

# **High Speed Rail (Crewe – Manchester)**

## **Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

### **Volume 5: Appendix AQ-001-0MA02**

#### **Air quality**

Air quality report

MA02: Wimboldsley to Lostock Gralam

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Air quality report

MA02: Wimboldsley to Lostock Gralam



## Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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# Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	Structure of this appendix	3
1.2	Scope, methodology, data sources, assumptions and limitations	4
<b>2</b>	<b>Construction dust assessment</b>	<b>5</b>
<b>3</b>	<b>Assessment of road traffic emissions</b>	<b>6</b>
3.1	Overview	6
3.2	Model verification	6
3.3	Assessment of construction traffic emissions	8
3.4	Assessment of operational traffic emissions	22
<b>Tables</b>		
	Table 1: Comparison of monitored and modelled NO <sub>2</sub> concentrations	6
	Table 2: Comparison of monitored and adjusted modelled NO <sub>2</sub> concentrations	7
	Table 3: Modelled receptors and background concentrations (construction phase)	8
	Table 4: Modelled ecological receptor backgrounds, APIS data and critical loads (construction phase)	9
	Table 5: Modelled ecological receptor acid deposition backgrounds, APIS data and critical loads (construction phase)	9
	Table 6: Comparison of impact descriptors for annual mean NO <sub>2</sub> concentrations across construction scenarios	10
	Table 7: Predicted annual mean NO <sub>2</sub> concentrations and impacts (construction phase)	12
	Table 8: Predicted annual mean PM <sub>10</sub> concentrations and impacts (construction phase)	14
	Table 9: Predicted annual mean PM <sub>2.5</sub> concentrations and impacts (construction phase)	16
	Table 10: Predicted annual mean of NO <sub>x</sub> concentrations at ecological sites (construction phase)	18
	Table 11: Assessment of N deposition at ecological sites (construction phase)	19
	Table 12: Assessment of acid deposition at ecological sites (construction phase)	20
	Table 13: Modelled human receptors and background concentrations (operational phase)	23
	Table 14: Predicted annual mean NO <sub>2</sub> concentrations and impacts (operation phase)	24
	Table 15: Predicted annual mean PM <sub>10</sub> concentrations and impacts (operation phase)	25

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Table 16: Predicted annual mean PM<sub>2.5</sub> concentrations and impacts (operation phase) 27

# 1 Introduction

## 1.1 Structure of this appendix

- 1.1.1 This report is an appendix to the air quality assessment which forms part of Volume 5 of the Supplementary Environmental Statement 1 (SES1) and Additional Provision 1 Environmental Statement (AP1 ES) for the Wimboldsley to Lostock Gralam area (MA02).
- 1.1.2 This appendix provides details of changes to the air quality assessment since the High Speed Two (HS2) High Speed Rail (Crewe – Manchester) Environmental Statement (ES)<sup>1</sup> published in 2022 (the main ES).
- 1.1.3 This report is structured into two parts: Part 1 – SES1 and Part 2 – AP1 ES. This report should be read in conjunction with Volume 5, Appendix: AQ-001-0MA02, which accompanied the main ES.
- 1.1.4 In order to differentiate between the original proposals assessed as part of the main ES and subsequent changes, the following terms are used:
- ‘the original scheme’ – the Bill scheme submitted to Parliament in January 2022, which was assessed in the main ES;
  - ‘the SES1 scheme’ – the original scheme with the changes described in SES1 that are within the existing powers of the Bill; and
  - ‘the AP1 revised scheme’ – the original scheme as amended by the SES1 changes and AP1 amendments.
- 1.1.5 Maps relevant to this appendix are contained in the SES1 and AP1 ES, Volume 5, Air quality Map Book: Map Series AQ-01.
- 1.1.6 In addition, the traffic data used for the air quality assessment is set out in Background Information and Data (BID) which accompanies the SES1 and AP1 ES (see BID AQ-002-0MA02 SES1 and AP1 ES)<sup>2</sup>.
- 1.1.7 Where it has been possible to differentiate the air quality assessment between the SES1 changes and the AP1 amendments, this has been done and presented in this report.

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<sup>1</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

<sup>2</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, Additional data used in the air quality assessment*, BID AQ-002-0MA02 SES1 and AP1 ES. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>.

However, the assessment of road traffic emissions is a combined assessment of both SES1 changes and AP1 amendments in this area.

## 1.2 Scope, methodology, data sources, assumptions and limitations

1.2.1 The assessment scope, key assumptions and limitations are as set out in the main ES Environmental Impact Assessment Scope and Methodology Report (SMR)<sup>3</sup> (see main ES Volume 5, Appendix: CT-001-00001).

1.2.2 The air quality standards for this assessment are:

- $40\mu\text{g}/\text{m}^3$  as an annual mean for nitrogen dioxide ( $\text{NO}_2$ ) and fine particulate matter ( $\text{PM}_{10}$ );
- $200\mu\text{g}/\text{m}^3$  one-hour mean  $\text{NO}_2$  concentrations, not to be exceeded more than 18 times a year (equivalent to the 99.8<sup>th</sup> percentile of the one-hour mean);
- $50\mu\text{g}/\text{m}^3$  24-hour mean  $\text{PM}_{10}$  concentrations, not to be exceeded more than 35 times a year (equivalent to the 90.4<sup>th</sup> percentile of the 24-hour mean); and
- $20\mu\text{g}/\text{m}^3$  as an annual mean for very fine particulate matter ( $\text{PM}_{2.5}$ ).

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<sup>3</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Report*, Volume 5, Appendix: CT-001-00001. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

## **2 Construction dust assessment**

- 2.1.1 There are no changes to the reported data in the main ES for any of the design elements for the assessment of dust emissions during construction of the AP1 revised scheme.



## 3 Assessment of road traffic emissions

### 3.1 Overview

3.1.1 This section provides details of the assessment of road traffic emissions during construction of the AP1 revised scheme. The assessment considers the combined effects of SES1 changes and AP1 amendments in this area.

### 3.2 Model verification

3.2.1 Since the main ES, additional traffic information has been collected, as well as further information relating to local junction modelling. As a result of this, revised traffic data for the baseline year of 2018 has become available. The model verification has therefore been updated to take account of this revised baseline traffic data.

3.2.2 Model verification was undertaken on a route-wide basis where monitoring sites are located adjacent to the modelled road network. The objectives of the model verification are to evaluate model performance and to determine if model adjustment is required.

3.2.3 Some monitoring locations were not considered suitable for model verification, due to missing traffic or monitoring data, or other spatial considerations. A total of 19 monitoring sites, spread across both Hough to Walley's Green (MA01) and Wimboldsley to Lostock Gralam areas (MA02), were included in the verification exercise. The comparison of monitored and modelled NO<sub>2</sub> concentrations is shown in Table 1.

**Table 1: Comparison of monitored and modelled NO<sub>2</sub> concentrations**

Site	Monitored concentration (µg/m <sup>3</sup> )	Modelled concentration (µg/m <sup>3</sup> )	Difference ((modelled-monitored/monitored)*100)
MA01.1	28.0	13.9	-50.3%
MA01.2	38.8	23.7	-39.0%
MA01.3	31.5	18.6	-40.8%
MA01.8	34.3	19.6	-42.7%
MA01.9	32.7	21.8	-33.4%
MA01.15	34.9	18.9	-45.9%
MA01.17	26.9	16.8	-37.7%
MA01.18	32.6	16.6	-49.2%
MA02.19	28.2	16.3	-42.4%
MA02.20	35.6	21.9	-38.4%
MA02.21	48.5	30.6	-36.9%
MA02.22	25.4	17.1	-32.5%
MA02.23	35.1	16.4	-53.3%
MA02.30	39.5	19.1	-51.5%

## Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Site	Monitored concentration ( $\mu\text{g}/\text{m}^3$ )	Modelled concentration ( $\mu\text{g}/\text{m}^3$ )	Difference ((modelled-monitored/monitored)*100)
MA02.33	31.2	19.2	-38.5%
MA02.35	36.7	18.4	-49.9%
MA02.41	32.0	21.1	-33.9%
MA02.42	38.0	21.3	-44.0%
MA02.43	31.7	21.2	-33.1%

3.2.4 As nearly all the modelled  $\text{NO}_2$  concentrations were greater than  $\pm 25\%$  of the monitored concentrations, and there was systematic under prediction, model adjustment was undertaken. Two adjustment factors were calculated: a factor of 2.2 for locations covered by the Northwich transport model (which includes Moulton, Northwich, Lach Dennis, Lostock Gralam and Wincham); and a factor of 2.6 for locations covered by the Crewe and Winsford transport models (which include Crewe, Middlewich and Winsford). An additional adjustment factor of 1.5 was used for locations covered by the M6 J19 transport model, as presented in SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA03. Modelled concentrations of  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  have not been adjusted. The comparison of monitored and adjusted modelled  $\text{NO}_2$  concentrations is shown in Table 2.

**Table 2: Comparison of monitored and adjusted modelled  $\text{NO}_2$  concentrations**

Site	Monitored concentration ( $\mu\text{g}/\text{m}^3$ )	Modelled adjusted concentration ( $\mu\text{g}/\text{m}^3$ )	Percent difference (modelled - monitored/monitored)
MA01.1	28.0	21.2	-24.3%
MA01.2	38.8	45.1	16.4%
MA01.3	31.5	29.0	-7.7%
MA01.8	34.3	30.8	-10.1%
MA01.9	32.7	35.8	9.4%
MA01.15	34.9	29.7	-15.0%
MA01.17	26.9	25.5	-5.0%
MA01.18	32.6	24.9	-23.8%
MA02.19	28.2	24.0	-15.0%
MA02.20	35.6	35.4	-0.3%
MA02.21	48.5	51.3	5.8%
MA02.22	25.4	26.0	2.4%
MA02.23	35.1	28.1	-20.0%
MA02.30	39.5	39.5	0.0%
MA02.33	31.2	32.9	5.5%
MA02.35	36.7	31.2	-15.1%
MA02.41	32.0	33.2	3.7%
MA02.42	38.0	32.9	-13.5%
MA02.43	31.7	39.1	23.2%

### 3.3 Assessment of construction traffic emissions

- 3.3.1 The assessment of construction traffic emissions has used traffic data based on an estimate of the average daily flows in the peak year during the construction period (2025 – 2037). However, vehicle emissions and background concentrations have been taken for the first construction year in 2025. Three construction scenarios have been assessed for air quality to capture peak construction traffic activity at different times in the construction period. It has been assumed that the changes in construction traffic will occur for the whole year. In some cases, this is a conservative approach, as the duration of the peak traffic flows may well be much shorter. These scenarios have been assessed against the relevant future baseline case without the AP1 revised scheme.
- 3.3.2 Traffic data in the study area have been screened to identify roads that require further assessment and to confirm the likely effect of the change in emissions from vehicles using these roads during construction of the AP1 revised scheme.
- 3.3.3 Traffic data for construction vehicles using the site haul routes and moving between compounds have also been included in the assessment. Additional roads have also been included in the assessment where relevant to account for their emissions at nearby receptors.

### Receptors assessed and background concentrations

- 3.3.4 Details of the assessed receptors and the background concentrations used in the assessment remain as reported within the main ES Volume 5, Appendix: AQ-001-0MA02. There were eight human receptors modelled in the main ES that have not been modelled as part of the AP1 revised scheme and 11 receptors have been added due to changes in the study area. The additional human receptors and background concentrations are shown in Table 3.
- 3.3.5 One designated ecological receptor, Wettenhall and Darnhall Woods Site of Special Scientific Interest (SSSI), was identified within 200m of the screened in roads within the Wimboldsley to Lostock Gralam area (MA02) during construction of the AP1 revised scheme.
- 3.3.6 Table 4 shows the background concentrations for NO<sub>x</sub>, background nitrogen deposition and critical loads. Table 5 shows the background acid deposition and critical loads. Acid deposition was not previously considered in the main ES.

**Table 3: Modelled receptors and background concentrations (construction phase)**

Receptor	Description/location	Ordnance Survey coordinates	Background concentrations in 2025 (µg/m <sup>3</sup> )			
			NO <sub>x</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
02-C-H039	Middlewich Road, Knutsford	373787, 373515	13.4	10.3	11.2	7.1

Receptor	Description/location	Ordnance Survey coordinates	Background concentrations in 2025 ( $\mu\text{g}/\text{m}^3$ )			
			NOx	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
02-C-H040	Holmes Chapel Road, Knutsford	375803, 376620	9.4	7.4	9.9	6.2
02-C-H041	A54 Middlewich Road, Winsford	367749, 366003	11.9	9.1	9.7	6.4
02-C-H042	A530 Chester Road, Middlewich	369784, 366481	9.9	7.7	10.0	6.5
02-C-H043	A533, Static Trailer Bay	366684, 369849	9.0	7.0	9.9	6.2
02-C-H044	B5082, Holmes Chapel Road, Lach Dennis	370473, 372047	8.7	6.8	9.4	5.9
02-C-H045	Shurlach Road, Northwich	367801, 372665	12.8	9.7	10.5	6.8
02-C-H046	B5082, Middlewich Road	367352, 373567	10.9	8.4	10.2	6.8
02-C-H047	B5075 Ollershaw Lane, Marston	367026, 375107	11.1	8.5	10.3	6.2
02-C-H048	A530 Nantwich Rd, Middlewich	369952, 366351	9.9	7.7	10.0	6.5
02-C-H049	A530 Nantwich Rd, Middlewich	369949, 366349	9.9	7.7	10.0	6.5

**Table 4: Modelled ecological receptor backgrounds, APIS data and critical loads (construction phase)**

Receptor	Sensitive habitat	2025 NOx background concentration ( $\mu\text{g}/\text{m}^3$ )	APIS data <sup>4</sup> of average total N deposition (kg N/ha/yr)	Critical load (kg N/ha/yr)
Wettenhall and Darnhall Woods SSSI	Deciduous woodland	7.1	53.4	10

**Table 5: Modelled ecological receptor acid deposition backgrounds, APIS data and critical loads (construction phase)**

Receptor	Sensitive habitat	APIS data of average total acid deposition (k eq/ha/yr)	Critical load (k eq/ha/yr) (min)	Critical load (k eq/ha/yr) (max)
Wettenhall and Darnhall Woods SSSI	Deciduous woodland	3.8	0.1	0.4

## Assessment results

3.3.7 Table 6 presents the predicted NO<sub>2</sub> impacts across all assessed scenarios for each assessed receptor. All impacts are predicted to be negligible for PM<sub>10</sub> and PM<sub>2.5</sub> concentrations. Table 7 to Table 9 provide the summary of the modelled pollutant concentrations at the assessed receptors for the worst case construction traffic scenarios. The magnitude of change and impact descriptor are also provided along with a comparison against the main ES. Table 10

<sup>4</sup> UK Centre for Ecology and Hydrology (2021), *Air Pollution Information System*. Available online at: <http://www.apis.ac.uk/>.

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**  
**SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02**  
 Air quality  
 MA02  
 Air quality report

to Table 12 provide the summary of the ecological receptors for the worst case construction traffic scenarios.

**Table 6: Comparison of impact descriptors for annual mean NO<sub>2</sub> concentrations across construction scenarios**

Receptor	Impact descriptors for annual mean NO <sub>2</sub> concentrations		
	Scenario 1	Scenario 2	Scenario 3
02-C-H001	Negligible	Negligible	-
02-C-H002	Negligible	Negligible	-
02-C-H003	Negligible	Negligible	-
02-C-H004	Negligible	Negligible	-
02-C-H005	Negligible	Negligible	-
02-C-H007	Negligible	Negligible	-
02-C-H010	Negligible	Negligible	-
02-C-H011	Slight adverse	Slight adverse	-
02-C-H012	Negligible	Negligible	-
02-C-H013	Negligible	Negligible	-
02-C-H014	Negligible	Negligible	-
02-C-H015	Negligible	Negligible	-
02-C-H016	Negligible	Negligible	-
02-C-H018	Negligible	Negligible	-
02-C-H019	Negligible	Negligible	-
02-C-H020	Negligible	Negligible	-
02-C-H021	Negligible	Negligible	-
02-C-H022	Negligible	-	Negligible
02-C-H024	Negligible	-	Slight adverse
02-C-H025	Negligible	-	Negligible
02-C-H026	Negligible	-	Negligible
02-C-H027	Negligible	-	Moderate beneficial
02-C-H028	Negligible	-	Negligible
02-C-H030	Negligible	-	Negligible
02-C-H031	Negligible	-	Negligible
02-C-H033	Negligible	-	Negligible
02-C-H034	Negligible	Negligible	-
02-C-H035	Negligible	Negligible	Negligible
02-C-H037	Negligible	Negligible	Negligible
02-C-H038	Negligible	Slight beneficial	Negligible
02-C-H039*	Negligible	Negligible	Negligible
02-C-H040*	Negligible	Negligible	Negligible
02-C-H041*	Negligible	Negligible	-
02-C-H042*	Negligible	Negligible	-

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Impact descriptors for annual mean NO <sub>2</sub> concentrations		
	Scenario 1	Scenario 2	Scenario 3
02-C-H043*	Negligible	-	Negligible
02-C-H044*	Negligible	-	Negligible
02-C-H045*	Negligible	-	Negligible
02-C-H046*	Negligible	-	Negligible
02-C-H047*	Negligible	-	Negligible
02-C-H048*	Moderate adverse	Moderate adverse	-
02-C-H049*	Slight adverse	Slight adverse	-

Note: \* Indicates that the receptor is new to the SES1 and AP1 ES

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

**Table 7: Predicted annual mean NO<sub>2</sub> concentrations and impacts (construction phase)**

Receptor	Description/location	NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )		Change in NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
02-C-H001	A530 Wimboldsley Primary, Nantwich Road A530, Wimboldsley	20.0	20.0	< 0.1	Negligible	Negligible	Not significant
02-C-H002	B5074 Swanlow Lane, Winsford	17.7	19.7	2.0	Negligible	Slight adverse	Not significant
02-C-H003	A533 Booth Lane, Moston	13.3	13.3	< 0.1	Negligible	Negligible	Not significant
02-C-H004	Durham Drive, Winsford	9.3	10.9	1.6	Negligible	Slight adverse	Not significant
02-C-H005	Clive Green Lane, Stanthorne	15.5	15.5	< 0.1	Negligible	Slight adverse	Not significant
02-C-H007	Heritage Rise, Winsford	15.5	15.7	0.2	Negligible	Negligible	Not significant
02-C-H010	A54 Kinderton Street, Middlewich	29.4	29.2	-0.2	Negligible	Slight adverse	Not significant
02-C-H011	Pinfold Lane, Middlewich	29.3	30.7	1.4	Slight adverse	Slight adverse	Not significant
02-C-H012	A54 Kinderton Street, Middlewich	26.6	26.7	0.1	Negligible	Negligible	Not significant
02-C-H013	Over Fair Close, Winsford	16.8	17.7	0.9	Negligible	Negligible	Not significant
02-C-H014	A54 Holmes Chapel Road, Middlewich	28.4	27.4	-1.0	Negligible	Negligible	Not significant
02-C-H015	Middlewich Road, Stanthorne	13.7	13.7	< 0.1	Negligible	Negligible	Not significant
02-C-H016	A54 Holmes Chapel Road, Sproston	23.7	24.4	0.7	Negligible	Negligible	Not significant
02-C-H018	Road One, Winsford	15.7	16.7	1.0	Negligible	Negligible	Not significant
02-C-H019	Bostock Road, Bostock	11.7	12.9	1.2	Negligible	Negligible	Not significant
02-C-H020	A530 King Street, Byley	25.6	25.6	< 0.1	Negligible	Negligible	Not significant
02-C-H021	A530 King Street, Whatcroft	25.2	25.2	< 0.1	Negligible	Negligible	Not significant
02-C-H022	Davenham Road, Northwich	10.6	11.2	0.6	Negligible	Negligible	Not significant
02-C-H024	B5082 Pennys Lane, Lach Dennis	13.0	15.2	2.2	Slight adverse	Negligible	Not significant
02-C-H025	Tudor Close, Rudheath	30.7	31.1	0.4	Negligible	Negligible	Not significant

## Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )		Change in NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
02-C-H026	Land Adjacent, A556, Birches Lane, Lostock Gralam Northwich	12.3	13.0	0.7	Negligible	Negligible	Not significant
02-C-H027	Birches Lane, Lostock Green	18.0	19.2	1.2	Negligible	Negligible	Not significant
02-C-H028	Birches Lane, Lostock Green	11.3	13.2	1.9	Negligible	Negligible	Not significant
02-C-H030	Griffiths Road, Lostock Green	15.9	15.4	-0.5	Negligible	Negligible	Not significant
02-C-H031	A556 Chester Road, Plumley	15.3	16.3	1.0	Negligible	Negligible	Not significant
02-C-H033	A559 Marston Lane, Marston	21.7	22.4	0.7	Negligible	Negligible	Not significant
02-C-H034	A530 Nantwich Road, Wimboldsley	24.0	25.0	1.0	Negligible	Negligible	Not significant
02-C-H035	Alder Way, Holmes Chapel	13.7	14.1	0.4	Negligible	Negligible	Not significant
02-C-H037	Knutsford Road, Cranage	12.6	13.0	0.4	Negligible	Negligible	Not significant
02-C-H038	Middlewich Road, Allstock	34.3	34.1	-0.2	Negligible	Negligible	Not significant
02-C-H039*	Middlewich Road, Knutsford	15.9	16.6	0.7	Negligible	-	Not significant
02-C-H040*	Holmes Chapel Road, Knutsford	17.6	18.4	0.8	Negligible	-	Not significant
02-C-H041*	A54 Middlewich Road, Winsford	21.6	23.3	1.7	Negligible	-	Not significant
02-C-H042*	A530 Chester Road, Middlewich	30.1	30.4	0.3	Negligible	-	Not significant
02-C-H043*	A533, Static Trailer Bay	22.8	23.7	0.9	Negligible	-	Not significant
02-C-H044*	B5082, Holmes Chapel Road, Lach Dennis	13.9	15.1	1.2	Negligible	-	Not significant
02-C-H045*	Shurlach Road, Northwich	25.1	25.6	0.5	Negligible	-	Not significant
02-C-H046*	B5082, Middlewich Road	24.4	25.6	1.2	Negligible	-	Not significant
02-C-H047*	B5075 Ollershaw Lane, Marston	20.1	21.1	1.0	Negligible	-	Not significant
02-C-H048*	A530 Nantwich Rd, Middlewich	28.1	30.5	2.4	Moderate adverse	-	Significant. Different



**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )		Change in NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
							significant effect
02-C-H049*	A530 Nantwich Rd, Middlewich	27.6	30.0	2.4	Slight adverse	-	Not significant

Note: \* Indicates that the receptor is new to the SES1 and AP1 ES

**Table 8: Predicted annual mean PM<sub>10</sub> concentrations and impacts (construction phase)**

Receptor	Description/location	PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
02-C-H001	A530 Wimboldsley Primary, Nantwich Road A530, Wimboldsley	10.7	11.0	0.3	Negligible	Negligible	Not significant
02-C-H002	B5074 Swanlow Lane, Winsford	10.1	10.3	0.2	Negligible	Negligible	Not significant
02-C-H003	A533 Booth Lane, Moston	10.5	10.5	< 0.1	Negligible	Negligible	Not significant
02-C-H004	Durham Drive, Winsford	9.8	10.0	0.2	Negligible	Negligible	Not significant
02-C-H005	Clive Green Lane, Stanthorne	11.2	11.2	< 0.1	Negligible	Negligible	Not significant
02-C-H007	Heritage Rise, Winsford	10.7	10.7	< 0.1	Negligible	Negligible	Not significant
02-C-H010	A54 Kinderton Street, Middlewich	12.8	12.8	< 0.1	Negligible	Negligible	Not significant
02-C-H011	Pinfold Lane, Middlewich	12.7	12.9	0.2	Negligible	Negligible	Not significant
02-C-H012	A54 Kinderton Street, Middlewich	12.6	12.7	0.1	Negligible	Negligible	Not significant
02-C-H013	Over Fair Close, Winsford	11.0	11.1	0.1	Negligible	Negligible	Not significant
02-C-H014	A54 Holmes Chapel Road, Middlewich	13.2	13.2	< 0.1	Negligible	Negligible	Not significant
02-C-H015	Middlewich Road, Stanthorne	10.9	11.1	0.2	Negligible	Negligible	Not significant
02-C-H016	A54 Holmes Chapel Road, Sproston	11.9	12.0	0.1	Negligible	Negligible	Not significant

## Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
02-C-H018	Road One, Winsford	11.4	11.6	0.2	Negligible	Negligible	Not significant
02-C-H019	Bostock Road, Bostock	9.8	9.9	0.1	Negligible	Negligible	Not significant
02-C-H020	A530 King Street, Byley	11.4	11.3	-0.1	Negligible	Negligible	Not significant
02-C-H021	A530 King Street, Whatcroft	11.7	11.7	< 0.1	Negligible	Negligible	Not significant
02-C-H022	Davenham Road, Northwich	9.6	9.6	< 0.1	Negligible	Negligible	Not significant
02-C-H024	B5082 Pennys Lane, Lach Dennis	10.3	10.5	0.2	Negligible	Negligible	Not significant
02-C-H025	Tudor Close, Rudheath	12.8	12.8	< 0.1	Negligible	Negligible	Not significant
02-C-H026	Land Adjacent, A556, Birches Lane, Lostock Gralam Northwich	10.9	11.0	0.1	Negligible	Negligible	Not significant
02-C-H027	Birches Lane, Lostock Green	11.4	11.6	0.2	Negligible	Negligible	Not significant
02-C-H028	Birches Lane, Lostock Green	10.8	10.9	0.1	Negligible	Negligible	Not significant
02-C-H030	Griffiths Road, Lostock Green	10.7	10.6	-0.1	Negligible	Negligible	Not significant
02-C-H031	A556 Chester Road, Plumley	11.3	11.5	0.2	Negligible	Negligible	Not significant
02-C-H033	A559 Marston Lane, Marston	11.3	11.4	0.1	Negligible	Negligible	Not significant
02-C-H034	A530 Nantwich Road, Wimboldsley	11.0	11.2	0.2	Negligible	Negligible	Not significant
02-C-H035	Alder Way, Holmes Chapel	10.4	10.5	0.1	Negligible	Negligible	Not significant
02-C-H037	Knutsford Road, Cranage	12.1	12.2	0.1	Negligible	Negligible	Not significant
02-C-H038	Middlewich Road, Allstock	15.2	15.3	0.1	Negligible	Negligible	Not significant
02-C-H039*	Middlewich Road, Knutsford	12.2	12.3	0.1	Negligible	-	Not significant
02-C-H040*	Holmes Chapel Road, Knutsford	11.6	11.8	0.2	Negligible	-	Not significant
02-C-H041*	A54 Middlewich Road, Winsford	11.0	11.2	0.2	Negligible	-	Not significant
02-C-H042*	A530 Chester Road, Middlewich	12.5	12.5	< 0.1	Negligible	-	Not significant

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
02-C-H043*	A533, Static Trailer Bay	11.3	11.4	0.1	Negligible	-	Not significant
02-C-H044*	B5082, Holmes Chapel Road, Lach Dennis	10.1	10.2	0.1	Negligible	-	Not significant
02-C-H045*	Shurlach Road, Northwich	12.7	12.8	0.1	Negligible	-	Not significant
02-C-H046*	B5082, Middlewich Road	12.5	12.7	0.2	Negligible	-	Not significant
02-C-H047*	B5075 Ollershaw Lane, Marston	11.8	12.0	0.2	Negligible	-	Not significant
02-C-H048*	A530 Nantwich Rd, Middlewich	12.6	13.0	0.4	Negligible	-	Not significant
02-C-H049*	A530 Nantwich Rd, Middlewich	12.5	12.9	0.4	Negligible	-	Not significant

Note: \* Indicates that the receptor is new to the SES1 and AP1 ES

**Table 9: Predicted annual mean PM<sub>2.5</sub> concentrations and impacts (construction phase)**

Receptor	Description/location	PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
02-C-H001	A530 Wimboldsley Primary, Nantwich Road A530, Wimboldsley	6.7	6.9	0.2	Negligible	Negligible	Not significant
02-C-H002	B5074 Swanlow Lane, Winsford	6.5	6.6	0.1	Negligible	Negligible	Not significant
02-C-H003	A533 Booth Lane, Moston	6.4	6.5	0.1	Negligible	Negligible	Not significant
02-C-H004	Durham Drive, Winsford	6.4	6.5	0.1	Negligible	Negligible	Not significant
02-C-H005	Clive Green Lane, Stanthorne	6.8	6.8	< 0.1	Negligible	Negligible	Not significant
02-C-H007	Heritage Rise, Winsford	6.9	6.9	< 0.1	Negligible	Negligible	Not significant
02-C-H010	A54 Kinderton Street, Middlewich	8.1	8.1	< 0.1	Negligible	Negligible	Not significant
02-C-H011	Pinfold Lane, Middlewich	8.0	8.1	0.1	Negligible	Negligible	Not significant

## Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
02-C-H012	A54 Kinderton Street, Middlewich	8.0	8.0	< 0.1	Negligible	Negligible	Not significant
02-C-H013	Over Fair Close, Winsford	6.8	6.8	< 0.1	Negligible	Negligible	Not significant
02-C-H014	A54 Holmes Chapel Road, Middlewich	8.3	8.3	< 0.1	Negligible	Negligible	Not significant
02-C-H015	Middlewich Road, Stanthorne	6.7	6.8	0.1	Negligible	Negligible	Not significant
02-C-H016	A54 Holmes Chapel Road, Sproston	7.3	7.4	0.1	Negligible	Negligible	Not significant
02-C-H018	Road One, Winsford	7.6	7.7	0.1	Negligible	Negligible	Not significant
02-C-H019	Bostock Road, Bostock	6.3	6.4	0.1	Negligible	Negligible	Not significant
02-C-H020	A530 King Street, Byley	7.2	7.2	< 0.1	Negligible	Negligible	Not significant
02-C-H021	A530 King Street, Whatcroft	7.3	7.2	-0.1	Negligible	Negligible	Not significant
02-C-H022	Davenham Road, Northwich	6.2	6.2	< 0.1	Negligible	Negligible	Not significant
02-C-H024	B5082 Pennys Lane, Lach Dennis	6.5	6.6	0.1	Negligible	Negligible	Not significant
02-C-H025	Tudor Close, Rudheath	8.0	8.0	< 0.1	Negligible	Negligible	Not significant
02-C-H026	Land Adjacent, A556, Birches Lane, Lostock Gralam Northwich	6.7	6.8	0.1	Negligible	Negligible	Not significant
02-C-H027	Birches Lane, Lostock Green	7.1	7.1	< 0.1	Negligible	Negligible	Not significant
02-C-H028	Birches Lane, Lostock Green	6.7	6.8	0.1	Negligible	Negligible	Not significant
02-C-H030	Griffiths Road, Lostock Green	6.9	6.8	-0.1	Negligible	Negligible	Not significant
02-C-H031	A556 Chester Road, Plumley	7.0	7.0	< 0.1	Negligible	Negligible	Not significant
02-C-H033	A559 Marston Lane, Marston	7.1	7.1	< 0.1	Negligible	Negligible	Not significant
02-C-H034	A530 Nantwich Road, Wimboldsley	7.0	7.1	0.1	Negligible	Negligible	Not significant
02-C-H035	Alder Way, Holmes Chapel	6.6	6.7	0.1	Negligible	Negligible	Not significant

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme				
02-C-H037	Knutsford Road, Cranage	7.4	7.5	0.1	Negligible	Negligible	Not significant
02-C-H038	Middlewich Road, Allostock	9.6	9.6	< 0.1	Negligible	Negligible	Not significant
02-C-H039*	Middlewich Road, Knutsford	7.6	7.7	0.1	Negligible	-	Not significant
02-C-H040*	Holmes Chapel Road, Knutsford	7.2	7.3	0.1	Negligible	-	Not significant
02-C-H041*	A54 Middlewich Road, Winsford	7.1	7.2	0.1	Negligible	-	Not significant
02-C-H042*	A530 Chester Road, Middlewich	7.9	7.9	< 0.1	Negligible	-	Not significant
02-C-H043*	A533, Static Trailer Bay	7.1	7.1	< 0.1	Negligible	-	Not significant
02-C-H044*	B5082, Holmes Chapel Road, Lach Dennis	6.4	6.5	0.1	Negligible	-	Not significant
02-C-H045*	Shurlach Road, Northwich	8.0	8.0	< 0.1	Negligible	-	Not significant
02-C-H046*	B5082, Middlewich Road	8.1	8.2	0.1	Negligible	-	Not significant
02-C-H047*	B5075 Ollershaw Lane, Marston	7.1	7.2	0.1	Negligible	-	Not significant
02-C-H048*	A530 Nantwich Rd, Middlewich	7.9	8.2	0.3	Negligible	-	Not significant
02-C-H049*	A530 Nantwich Rd, Middlewich	7.9	8.1	0.2	Negligible	-	Not significant

Note: \* Indicates that the receptor is new to the SES1 and AP1 ES

**Table 10: Predicted annual mean of NO<sub>x</sub> concentrations at ecological sites (construction phase)**

Ecological site	Distance to road (m)	NO <sub>x</sub> concentrations (µg/m <sup>3</sup> )		Change in NO <sub>x</sub> concentrations (µg/m <sup>3</sup> )	Comparison against air quality standard (30µg/m <sup>3</sup> )	Percent change in relation to air quality standard
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme			
Wettenhall and Darnhall Woods SSSI	80	9.3	9.7	0.4	Within standard	1.4%
	85	9.2	9.6	0.4	Within standard	1.3%
	90	9.1	9.5	0.4	Within standard	1.3%

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Ecological site	Distance to road (m)	NOx concentrations ( $\mu\text{g}/\text{m}^3$ )		Change in NOx concentrations ( $\mu\text{g}/\text{m}^3$ )	Comparison against air quality standard ( $30\mu\text{g}/\text{m}^3$ )	Percent change in relation to air quality standard
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme			
	100	9.0	9.3	0.4	Within standard	1.2%
	110	8.8	9.2	0.3	Within standard	1.1%
	120	8.7	9.0	0.3	Within standard	1.0%
	130	8.6	8.9	0.3	Within standard	0.9%

**Table 11: Assessment of N deposition at ecological sites (construction phase)**

Ecological site	Distance to road (m)	Dry deposition (kg N/ha/yr)		Change in N deposition (kg N/ha/yr)	Critical load (kg N/ha/yr)	Percent change in relation to lower critical load
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme			
Wettenhall and Darnhall Woods SSSI	80	53.8	53.8	0.1	10	0.7%
	85	53.7	53.8	0.1	10	0.6%
	90	53.7	53.8	0.1	10	0.6%
	100	53.7	53.8	0.1	10	0.6%
	110	53.7	53.7	< 0.1	10	0.5%
	120	53.7	53.7	< 0.1	10	0.5%
	130	53.6	53.7	0.1	10	0.5%

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

**Table 12: Assessment of acid deposition at ecological sites (construction phase)**

Ecological site	Distance to road (m)	Acid deposition (k eq/ha/yr)		Change in acid deposition as percent of CLmax	With AP1 revised scheme acid deposition as percent of CLmax
		2025 without the AP1 revised scheme	2025 with the AP1 revised scheme		
Wettenhall and Darnhall Woods SSSI	80	3.8	3.8	1.3%	1065.7%
	85	3.8	3.8	1.3%	1065.7%
	90	3.8	3.8	1.1%	1065.6%
	100	3.8	3.8	1.1%	1065.5%
	110	3.8	3.8	1.0%	1065.5%
	120	3.8	3.8	1.0%	1065.4%
	130	3.8	3.8	0.9%	1065.3%

- 3.3.8 The annual mean NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations are predicted to be within the air quality standards during construction of the AP1 revised scheme. Since the annual mean NO<sub>2</sub> concentrations are predicted to be well below 60µg/m<sup>3</sup>, the hourly mean standard is also expected to be met. Similarly, since the annual mean PM<sub>10</sub> concentrations are predicted to be below 35µg/m<sup>3</sup>, the daily mean standard is also expected to be met.
- 3.3.9 Negligible impacts are predicted at all human receptors for annual mean PM<sub>10</sub> and PM<sub>2.5</sub> concentrations.
- 3.3.10 Moderate adverse impacts are predicted at one location (the A530 Nantwich Road, Middlewich) for annual mean NO<sub>2</sub> concentrations. Negligible or slight impacts are predicted at all other human receptors for annual mean NO<sub>2</sub>.
- 3.3.11 Annual mean NO<sub>x</sub> concentrations at the Wettenhall and Darnhall Woods SSSI are predicted to be within the air quality standard. However, the changes in NO<sub>x</sub> concentrations are predicted to be greater than 1% of the air quality standard up to 110m from the roadside. The change in nitrogen deposition due to the AP1 revised scheme is predicted to be less than 1% of the lower critical load for this site. Acid deposition rates are predicted to be above the lower critical load at all modelled receptors. The change in acid deposition due to the AP1 revised scheme is predicted to be greater than 1% of the maximum critical load up to 100m from the roadside.

## **Assessment of significance**

- 3.3.12 No significant effects are anticipated at any receptors in relation to annual mean PM<sub>10</sub> or PM<sub>2.5</sub> concentrations.
- 3.3.13 Compared to the main ES worst case construction traffic scenarios, one new significant effect is anticipated at a receptor on the A530 Nantwich Road, Middlewich in relation to annual mean NO<sub>2</sub> concentrations. No new or different significant effects are anticipated at other receptors in the area.
- 3.3.14 Since the change in NO<sub>x</sub> concentrations are predicted to be greater than 1% of the air quality standard, there is the potential for significant effects to occur at Wettenhall and Darnhall Woods SSSI due to NO<sub>x</sub> concentrations and this is further assessed in the SES1 and AP1 ES Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02).
- 3.3.15 Since the change in N deposition is predicted to be less than 1% of the lower critical load, no significant effects are predicted at Wettenhall and Darnhall Woods SSSI due to N deposition.
- 3.3.16 Since the change in acid deposition is predicted to be greater than 1% of the maximum critical load, there is the potential for significant effects to occur at Wettenhall and Darnhall Woods SSSI due to acid deposition and this is further assessed in the SES1 and AP1 ES Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02).



## 3.4 Assessment of operational traffic emissions

### Operational traffic model

3.4.1 For the assessment of traffic on the highway network, data for the year 2038 were used as the operational year of the AP1 revised scheme.

### Screening of traffic data

3.4.2 The screening process identified a total of 42 roads in the Wimboldsley to Lostock Gramam area (MA02) exceeding the thresholds for changes in AADT or daily HDV flows and/or changes in road alignment by 5m or more. These roads include:

- the A54 Winsford by-pass/Middlewich Road/St Michaels Way/Kinderton Street/Holmes Chapel Road/Chester Road;
- the A530 Nantwich Road/Chester Road/King Street/Griffiths Road;
- the A533 Bostock Road/Dane Street/London Road/Kingsmead;
- the A556 Shurlach Road;
- the B5082 Penny's Lane;
- Birches Lane;
- Crowder's Lane;
- Coalpit Lane;
- Birch Lane;
- Clive Lane; and
- Clive Green Lane.

3.4.3 Further roads have been included in the assessment to account for their emissions at nearby receptors.

### Receptors assessed and background concentrations

3.4.4 Details of the assessed receptors and the background concentrations used in the assessment remain as reported within the main ES Volume 5, Appendix: AQ-001-0MA02. Six receptors have been removed and six receptors have been added due to changes in the study area. The additional human receptors are shown in Table 13.

3.4.5 The location of all receptors is shown in the accompanying SES1 and AP1 ES, Volume 5, Air quality Map Book: Map Series AQ-01.

**Table 13: Modelled human receptors and background concentrations (operational phase)**

Receptor	Description/location	Ordnance Survey coordinates	Background concentrations in 2038 ( $\mu\text{g}/\text{m}^3$ )			
			NOx	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2-O-H29	Beechfields, Winsford	366793, 365945	7.4	5.9	9.0	6.0
2-O-H30	Coal Pit Lane, Middlewich	369020, 366312	9.2	7.2	9.9	6.4
2-O-H31	A54 Chester Road, Middlewich	369784, 366481	9.2	7.2	9.9	6.4
2-O-H32	A54 Middlewich Road, Middlewich	368224, 366608	8.6	6.7	10.4	6.4
2-O-H33	A556 Shurlach Road, Northwich	367590, 372510	12.0	9.2	10.5	6.7
2-O-H34	A530 Griffiths Road, Northwich	368637, 374720	10.2	7.9	9.6	6.3

## Assessment results

3.4.6 Table 14, Table 15 and Table 16 provide the summary of the modelled pollutant concentrations for the assessed human receptors. The magnitude of change and impact descriptor are also derived following the Institute of Air Quality Management (IAQM)/Environmental Protection UK (EPUK) methodology<sup>5</sup>.

<sup>5</sup> Institute of Air Quality Management (2017), *Land-Use Planning Development Control: Planning For Air Quality*.

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

**Table 14: Predicted annual mean NO<sub>2</sub> concentrations and impacts (operation phase)**

Receptor	Description/location	NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )		Change in NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2038 without the AP1 revised scheme	2038 with the AP1 revised scheme				
2-O-H01	Nantwich Road, Occleston	14.5	8.8	-5.7	Moderate beneficial	Moderate beneficial	Significant (not new)
2-O-H02	Primary School, Occleston	11.5	11.6	0.1	Negligible	Negligible	Not significant
2-O-H03	Nantwich Road, Occleston	11.5	11.4	-0.1	Negligible	Negligible	Not significant
2-O-H04	Clive Green Lane, Occleston	10.6	8.2	-2.4	Slight beneficial	Negligible	Not significant
2-O-H05	Clive Green Lane, Occleston	8.3	8.9	0.6	Negligible	Negligible	Not significant
2-O-H06	Nantwich Road, Occleston	12.0	12.2	0.2	Negligible	Negligible	Not significant
2-O-H07	Clive Green Lane, Winsford	9.3	9.9	0.6	Negligible	Negligible	Not significant
2-O-H08	Clive Green Lane, Winsford	9.7	10.2	0.5	Negligible	Negligible	Not significant
2-O-H09	Clive Green Lane, Winsford	14.3	14.8	0.5	Negligible	Negligible	Not significant
2-O-H10	Middlewich Road, Winsford	14.4	14.4	< 0.1	Negligible	Negligible	Not significant
2-O-H11	Middlewich Road, Winsford	10.5	10.4	-0.1	Negligible	Negligible	Not significant
2-O-H14	Middlewich Road, Middlewich	11.4	11.2	-0.2	Negligible	Negligible	Not significant
2-O-H15	Bostock Road, Winsford	8.5	7.9	-0.6	Negligible	Negligible	Not significant
2-O-H18	Holmes Chapel Road, Northwich	9.2	9.3	0.1	Negligible	Negligible	Not significant
2-O-H19	Pennys Lane, Northwich	8.8	9.6	0.8	Negligible	Negligible	Not significant
2-O-H22	Birches Lane, Northwich	7.9	7.8	-0.1	Negligible	Negligible	Not significant
2-O-H23	Birches Lane, Northwich	8.3	7.9	-0.4	Negligible	Negligible	Not significant
2-O-H24	Birches Lane, Northwich	11.2	8.4	-2.8	Slight beneficial	Slight beneficial	Not significant
2-O-H25	Birches Lane, Northwich	8.3	8.8	0.5	Negligible	Negligible	Not significant
2-O-H26	Harris Road, Northwich	10.6	10.6	< 0.1	Negligible	Negligible	Not significant

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )		Change in NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2038 without the AP1 revised scheme	2038 with the AP1 revised scheme				
2-O-H27	Lostock Lodge, Northwich	10.3	10.3	< 0.1	Negligible	Negligible	Not significant
2-O-H29*	Beechfields, Winsford	11.0	11.3	0.3	Negligible	N/A	Not significant
2-O-H30*	Coal Pit Lane, Middlewich	8.4	8.5	0.1	Negligible	N/A	Not significant
2-O-H31*	A54 Chester Road, Middlewich	17.7	16.6	-1.1	Negligible	N/A	Not significant
2-O-H32*	A54 Middlewich Road, Middlewich	7.3	7.6	0.3	Negligible	N/A	Not significant
2-O-H33*	A556 Shurlach Road, Northwich	14.1	14.3	0.2	Negligible	N/A	Not significant
2-O-H34*	A530 Griffiths Road, Northwich	10.9	10.6	-0.3	Negligible	N/A	Not significant

Note: \* Indicates that receptor is new to the SES1 and AP1 ES

**Table 15: Predicted annual mean PM<sub>10</sub> concentrations and impacts (operation phase)**

Receptor	Description/location	PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2038 without the AP1 revised scheme	2038 with the AP1 revised scheme				
2-O-H01	Nantwich Road, Occleston	11.1	9.6	-1.5	Negligible	Negligible	Not significant
2-O-H02	Primary School, Occleston	10.7	10.7	< 0.1	Negligible	Negligible	Not significant
2-O-H03	Nantwich Road, Occleston	11.7	11.7	< 0.1	Negligible	Negligible	Not significant
2-O-H04	Clive Green Lane, Occleston	11.1	10.5	-0.6	Negligible	Negligible	Not significant
2-O-H05	Clive Green Lane, Occleston	10.3	10.4	0.1	Negligible	Negligible	Not significant
2-O-H06	Nantwich Road, Occleston	11.1	11.1	< 0.1	Negligible	Negligible	Not significant
2-O-H07	Clive Green Lane, Winsford	10.4	10.6	0.2	Negligible	Negligible	Not significant
2-O-H08	Clive Green Lane, Winsford	10.5	10.6	0.1	Negligible	Negligible	Not significant
2-O-H09	Clive Green Lane, Winsford	10.9	11.0	0.1	Negligible	Negligible	Not significant

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>10</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2038 without the AP1 revised scheme	2038 with the AP1 revised scheme				
2-O-H10	Middlewich Road, Winsford	11.0	11.0	< 0.1	Negligible	Negligible	Not significant
2-O-H11	Middlewich Road, Winsford	10.0	10.1	0.1	Negligible	Negligible	Not significant
2-O-H14	Middlewich Road, Middlewich	11.0	10.9	-0.1	Negligible	Negligible	Not significant
2-O-H15	Bostock Road, Winsford	10.6	10.5	-0.1	Negligible	Negligible	Not significant
2-O-H18	Holmes Chapel Road, Northwich	10.1	10.1	< 0.1	Negligible	Negligible	Not significant
2-O-H19	Pennys Lane, Northwich	10.1	10.4	0.3	Negligible	Negligible	Not significant
2-O-H22	Birches Lane, Northwich	10.6	10.5	-0.1	Negligible	Negligible	Not significant
2-O-H23	Birches Lane, Northwich	10.7	10.6	-0.1	Negligible	Negligible	Not significant
2-O-H24	Birches Lane, Northwich	11.4	10.7	-0.7	Negligible	Negligible	Not significant
2-O-H25	Birches Lane, Northwich	10.7	10.8	0.1	Negligible	Negligible	Not significant
2-O-H26	Harris Road, Northwich	11.2	11.2	< 0.1	Negligible	Negligible	Not significant
2-O-H27	Lostock Lodge, Northwich	11.0	11.0	< 0.1	Negligible	Negligible	Not significant
2-O-H29*	Beechfields, Winsford	10.6	10.7	0.1	Negligible	N/A	Not significant
2-O-H30*	Coal Pit Lane, Middlewich	10.2	10.2	< 0.1	Negligible	N/A	Not significant
2-O-H31*	A54 Chester Road, Middlewich	12.4	12.1	-0.3	Negligible	N/A	Not significant
2-O-H32*	A54 Middlewich Road, Middlewich	10.6	10.6	< 0.1	Negligible	N/A	Not significant
2-O-H33*	A556 Shurlach Road, Northwich	12.4	12.5	0.1	Negligible	N/A	Not significant
2-O-H34*	A530 Griffiths Road, Northwich	10.6	10.5	-0.1	Negligible	N/A	Not significant

Note: \* Indicates that receptor is new to the SES1 and AP1 ES

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

**Table 16: Predicted annual mean PM<sub>2.5</sub> concentrations and impacts (operation phase)**

Receptor	Description/location	PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2038 without the AP1 revised scheme	2038 with the AP1 revised scheme				
2-O-H01	Nantwich Road, Occleston	7.0	6.2	-0.8	Negligible	Negligible	Not significant
2-O-H02	Primary School, Occleston	6.7	6.7	< 0.1	Negligible	Negligible	Not significant
2-O-H03	Nantwich Road, Occleston	7.0	7.0	< 0.1	Negligible	Negligible	Not significant
2-O-H04	Clive Green Lane, Occleston	6.7	6.4	-0.3	Negligible	Negligible	Not significant
2-O-H05	Clive Green Lane, Occleston	6.4	6.5	0.1	Negligible	Negligible	Not significant
2-O-H06	Nantwich Road, Occleston	7.0	7.0	< 0.1	Negligible	Negligible	Not significant
2-O-H07	Clive Green Lane, Winsford	6.5	6.6	0.1	Negligible	Negligible	Not significant
2-O-H08	Clive Green Lane, Winsford	6.5	6.6	0.1	Negligible	Negligible	Not significant
2-O-H09	Clive Green Lane, Winsford	7.0	7.1	0.1	Negligible	Negligible	Not significant
2-O-H10	Middlewich Road, Winsford	7.1	7.1	< 0.1	Negligible	Negligible	Not significant
2-O-H11	Middlewich Road, Winsford	6.5	6.5	< 0.1	Negligible	Negligible	Not significant
2-O-H14	Middlewich Road, Middlewich	7.0	7.0	< 0.1	Negligible	Negligible	Not significant
2-O-H15	Bostock Road, Winsford	6.5	6.4	-0.1	Negligible	Negligible	Not significant
2-O-H18	Holmes Chapel Road, Northwich	6.3	6.3	< 0.1	Negligible	Negligible	Not significant
2-O-H19	Pennys Lane, Northwich	6.4	6.5	0.1	Negligible	Negligible	Not significant
2-O-H22	Birches Lane, Northwich	6.5	6.5	< 0.1	Negligible	Negligible	Not significant
2-O-H23	Birches Lane, Northwich	6.6	6.5	-0.1	Negligible	Negligible	Not significant
2-O-H24	Birches Lane, Northwich	7.0	6.6	-0.4	Negligible	Negligible	Not significant
2-O-H25	Birches Lane, Northwich	6.6	6.6	< 0.1	Negligible	Negligible	Not significant
2-O-H26	Harris Road, Northwich	7.0	7.0	< 0.1	Negligible	Negligible	Not significant
2-O-H27	Lostock Lodge, Northwich	6.9	6.9	< 0.1	Negligible	Negligible	Not significant

**Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02

Air quality

MA02

Air quality report

Receptor	Description/location	PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )		Change in PM <sub>2.5</sub> concentrations (µg/m <sup>3</sup> )	Impact descriptor	Impact descriptor in the main ES	Significance
		2038 without the AP1 revised scheme	2038 with the AP1 revised scheme				
2-O-H29*	Beechfields, Winsford	6.8	6.9	0.1	Negligible	N/A	Not significant
2-O-H30*	Coal Pit Lane, Middlewich	6.6	6.6	< 0.1	Negligible	N/A	Not significant
2-O-H31*	A54 Chester Road, Middlewich	7.8	7.6	-0.2	Negligible	N/A	Not significant
2-O-H32*	A54 Middlewich Road, Middlewich	6.4	6.5	0.1	Negligible	N/A	Not significant
2-O-H33*	A556 Shurlach Road, Northwich	7.8	7.8	< 0.1	Negligible	N/A	Not significant
2-O-H34*	A530 Griffiths Road, Northwich	6.8	6.7	-0.1	Negligible	N/A	Not significant

Note: \* Indicates that receptor is new to the SES1 and AP1 ES

- 3.4.7 The annual mean NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations are predicted to be within the air quality standards during operation of the AP1 revised scheme. Since the annual mean NO<sub>2</sub> concentrations are predicted to be well below 60µg/m<sup>3</sup>, the hourly mean standard is also expected to be met. Similarly, since the annual mean PM<sub>10</sub> concentrations are predicted to be below 35µg/m<sup>3</sup>, the daily mean standard is also expected to be met.
- 3.4.8 Negligible impacts are predicted at the majority of human receptors for annual mean NO<sub>2</sub> concentrations. One modelled residential receptor will experience significant beneficial effects for NO<sub>2</sub> concentrations in the Wimboldsley to Lostock Gralam area (MA02). This is receptor 2-O-H01, located on the A530 Nantwich Road, Occleston, due to the realignment of this road. Negligible impacts are predicted at all human receptors for annual mean PM<sub>10</sub> and PM<sub>2.5</sub> concentrations.

## **Assessment of significance**

- 3.4.9 One modelled residential receptor is predicted to experience significant beneficial effects for NO<sub>2</sub> concentrations in the Wimboldsley to Lostock Gralam area (MA02). No significant effects are anticipated at any receptors in relation to annual mean PM<sub>10</sub> and PM<sub>2.5</sub> concentrations.
- 3.4.10 There are no new or different significant effects from operation of the AP1 revised scheme compared to the main ES.





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