over WITHOUT development concentrations of greater than 25%

Air Quality Significance Criteria	Annual Mean Particulate Matter (PM₁₀)
Major Adverse	<p>WITH development results in an <i>increase</i> in concentrations over WITHOUT development concentrations of greater than 1 μgm^{-3} or 2.5%; where WITHOUT development concentrations are predicted to exceed the 40 μgm^{-3} objective limit value;</p> <p>Or</p> <p>WITH development results in <i>increases</i> in concentrations greater than 1 μgm^{-3} or 2.5% that are predicted to cause exceedance of the 40 μgm^{-3} objective limit value; where WITHOUT development concentrations are NOT predicted to exceed 40 μgm^{-3} objective limit value;</p>

	<p>Or</p> <p>WITH development results in an <i>increase</i> in concentrations over WITHOUT development greater than 25%</p>
Moderate Adverse	<p>WITH development results in <i>increases</i> in concentrations greater than 1 $\mu\text{g}\text{m}^{-3}$ or 2.5% that are predicted to cause exceedance of the 31 $\mu\text{g}\text{m}^{-3}$ confidence level, but actual concentration is less than 40 $\mu\text{g}\text{m}^{-3}$ objective limit value, where WITHOUT development concentrations are NOT predicted to exceed the 31 $\mu\text{g}\text{m}^{-3}$ confidence level;</p> <p>Or</p> <p>WITH development results in an <i>increase</i> in concentrations over WITHOUT development concentrations of less than 1 $\mu\text{g}\text{m}^{-3}$ or 2.5%; where WITHOUT development concentrations are predicted to exceed the 40 $\mu\text{g}\text{m}^{-3}$ objective limit value;</p> <p>Or</p> <p>WITH development results in an <i>increase</i> in concentrations over WITHOUT development of greater than 10% but less than 25%</p>
Minor Adverse	<p>WITH development results in an <i>increase</i> in concentrations over WITHOUT development concentrations of greater than 1 $\mu\text{g}\text{m}^{-3}$ or 2.5% but less than 10%</p>
No significance/ insignificant	<p>WITH development results in a <i>change</i> in concentrations over WITHOUT development concentrations of less than 1 $\mu\text{g}\text{m}^{-3}$ or 2.5%</p>
Minor beneficial	<p>WITH development results in a <i>decrease</i> in concentrations over WITHOUT development concentrations of greater than 1 $\mu\text{g}\text{m}^{-3}$ or 2.5% but less than 10%</p>
Moderate beneficial	<p>WITH development results in a <i>decrease</i> in concentrations over WITHOUT development concentrations of greater than 10% but less than 25%</p>
Major beneficial	<p>WITH development results in a <i>decrease</i> in concentrations over WITHOUT development concentrations of greater than 25%</p>

4. RESULTS AND INTERPRETATION

4.1 The results of the DMRB assessment for all pollutants, calculated at existing sensitive receptors 1 to 8, are included in Appendix A attached to this report. The results for NO₂, as corrected concentrations, and PM₁₀, as uncorrected concentrations, for 2009 and 2019 are included in Table 13.9.

Table 13.9: DMRB Modelled Results for NO₂ (corrected) and PM₁₀ (uncorrected) for Existing Sensitive Receptors 1 to 8.			
	2009 Base Year	2019 Without Dev	2019 With Dev
ESR 1			
NO ₂ Annual Mean µgm ⁻³	32.28	26.33	26.33
PM ₁₀ Annual Mean µgm ⁻³	16.02	14.66	14.66
ESR 2			
NO ₂ Annual Mean µgm ⁻³	37.04	29.72	29.72
PM ₁₀ Annual Mean µgm ⁻³	16.31	14.85	14.85
ESR 3			
NO ₂ Annual Mean µgm ⁻³	30.82	25.03	24.60
PM ₁₀ Annual Mean µgm ⁻³	15.71	14.50	14.42
ESR 4			
NO ₂ Annual Mean µgm ⁻³	29.46	25.48	26.23
PM ₁₀ Annual Mean µgm ⁻³	15.56	14.33	14.36
ESR 5			
NO ₂ Annual Mean µgm ⁻³	26.86	21.54	21.62
PM ₁₀ Annual Mean µgm ⁻³	15.53	14.23	14.23
ESR 6			
NO ₂ Annual Mean µgm ⁻³	23.35	18.47	18.55
PM ₁₀ Annual Mean µgm ⁻³	15.09	14.30	14.30
ESR 7			
NO ₂ Annual Mean µgm ⁻³	32.15	23.75	23.87

PM ₁₀ Annual Mean μgm^{-3}	15.36	14.17	14.17
ESR 8			
NO ₂ Annual Mean μgm^{-3}	16.07	11.30	11.30
PM ₁₀ Annual Mean μgm^{-3}	14.20	13.28	13.28

- 4.2 The modelled NO₂ results from DMRB have been adjusted to take into consideration roadside NO_x as NO₂ concentrations using the updated⁷ NO_x to NO₂ calculator provided by the UK National Air Quality Archive and corrected using the method detailed in TG09. PM₁₀ results are not corrected as no representative monitoring data is available for the assessment area. Uncorrected NO₂ and PM₁₀ modelled results are shown in Appendix A.
- 4.3 The predicted DMRB results for the existing sensitive receptor locations, shown in Table 13.9, show that NO₂ and PM₁₀ concentrations for 2009 (base year), 2019 (without and with development scenarios) are not predicted to exceed the NO₂ and PM₁₀ annual mean objective of 40 μgm^{-3} for both pollutants.
- 4.4 Concentration changes and percentage differences for both NO₂ and PM₁₀ concentrations for without development and with development scenarios for 2019 are shown in Table 13.10.

Table 13.10 - Differences in Annual Mean Concentrations for PM₁₀ and NO₂		
Receptor	2019 “without” and “with development”	
	Difference (μgm^{-3})	% Change
NO₂ Annual Mean		
ESR 1	0.00	0.00%
ESR 2	0.00	0.00%
ESR 3	-0.43	-1.76%
ESR 4	+0.75	+2.85%
ESR 5	+0.08	+0.36%
ESR 6	+0.08	+0.42%
ESR 7	+0.12	+0.50%
ESR 8	0.00	0.00%

⁷ Based on the report ‘Deriving NO₂ from NO_x for Air Quality Assessment of Roads – Updated to 2006,’ Air Quality Consultants.

PM₁₀ Annual Mean		
ESR 1	0.00	0.00%
ESR 2	0.00	0.00%
ESR 3	-0.08	-0.55%
ESR 4	+0.03	+0.21%
ESR 5	0.00	0.00%
ESR 6	0.00	0.00%
ESR 7	0.00	0.00%
ESR 8	0.00	0.00%

- 4.5 The DMRB assessment shows that the proposed WTP will increase NO₂ concentrations at receptor locations 4, 5, 6 and 7 in 2019. With the exception of receptor 4 all of the increases are significantly less than 1µg⁻³ or 2.5%, and therefore considered to be insignificant in accordance with the criteria detailed in Tables 13.7 and 13.8.
- 4.6 At receptor 4 an increase in the NO₂ concentrations slightly over 2.5% is experienced and this would therefore be considered to be a minor adverse impact in accordance with the criteria detailed in Tables 13.7 and 13.8. However the increase, between without and with development scenarios, is less than 1µg and significantly below the air quality objective. An increase in PM₁₀ concentration is also experienced at this receptor although this is below 1µg or 2.5% and therefore considered insignificant.
- 4.7 The decrease in NO₂ and PM₁₀ concentrations experienced at ESR 3 is due to a decrease in HGV percentages along Griffiths Road.
- 4.8 No changes in NO₂ concentration are experienced at receptors 1, 2 and 8. No change in PM₁₀ concentrations are experienced at receptors 1, 2, 5, 6, 7 and 8.

5. CONCLUSIONS

- 5.1 Using traffic flows for 2007, 2009 and 2019, default background concentration maps and the procedures outlined in DMRB, air quality predictions have been carried out at eight existing sensitive receptors located adjacent to those routes most likely to be affected by vehicles travelling to and from the site.
- 5.2 The results of the air quality assessment indicate that one minor adverse impact will be experienced at one receptor location in terms of NO₂ concentration change between without development and with development scenarios in 2019. Changes in NO₂ and PM₁₀ concentrations between without development and with development scenarios in 2019 for all other receptors are considered not significant.
- 5.3 The current air quality objectives for all pollutants considered will not be exceeded at any of the assessed receptor locations in 2009 or 2019. It is therefore not necessary to recommend further detailed air quality assessment works to consider potential road traffic emissions. In turn it is not necessary to recommend any mitigation measures in respect of road traffic emissions.



Wardell Armstrong
Engineering & Environmental Solutions