DMRB: Assessment of Local Air Quality

OUTPUT SHEET

Current receptor

Receptor Name	Ash to Brookwood A322 with 100m	Receptor number	8
Assessment year	2025		

Results

Pollutant	Annual mean				For comparison with Air Quality Standards		
	Background concentration	Road traffic component	Total	Units	Metric	Value	Units
CO	0.00	0.00	0.00	mg/m^3	Annual mean*	0.00	mg/m^3
Benzene	0.00	0.00	0.00	$\mu g/m^3$	Annual mean	0.00	$\mu g/m^3$
1,3-butadiene	0.00	0.00	0.00	$\mu g/m^3$	Annual mean	0.00	$\mu g/m^3$
NO_x	10.7	0.7	11.4	$\mu g/m^3$	Not applicable		
NO_2	8.2	0.2	8.4	$\mu g/m^3$	Annual mean*	8.4	$\mu g/m^3$
PM_{10}	0.0	0.06	0.06	$\mu g/m^3$	Annual mean	0.1	$\mu g/m^3$
					Days >50$\mu g/m^3$	0	Days

* See Footnote 32 in DMRB Volume 11 Chapter 3

Contribution of each link to annual mean

Link number	CO (mg/m³)	Benzene (µg/m³)	1,3-butadiene (µg/m³)	NOx (µg/m³)	PM_{10} (µg/m³)
1	0.00	0.00	0.00	0.67	0.06
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

All receptors

Receptor number	Name	Year	Pollutant concentrations at receptor						
			CO *	Benzene	1,3-butadiene	NO_x	NO_2 *	PM_{10}	
			Annual mean mg/m³	Annual mean µg/m³	Annual mean µg/m³	Annual mean µg/m³	Annual mean µg/m³	Annual mean µg/m³	Days >50µg/m³
1	Ash to Brookwood A322 without 5m	2025	0.03	0.03	0.03	16.79	10.25	0.57	0.00
2	Ash to Brookwood A322 with 5m	2025	0.03	0.03	0.03	17.65	10.52	0.65	0.00
3	Ash to Brookwood A322 without 10m	2025	0.03	0.03	0.03	16.20	10.06	0.51	0.00
4	Ash to Brookwood A322 with 10m	2025	0.03	0.03	0.03	16.97	10.31	0.59	0.00
5	Ash to Brookwood A322 without 50m	2025	0.01	0.01	0.01	12.65	8.90	0.18	0.00
6	Ash to Brookwood A322 with 50m	2025	0.01	0.01	0.01	12.93	8.99	0.21	0.00
7	Ash to Brookwood A322 without 100m	2025	0.00	0.00	0.00	11.28	8.41	0.05	0.00
8	Ash to Brookwood A322 with 100m	2025	0.00	0.00	0.00	11.37	8.44	0.06	0.00

* See Footnote 32 in DMRB Volume 11 Chapter 3

Assesment of Impact as a % of Critical Load

Ash to Brookwood

Estimated Worst Case Background 2020	Critical Load*	Worst case process contribution	PEC	PEC as % of Critical load
10.78	10	0.03	10.81	108
10.78	20	0.03	10.81	54

IS IMPACT LESS THAN 1% OF CRITICAL LOAD?

Where critical load is taken as

10	0.265	**NO**
20	0.133	**YES**

IS PEC LESS THAN 70% OF CRITICAL LOAD?

10	108	**NO**
20	54	**YES**

***CRITICAL LOADS**

APIS 2011	**kg N ha-1 y-1**
Northern Atlantic wet Heaths with Erica tetralix	10 - 20

APIS 2011

	kg N ha-1 y-1
WOODLARK NIGHTJAR AND DARTFORD WARBLER	10 - 20

Assesment of Impact as a % of Critical Load

ASH TO BROOKWOOD HEATH

Distance (m)	Estimated Worst Case Background 2020	Critical Load*	Worst case process	PEC	PEC as % of Critical load
5	10.78	10	0.027	10.81	108
10	10.78	10	0.024	10.80	108
50	10.78	10	0.009	10.79	108
100	10.78	10	0.003	10.78	108

	IS IMPACT LESS THAN 1% OF CRITICAL LOAD? Where critical load is taken as			
5	10	0.265	NO	
10	10	0.243	NO	
50	10	0.095	YES	
100	10	0.030	YES	

Distance Regression (Exponential)

DISTANCE	EXPONENTIAL
10	0.2399
50	**0.0956**
100	0.0303

NB SPA SAC STARTS AT APPROX 70M FROM CENTRELINE

***CRITICAL LOADS**

APIS 2011	**kg N ha-1 y-1**
Northern Atlantic wet Heaths with Erica tetralix	10 - 20

APIS 2011

	kg N ha-1 y-1
WOODLARK NIGHTJAR AND DARTFORD WARBLER	10 - 20

DMRB Volume 11 Section 3 Part 1 HA 207/07
Assessment of Designated Sites Annex F

1. Identify Sensitive Site
Is the site sensitive to N deposition?

ASH TO BROOKWOODS HEATH SPA (within 200m of A322)
Part of Thames Basin Heaths
SPA due to three bird species - See APIS
All sensitive to Nitrogen - See APIS

THURSLEY ASH PIRBRIGHT AND CHOBHAM SAC

2. Obtain total average N deposition for 5km grid square

See APIS

Ash to Brookwoods Heath SPA - Location for SSSI unit 2 SU957556*

www.gridreferencefinder.com - 495700, 155600

NB - Location ~630m from A322 Bagshot Road

www.apis.ac.uk - search database by habitat or species - Site Relevant Critical Loads

Therefore:

Species	**2005 N deposition (kg/ha/yr)**	**2020 N deposition (kg/ha/yr)**
Woodlark	**16.24**	10.78
Nightjar	**16.24**	10.78
Dartford Warbler	**16.24**	10.78
TYPICAL N DEPOSTION FOR CALCULATION		10.78

*www.english-nature.org.uk

SSSI Ash to Brookwood Heaths	**2005 N deposition (kg/ha/yr)**	**2020 N deposition (kg/ha/yr)**
Northern Atlantic wet Heaths with Erica tetralix	**15.97**	10.36

3. Obtain NO2 and NOX background

Air Quality Archive - http://uk-air.defra.gov.uk/
Local Air quality Managment (LAQM) - Tools for LAQM - Background Maps - Nox NO2 etc 2008 background maps - download CSV 2008 2020 background maps
Select Authority - Select Pollutants (NO2 -Nox) - Select year (2010) - Get data - save
Locate grid ref (see previous sheet)

Therefore:
Best Grid ref see below

Grid Ref chosen	NO2 2020	NOX 2020	
496500, 156500	8.39	10.97	WBC
495500, 156500	7.96	10.36	WBC
495500, 155500	8.42	11	GBC
496500, 155500	8.07	10.51	WBC
AVE	8.21	10.71	

*NB these values provide an average for the area. Guidance recommends background is taken from up to 4km away so that road contrib is not double Counted. Road contribution to Nox is calculated here as at ~1.53ug/m3

4. Calculate the NO2 Concentration in transect near the road

See typical DMRB screening

Most App Background for Ash to Brookwood SPA/SAC 2020 (Only Available to 2020 - can use as worst case)

	Nox	NO2
Average Values	10.71	8.21

With out dev flows A	With Dev (scenario D) flows A322	WITH MINUS WITHOUT	% HGV without	% HGV with	Ave Speed (kph) without	Ave Speed (kph) with
7170	8180	1010	6	6	60.2	60.3

Receptor number	Name	Year	NO_x Annual mean µg/m^3	NO_2 * Annual mean	WORST CASE PC
1	Ash to Brookwood A322 without 5m	2025	16.79	10.25	
2	Ash to Brookwood A322 with 5m	2025	17.65	10.52	**0.27**
3	Ash to Brookwood A322 without 10m	2025	16.20	10.06	
4	Ash to Brookwood A322 with 10m	2025	16.97	10.31	**0.24**
5	Ash to Brookwood A322 without 50m	2025	12.65	8.90	
6	Ash to Brookwood A322 with 50m	2025	12.93	8.99	**0.09**
7	Ash to Brookwood A322 without 100m	2025	11.28	8.41	
8	Ash to Brookwood A322 with 100m	2025	11.37	8.44	**0.03**

* See traffic analysis for derivation of AADF

NB IS WITH MINUS WITHOUT GREATER THAN 1000? FURTHER ANALYSIS REQUIRED

5. Estimate the dry deposition of NO2 in a transect near the road

Distance from Road	NO2 2020	N deposition 2020*
5m	0.27	0.027
10m	0.24	0.024
50m	0.09	0.009
100m	0.03	0.003

NB calulation taken at 5m from centreline

* As per EMEP Eulerian photochemistry model see Annex F

6. Determine the road increment to NO2 dry deposition

Step 6 not clear. Therefore :

APIS Background N for this location in 2020	10.78
Calculated 'process contribtion' N deposition for this location*	0.027
Calculated 'process contribtion' N deposition for this location*	0.024
Calculated 'process contribtion' N deposition for this location*	0.009
Calculated 'process contribtion' N deposition for this location*	0.003

* Based upon Annex F instructions