Statutory Consultation 2022

Preliminary Environmental Information Report

Volume 3: Appendix 7.2

Air Quality Baseline Data

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1 BASELINE DATA

1.1.1 Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment. These are present from various sources, such as industrial processes, commercial and domestic activities, traffic and natural sources.

1.2 Sources of air pollution

Industrial processes

1.2.1 Industrial air pollution sources are regulated through a system of operating permits or authorisations, requiring stringent emission limits to be met and ensuring that any releases to the environment are minimised or rendered harmless. Regulated (or prescribed) industrial processes are classified as Part A or Part B processes and are regulated through the Environmental Permitting system (Ref. 1.1, 1.2, 1.3). The more polluting processes are regulated by the Environment Agency (EA), and the less polluting ones by the local authorities. Local authorities also regulate only for emissions to air, whereas the EA regulates emissions to air, water and land.

1.2.2 There is no Part A process with emissions to air listed on the EA website within 10km of the Proposed Development.

1.2.3 IBC Vehicles Limited located on Kimpton Road is a Part A2 process regulated by LBC. Emissions from this Part A2 and Part B process are assumed to be included in the Defra background concentrations, in monitored concentrations, and in the NAEI gridded emissions.

1.3 Monitoring results

Automatic monitoring

1.3.1 Automatic monitoring of pollutants is undertaken by Luton Borough Council (LBC) at two locations, by North Hertfordshire District Council (NHDC) at two locations and by Central Bedfordshire Council (CBC) at one location. London Luton Airport Operations Limited (LLAOL) also operates an automatic monitor at the airport and the continuous monitoring station (LA001) was setup as in 2018 by the Applicant. The details of the monitoring locations are shown in **Table 1.1**. The results for recent years are shown in **Table 1.2** to **Table 1.5**. Monitoring locations are provided in **Figure 7.2**.

1.3.2 Exceedances of the NO_2 annual mean standard were recorded at LN60, CM2, and NH1 in 2019. Concentrations at the LA001 were below the objective.

1.3.3 No exceedances of the PM_{10} and $PM_{2.5}$ annual mean standards were recorded in 2019 at any of the monitoring sites.

1.3.4 No exceedances of the annual mean standards for all pollutants measured were recorded at the LA001 monitoring site. However, one exceedance of a short-term objective was noted. This was the short-term objective for ozone. However, ozone is a trans-boundary pollutant which is formed in the

atmosphere from reactions involving other pollutants. Monitoring from across the UK has shown similar results and it can be concluded that this exceedance is not attributed to a local source.

1.3.5 The automatic monitoring carried out by CBC and Buckinghamshire District Council (BDC) have not been presented as the monitoring stations are outside of the study area.

Table 1.1: Site details for automatic air quality monitors

ID	Name	Type	Pollutants monitored	Easting	Northing	Distance from Main Application Site (km)
LN60	Dunstable Road East	Roadside	NO_2; PM_{10}; PM_4; $PM_{2.5}$; PM_1	508708	221352	2.5
LA08	LLAOL	Urban background	PM_{10}	511871	221142	0
LA001	London Luton Airport FutureLuToN monitoring station	Urban background	NO_2; NOx; PM_{10}; $PM_{2.5}$; O_3; SO_2; CO; VOCs; Black carbon	512578	222204	0.5
CM2	AURN A505 Dunstable Road	Roadside	NO_2	505927	222644	5.5
NH1	Stevenage Road NOx	Roadside	NO_2	518740	228348	10
NH2	Stevenage Road PM	Roadside	PM_{10}; $PM_{2.5}$	518713	228349	10

Table 1.2: Monitored NO_2 concentrations at the automatic monitors

ID	Annual mean NO_2 concentrations (µg/m³)					No. of hours when hourly mean NO_2 concentrations are greater than 200µg/m³				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
LN60	47	39	-	40		0	2	0		
LA001				17	12					
CM2	50	44		39		1	16	6		
NH1	50	48		45		0	10	4		
Air quality standard	40					18 exceedances				

Table 1.3: Monitored PM_{10} and $PM_{2.5}$ concentrations at the automatic monitors

ID	Annual mean PM_{10} concentrations (µg/m³)					Annual mean $PM_{2.5}$ concentrations (µg/m³)				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
LN60	15(3)	16(4)		16		9	10		10	
LA08	18(1)	18(1)		16		N/A	N/A	N/A	N/A	N/A
LA001	N/A	N/A	N/A	14	12	N/A	N/A	N/A	12	10
NH2	20(4)	19(7)		18		13	12		8	
Air quality standard	40 (35 exceedances)					20				
In brackets () are number of hours when PM_{10} daily mean is greater than 50µg/m³ (35 allowed)										

Table 1.4: Summary of annual results from LA001 (µg/m^3)

Pollutant	2019	2020				Annual mean standard	Notes
	Annual mean	Raw results	Annual data capture (%)	Annualisation factor	Annual mean		
NO_2	17	11.93	99%	-	11.93 ^	40	
PM_{10}	13.5	11.69	83%	-	11.69 ^	40	
$PM_{2.5}$	11.6	10.06	83%	-	10.06 ^	25	
SO_2	0.77	0.57	98%	-	0.57 ^	-	No relevant annual mean objective.
O_3	51.5	56.99	98%	-	56.99 ^	-	No relevant annual mean objective.
CO	-	0.13	86%	-	0.13 ^	-	No relevant annual mean objective.
Benzene	0.39	0.25	66%	-	0.25 *	16.25	No appropriate Defra site with at least 85% data capture to annualise.
Toluene	0.51	0.35	64%	1.01	0.36	1,910	
Ethylbenzene	0.49	0.3	42%	1.04	0.32	4,410	
m/p-xylene	1.13	0.49	32%	0.95	0.47	4,410	
o-xylene	0.59	0.31	38%	0.99	0.31	4,410	

Pollutant	2019	2020				Annual mean standard	Notes
	Annual mean	Raw results	Annual data capture (%)	Annualisation factor	Annual mean		
Naphthalene	0.02	0.03	66%	-	0.03 *	530	No appropriate Defra site monitoring Naphthalene.
Black Carbon	0.6	0.37	70%	1.1	0.41	-	No relevant annual mean objective.
Notes: Annual data capture below 75% need to be annualised following Defra guidance. ^ Annualisation not required as data capture >75% * Annualisation not appropriate, see notes column for further information.							

Table 1.5: Summary of short-term statistics (µg/m^3)

Pollutant	Statistic	Result	Objective
NO_2	99.8th percentile 1-hour mean	67.4	200
PM_{10}	90.4th percentile 24-hour mean	20.9	50
SO_2	99.7th percentile 1-hour mean	2.5	350
	99.2nd percentile 24-hour mean	1.20	125
O_3	97.3rd percentile of daily maximums of 8-hour means	**125.1** †	100
CO	maximum daily running 8-hour mean	0.5	10
Note: Any exceedances are shown in **bold**. † Recorded 43 days which exceeded.			

Diffusion tube monitoring

London Luton Airport Operations Limited

1.3.6 LLAOL operates 20 diffusion tube sites in and in the vicinity of the airport. The details of these monitoring sites, and the monitored concentrations for annual mean NO_2 for 2016 to 2019, are shown in **Table 1.6** and **Table 1.7** respectively. The locations of all monitoring is provided in **Figure 7.2**. Exceedances of annual mean NO_2 standard have been recorded at LLA 1 (Outside Zone 2), LLA 7 (Drop off zone), LLA 14 (Undercroft access road) and LLA16 (Exit road plaza) in 2019, with a maximum concentration of 48µg/m^3 recorded at LLA 1. These sites do not represent relevant long-term human exposure and therefore the annual mean air quality standard does not apply at these locations. All exceedances are attributed to emissions from road traffic.

Table 1.6: LLAOL diffusion tube monitoring location details

ID	Name	Type	Easting	Northing	In AQMA?
LLA 1	Outside Zone 2_prior to Jun 19	Other	511903	221278	No
LLA 1*	Outside Zone 2_from Jun 19	Other	511920	221334	No
LLA 2	Airport Approach Road	Roadside	511579	220960	No
LLA 3	Runway Threshold Western	Other	511170	220436	No
LLA 4	Runway Threshold Eastern	Other	513644	221207	No
LLA 5	Adjacent to Stand 5	Other	511711	221337	No
LLA 6	President Way Jct	Roadside	511682	221727	No
LLA 7	Drop Off Zone_prior to Dec 19	Roadside	512166	221226	No
LLA 7*§	Drop Off Zone_from Dec 19	Roadside	512105	221168	No
LLA 8	BAM Co-located	Other	511867	221148	No
LLA 9	Stagenhoe Bottom Farm	Rural	517602	222572	No
LLA 10	Grove Farm Slip End	Rural	507667	217744	No
LLA 11	Dane End	Roadside	513140	220669	No
LLA 12	Adjacent to Stand 60	Roadside	511886	221566	No
LLA 13	Eaton Green Road	Roadside	511901	222055	No
LLA 14	Undercroft Access Road	Kerbside	511995	221316	No
LLA 15	Eaton Green Road – EasyJet CP	Kerbside	511168	221706	No
LLA 16	Exit Road Plaza	Roadside	512158	221087	No
LLA 16*	Stand 23R airside	Other	512275	221115	No
LLA 17	A1081 New Airport Way 1	Roadside	509489	219237	No
LLA 18†	A1081 New Airport Way 2	Roadside	510991	220497	No
LLA 18‖	A1081 New Airport Way 2	Roadside	510779	220279	No

LLA 19	Breachwood Green Community Hall	Rural	515109	221933	No
LA01†	Terminal Patio	Other	511847	221336	No
LA07†	Terminal Car Park	Other	512181	221352	No
LA16†	Set Down Area	Kerbside	511954	221313	No
LA18†	Breachwood Green	Kerbside	515053	221778	No
LA19†	Kensworth	Kerbside	502848	218161	No
LA20†	Short Term Car Park	Kerbside	-	-	No

*Tube moved to new location part way through 2019.

‖ Tube moved to new location prior to the start of the year.

† Monitoring discontinued at location prior to 2019, data provided for legacy purposes.

§ Insufficient data capture for the full calendar year to generate meaningful annual mean concentration for 2019 (i.e. data capture <25%).

Table 1.7: LLAOL diffusion tube monitored NO_2 concentrations

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020*
LLA 1	NDA	NDA	46	48	
LLA 1	NDA	NDA	NDA	37	
LLA 2	40	38	38	34	
LLA 3	24	23	25	22	
LLA 4	17	19	18	18	
LLA 5	43	40	40	37	
LLA 6	34	35	35	34	
LLA 7	NDA	NDA	44	46	
LLA 7	NDA	NDA	NDA	NDA	
LLA 8	34	32	32	32	
LLA 9	10	11	11	10	
LLA 10	12	11	12	11	
LLA 11	15	15	15	13	
LLA 12	39	38	38	36	
LLA 13	27	25	26	24	
LLA 14	NDA	NDA	42	42	
LLA 15	NDA	NDA	32	31	
LLA 16	NDA	NDA	44	44	
LLA 16	NDA	NDA	NDA	32	
LLA 17	NDA	NDA	40	32	
LLA 18	NDA	NDA	38	NDA	

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020*
LLA 18	NDA	NDA	NDA	29	
LLA 19	NDA	NDA	NDA	16	
LA01	31	33	NDA	NDA	
LA07	36	46	NDA	NDA	
LA16	41	40	NDA	NDA	
LA18	14	14	NDA	NDA	
LA19	12	NDA	NDA	NDA	
LA20	NDA	41	NDA	NDA	
NDA – No data available * No 2020 data available					

Luton Borough Council

1.3.7 LBC monitored at 42 different locations in 2019. The details of the monitoring locations and the monitored results from 2016 to 2019 are shown in **Table 1.8** and **Table 1.9** respectively.

1.3.8 The LBC diffusion tube monitoring network recorded exceedances at three roadside locations in 2019. All exceedances were recorded in or very close to the Luton AQMA No.3. All of these exceedances are attributed to road traffic emissions. All locations close to the airport were below the annual mean standard.

Table 1.8: LBC diffusion tube monitoring location details

ID	Name	Type	Easting	Northing	In AQMA?
LN07	Guildford Street/Bute Street	Roadside	509227	221455	No
LN11	Upper George Street	Roadside	508910	221321	No
LN15	Armitage Garden	Roadside	505557	222325	Yes
LN16	Belper Road	Roadside	505492	222607	Yes
LN17	Wyndham Road	Roadside	505324	222812	Yes
LN18	Copperfields	Roadside	505014	223538	No
LN22	1 Mistletoe Hill	Urban Background	511341	221864	No
LN23	Eaton Green Road 1	Roadside	511377	221814	No

ID	Name	Type	Easting	Northing	In AQMA?
LN24	19 Barnston Close	Urban Background	511902	222144	No
LN25	Eaton Green Road 2	Roadside	511893	222068	No
LN26	8 Keeble Close	Urban Background	512109	222234	No
LN27	Eaton Green Road 3	Roadside	512134	222198	No
LN28	Caddington Road	Roadside	507798	219832	No
LN52	Dunstable Rd/Cardigan St Residential	Roadside	508689	221379	Yes
LN53	3rd Floor Bagshawe Court F.F.	Suburban	507717	219923	No
LN54	M1 Corner Bagshawe Court F.F.	Suburban	507712	219915	No
LN55	M1 Corner Wyatt Court FF	Suburban	507732	219886	No
LN56	20 Wyatt Court FF	Suburban	507747	219894	No
LN57	Hitchin Rd/Cannon Lane Resi 1	Roadside	510747	224311	No
LN58	Hitchin Rd/Cannon Lane Resi 2	Roadside	510747	224311	No
LN59	Hitchin Rd/Cannon Lane Resi 3	Roadside	510747	224311	No
LN61	CRAQM 2A	Roadside	508708	221352	Yes
LN62	CRAQM 2B	Roadside	508708	221352	Yes
LN63	CRAQM 2C	Roadside	508708	221352	Yes
LN64	Park Viaduct - Park Street	Roadside	509563	220952	No
LN65	Park Viaduct - Queens Close	Roadside	509486	220865	No

ID	Name	Type	Easting	Northing	In AQMA?
LN66	Park Viaduct	Roadside	509288	220925	Yes
LN67	Castle Street	Roadside	509083	220709	No
LN68	London Road	Roadside	508969	220487	No
LN69	John Street	Roadside	509326	221357	No
LN70	Crawley Green Road	Roadside	509813	221161	No
LN71	Crescent Road	Urban Background	509549	221623	No
LN72	Hucklesby Way	Urban Background	508937	221745	No
LN73	Mill Street	Roadside	508959	221633	No
LN74	Dunstable Road - Bury Park	Roadside	508165	222002	No
LN75	New Bedford Road	Roadside	508745	222122	No
LN76	Leagrave Road	Urban Background	507574	222948	No
LN77	Marsh Road	Roadside	506496	224018	No
LN78	Hibbert Street	Roadside	509109	220676	No
LN79	Castle Street 2	Roadside	509050	220634	No
LN80	Windsor Street	Roadside	509038	220719	No
LN81	Bank Close	Suburban	505034	223729	Yes
LN82	11 Withy Close	Suburban	504828	223999	Yes
LN83	b/h 9 Copperfields	Suburban	505116	223467	Yes
LN84	97 Lime Avenue	Suburban	505230	223304	Yes
LN85	26 Belper Road	Suburban	505481	222545	Yes
LN86	Bradley Road_by M1 Bridge	Roadside	505586	222235	Yes

Table 1.9: LBC diffusion tube monitored NO_2 concentrations

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020
LN07	30	27	27	28	-
LN11	39	34	34	34	-
LN15	31	30	26	27	-
LN16	36	35	30	31	-
LN17	39	36	34	33	-
LN18	28	24	24	22	-
LN22	25	23	21	23	-
LN23	36	37	29	35	-
LN24	24	22	20	22	-
LN25	30	29	27	30	-
LN26	21	20	20	20	-
LN27	30	30	28	28	-
LN28	46	46	40	39	-
LN52	49	43	40	43	-
LN53	34	33	28	28	-
LN54	34	34	27	28	-
LN55	34	33	29	27	-
LN56	34	31	29	28	-
LN57	33	-	-	-	-
LN58	32	-	-	-	-
LN59	34	-	-	-	-
LN61	45	43	39*	41	-
LN62	46	41	39*	41	-
LN63	46	42	39*	41	-
LN64	34	31	28	31	-
LN65	27	26	23	24	-
LN66	39	39	33	37	-
LN67	48	42	41	43	-
LN68	35	33	31	32	-
LN69	33	31	29	31	-
LN70	34	34	31	33	-
LN71	32	31	31	31	-
LN72	31	30	31	30	-

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020
LN73	44	42	37	38	-
LN74	41	39	35	37	-
LN75	41	38	36	37	-
LN76	34	32	31	31	-
LN77	37	36	33	36	-
LN78	34	32	29	31	-
LN79	37	33	37	34	-
LN80	36	34	37	33	-
LN81	-	38	32	31	-
LN82	-	32	27	28	-
LN83	-	25	25	22	-
LN84	-	27	25	25	-
LN85	-	-	28	30	-
LN86	-	42	37	39	-

Central Bedfordshire Council

1.3.9 Diffusion tube monitoring is undertaken by CBC and details of the monitoring locations are presented in **Table 1.10**. Monitoring results for recent years are shown in and **Table 1.11**. All diffusion tube monitoring has been carried out at roadside locations.

1.3.10 Monitoring sites of particular relevance are located in or near to the Dunstable AQMA, approximately 7km from the airport. They are relevant to this baseline assessment as the Proposed Development may result in changes to traffic in this area. Exceedances of the standard were recorded in this AQMA in 2019.

Table 1.10: CBC diffusion tube monitoring location details

ID	Name	Type	Easting	Northing	In AQMA?
N1	A1 Sandy	Roadside	516436	249600	Yes
N4	A1 Beeston	Roadside	516485	249202	No
N6	Bedford Rd Sandy	Roadside	517160	248190	Yes
N20	A1 Carter St Sandy	Roadside	516621	249100	Yes
N16	Bedford Rd Sandy	Roadside	516534	249974	Yes
N17	Bedford Rd Sandy	Roadside	516593	249083	Yes
N18	Eddie's Cottage Sandy	Roadside	516569	249074	Yes
N21	Ampthill 1	Roadside	516579	249070	Yes

ID	Name	Type	Easting	Northing	In AQMA?
N22	Ampthill 2	Roadside	503444	238197	Yes
N23	Ampthill 3	Roadside	503466	238141	Yes
N25	Akbar A1 Sandy	Roadside	503458	283039	Yes
N26	Woburn	Roadside	516568	250174	No
N27	Church St Ampthill	Roadside	494900	233230	Yes
N28	Carter St Sandy	Roadside	503576	238167	Yes
N30	A1/Carter St Sandy	Roadside	516551	249967	Yes
N31	Bedford Rd Sandy	Roadside	516524	249942	Yes
N32	Chandos Ampthill	Roadside	516690	249109	Yes
N33	Moggerhanger	Roadside	503400	237913	No
N34	Langford	Roadside	514216	249194	No
N35	A1 Sandy (roundabout)	Roadside	518620	241387	Yes
1	High St South Dunstable	Roadside	516493	249175	Yes
10	Houghton Regis	Roadside	501936	221837	No
17	Mayfield/London Rd Dunstable	Roadside	501991	223965	No
18	Argos High St North Dunstable	Roadside	502848	220688	Yes
27	Luton Rd Dunstable	Roadside	501705	222089	Yes
33	Church St Dunstable	Roadside	503195	222119	Yes
34	High St South Dunstable	Roadside	501962	221884	Yes
36	Luton Rd Dunstable	Roadside	501911	221853	Yes
37	Luton Rd Dunstable	Roadside	503874	222334	Yes
39	Houghton Rd Dunstable	Roadside	502838	222071	No
48	Poynters/Katherine Dunstable	Roadside	501151	222821	No
49	Poynters/Hadrian Dunstable	Roadside	503745	222914	No
50	Luton Rd Dunstable	Roadside	503569	223034	No
52	Hockliffe St Leighton Buzzard	Roadside	502815	222065	No
54	High St North/Vauxhall Dunstable	Roadside	492512	225235	No
55	West St Dunstable	Roadside	500938	222899	No
56	West St Leighton Buzzard	Roadside	501662	221768	No
57	Church St Dunstable	Roadside	491800	225041	No
58	Hockliffe	Roadside	502456	222023	No
59	Beancroft Rd,Marston Moretaine	Roadside	497400	226676	No

Table 1.11: CBC diffusion tube monitored NO_2 concentrations

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020
N1	33.0	34.0	27.0	28.0	-
N4	43.0	44.0	36.8	-	-
N6	37.2	33.9	33.5	29.8	-
N20	34.3	33.5	30.7	29.4	-
N16	69.8	66.3	66.1	57.5	-
N17	40.6	40.8	36.1	34.4	-
N18	48.3	54.0	51.2	45.1	-
N21	29.9	30.2	27.9	27.4	-
N22	25.9	24.5	24.4	24.5	-
N23	42.0	39.7	37.7	38.6	-
N25	46.4	44.1	42.9	39.4	-
N26	38.1	36.8	32.6	32.4	-
N27	40.7	34.8	34.1	31.0	-
N28	34.4	33.8	32.5	30.3	-
N30	24.6	25.1	21.4	21.1	-
N31	59.9	57.1	46.0	44.4	-
N32	27.9	27.4	25.5	26.4	-
N33	27.9	27.5	25.2	23.7	-
N34	-	29.7	28.7	28.3	-
N35	-	-	-	17.9	-
1	-	-	-	43.4	-
10	41.5	35.6	37.2	37.5	-
17	35.5	33.8	29.3	29.5	-
18	33.5	29.2	29.6	27.4	-
27	40.1	35.1	37.7	34.8	-
33	33.2	29.8	31.8	28.1	-
34	39.5	37.4	34.2	37.3	-
36	48.2	40.6	38.1	36.4	-
37	35.6	33.5	27.2	-	-
39	54.6	48.0	44.1	36.5	-
48	35.3	31.6	28.3	31.3	-
49	37.1	33.4	32.7	29.6	-
50	32.8	29.9	28.2	26.9	-

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020
52	52.2	50.8	46.5	42.1	-
54	38.9	38.4	33.5	33.3	-
55	28.2	23.5	-	-	-
56	44.3	41.9	39.6	39.9	-
57	-	26.2	30.7	29.4	-
58	-	26.2	28.6	-	-
59	-	-	32.5	32.5	-

North Hertfordshire District Council

1.3.11 The details of diffusion tube monitoring locations carried out by NHDC is presented in **Table 1.12**. The results of monitored annual average NO_2 concentrations are shown in **Table 1.13**.

1.3.12 There were four exceedances recorded in 2019, all at roadside locations all of which were in AQMAs in Hitchin.

1.3.13 The monitoring sites located in and surrounding the AQMAs of NHDC in Hitchin are of relevance and are situated within 10km of the airport. The sites are relevant as the Proposed Development may change traffic flows in this area.

Table 1.12: NHDC diffusion tube monitoring location details

ID	Name	Type	Easting	Northing	In AQMA?
NH06	Melbourn Road_Opposite Town Hall_Royston	Roadside	535906	240794	No
NH45	Stevenage Road A_Hitchin	Roadside	518708	228347	Yes
NH59	NH04a_Clothall Road_Baldock	Roadside	524649	234061	No
NH60	NH13a_Willian Road_Hitchin	Roadside	519916	230099	No
NH61	NH53a_Whitehorse Street_Baldock_nr town hall	Roadside	524428	233882	No
NH63	NH02a_Library Hitchin	Roadside	518160	229092	Yes
NH67	Cadwell Court_Hitchin	Roadside	519225	230553	No
NH127	64 Grove Road_Hitchin	Roadside	518821	229993	No
NH72	Opp Rose Crown_Whitehorse Street_Baldock	Roadside	524502	233948	No
NH103	Westbrook Court_Hitchin	Roadside	518773	228342	Yes

ID	Name	Type	Easting	Northing	In AQMA?
NH77	Upper Tilehouse Street_Hitchin_traffic lights	Roadside	518006	229032	Yes
NH82	Upper Tilehouse Street_Nr Roundabout	Roadside	518129	229065	Yes
NH87	11 Stevenage Road_Hitchin	Roadside	518731	228362	No
NH88	Church St_Baldock_Opp. Town Hall	Kerbside	524448	233898	No
NH89	London Road_Hitchin	Roadside	518706	228293	No
NH91	St Johns Road_Hitchin	Roadside	518656	228406	No
NH92	Stevenage Road_Griffin_Hitchin	Roadside	518872	228305	Yes
NH93	Park Way_Hitchin	Roadside	518130	229036	Yes
NH94	Offley Road_Hitchin	Roadside	517915	228967	No
NH95	Pirton Road_Hitchin	Roadside	517886	228975	No
NH98	Walsworth_Radcliffe Road_Hitchin	Roadside	519080	229510	No
NH99	Nightingale Road_Hitchin	Roadside	518953	229786	No
NH108	Hitchin_Hermitage Road_97	Roadside	518534	229302	No
NH104	Dower Court_A_Stevenage Road_Hitchin	Roadside	518757	228334	Yes
NH105	94-98 Stevenage Road_Hitchin	Roadside	519067	228255	Yes
NH106	Morello Gardens_Stevenage Road_Hitchin	Roadside	519250	228218	No
NH107	Whitehill Road_Hitchin	Roadside	518720	228335	No
NH110	Stevenage Road_AQ Analyser 1_Hitchin	Roadside	518740	228348	Yes
NH111	Stevenage Road_AQ Analyser 2_Hitchin	Roadside	518740	228348	Yes
NH112	Stevenage Road_AQ Analyser 3_Hitchin	Roadside	518740	228348	Yes
NH114	Old Park Road_Hitchin_number 20	Roadside	518150	229160	Yes
NH115	Old North Road_Royston	Roadside	535373	241466	No
NH116	6 Horseshoe_Park Street_Hitchin	Roadside	518492	228669	No
NH117	Hitchin - Fishponds Road	Roadside	518278	229752	No
NH119	High Street_125_Codicote	Roadside	521767	218110	No
NH120	Five House Farmhouse Sandon Rd_Therfield	Rural	533805	233823	No

ID	Name	Type	Easting	Northing	In AQMA?
NH121	1 Hadrians Way_Baldock	Roadside	523849	233497	No
NH122	29 Hopewell Rd_Baldock	Roadside	523917	233917	No
NH123	Dunkerley Ct_LGC	Roadside	522289	232985	No
NH124	82 Bedford Rd_LGC	Roadside	520967	233073	No
NH125	11 Luton Rd_Cockernhoe	Rural	512486	223251	No
NH128	57 Codicote High Street	Roadside	521497	218415	No
NH129	119 London Road_Knebworth	Roadside	525205	220142	No
NH130	Opp Old White Horse_Station Rd_Baldock	Roadside	524597	234119	No
Nh131	The Clock House_Turnpike Lane_Ickleford	Kerbside	518215	231528	No
NH132	Opp Laurel Way_Arlesey Road_Ickleford	Roadside	518283	231366	No
Nh133	George & Dragon_High Street_Graveley	Roadside	523124	227776	No
NH134	6 Bucks Head Cottages_Stevenage Rd_L.Wymondley	Roadside	521516	227449	No

Table 1.13: NHDC diffusion tube monitored NO_2 concentrations

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020
NH06	25.9	26.5	-	24.8	-
NH45	45.2	42.3	-	38.3	-
NH59	27.8	26.3	-	23.4	-
NH60	29.9	29.4	-	24.5	-
NH61	30.4	27.7	-	26.8	-
NH63	37.2	35.8	-	32.1	-
NH67	27.2	28.3	-	23.5	-
NH127	-	-	-	21	-
NH72	32.1	31.3	-	26.8	-
NH103	39.8	38.6	-	34.4	-
NH77	39	36.9	-	34	-
NH82	36.5	33.3	-	32	-
NH87	26.9	26.9	-	23.7	-
NH88	39.9	40.5	-	35.7	-

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020
NH89	29.7	28.2	-	23.6	-
NH91	31.9	32.2	-	29.8	-
NH92	46.1	44.4	-	36.7	-
NH93	49	45.5	-	41.9	-
NH94	34.1	34.3	-	27.5	-
NH95	31.8	33	-	28.9	-
NH98	30.4	28.6	-	26.6	-
NH99	30.7	29.8	-	28	-
NH108	34	33.1	-	31.8	-
NH104	30.8	32.2	-	25.7	-
NH105	46	43.3	-	37.7	-
NH106	37.7	35.3	-	35.4	-
NH107	29	27.8	-	26.5	-
NH110	50.2	48.2	-	43	-
NH111	56.4	54.3	-	49.8	-
NH112	54.2	49.6	-	42	-
NH114	30.5	29	-	25.2	-
NH115	26.5	26.8	-	24.3	-
NH116	-	35.8	-	31.2	-
NH117	-	28.1	-	26	-
NH119	-	26.1	-	23	-
NH120	-	13.7	-	12.1	-
NH121	-	-	-	20.9	-
NH122	-	-	-	19.6	-
NH123	-	-	-	19	-
NH124	-	-	-	18.6	-
NH125	-	-	-	17.7	-
NH128	-	-	-	25	-
NH129	-	-	-	27.2	-
NH130	-	-	-	30.7	-
Nh131	-	-	-	38	-
NH132	-	-	-	18.7	-
Nh133	-	-	-	18.2	-

St Albans City and District Council

1.3.14 The details of the relevant diffusion tube monitor location (SA142) in the study area is presented in **Table 1.14** and **Table 1.15**. The diffusion tube is located 15km south from the airport, but is relevant to the residential receptor located along the M1 in the St Albans District Council (SADC) AQMA No. 2.

Table 1.14: SADC diffusion tube monitoring location details

ID	Name	Type	Easting	Northing	In AQMA?
SA142	Beech Tree Cottage St Albans (AL3 6AR)	Roadside	510754	206091	Yes

Table 1.15: SADC diffusion tube monitored NO_2 concentrations

ID	Annual mean NO_2 concentrations ($\mu g/m^3$)				
	2016	2017	2018	2019	2020
SA142	-	36.0	30.2	30.4	-

Scheme specific monitoring

1.3.15 Monitoring is being undertaken using diffusion tubes, which are a passive monitoring method widely used in the UK for measuring ambient concentrations. The monitoring is carried out at multiple locations for nitrogen dioxide (NO_2) and volatile organic compounds (VOCs). The VOCs measured are: BTEX (Benzene, Toluene, Ethylbenzene, m/p-Xylene and o-Xylene), Naphthalene and 1,3 Butadiene.

1.3.16 Monitoring using diffusion tubes for NO_2 was carried out at 11 locations. Monitoring of VOCs was carried out at five locations. The details of each site are provided in **Table 1.16**.

NO_2

1.3.17 The measured annual mean NO_2 concentrations from 2018 to 2020 are presented in **Table 1.17**. Most monitoring locations measured concentrations well below the annual mean NO_2 air quality objective of $40\mu g/m^3$, except at Vauxhall Way (site L7).

1.3.18 The recorded concentrations at Vauxhall Way (site L7) are above the air quality objective. However, there is not any relevant human exposure (i.e. homes, schools, care homes) roadside. This means there would be no requirement to declare an air quality management area (AQMA).

1.3.19 The exceedance of the NO_2 objective measured at site L7 is likely due to proximity of road traffic, the large car park to the east of the road, and the traffic and emissions generated by the industrial unit (Leadec Industrial Services

Vauxhall) to the west. The situation is exacerbated by a possible 'street canyon' effect caused by high walls either side of the road.

1.3.20 During to the nationwide lockdown due to the Covid-19 pandemic, there was a reduction in road traffic. This is reflected in the 2020 annual mean NO_2 concentrations at the monitoring sites compared to the 2018 and 2019 annual mean NO_2 concentrations.

BTEX

1.3.21 The measured annual mean BTEX concentrations from 2018 to 2020 are presented in

1.3.22 **Table 1.18** to **Table 1.22**.

1.3.23 The measured BTEX concentrations were well below all relevant air quality standards from 2018 to 2020. For benzene, the highest concentration recorded in 2020 is 31% of the air quality standard and for all the other VOCs the highest recorded concentration in 2020 is a maximum of 0.15% of the relevant standard.

1.3.24 Benzene concentrations were well below the annual mean Benzene air quality standard of 5µg/m^3 in all years. For all the BTEX results, 26% of the total raw data analysed in the laboratory was less than the detection limit of the equipment. This emphasises that many of the measurements were trace amounts of the BTEX compounds.

1.3.25 The recorded concentrations of VOCs in 2020 was slightly lower compared to the previous years. This could be explained by the national lockdown during Covid-19 where there was a reduction in road and air traffic.

Napthalene

1.3.26 The measured annual mean Naphthalene concentrations in 2018 to 2020 are presented in **Table 1.23**. The measured annual mean Naphthalene concentrations were well below the annual mean Naphthalene air quality standard of 530µg/m^3.

1,3, Butadiene

1.3.27 The measured annual mean 1,3 Butadiene concentrations from 2018 to 2020 are presented in **Table 1.24**.

1.3.28 All concentrations are well below the annual mean 1,3 Butadiene air quality standard of 2.25µg/m^3. In 2020, most of the measurements were below the detection limit of the laboratory equipment, suggesting trace values. This is similar to the previous years.

Table 1.16: Scheme specific diffusion tube monitoring location details

Site ID	Location	OS grid reference		Height (m)	Distance to kerb (m)	Pollutants being measured	Notes
		X	Y				
L1	Dunstable Road East	508708	221352	2.0	2.4	NO_2	Co-location with the LBC "Luton Dunstable Road East (HB007)" monitoring station
L2 and V1	Crawley Green Road	511155	222445	2.1	1.2	NO_2, BTEX, Naphthalene, 1,3, Butadiene	
L3	Wigmore Lane	511780	222760	2.0	1.0	NO_2	
L4	Eaton Green Road/Darley Road	513223	222397	2.0	1.5	NO_2	
L5 and V3	Chapel Road, Breachwood Green	515047	221904	2.0	2.8	NO_2, BTEX, Naphthalene, 1,3, Butadiene	
L6	Winch Hill	513773	221752	1.9	1.2	NO_2	
L7	Vauxhall Way	511057	221386	2.0	2.1	NO_2	
L8	Kimpton Road	510543	220706	2.0	2.1	NO_2	
L9 and V5	Luton Parkway Station Exit (North)	510552	220660	1.8	-	NO_2, BTEX, Naphthalene, 1,3, Butadiene	
L10	Luton Road, Caddington	506541	219854	2.1	1.0	NO_2	
L11 and V2 (LA001)	Wigmore Valley Park (Air Quality Monitoring Station)	512569	222207	1.6	-	NO_2, BTEX, Naphthalene, 1,3, Butadiene	Co-location with Luton Rising automatic monitoring station LA001.

Site ID	Location	OS grid reference		Height (m)	Distance to kerb (m)	Pollutants being measured	Notes
		X	Y				
V4	Copt Hall Road	512497	220008	1.9	1.4	BTEX, Naphthalene, 1,3, Butadiene	
Note: BTEX includes: Benzene, Toluene, Ethylbenzene, m/p-Xylene and o-Xylene. “L” prefix denotes NO_2 tubes and “V” prefix denotes VOC tubes							

Table 1.17: Scheme specific diffusion tube monitored NO_2 concentrations

Site ID	Location	Annualised and bias adjusted annual mean NO_2 concentrations ($\mu g/m^3$)		
		2018	2019	2020
L1	Dunstable Road East	37.0	40.3	28.5
L2	Crawley Green Road	30.9	29.2	21.6
L3	Wigmore Lane	25.5	28.3	19.1
L4	Eaton Green Road/Darley Road	16.2	20.2	13.1
L5	Chapel Road, Breachwood	11.2	14.4	9.8
L6	Winch Hill	14.2	17.1	11.0
L7	Vauxhall Way	68.9	71.2	45.3
L8	Kimpton Road	27.6	33.1	22.2
L9	Luton Parkway Station Exit (North)	24.8	31.9	20.2
L10	Luton Road, Caddington	19.0	24.9	16.7
L11	Wigmore Valley Park	n/a	20.5	12.3

Site ID	Location	Annualised and bias adjusted annual mean NO_2 concentrations ($\mu g/m^3$)		
		2018	2019	2020
	(Air Quality Monitoring Station)			
Air quality objective		40		

Table 1.18: Annual mean Benzene concentrations from 2018 to 2020

Site ID	Location	Annual mean Benzene concentrations ($\mu g/m^3$)		
		2018	2019	2020
V1	Crawley Green Road	1.2	1.1	1.1
V2	Wigmore Valley Park	1.0	1.0	0.9
V3	Chapel Road, Breachwood	1.0	0.9	0.9
V4	Copt Hall Road	1.2	0.9	0.8
V5	Luton Parkway Station Exit (North)	1.0	1.0	1.0
Air quality objective		5		

Table 1.19: Annual mean Toluene concentrations from 2018 to 2020

Site ID	Location	Annual mean Toluene concentrations (µg/m3)		
		2018	2019	2020
V1	Crawley Green Road	2.7	1.6	1.5
V2	Wigmore Valley Park	2.0	1.3	0.9
V3	Chapel Road, Breachwood	1.1	0.9	0.8
V4	Copt Hall Road	2.2	0.8	0.7
V5	Luton Parkway Station Exit (North)	1.8	1.8	1.6

Site ID	Location	Annual mean Toluene concentrations (µg/m3)		
		2018	2019	2020
Air quality objective		1,910		

Table 1.20: Annual mean Ethylbenzene concentrations from 2018 to 2020

Site ID	Location	Annual mean Ethylbenzene concentrations (µg/m3)		
		2018	2019	2020
V1	Crawley Green Road	0.5	0.7	0.7
V2	Wigmore Valley Park	0.6	0.7	0.4
V3	Chapel Road, Breachwood	0.8	0.4	0.4
V4	Copt Hall Road	1.1	0.8	0.4
V5	Luton Parkway Station Exit (North)	1.0	0.5	0.6
Air quality objective		4,410		

Table 1.21: Annual mean m/p-Xylene concentrations from 2018 to 2020

Site ID	Location	Annual mean m/p-Xylene concentrations (µg/m3)		
		2018	2019	2020
V1	Crawley Green Road	1.7	1.7	2.1
V2	Wigmore Valley Park	1.2	1.4	1.0
V3	Chapel Road, Breachwood	1.0	0.7	0.7
V4	Copt Hall Road	1.7	1.4	1.2
V5	Luton Parkway Station Exit (North)	1.8	1.6	1.7
Air quality objective		4,410		

Table 1.22: Annual mean o-Xylene concentrations from 2018 to 2020

Site ID	Location	Annual mean o-Xylene concentrations (µg/m3)		
		2018	2019	2020
V1	Crawley Green Road	0.7	0.6	0.8
V2	Wigmore Valley Park	0.5	0.6	0.4
V3	Chapel Road, Breachwood	0.4	0.3	0.3
V4	Copt Hall Road	0.6	0.6	0.5
V5	Luton Parkway Station Exit (North)	0.7	0.6	0.7
Air quality objective		4,410		

Table 1.23: Annual mean Naphthalene concentrations from 2018 to 2020

Site ID	Location	Annual mean Naphthalene concentrations (µg/m3)		
		2018	2019	2020
V1	Crawley Green Road	0.1	0.1	0.1
V2	Wigmore Valley Park	0.1	0.1	0.1
V3	Chapel Road, Breachwood	0.4	0.3	0.2
V4	Copt Hall Road	0.1	0.1	0.1
V5	Luton Parkway Station Exit (North)	0.1	0.1	0.1
Air quality objective		530		

Table 1.24: Annual mean 1,3, Butadiene concentrations from 2018 and 2020

Site ID	Location	Annual mean 1,3, Butadiene concentrations (µg/m3)		
		2018	2019	2020
V1	Crawley Green Road	<0.1	<0.1	<0.1

Site ID	Location	Annual mean 1,3, Butadiene concentrations (µg/m3)		
		2018	2019	2020
V2	Wigmore Valley Park	<0.1	<0.1	<0.1
V3	Chapel Road, Breachwood	<0.1	<0.1	<0.1
V4	Copt Hall Road	0.1	<0.1	<0.1
V5	Luton Parkway Station Exit (North)	<0.1	<0.1	<0.1
Air quality objective		2.25		

1.4 Background concentrations

1.4.1 The Defra website (Ref. 1.4) includes estimated background air pollution data for each 1km by 1km OS grid square in the UK. Baseline concentrations for 2019 have been taken from the latest Defra maps and are presented in **Table 1.25** for the grid squares that cover the Main Application Site. Defra's estimated background concentrations are well below the air quality standards for annual mean NO_2 and PM_{10} (40µg/m^3) and $PM_{2.5}$ (25 µg/m^3).

1.4.2 The urban background results from the LBC 2019 monitoring sites have been compared to the Defra background NO_2 concentrations in **Table 1.26**. On average, the urban background monitoring results are 13% higher than the Defra predicted backgrounds. This suggests that the Defra numbers may be underpredicting the urban background concentrations.

Table 1.25: Defra background pollutant concentrations for 2019

OS grid square		Annual mean concentration (µg/m^3)			
X	Y	NOx	NO_2	PM_{10}	$PM_{2.5}$
511500	222500	22.5	16.1	15.6	10.7
512500	222500	22.6	16.1	15.1	10.3
510500	221500	23.3	16.6	15.7	10.7
511500	221500	38.3	24.6	15.8	10.7
512500	221500	31.9	21.2	15.4	10.1
513500	221500	27.9	19.1	15.3	9.8
510500	220500	27.9	19.3	16.5	11.2
511500	220500	31.3	21.0	15.6	10.3
512500	220500	28.4	19.3	14.8	9.8

Table 1.26: Comparison between Defra and monitored background NO_2 (µg/m^3)

Monitoring site	OS Grid Square		Defra mapped	Monitored	Difference (%)
	X	Y	NO_2	NO_2	
LN22	511341	221864	24.6	23.0	-7%
LN24	511902	222144	16.1	22.0	27%
LN26	512109	222234	16.1	20.0	19%

2 BACKGROUND MODELLING RESULTS

2.1.1 The comparison between the modelled and monitored NO_2 concentrations from all sources (including major roads) is presented in **Table 2.1** and show a high

level of agreement where on average, the modelled background concentration is 2% higher than the monitored concentrations.

Table 2.1: Comparison between modelled and monitored background NO_2 (µg/m^3)

ID	OS Grid Square		Annual mean concentration (ug/m^3)		Difference (modelled - monitored) (%)
	X	Y	Modelled background	Monitored	
LN22	511341	221864	25.0	23.0	8%
LN24	511902	222144	21.6	22.0	-2%
LN26	512109	222234	20.1	20.0	1%

2.1.2 The modelled background concentrations for NO_2 have also been compared with the Defra maps for the grid squares that the modelled receptors are located and is presented in **Table 2.2** presents the concentrations with the contributions from major roads and airport sources removed, because these were explicitly modelled in the assessment. On average, the modelled background concentrations are 15% higher than the Defra predicted backgrounds.

Table 2.2: Comparison between modelled and Defra background NO_2 (µg/m^3)

ID	OS Grid Square		Annual mean concentration (ug/m^3)		Difference (modelled - Defra mapped) (%)
	X	Y	Modelled background	Defra mapped	
LN22	511500	221500	25.0	24.6	1%
LN24	511500	222500	21.6	16.1	25%
LN26	512500	222500	20.1	16.1	20%

2.1.3 The modelled background concentrations for PM_{10} have been compared with the monitored concentrations. The comparison is presented in **Table 2.3** and shows a good level of agreement.

Table 2.3: Comparison between modelled and monitored background PM_{10} (µg/m^3)

ID			Annual mean concentration (ug/m^3)		Difference (modelled - monitored) (%)
	X	Y	Modelled background	Monitored	
LA08	511871	221142	14.7	16.0	-9%

2.1.4 The comparison between the modelled background PM_{10} concentrations and Defra mapped concentrations is presented in **Table 2.4**. On average, the

modelled background concentrations are 3% lower than the Defra predicted backgrounds.

Table 2.4: Comparison between modelled and Defra mapped PM_{10} ($\mu g/m^3$)

ID	OS Grid Square		Annual mean concentration (ug/m^3)		Difference (modelled - Defra mapped) (%)
	X	Y	Modelled background	Defra mapped	
LA08	511871	221142	14.7	15.8	-8%
LN22	511341	221864	15.5	15.8	-2%
LN24	511902	222144	15.2	15.6	-2%
LN26	512109	222234	15.1	15.1	0%

2.1.5 The modelled $PM_{2.5}$ backgrounds have been compared with the Defra background concentrations for the same grid square and the comparison is presented in **Table 2.5**. On average, the modelled background concentrations are 1% lower than the Defra predicted backgrounds.

Table 2.5: Comparison between modelled and Defra mapped $PM_{2.5}$ ($\mu g/m^3$)

ID	OS Grid Square		Annual mean concentration (ug/m3)		Difference (modelled - Defra mapped) (%)
	X	Y	Modelled background	Defra mapped	
LA08	511871	221142	10.2	10.7	-5%
LN22	511341	221864	10.8	10.7	1%
LN24	511902	222144	10.6	10.7	-1%
LN26	512109	222234	10.5	10.3	2%

3 MODEL VERIFICATION

3.1.1 This section presents the results of the model verification process.

3.1.2 **Table 3.1** provides details of the monitoring sites which have been removed from the verification process. The review process was carried out as detailed in **Appendix 7.1** in Volume 3 of the PEIR. It resulted in two monitoring points being excluded and two locations used the average of triplicate tubes (NH100, 111, 112 and LN61, 62, 63).

Table 3.1: Monitoring sites removed from the verification process

Site removed	Adjustment location	Justification for exclusion
M58	Hitchin AQMA	Adjacent to a bus stop which is not reflected in the modelling.

Site removed	Adjustment location	Justification for exclusion
M67	Hitchin AQMA	Adjacent to a petrol station which is not reflected in the modelling.

3.1.3 **Table 3.2** presents the comparison of modelled with monitored NO_2 concentrations prior to any adjustment and **Table 3.3** presents the comparison of modelled with monitored NO_2 concentrations after adjustment.

3.1.4 **Inset 3.1** to **Inset 3.3** shows the comparison of the model's performance in the study after adjustment for the different adjustment areas.

Table 3.2: Comparison of modelled and monitored NO_2 concentrations (no adjustment)

Monitoring site	Modelled NO_2 (µg/m³)	Monitored NO_2 (µg/m³)	Ratio
Roads			
LN60	30.9	40.0	1.3
CM2	19.9	39.0	2.0
LN28	24.9	39.0	1.6
LN52	29.2	43.0	1.5
LN61	31.1	41.0	1.3
LN64	24.6	31.0	1.3
LN65	20.7	24.0	1.2
LN66	24.1	37.0	1.5
LN67	21.9	43.0	2.0
LN68	18.9	32.0	1.7
LN70	25.3	33.0	1.3
LN71	21.4	31.0	1.5
LN74	19.4	37.0	1.9
LN75	20.3	37.0	1.8
LN79	20.0	34.0	1.7
LLA 15	24.3	31.0	1.3
LLA 17	25.7	32.0	1.2
L1	31.1	41.0	1.3
L2	21.6	30.0	1.4
L3	19.3	30.0	1.6
L4	16.1	20.0	1.2
L8	22.8	35.0	1.5
L10	17.0	25.0	1.5
1	19.1	37.5	2.0
18	22.5	34.8	1.6
27	20.0	28.1	1.4

Monitoring site	Modelled NO_2 (µg/m³)	Monitored NO_2 (µg/m³)	Ratio
33	18.7	37.3	2.0
34	26.5	36.4	1.4
37	23.5	36.5	1.6
50	24.9	42.1	1.7
55	24.6	39.9	1.6
NH1	25.3	45.0	1.8
NH45	25.3	38.3	1.5
NH103	22.6	34.4	1.5
NH87	18.7	23.7	1.3
NH89	17.4	23.6	1.4
NH104	20.3	25.7	1.3
NH107	20.3	26.5	1.3
NH110	25.6	44.9	1.8
Airport			
LN23	24.1	35.0	1.5
LN25	22.2	30.0	1.3
LN27	21.3	28.0	1.3
LLA 2	31.6	34.0	1.1
LLA 3	19.3	22.0	1.1
LLA 5	32.5	37.0	1.1
LLA 6	28.0	34.0	1.2
LLA 7	25.2	46.0	1.8
LLA 8	30.3	32.0	1.1
LLA 12	29.9	36.0	1.2
LLA 13	21.7	24.0	1.1
LLA 14	26.5	42.0	1.6
Hitchin			
NH63	36.9	32.1	0.9
NH77	23.7	34.0	1.4
NH82	27.6	32.0	1.2

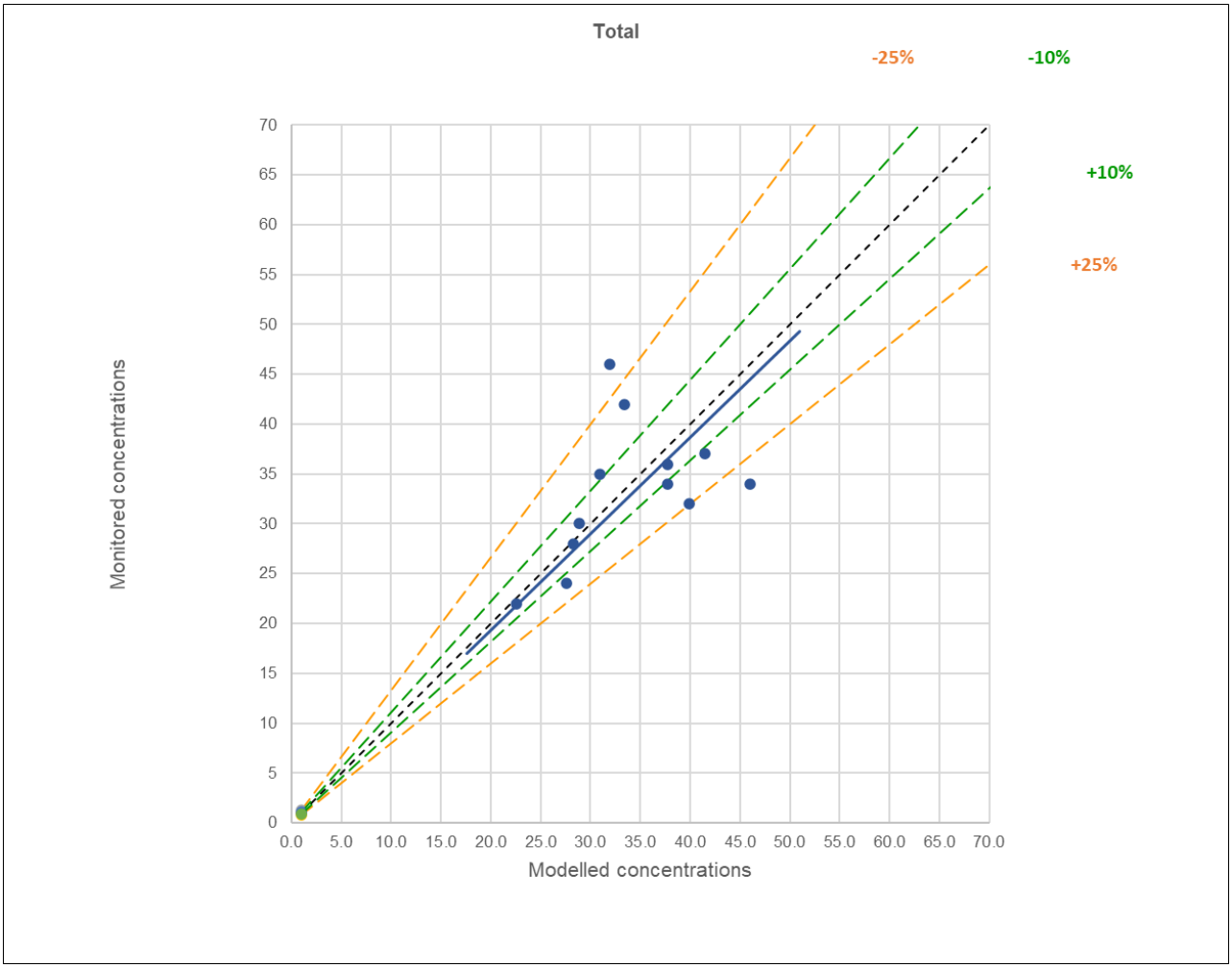
Table 3.3: Comparison of modelled and monitored NO_2 concentrations (after adjustment)

Monitoring site	Modelled NO_2 (µg/m³)	Monitored NO_2 (µg/m³)	Ratio
Roads			
LN60	46.5	40.0	0.9

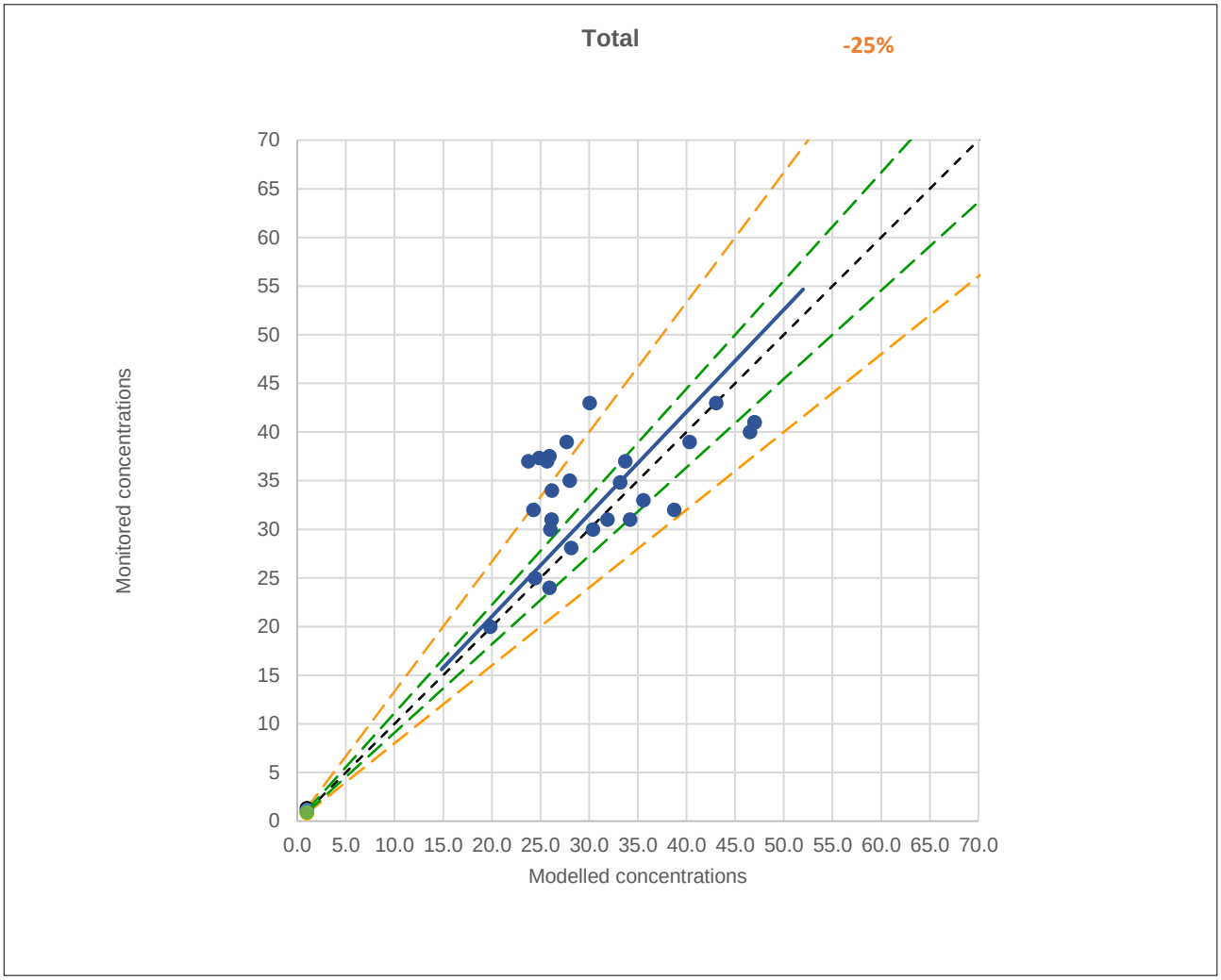
Monitoring site	Modelled NO_2 (µg/m³)	Monitored NO_2 (µg/m³)	Ratio
CM2	27.7	39.0	1.4
LN28	40.3	39.0	1.0
LN52	43.0	43.0	1.0
LN61	47.0	41.0	0.9
LN64	34.2	31.0	0.9
LN65	25.9	24.0	0.9
LN66	33.7	37.0	1.1
LN67	30.0	43.0	1.4
LN68	24.3	32.0	1.3
LN70	35.6	33.0	0.9
LN71	26.1	31.0	1.2
LN74	23.7	37.0	1.6
LN75	25.7	37.0	1.4
LN79	26.2	34.0	1.3
LLA 15	31.9	31.0	1.0
LLA 17	38.7	32.0	0.8
L1	47.0	41.0	0.9
L2	30.4	30.0	1.0
L3	26.0	30.0	1.2
L4	19.8	20.0	1.0
L8	28.0	35.0	1.3
L10	24.4	25.0	1.0
1	25.9	37.5	1.4
18	33.2	34.8	1.0
27	28.1	28.1	1.0
33	24.9	37.3	1.5
34	41.5	36.4	0.9
37	34.6	36.5	1.1
50	37.6	42.1	1.1
55	38.1	39.9	1.0
NH1	40.3	45.0	1.1
NH45	40.4	38.3	0.9
NH103	34.9	34.4	1.0
NH87	26.6	23.7	0.9
NH89	23.8	23.6	1.0
NH104	30.1	25.7	0.9

Monitoring site	Modelled NO_2 (µg/m³)	Monitored NO_2 (µg/m³)	Ratio
NH107	30.1	26.5	0.9
NH110	40.9	44.9	1.1
Airport			
LN23	30.9	35.0	1.1
LN25	28.9	30.0	1.0
LN27	28.3	28.0	1.0
LLA 2	46.0	34.0	0.7
LLA 3	22.6	22.0	1.0
LLA 5	41.5	37.0	0.9
LLA 6	37.8	34.0	0.9
LLA 7	31.9	46.0	1.4
LLA 8	39.9	32.0	0.8
LLA 12	37.8	36.0	1.0
LLA 13	27.5	24.0	0.9
LLA 14	33.4	42.0	1.3
Hitchin			
NH63	40.9	32.1	0.8
NH77	25.8	34.0	1.3
NH82	30.3	32.0	1.1

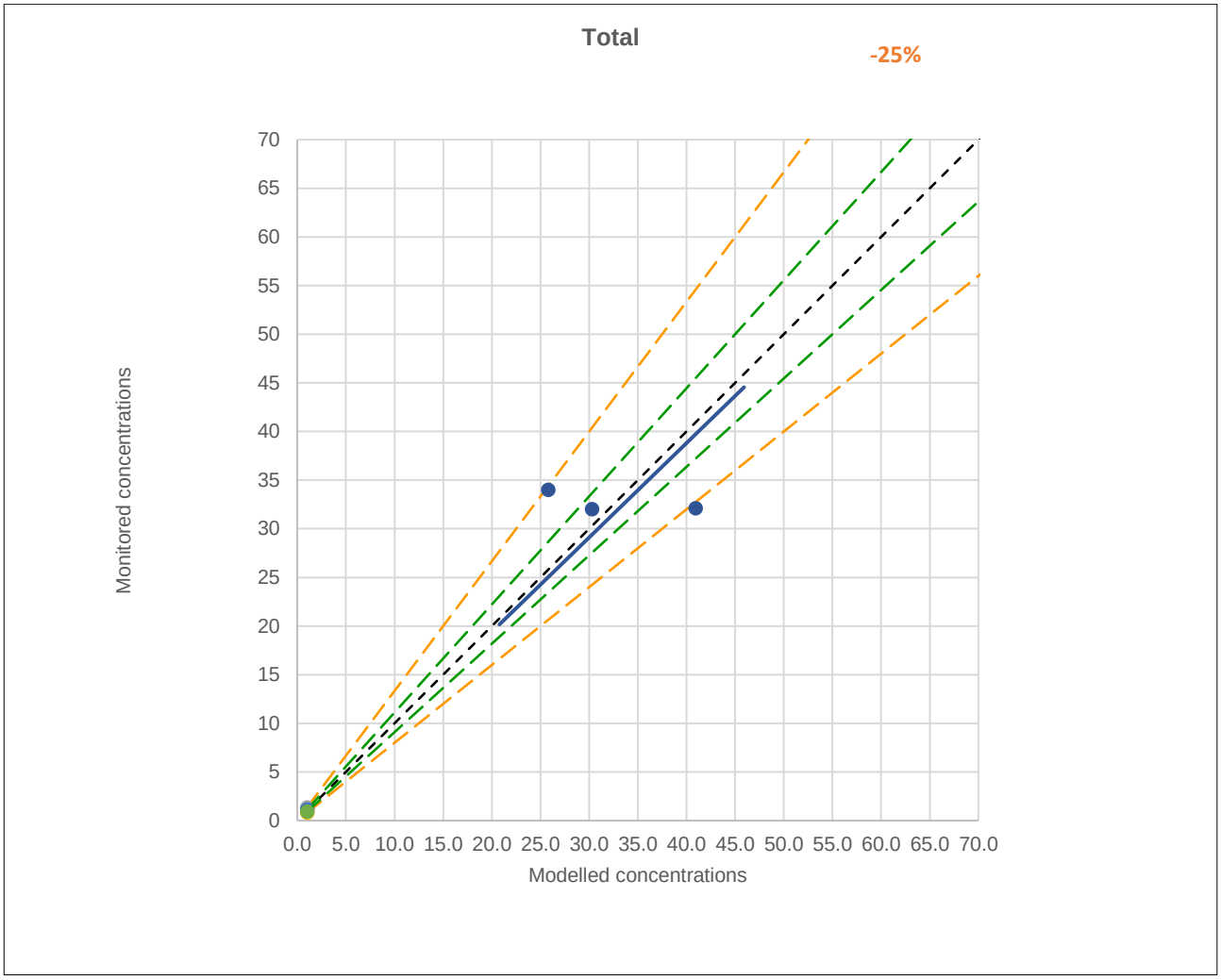
Inset 3.1: Model performance with adjustment – airport



Inset 3.2: Model performance with adjustment – roads



Inset 3.3: Model performance with adjustment – Hitchin AQMA



GLOSSARY AND ABBREVIATIONS

Term	Definition
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
BTEX	Benzene, Toluene, Ethylbenzene, m/p-Xylene and o-Xylene
CBC	Central Bedfordshire Council
CO	Carbon monoxide
DT	Diffusion tube
EA	Environment Agency
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LBC	Luton Borough Council
LLAOL	London Luton Airport Operations Limited, the current operators of London Luton Airport
NAEI	National Atmospheric Emissions Inventory
NHDC	North Hertfordshire District Council
NO	Nitric oxide
NOx	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
O_3	Ozone
PM_{10}	Particulate Matter 10 micrometers or smaller in diameter
$PM_{2.5}$	Particulate Matter 2.5 micrometers or smaller in diameter
SADC	St Albans District Council
SDC	Stevenage District Council
SO_2	Sulphur dioxide
VOC	Volatile Organic Compounds

REFERENCES

Ref 1.1 Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).
Ref 1.2 The Environmental Permitting (England and Wales) (Amendment) Regulations 2013, SI 2013/390.
Ref 1.3 The Environmental Permitting (England and Wales) Regulations 2016 (as amended).
Ref 1.4 Defra (2018) Background Maps. (Online)