Appendix 6A
Noise and Vibration Supporting Data

Introduction

This appendix supplements **Chapter 6: Noise and Vibration** of the ES Addendum and should be read in conjunction with this.

This appendix includes the following:

- Breakdown of forecast aircraft movements in each future assessment scenario;
- Details of updated information on the noise characteristics of the modernised fleet of aircraft;
- Full modelling outputs for assessments presented in the ES Addendum; and
- Assessments of effects for comparisons between all scenarios modelled.

Breakdown of Forecast Aircraft and Road Traffic Movements

Assessment Scenarios

Four scenarios are presented in this assessment. These are for the calendar year of 2017 as presented in the ES, and updated equivalents of the three future forecasts presented in the ES. The four scenarios are:

- Baseline (taken to be 2017);
- 10 million passengers per annum (mppa) 'Without Development' in 2024[1];
- 12 mppa 'With Development in 2030'; and
- 10 mppa 'Without Development' in 2030.

The 2017 results have not been reassessed, and those presented in the ES Addendum are the same as in the original ES.

Forecast aircraft movements – air noise

The number of aircraft movements by aircraft type are given in the tables below for each forecast scenario, and for each period assessed. "Summer" in the tables below relates to the 92-day period from 16 June to 15 September inclusive. It is important to note that this differs from the "summer season", which relates to the approximately 7-month long period of British Summer Time. The limit on aircraft movements between 23:30 and 06:00 relates to the summer season.

[1] The 10 mppa 2024 scenario has been assessed for air noise only, as per the original ES.

Table 6A.1 Summer aircraft movements, 10 mppa 2024

Aircraft Type	Number of (92-day) Summer Aircraft Movements, 10 mppa 2024			
	Arrivals		Departures	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Airbus A320	3303	760	3493	570
Airbus A320Neo	710	190	800	90
Airbus A321Neo	440	190	530	90
Airbus A321Neo XLR	0	0	0	0
ATR 42-300	110	0	110	0
ATR 72-500	110	0	110	0
ATR 72-600	600	0	600	0
Boeing 737 MAX 10	110	120	110	120
Boeing 737 MAX 8	1430	190	1210	400
Boeing 737-700W	100	0	100	0
Boeing 737-800W	913	290	1093	100
Boeing 787-8	0	110	110	0
Embraer 190	200	0	200	0
Embraer 195-E2	300	0	190	100
Embraer RJ145	110	0	110	0
Helicopter	235	0	235	0
Other	1605	5	1605	5
Total	10276	1855	10606	1475

Table 6A.2 Summer aircraft movements, 12 mppa 2030

Aircraft Type	Number of (92-day) Summer Aircraft Movements, 12 mppa 2030			
	Arrivals		Departures	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Airbus A320	762	240	913	100
Airbus A320Neo	2691	420	2731	380
Airbus A321Neo	1710	650	1890	480
Airbus A321Neo XLR	0	30	30	0
ATR 42-300	0	0	0	0
ATR 72-500	540	0	540	0
ATR 72-600	600	0	600	0
Boeing 737 MAX 10	340	120	330	120
Boeing 737 MAX 8	1941	490	1921	510
Boeing 737-700W	100	0	100	0
Boeing 737-800W	272	90	273	90
Boeing 787-8	0	110	110	0
Embraer 190	300	0	300	0
Embraer 195-E2	300	0	190	100
Embraer RJ145	0	0	0	0
Helicopter	235	0	235	0
Other	1605	5	1605	5
Total	11396	2155	11768	1785

Table 6A.3 Summer aircraft movements, 10 mppa 2030

Aircraft Type	Number of (92-day) Summer Aircraft Movements, 10 mppa 2030			
	Arrivals		Departures	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Airbus A320	762	240	893	100
Airbus A320Neo	2331	410	2461	290
Airbus A321Neo	1090	450	1240	290
Airbus A321Neo XLR	0	0	0	0
ATR 42-300	0	0	0	0
ATR 72-500	210	0	220	0
ATR 72-600	710	0	710	0
Boeing 737 MAX 10	340	120	330	120
Boeing 737 MAX 8	1871	380	1831	410
Boeing 737-700W	100	0	100	0
Boeing 737-800W	272	90	273	90
Boeing 787-8	0	110	110	0
Embraer 190	200	0	200	0
Embraer 195-E2	300	0	190	100
Embraer RJ145	0	0	0	0
Helicopter	235	0	235	0
Other	1605	5	1605	5
Total	10026	1805	10398	1405

Table 6A.4 Summer night-time aircraft movements, 10 mppa 2024

Aircraft Type	Number of (92-day) Summer Night-time Aircraft Movements, 10 mppa 2024					
	Arrivals			Departures		
	23:00 – 23:29	23:30 – 05:59	06:00 – 06:59	23:00 – 23:29	23:30 – 05:59	06:00 – 06:59
Airbus A320	270	490	0	0	0	570
Airbus A320Neo	0	190	0	0	0	90
Airbus A321Neo	90	100	0	0	0	90
Airbus A321Neo XLR	0	0	0	0	0	0
ATR 42-300	0	0	0	0	0	0
ATR 72-500	0	0	0	0	0	0
ATR 72-600	0	0	0	0	0	0
Boeing 737 MAX 10	0	120	0	0	0	120
Boeing 737 MAX 8	0	190	0	0	100	300
Boeing 737-700W	0	0	0	0	0	0
Boeing 737-800W	90	200	0	0	0	100
Boeing 787-8	0	110	0	0	0	0
Embraer 190	0	0	0	0	0	0
Embraer 195-E2	0	0	0	0	0	100
Embraer RJ145	0	0	0	0	0	0
Helicopter	0	0	0	0	0	0
Other	0	5	0	0	5	0
Total	450	1405	0	0	105	1370

Table 6A.5 Summer night-time aircraft movements, 12 mppa 2030

Aircraft Type	Number of (92-day) Summer Night-time Aircraft Movements, 12 mppa 2030					
	Arrivals			Departures		
	23:00 – 23:29	23:30 – 05:59	06:00 – 06:59	23:00 – 23:29	23:30 – 05:59	06:00 – 06:59
Airbus A320	70	170	0	0	0	100
Airbus A320Neo	90	330	0	0	0	380
Airbus A321Neo	160	490	0	0	0	480
Airbus A321Neo XLR	0	0	30	0	0	0
ATR 42-300	0	0	0	0	0	0
ATR 72-500	0	0	0	0	0	0
ATR 72-600	0	0	0	0	0	0
Boeing 737 MAX 10	0	120	0	0	0	120
Boeing 737 MAX 8	80	410	0	0	110	400
Boeing 737-700W	0	0	0	0	0	0
Boeing 737-800W	90	0	0	0	0	90
Boeing 787-8	0	110	0	0	0	0
Embraer 190	0	0	0	0	0	0
Embraer 195-E2	0	0	0	0	0	100
Embraer RJ145	0	0	0	0	0	0
Helicopter	0	0	0	0	0	0
Other	0	5	0	0	5	0
Total	490	1635	30	0	115	1670

Table 6A.6 Summer night-time aircraft movements, 10 mppa 2030

Aircraft Type	Number of Summer Night-time Aircraft Movements, 10 mppa 2030					
	Arrivals			Departures		
	23:00 – 23:29	23:30 – 05:59	06:00 – 06:59	23:00 – 23:29	23:30 – 05:59	06:00 – 06:59
Airbus A320	70	170	0	0	0	100
Airbus A320Neo	90	320	0	0	0	290
Airbus A321Neo	170	280	0	0	0	290
Airbus A321Neo XLR	0	0	0	0	0	0
ATR 42-300	0	0	0	0	0	0
ATR 72-500	0	0	0	0	0	0
ATR 72-600	0	0	0	0	0	0
Boeing 737 MAX 10	0	120	0	0	0	120
Boeing 737 MAX 8	0	380	0	0	110	300
Boeing 737-700W	0	0	0	0	0	0
Boeing 737-800W	90	0	0	0	0	90
Boeing 787-8	0	110	0	0	0	0
Embraer 190	0	0	0	0	0	0
Embraer 195-E2	0	0	0	0	0	100
Embraer RJ145	0	0	0	0	0	0
Helicopter	0	0	0	0	0	0
Other	0	0	5	0	0	5
Total	420	1380	5	0	110	1295

Table 6A.7 gives the typical loudest aircraft which has been used for the assessment in different scenarios. This has been taken to be the aircraft which, including any other louder aircraft, operates at least once per summer night for each scenario and each combination of runway and operation. The number of movements per night by the typical aircraft (and any louder aircraft) is also given in brackets.

Table 6A.7 Typical loudest aircraft operations in different scenarios

Operation, Runway	Typical loudest aircraft (frequency per average summer night)		
	10 mppa 2024	12 mppa 2030	10 mppa 2030
Arrival, 09	Airbus A321neo (1)	Airbus A321neo (2)	Airbus A321neo (1)
Departure, 09	Airbus A320 (2)	Airbus A321neo (2)	Airbus A321neo (1)
Arrival, 27	Boeing 737-800 (2)	Airbus A321neo (6)	Airbus A321neo (5)
Departure, 27	Airbus A320 (6)	Airbus A320 (2)	Airbus A320 (2)

Forecast aircraft movements – ground noise

Forecast summer aircraft movements for use in the ground noise prediction model are summarised in **Table 6A.8**. "Summer" in the tables below relates to the 92-day period from 16 June to 15 September inclusive.

Table 6A.8 Number of summer aircraft movements by aircraft category

Aircraft category	Number of summer movements			
	10 mppa 2030		12 mppa 2030	
	Day	Night	Day	Night
Small Jets	110	110	110	110
Medium Jets	14784	3090	17094	3820
Large Jets	610	10	610	10
Turbo-props	4450	0	4880	0
Total	19954	3210	22694	3940

Forecast road traffic movements

Traffic flow information for the future scenarios has been provided by Stantec and is given in **Table 6A.9**. These flows are given in terms of 18 hour Annual Average Weekday Traffic (AAWT) flows and includes the total motor vehicles, percentage of heavy vehicles (HGVs) and maximum traffic speed.

Table 6A.9 Road traffic flows around the proposed development provided by Bristol Airport

Roads	18 hours AAWT flows Total (%HGVs)		Max. traffic speed (km/h)
	10 mppa 2030	12 mppa 2030	
R1 Downside Road	7,773 (4%)	8,263 (4%)	64
R2 A38 (North of airport access)	36,006 (4%)	39,793 (4%)	80
R3 Roundabout airport access	29,109 (4%)	32,532 (5%)	32
R4 A38 (South of airport access)	28,734 (4%)	29,798 (4%)	80
West Lane	7,475 (1%)	8,191 (1%)	64
North Side Road (airport access)	22,587 (6%)	28,004 (6%)	32

Updated Aircraft Information

The air noise modelling has been carried out using the Aviation Environmental Design Tool (AEDT) software, version 3c. The original ES used version 2d. The software contains a library of data for different aircraft types. Each actual aircraft type that operates is assigned to an AEDT aircraft type for modelling purposes. For the most common aircraft types that operated in 2017, noise levels measured at Bristol Airport's Noise Monitoring Terminals (NMTs) are compared with those predicted by AEDT, and where necessary the default noise levels are adjusted in order to more accurately model the noise produced by aircraft operating at Bristol Airport. This process is known as validation.

For the future scenarios, it is forecast that there will be some aircraft operating at Bristol Airport that did not operate in significant numbers in 2017, and therefore it is not possible to use actual measured results to validate them. For most of these types, there are corresponding AEDT aircraft types which are used to model them.

As the Airbus A320neo (new engine option) and A321neo were relatively new at the time of the original ES, the AEDT 2d library did not contain a specific corresponding aircraft type. AEDT 3c includes the Airbus A320neo, but not the Airbus A321neo. Additionally, AEDT 3c includes updated data for the Boeing 737 MAX 8 aircraft type.

For the original ES, the current engine option (ceo) equivalent AEDT aircraft types were therefore used for the Airbus aircraft with modifications made to their engine noise levels to account for the lower noise emissions of the new aircraft. The modifications to the engine noise levels were based on a comparison of the European Union Aviation Safet Agency (EASA) aircraft certification noise levels for the current and new variants of the particular aircraft.

For the ES Addendum, the Airbus A320neo utilised the newly available aircraft type in AEDT 3c, and otherwise the same modelled aircraft types were used as the original ES. In-service data is now available for the Airbus A320neo and A321neo, which both operated at Bristol Airport in 2019. This data has been used in preference to the noise certification data, as it represents the actual aircraft operating at Bristol Airport. Although the number of results for the A321neo is relatively limited, these are broadly in line with measurements obtained at other UK airports.

Table 6A.10 Average measured and default predicted noise levels and validated modifications

Aircraft type and operation	AEDT type	2019 number of measured results		2019 average measured noise levels SEL dB(A)		Default AEDT predicted noise levels SEL dB(A)		Noise level modification dB(A)	Movement-weighted average noise level difference[1] SEL dB(A)
		NMT2	NMT5	NMT2	NMT5	NMT2	NMT5		
Airbus A320neo Arrivals	A320-271N	537	1558	82.9	84.2	82.6	84.4	0.0	0.0
Airbus A320neo Departures	A320-271N	1603	607	81.1	80.5	80.1	81.3	+0.4	0.0
Airbus A321neo Arrivals	A321-232	45	125	84.1	85.2	83.9	85.9	-0.5	0.0
Airbus A321neo Departures	A321-232	123	32	82.6	82.4	83.2	84.4	-0.9	0.0

1. Validated minus measured.

Full Modelling Outputs

Air Noise Outputs

This section presents the results of the air noise assessment undertaken using the assessment criteria described in **Chapter 6** of the ES Addendum.

Daytime

Table 6A.11, Table 6A.12 and **Table 6A.13** give the area, number of dwellings and population counts respectively within each contour band for the three different scenarios newly assessed in the ES Addendum. The counts include all those dwellings or people within a specified contour band so, for example, 200 dwellings within a 60 dB contour includes those within the 63 dB, 66 and 69 dB bands as well. Noise contours are presented in **Figure 6A.1**, **Figure 6A.2**, **and Figure 6A.3**.

Table 6A.11 Contour areas, $L_{Aeq,16h}$ average mode summer day

Contour $L_{Aeq,16h}$ (dB)	Contour Areas (km^2)		
	10 mppa 2024	12 mppa 2030	10 mppa 2030
51 (LOAEL)	37.1	35.2	30.7
54	19.7	19.1	16.6
57	10.7	10.7	9.0
60	6.0	5.8	4.9
63 (SOAEL)	3.0	2.9	2.4
66	1.6	1.5	1.3
69 (UAEL)	0.9	0.9	0.8

Table 6A.12 Number of dwellings, $L_{Aeq,16h}$ average mode summer day

Contour $L_{Aeq,16h}$ (dB)	Number of Dwellings		
	10 mppa 2024	12 mppa 2030	10 mppa 2030
51 (LOAEL)	3200	3100	2600
54	900	900	750
57	450	450	350
60	150	150	80
63 (SOAEL)	20	10	10
66	1	1	1
69 (UAEL)	0	0	0

Table 6A.13 Population counts, $L_{Aeq,16h}$ average mode summer day

Contour $L_{Aeq,16h}$ (dB)	Population Count		
	10 mppa 2024	12 mppa 2030	10 mppa 2030
51 (LOAEL)	7800	7450	6350
54	2250	2200	1850
57	1050	1100	850
60	300	300	200
63 (SOAEL)	50	40	40
66	3	3	3
69 (UAEL)	0	0	0

Night-time

Table 6A.14, **Table 6A.15** and **Table 6A.16** give the area, number of dwellings and population counts respectively within each contour band for the three different scenarios newly assessed in the ES Addendum. The counts include all those dwellings or people within a specified contour band. Noise contours are presented in **Figure 6A.4**, **Figure 6A.5**, **and Figure 6A.6**.

Table 6A.14 Contour areas, $L_{Aeq,8h}$ average mode summer night

Contour $L_{Aeq,8h}$ (dB)	Contour Areas (km^2)		
	10 mppa 2024	12 mppa 2030	10 mppa 2030
45 (LOAEL)	47.8	50.0	42.4
48	26.0	28.1	23.2
51	13.9	15.3	12.8

Contour $L_{Aeq,8h}$ (dB)	Contour Areas (km^2)		
	10 mppa 2024	12 mppa 2030	10 mppa 2030
54	7.3	8.3	6.7
55 (SOAEL)	6.0	6.8	5.4
57	3.8	4.3	3.3
60	1.9	2.1	1.7
63 (UAEL)	1.1	1.2	1.0

Table 6A.15 Number of dwellings, $L_{Aeq,8h}$ average mode summer night

Contour $L_{Aeq,8h}$ (dB)	Number of Dwellings		
	10 mppa 2024	12 mppa 2030	10 mppa 2030
45 (LOAEL)	3800	4000	3400
48	1400	1800	1150
51	650	750	600
54	300	300	250
55 (SOAEL)	200	250	100
57	60	70	50
60	1	0	1
63 (UAEL)	0	0	0

Table 6A.16 Population counts, $L_{Aeq,8h}$ average mode summer night

Contour $L_{Aeq,8h}$ (dB)	Population Count		
	10 mppa 2024	12 mppa 2030	10 mppa 2030
45 (LOAEL)	9300	9800	8250
48	3400	4400	2800
51	1550	1800	1450
54	700	800	550
55 (SOAEL)	450	550	300
57	150	150	150
60	3	0	3
63 (UAEL)	0	0	0

Detailed Night Noise Levels

Difference contours have been prepared, comparing each of the three different scenarios newly assessed in the ES Addendum for each of the periods 23:00 to 23:30, 23:30 to 06:00, and 06:00 to 07:00. The contour references are given in **Table 6A.17**.

Table 6A.17 Figure references, detailed night difference contours

Comparison	Number of Dwellings		
	23:00-23:30 (dB $L_{Aeq,30m}$)	**23:30-06:00 (dB $L_{Aeq,6.5h}$)**	**06:00-07:00 (dB $L_{Aeq,1h}$)**
10 mppa 2024 to 10 mppa 2030	Figure 6A.7	Figure 6A.8	Figure 6A.9
10 mppa 2024 to 12 mppa 2030	Figure 6A.10	Figure 6A.11	Figure 6A.12
10 mppa 2030 to 12 mppa 2030	Figure 6A.13	Figure 6A.14	Figure 6A.15

Receptor Analysis

Table 6A.18 and **Table 6A.19** give the average summer day and night noise levels at a series of representative receptors around Bristol Airport for the three different scenarios newly assessed in the ES Addendum.

Table 6A.18 Residential receptor air noise levels, $L_{Aeq,16h}$ average mode summer day

Receptor		$L_{Aeq,16h}$ (dB)		
		10 mppa 2024	**12 mppa 2030**	**10 mppa 2030**
1	Henley Park, Yatton	53	53	52
2	Bishops Road, Cleeve	53	53	52
3	Fountain Treeworks, Brockley	62	61	61
4	Cooks Bridle Path, Downside	61	61	60
5	Downside Road, Downside	60	59	58
6	School Lane, Lulsgate Bottom	62	61	60
7	Hillview Gardens, Felton	55	55	54
8	Market Place, Winford	59	60	59
9	Chew Magna, North Wick	54	54	53
10	Church Road, Norton Malreward	50	50	49
11	Lye Mead, Winford	53	53	53
12	Red Hill, Redhill	51	51	50
13	Wrington Hill, Wrington	58	58	57
14	Southlands Way, Congresbury	53	52	52

Table 6A.19 Residential receptor air noise levels, $L_{Aeq,8h}$ average mode summer night

Receptor		$L_{Aeq,8h}$ (dB)		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
1	Henley Park, Yatton	48	49	48
2	Bishops Road, Cleeve	48	49	48
3	Fountain Treeworks, Brockley	57	57	56
4	Cooks Bridle Path, Downside	56	56	55
5	Downside Road, Downside	54	55	54
6	School Lane, Lulsgate Bottom	56	57	56
7	Hillview Gardens, Felton	50	51	50
8	Market Place, Winford	55	55	55
9	Chew Magna, North Wick	50	50	50
10	Church Road, Norton Malreward	46	46	45
11	Lye Mead, Winford	49	50	49
12	Red Hill, Redhill	46	46	45
13	Wrington Hill, Wrington	53	54	52
14	Southlands Way, Congresbury	48	48	47

Annoyance

Table 6A.20 gives the number of people likely to be highly annoyed by air noise around Bristol Airport for the three different scenarios newly assessed in the ES Addendum. The results are given for each 3 dB wide contour band as well as the total.

Table 6A.20 Highly annoyed population count, $L_{Aeq,16h}$ average mode summer day

Contour Band $L_{Aeq,16h}$ (dB)	% Highly Annoyed	Highly Annoyed Population Count		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
51 - 54	8	450	400	350
54 - 57	11	150	100	100
57 - 60	15	100	100	100
60 - 63	20	50	50	30
63 - 66	27	10	10	10
66 - 69	35	1	1	1
Total[1]		750	700	600

1. Total based on unrounded data.

Sleep Disturbance

Table 6A.21 gives the number of people likely to be highly sleep disturbed by air noise around Bristol Airport for the three different scenarios newly assessed in the ES Addendum. The results are given for each 5 dB wide contour band as well as the total.

Table 6A.21 Highly sleep disturbed population count, L_{night} average mode annual night

Contour Band L_{night} (dB)	% Highly Sleep Disturbed	Highly Sleep Disturbed Population Count		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
45 - 50	6	350	350	350
50 - 55	9	100	100	100
55 - 60	12	20	20	20
60 – 65	16	0	0	0
65+[1]	19	0	0	0
Total[2]		450	450	500

1. Data included for completeness. Sleep disturbance data normally confined to 45 to 65 dB Lnight for accuracy.
2. Total based on unrounded data.

SEL contours - Runway 09

Table 6A.22 to

Table 6A.27 give the area, number of dwellings and population counts respectively within each contour band for the Airbus A321neo and Boeing 737 MAX 8. These, along with the Airbus A320 and Boeing 737-800 which were presented in the original ES, include the most common and loudest aircraft operations that occur at least once per night in all scenarios. The counts include all those dwellings or people within a specified contour band. Contours are presented at 90 dB SEL for the Airbus A321neo and Boeing 737 MAX 8 in **Figure 6A.16** and **Figure 6A.17** respectively.

Table 6A.22 Contour areas, SEL, runway 09 arrivals

Contour SEL (dB(A))	Contour Areas (km^2)	
	A321neo	B737 MAX 8
80	7.5	6.5
90	0.6	0.5
100	0.1	0.1

Table 6A.23 Number of dwellings, SEL, runway 09 arrivals

Contour SEL (dB(A))	Number of Dwellings	
	A321neo	B737 MAX 8
80	200	150
90	0	0
100	0	0

Table 6A.24 Population count, SEL, runway 09 arrivals

Contour SEL (dB(A))	Population Count	
	A321neo	B737 MAX 8
80	450	400
90	0	0
100	0	0

Table 6A.25 Contour areas, SEL, runway 09 departures

Contour SEL (dB(A))	Contour Areas (km^2)	
	A321neo	B737 MAX 8
80	20.0	11.5
90	4.5	1.5
100	0.5	0.2

Table 6A.26 Number of dwellings, SEL, runway 09 departures

Contour SEL (dB(A))	Number of Dwellings	
	A321neo	B737 MAX 8
80	1000	850
90	350	10
100	0	0

Table 6A.27 Population count, SEL, runway 09 departures

Contour SEL (dB(A))	Population Count	
	A321neo	B737 MAX 8
80	2450	2000
90	900	40
100	0	0

SEL contours - Runway 27

Table 6A.28 to **Table 6A.33** give the area, number of dwellings and population counts respectively within each contour band for the Airbus A321neo and Boeing 737 MAX 8. These, along with the Airbus A320 and Boeing 737-800 which were presented in the original ES, include the most common and loudest aircraft operations that occur at least once per night in all scenarios. The counts include all those dwellings or people within a specified contour band. Contours are presented at 90 dB SEL for the Airbus A321neo and Boeing 737 MAX 8 in **Figure 6A.16** and **Figure 6A.17** respectively.

Table 6A.28 Contour areas, SEL, runway 27 arrivals

Contour SEL (dB(A))	Contour Areas (km^2)	
	A321neo	B737 MAX 8
80	9.1	8.0
90	0.8	0.6
100	0.1	0.1

Table 6A.29 Number of dwellings, SEL, runway 27 arrivals

Contour SEL (dB(A))	Number of Dwellings	
	A321neo	B737 MAX 8
80	550	500
90	10	0
100	0	0

Table 6A.30 Population count, SEL, runway 27 arrivals

Contour SEL (dB(A))	Population Count	
	A321neo	B737 MAX 8
80	1300	1200
90	40	0
100	0	0

Table 6A.31 Contour areas, SEL, runway 27 departures

Contour SEL (dB(A))	Contour Areas (km²)	
	A321neo	B737 MAX 8
80	19.4	10.5
90	4.6	1.4
100	0.5	0.2

Table 6A.32 Number of dwellings, SEL, runway 27 departures

Contour SEL (dB(A))	Number of Dwellings	
	A321neo	B737 MAX 8
80	1150	250
90	10	1
100	0	0

Table 6A.33 Population count, SEL, runway 27 departures

Contour SEL (dB(A))	Population Count	
	A321neo	B737 MAX 8
80	2750	550
90	30	3
100	0	0

L_{Amax} contours - Runway 09

Table 6A.34 to

Table 6A.39 give the area, number of dwellings and population counts respectively within each contour band for the Airbus A321neo and Boeing 737 MAX 8. These, along with the Airbus A320 and Boeing 737-800 which were presented in the original ES, include the most common and loudest aircraft operations that occur at least once per night in all scenarios. The counts include all those dwellings or people within a specified contour band. Contours are presented at 80 dB L_{Amax} for the Airbus A321neo and Boeing 737 MAX 8 in **Figure 6A.18** and **Figure 6A.19** respectively.

Table 6A.34 Contour areas, L_{Amax}, runway 09 arrivals

Contour L_{Amax} (dB(A))	Contour Areas (km^2)	
	A321neo	B737 MAX 8
70	5.4	4.8
80	1.2	1.0
90	0.3	0.2

Table 6A.35 Number of dwellings, L_{Amax}, runway 09 arrivals

Contour L_{Amax} (dB(A))	Number of Dwellings	
	A321neo	B737 MAX 8
70	50	50
80	2	0
90	0	0

Table 6A.36 Population count, L_{Amax}, runway 09 arrivals

Contour L_{Amax} (dB(A))	Population Count	
	A321neo	B737 MAX 8
70	100	100
80	5	0
90	0	0

Table 6A.37 Contour areas, L_{Amax}, runway 09 departures

Contour L_{Amax} (dB(A))	Contour Areas (km^2)	
	A321neo	B737 MAX 8
70	18.6	14.0
80	5.7	2.0
90	0.9	0.5

Table 6A.38 Number of dwellings, L_{Amax}, runway 09 departures

Contour L_{Amax} (dB(A))	Number of Dwellings	
	A321neo	B737 MAX 8
70	950	750
80	500	70
90	0	0

Table 6A.39 Population count, L_{Amax}, runway 09 departures

Contour L_{Amax} (dB(A))	Population Count	
	A321neo	B737 MAX 8
70	2300	1900
80	1200	150
90	0	0

L_{Amax} contours - Runway 27

Table 6A.40 to **Table 6A.45** give the area, number of dwellings and population counts respectively within each contour band for the Airbus A321neo and Boeing 737 MAX 8. These, along with the Airbus A320 and Boeing 737-800 which were presented in the original ES, include the most common and loudest aircraft operations that occur at least once per night in all scenarios. The counts include all those dwellings or people within a specified contour band. Contours are presented at 80 dB L_{Amax} for the Airbus A321neo and Boeing 737 MAX 8 in **Figure 6A.18** and **Figure 6A.19** respectively.

Table 6A.40 Contour areas, L_{Amax}, runway 27 arrivals

Contour L_{Amax} (dB(A))	Contour Areas (km^2)	
	A321neo	B737 MAX 8
70	6.7	6.0
80	1.2	1.1
90	0.3	0.3

Table 6A.41 Number of dwellings, L_{Amax}, runway 27 arrivals

Contour L_{Amax} (dB(A))	Number of Dwellings	
	A321neo	B737 MAX 8
70	500	450
80	60	10
90	0	0

Table 6A.42 Population count, L_{Amax}, runway 27 arrivals

Contour L_{Amax} (dB(A))	Population Count	
	A321neo	B737 MAX 8
70	1200	1100
80	150	40
90	0	0

Table 6A.43 Contour areas, L_{Amax}, runway 27 departures

Contour L_{Amax} (dB(A))	Contour Areas (km^2)	
	A321neo	B737 MAX 8
70	17.2	12.4
80	6.0	2.0
90	0.9	0.5

Table 6A.44 Number of dwellings, L_{Amax}, runway 27 departures

Contour L_{Amax} (dB(A))	Number of Dwellings	
	A321neo	B737 MAX 8
70	500	150
80	20	0
90	0	0

Table 6A.45 Population count, L_{Amax}, runway 27 departures

Contour L_{Amax} (dB(A))	Population Count	
	A321neo	B737 MAX 8
70	1150	300
80	40	0
90	0	0

Non-residential receptors

Table 6A.46, **Table 06.47** and **Table 6A.48** give the average summer day noise level for the schools, places of worship and amenity areas in the vicinity of Bristol Airport for the three different scenarios newly assessed in the ES Addendum. There are no healthcare facilities in the vicinity of Bristol Airport.

Table 6A.46 Schools noise exposure levels, $L_{Aeq,16h}$ average mode summer day

Receptor		$L_{Aeq,16h}$ (dB)		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
S2	Winford Primary, Winford	58	58	57
S3	St. Andrew's Primary, Congresbury	51	51	50
S4	Yatton Junior, Yatton	51	51	50
S5	Marksbury Primary, Marksbury	35	34	34

Receptor		$L_{Aeq,16h}$ (dB)		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
S6	St. Anne's Primary, Hewish	50	50	49
S7	Chew Magna Primary, Chew Magna	41	41	40
S8	Wrington Primary, Wrington	47	47	46
S9	Court de Wyck Primary, Cleeve	50	50	49
S10	Pensford Primary, Pensford	42	41	41
S11	Dundry Primary, Dundry	44	44	43
S12	Stanton Drew Primary, Stanton Drew	38	37	37
S13	Woodspring School, Weston-Super-Mare	48	47	46

Note – S1 (St. Katharine's School, Felton) which was presented in the original ES **Appendix 7D** is no longer a school.

Table 06.47 Places of worship noise exposure levels, $L_{Aeq,16h}$ average mode summer day

Receptor		$L_{Aeq,16h}$ (dB)		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
W1	St Thomas A Becket's Church, Pensford	41	41	40
W2	Marksbury Methodist Church, Marksbury	35	34	34
W3	St Barnabas Church, Claverham	48	47	46
W4	St Dunstan And St Anthony Church, Claverham	53	52	52
W5	Chew Magna Baptist Church, Chew Magna	40	39	39
W6	Sacred Heart Church, Chew Magna	40	40	39
W7	All Saints Church, Publow	43	43	42
W8	St James Church, Regil	39	39	38
W9	Holy Trinity Church, Cleeve	52	52	51
W10	St Margaret's Church, Queen Charlton	44	44	43
W11	St Mary and St Peters Church, Winford	56	56	56
W12	St Mary's Church, Compton Dando	44	43	43
W13	Congresbury Methodist Church, Congresbury	51	50	50
W14	Chewton Keynsham Church, Chewton Keynsham	47	46	46
W15	Dundry Baptist Church, Dundry	47	47	46
W16	St Nicholas Church, Brockley	47	47	46
W17	St Andrews Church of England, Hartcliffe	43	42	42

	Receptor	$L_{Aeq,16h}$ (dB)		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
W18	Wrington United Reformed Church, Wrington	49	48	48
W19	Holy Saviour's Church, Hewish	47	47	46
W20	Yatton Methodist Church, Yatton	51	50	50
W21	St Andrews Church, Congresbury	51	50	50
W22	Holy Trinity Church, Norton Malreward	50	50	49
W23	St Katherine's Church, Felton	59	58	58
W24	All Saints Church, Wrington	46	46	45
W25	All Saints Church, Kingston Seymour	46	45	44
W26	Claverham Free Church, Claverham	50	50	49
W27	The Church of Saint Mary The Virgin, Yatton	52	52	51
W28	Christ Church, Redhill	47	46	45
W29	St Michael, Dundry	45	44	44
W30	Gospel Hall - Pensford Gospel Church, Pensford	41	40	39
W31	St Michael's Church, Burnett	46	45	45
W32	St Mary's Church, Stanton Drew	39	39	38
W33	St. Andrew, Chew Magna	41	40	40
W34	Winford Baptist, Winford	56	56	55
W35	Horsecastle Chapel, Yatton	47	47	46

Table 6A.48 Amenity areas noise exposure levels, $L_{Aeq,16h}$ average mode summer day

	Receptor	$L_{Aeq,16h}$ (dB)		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
A1	The Glebe Field, Wrington	46	45	45
A2	Yatton Village Green, Yatton	52	52	51
A3	Glebelands Gardens, Yatton	52	51	51
A4	Bishport Avenue Open Space, Hartcliffe	43	43	43
A5	Streamcross Playing Field, Claverham	50	50	49
A6	Crosscombe Walk Open Space, Hartcliffe	42	42	41
A7	Court Farm Road Open Space, Whitchurch	43	43	42

Receptor		$L_{Aeq,16h}$ (dB)		
		10 mppa 2024	12 mppa 2030	10 mppa 2030
A8	Cadbury Hill, Yatton	55	55	54
A9	Vee Lane Play Area, Felton	59	60	59
A10	Manor Road Playing Field, Keynsham	43	42	42
A11	Marksbury Playground, Marksbury	35	34	33
A12	Chew Magna Playing Field, Chew Magna	43	43	42
A13	Orchid Drive Play Area, Keynsham	42	42	41
A14	Publow Lane Recreation Ground, Publow	43	42	42
A15	The Mead Play Area, Keynsham	42	42	41
A16	Hamilton Way Play Area, Whitchurch	44	43	43
A17	Congresbury Millennium Green, Congresbury	52	51	51
A18	Hangstones Playing Field, Yatton	51	50	50
A19	Rock Road Playing Field, Yatton	53	53	52
A20	Land at Saxon Court, St. Georges	45	45	44
A21	Holmoak Road Playing Field, Keynsham	42	42	41
A22	Chalfield Close Play Area, Keynsham	45	44	44
A23	Whitchurch Playground, Whitchurch	45	45	44
A24	Felton Common, Felton	68	68	67

Ground Noise Outputs

This section presents the results of the ground noise assessment undertaken using the assessment criteria described in **Chapter 6** of the ES Addendum.

Daytime

The area and number of dwellings within each contour band for the two scenarios newly assessed in the ES Addendum is given in **Table 6A.49** and **Table 6A.50**. The counts include all those dwellings or people within a specified contour band so, for example, 200 dwellings within a 60 dB contour includes those within the 65 and 70 dB bands as well. Noise contours are presented in **Figure 6A.20** and **Figure 6A.21**.

Table 6A.49 Contour areas, $L_{Aeq,16h}$ average summer day

Contour $L_{Aeq,16h}$ (dB)	Contour Areas (km^2)	
	10 mppa 2030	12 mppa 2030
50 (LOAEL)	3.5	3.7
55	2.0	2.0
60 (SOAEL)	1.2	1.2
65	0.8	0.8

Table 6A.50 Number of dwellings, $L_{Aeq,16h}$ average summer day

Contour $L_{Aeq,16h}$ (dB)	Number of Dwellings	
	10 mppa 2030	12 mppa 2030
50 (LOAEL)	90	100
55	30	4
60 (SOAEL)	1	1
65	0	0

Night-time

The area and number of dwellings within each contour band for the two scenarios newly assessed in the ES Addendum is given in **Table 6A.51** and

Table 6A.52. The counts include all those dwellings or people within a specified contour band so, for example, 200 dwellings within a 55 dB contour includes those within the 60 and 65 dB bands as well. Noise contours are presented in **Figure 6A.22** and **Figure 6A.23**.

Table 6A.51 Contour areas, $L_{Aeq,8h}$ average summer night

Contour $L_{Aeq,8h}$ (dB)	Contour Areas (km^2)	
	10 mppa 2030	12 mppa 2030
45 (LOAEL)	3.5	3.7
50	2.0	2.0
55 (SOAEL)	1.2	1.2
60	0.7	0.8

Table 6A.52 Number of dwellings, $L_{Aeq,8h}$ average summer night

Contour $L_{Aeq,8h}$ (dB)	Number of Dwellings	
	10 mppa 2030	12 mppa 2030
45 (LOAEL)	100	90
50	30	4
55 (SOAEL)	1	2
60	0	1

Specific residential receptors

Table 6A.53 gives the average summer day and night noise levels at a series of representative residential receptors for the two scenarios newly assessed in the ES Addendum.

Table 6A.53 Residential receptor ground noise levels, summer day and night

Receptor	Location	$L_{Aeq,16h}$ (dB)		$L_{Aeq,8h}$ (dB)	
		10mppa 2030	12mppa 2030	10mppa 2030	12mppa 2030
A	Cooks Bridle Path, Downside	62	63	59	60
B	Downside Road (West), Lulsgate Bottom	59	52	53	47
C	School Lane, Lulsgate Bottom	53	53	49	48
D	Red Hill (A38) (North), Redhill	46	46	40	41
E	Winters Lane (South), Redhill	48	49	43	44
F	Downside Road (South), Downside	53	55	49	50
G	Downside Road (North), Downside	51	49	46	45
H	Downside Road (East), Lulsgate Bottom	57	52	52	46
I	Bridgwater Road (A38), Lulsgate Bottom	51	50	46	45
J	Red Hill (A38) (South), Redhill	43	44	38	39
K	Winters Lane (North), Redhill	50	51	45	46

Non-residential receptors

Table 6A.54 gives the average summer day and night noise levels at the non-residential receptors closest to Bristol Airport for the two scenarios newly assessed in the ES Addendum.

Table 6A.54 Daytime noise levels at non-residential receptors around Bristol Airport

Receptor		$L_{Aeq,16h}$ (dB)	
		10 mppa 2030	12 mppa 2030
W23	St Katherine's Church, Felton	49	49
W28	Christ Church, Redhill	<45	<45
A9	Vee Lane Play Area, Felton	<45	<45
A24	Felton Common, Felton	47	47

Road Traffic Noise Outputs

The number of residential receptors within each contour band for the two scenarios newly assessed in the ES Addendum is shown in **Table 6A.55**. The counts include all those dwellings or people within a specified contour band so, for example, 20 dwellings within a 55 dB contour includes those within the 68 and 75 dB bands as well. Noise contours are presented in **Figure 6A.24 and Figure 6A.25**.

Table 6A.55 Numbers of residential receptors, $L_{A10,18h}$

Contour $L_{A18,18h}$ dB(A)	Number of receptors	
	10 mppa 2030	12 mppa 2030
55 (LOAEL)	150	150
60	90	90
68 (SOAEL)	40	40
70	20	20
75 (UAEL)	5	5

Assessment of effects

Assessment of air noise effects

General

To assess the effects of air noise arising from the impacts that have been described in **Section 0**, the assessment criteria set out in **Chapter 6** have been applied. The effects arise because of both the absolute noise level experienced at a receptor as well as the change in noise level that occurs through the introduction of the Proposed Development.

Consideration is given below to how the impacts resulting from a change in the air noise conditions are likely to affect residential and non-residential receptors for the following scenarios:

- 2017 Baseline vs Future 10 mppa in 2024;
- 2017 Baseline vs Future 12 mppa in 2030;
- Future 10 mppa in 2024 vs 12 mppa in 2030; and

- Future 10 mppa in 2030 vs 12 mppa in 2030.

The assessment compares air noise effects for residential receptors for each of the comparisons above, both for daytime and night-time.

Baseline (2017) vs Future (10 mppa in 2024)

The impact of air noise on residential receptors assuming that the Proposed Development does not proceed and Bristol Airport continues to grow to its current permitted capacity of 10 mppa by 2024 will give rise to the effects given in **Table 6A.56** for the daytime and **Table 6A.57** for the night-time. The small number of receptors that do not experience any change in noise between two scenarios are given in these tables in the "beneficial" receptor column.

Table 6A.56 Dwellings exposed to absolute noise and change in noise, 2017 to 10 mppa 2024, daytime

Subjective description of impact	Contour band, dB $L_{Aeq,16h}$	Number of dwellings in band, 10 mppa 2024	Beneficial[1] or adverse change	Change in Noise Level, dB Potential Impact Classification				
				Negligible	Minor	Moderate	Substantial	Very Substantial
				0 – 2 dB	2 – 3 dB	3 – 6 dB	6 – 9 dB	>9 dB
Negligible	**51 (LOAEL)**	2150	Beneficial	2150	0	0	0	0
		150	Adverse	150	0	0	0	0
Very minor	**54**	350	Beneficial	350	0	0	0	0
		150	Adverse	150	0	0	0	0
Minor	**57**	250	Beneficial	250	0	0	0	0
		70	Adverse	70	0	0	0	0
Minor/ Moderate	**60**	90	Beneficial	90	0	0	0	0
		20	Adverse	20	0	0	0	0
Moderate	**63 (SOAEL)**	10	Beneficial	10	0	0	0	0
		0	Adverse	0	0	0	0	0
Substantial	**66**	1	Beneficial	1	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**69 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		2850	Beneficial	2850	0	0	0	0
		400	Adverse	400	0	0	0	0

1. "Beneficial" rows include a small number of dwellings with zero change.

Table 6A.57 Dwellings exposed to absolute noise and change in noise, 2017 to 10 mppa 2024, night-time

Subjective description of impact	Contour band, dB $L_{Aeq,8h}$	Number of dwellings in band, 10 mppa 2024	Beneficial[1] or adverse change	Change in Noise Level, dB Potential Impact Classification				
				Negligible	Minor	Moderate	Substantial	Very Substantial
				0 – 2 dB	2 – 3 dB	3 – 6 dB	6 – 9 dB	>9 dB
Negligible	**45 (LOAEL)**	2200	Beneficial	2200	0	0	0	0
		250	Adverse	250	0	0	0	0
Very minor	**48**	650	Beneficial	650	0	0	0	0
		150	Adverse	150	0	0	0	0
Minor	**51**	250	Beneficial	250	0	0	0	0
		90	Adverse	90	0	0	0	0
Minor/ Moderate	**54**	100	Beneficial	100	0	0	0	0
		0	Adverse	0	0	0	0	0
Moderate	**55 (SOAEL)**	150	Beneficial	150	0	0	0	0
		60	Adverse	60	0	0	0	0
Substantial	**60**	1	Beneficial	1	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**63 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		3351	Beneficial	3300	0	0	0	0
		550	Adverse	500	0	0	0	0

1. "Beneficial" rows include a small number of dwellings with zero change.

Baseline (2017) vs Future (12 mppa in 2030)

The impact of air noise on residential receptors assuming that the Proposed Development proceeds and Bristol Airport continues to grow to 12 mppa by 2030 will give rise to the effects given in **Table 6A.58** for the daytime and **Table 6A.59** for the night-time. The small number of receptors that do not experience any change in noise between two scenarios are given in these tables in the "beneficial" receptor column.

Table 6A.58 Dwellings exposed to absolute noise and change in noise, 2017 to 12 mppa 2030, daytime

				Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{Aeq,16h}$**	**Number of dwellings in band, 12 mppa 2030**	**Beneficial or adverse change**	**Negligible**	**Minor**	**Moderate**	**Substantial**	**Very Substantial**
				0 – 2 dB	**2 – 3 dB**	**3 – 6 dB**	**6 – 9 dB**	**>9 dB**
Negligible	**51 (LOAEL)**	2100	Beneficial	2100	0	0	0	0
		90	Adverse	90	0	0	0	0
Very minor	**54**	300	Beneficial	300	0	0	0	0
		150	Adverse	150	0	0	0	0
Minor	**57**	100	Beneficial	100	0	0	0	0
		200	Adverse	200	0	0	0	0
Minor/ Moderate	**60**	40	Beneficial	40	0	0	0	0
		80	Adverse	80	0	0	0	0
Moderate	**63 (SOAEL)**	1	Beneficial	1	0	0	0	0
		10	Adverse	10	0	0	0	0
Substantial	**66**	1	Beneficial	1	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**69 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		2550	Beneficial	2550	0	0	0	0
		500	Adverse	500	0	0	0	0

Table 6A.59 Dwellings exposed to absolute noise and change in noise, 2017 to 12 mppa 2030, night-time

Subjective description of impact	Contour band dB $L_{Aeq,8h}$	Number of dwellings in band, 12 mppa 2030	Beneficial or adverse change	Change in Noise Level, dB Potential Impact Classification: Negligible 0 – 2 dB	Minor 2 – 3 dB	Moderate 3 – 6 dB	Substantial 6 – 9 dB	Very Substantial >9 dB
Negligible	**45 (LOAEL)**	2150	Beneficial	2150	0	0	0	0
		80	Adverse	80	0	0	0	0
Very minor	**48**	1000	Beneficial	1000	0	0	0	0
		70	Adverse	70	0	0	0	0
Minor	**51**	200	Beneficial	200	0	0	0	0
		200	Adverse	200	0	0	0	0
Minor/ Moderate	**54**	30	Beneficial	30	0	0	0	0
		60	Adverse	60	0	0	0	0
Moderate	**55 (SOAEL)**	70	Beneficial	70	0	0	0	0
		150	Adverse	150	0	0	0	0
Substantial	**60**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**63 (UAEL)**	1	Beneficial	1	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		3450	Beneficial	3450	0	0	0	0
		600	Adverse	600	0	0	0	0

Future (10 mppa in 2024) vs Future (12 mppa in 2030)

The impact of air noise on receptors assuming that the Proposed Development proceeds and Bristol Airport continues to grow from 10 mppa in 2024 to 12 mppa by 2030 will give rise to the effects given in **Table 6A.60** for the daytime and

Table 6A.61 for the night-time. The small number of receptors that do not experience any change in noise between two scenarios are given in these tables in the "beneficial" receptor column.

Table 6A.60 Dwellings exposed to absolute noise and change in noise, 10 mppa 2024 to 12 mppa 2030, daytime

			Change in Noise Level, dB Potential Impact Classification					
Subjective description of impact	**Contour band dB $L_{Aeq,16h}$**	**Number of dwellings in band, 12 mppa 2030**	**Beneficial or adverse change**	**Negligible 0 – 2 dB**	**Minor 2 – 3 dB**	**Moderate 3 – 6 dB**	**Substantial 6 – 9 dB**	**Very Substantial >9 dB**
Negligible	**51 (LOAEL)**	2100	Beneficial	2100	0	0	0	0
		100	Adverse	100	0	0	0	0
Very minor	**54**	300	Beneficial	300	0	0	0	0
		150	Adverse	150	0	0	0	0
Minor	**57**	70	Beneficial	70	0	0	0	0
		250	Adverse	250	0	0	0	0
Minor/ Moderate	**60**	40	Beneficial	40	0	0	0	0
		80	Adverse	80	0	0	0	0
Moderate	**63 (SOAEL)**	1	Beneficial	1	0	0	0	0
		10	Adverse	10	0	0	0	0
Substantial	**66**	1	Beneficial	1	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**69 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		2500	Beneficial	2500	0	0	0	0
		600	Adverse	600	0	0	0	0

Table 6A.61 Dwellings exposed to absolute noise and change in noise, 10 mppa 2024 to 12 mppa 2030, night-time

				Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{Aeq,8h}$**	**Number of dwellings in band, 12 mppa 2030**	**Beneficial or adverse change**	**Negligible** 0 – 2 dB	**Minor** 2 – 3 dB	**Moderate** 3 – 6 dB	**Substantial** 6 – 9 dB	**Very Substantial** >9 dB
Negligible	**45 (LOAEL)**	2200	Beneficial	2200	0	0	0	0
		10	Adverse	10	0	0	0	0
Very minor	**48**	1000	Beneficial	1000	0	0	0	0
		90	Adverse	90	0	0	0	0
Minor	**51**	150	Beneficial	150	0	0	0	0
		250	Adverse	250	0	0	0	0
Minor/ Moderate	**54**	30	Beneficial	30	0	0	0	0
		60	Adverse	60	0	0	0	0
Moderate	**55 (SOAEL)**	50	Beneficial	50	0	0	0	0
		200	Adverse	200	0	0	0	0
Substantial	**60**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**63 (UAEL)**	1	Beneficial	1	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		3400	Beneficial	3400	0	0	0	0
		600	Adverse	600	0	0	0	0

Future (10 mppa in 2030) vs Future (12 mppa in 2030)

The impact of air noise on receptors assuming that the Proposed Development proceeds and Bristol Airport continues to grow to 12 mppa by 2030 compared to if it was constrained to 10 mppa in 2030 will give rise to the effects given in **Table 6A.62** for the daytime and **Table 6A.63** for the night-time. The small number of receptors that do not experience any change in noise between two scenarios are given in these tables in the "beneficial" receptor column.

Table 6A.62 Dwellings exposed to absolute noise and change in noise, 10 mppa 2030 to 12 mppa 2030, daytime

				Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{Aeq,16h}$**	**Number of dwellings in band, 12 mppa 2030**	**Beneficial or adverse change**	**Negligible 0 – 2 dB**	**Minor 2 – 3 dB**	**Moderate 3 – 6 dB**	**Substantial 6 – 9 dB**	**Very Substantial >9 dB**
Negligible	**51 (LOAEL)**	0	Beneficial	0	0	0	0	0
		2,200	Adverse	2200	0	0	0	0
Very minor	**54**	0	Beneficial	0	0	0	0	0
		450	Adverse	450	0	0	0	0
Minor	**57**	0	Beneficial	0	0	0	0	0
		300	Adverse	300	0	0	0	0
Minor/ Moderate	**60**	0	Beneficial	0	0	0	0	0
		100	Adverse	100	0	0	0	0
Moderate	**63 (SOAEL)**	0	Beneficial	0	0	0	0	0
		10	Adverse	10	0	0	0	0
Substantial	**66**	0	Beneficial	0	0	0	0	0
		1	Adverse	1	0	0	0	0
Very Substantial	**69 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		0	Beneficial	0	0	0	0	0
		3,100	Adverse	3100	0	0	0	0

Table 6A.63 Dwellings exposed to absolute noise and change in noise, 10 mppa 2030 to 12 mppa 2030, night-time

				Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{Aeq,8h}$**	**Number of dwellings in band, 12 mppa 2030**	**Beneficial or adverse change**	**Negligible 0 – 2 dB**	**Minor 2 – 3 dB**	**Moderate 3 – 6 dB**	**Substantial 6 – 9 dB**	**Very Substantial >9 dB**
Negligible	**45 (LOAEL)**	0	Beneficial	0	0	0	0	0
		2200	Adverse	2200	0	0	0	0
Very minor	**48**	0	Beneficial	0	0	0	0	0
		1100	Adverse	1100	0	0	0	0
Minor	**51**	0	Beneficial	0	0	0	0	0
		400	Adverse	400	0	0	0	0
Minor/ Moderate	**54**	0	Beneficial	0	0	0	0	0
		90	Adverse	90	0	0	0	0
Moderate	**55 (SOAEL)**	0	Beneficial	0	0	0	0	0
		250	Adverse	250	0	0	0	0
Substantial	**60**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**63 (UAEL)**	0	Beneficial	0	0	0	0	0
		1	Adverse	1	0	0	0	0
Total		0	Beneficial	0	0	0	0	0
		4000	Adverse	4000	0	0	0	0

Assessment of ground noise effects

General

To assess the effects of ground noise arising from the impacts that have been described in **Section 0**, the assessment criteria set out in **Chapter 6** have been applied. The effects arise because of both the absolute noise level experienced at a receptor as well as the change in noise level that occurs through the introduction of the Proposed Development.

Consideration is given below to how the impacts resulting from a change in the ground noise conditions are likely to affect residential and non-residential receptors for the following scenarios:

- 2017 Baseline vs Future 10 mppa in 2030;

- 2017 Baseline vs Future 12 mppa in 2030; and
- Future 10 mppa in 2030 vs 12 mppa in 2030.

The assessment compares ground noise effects for residential receptors for each of the comparisons above, both for daytime and night-time.

Baseline (2017) vs Future (10 mppa in 2030)

The impact of ground noise on residential receptors assuming that the Proposed Development does not proceed and Bristol Airport continues to grow to its current permitted capacity of 10 mppa will give rise to the effects given in **Table 6A.64** for the daytime and **Table 6A.65** for the night-time. The small number of receptors that do not experience any change in noise between two scenarios are given in these tables in the "beneficial" receptor column.

Table 6A.64 Dwellings exposed to absolute noise and change in noise, 2017 to 10 mppa 2030, daytime

				Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{Aeq,16h}$**	**Number of dwellings in band, 10 mppa 2030**	**Beneficial or adverse change**	**Negligible** **0 – 2 dB**	**Minor** **2 – 3 dB**	**Moderate** **3 – 6 dB**	**Substantial** **6 – 9 dB**	**Very Substantial** **>9 dB**
Negligible	**50 (LOAEL)**	30	Beneficial	3	0	0	0	0
		20	Adverse	60	0	0	0	0
Minor	**55**	5	Beneficial	0	0	0	0	0
		20	Adverse	30	0	0	0	0
Moderate	**60 (SOAEL)**	1	Beneficial	0	0	0	0	0
		0	Adverse	1	0	0	0	0
Substantial	**65**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**70 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		40	Beneficial	3	0	0	0	0
		40	Adverse	90	0	0	0	0

Table 6A.65 Dwellings exposed to absolute noise and change in noise, 2017 to 10 mppa 2030, night-time

				Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{Aeq,8h}$**	**Number of dwellings in band, 10 mppa 2030**	**Beneficial or adverse change**	**Negligible** 0 – 2 dB	**Minor** 2 – 3 dB	**Moderate** 3 – 6 dB	**Substantial** 6 – 9 dB	**Very Substantial** >9 dB
Negligible	**45 (LOAEL)**	0	Beneficial	0	0	0	0	0
		80	Adverse	50	20	3	0	0
Minor	**50**	0	Beneficial	0	0	0	0	0
		30	Adverse	20	3	1	0	0
Moderate	**55 (SOAEL)**	0	Beneficial	0	0	0	0	0
		2	Adverse	0	1	0	0	0
Substantial	**60**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**65 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		0	Beneficial	0	0	0	0	0
		100	Adverse	70	30	4	0	0

Baseline (2017) vs Future (12 mppa in 2030)

The impact of ground noise on residential receptors assuming that the Proposed Development proceeds and Bristol Airport continues to grow to 12 mppa by 2030 will give rise to the effects given in

Table 6A.66 for the daytime and **Table 6A.67** for the night-time. The small number of receptors that do not experience any change in noise between two scenarios are given in these tables in the "beneficial" receptor column.

Table 6A.66 Dwellings exposed to absolute noise and change in noise, 2017 to 12 mppa 2030, daytime

				Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{Aeq,16h}$**	**Number of dwellings in band, 12 mppa 2030**	**Beneficial or adverse change**	**Negligible 0 – 2 dB**	**Minor 2 – 3 dB**	**Moderate 3 – 6 dB**	**Substantial 6 – 9 dB**	**Very Substantial >9 dB**
Negligible	**50 (LOAEL)**	60	Beneficial	20	9	30	0	0
		10	Adverse	40	0	0	0	0
Minor	**55**	0	Beneficial	0	0	0	0	0
		3	Adverse	3	0	0	0	0
Moderate	**60 (SOAEL)**	0	Beneficial	0	0	0	0	0
		1	Adverse	0	1	0	0	0
Substantial	**65**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Very Substantial	**70 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		60	Beneficial	20	9	30	0	0
		20	Adverse	40	1	0	0	0

Table 6A.67 Dwellings exposed to absolute noise and change in noise, 2017 to 12 mppa 2030, night-time

				Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{Aeq,8h}$**	**Number of dwellings in band, 10 mppa 2030**	**Beneficial or adverse change**	**Negligible 0 – 2 dB**	**Minor 2 – 3 dB**	**Moderate 3 – 6 dB**	**Substantial 6 – 9 dB**	**Very Substantial >9 dB**
Negligible	**45 (LOAEL)**	40	Beneficial	10	10	20	0	0
		70	Adverse	40	9	0	0	0
Minor	**50**	0	Beneficial	0	0	0	0	0
		2	Adverse	0	1	1	0	0
Moderate	**55 (SOAEL)**	0	Beneficial	0	0	0	0	0
		2	Adverse	0	0	1	0	0

Subjective description of impact	Contour band dB $L_{Aeq,8h}$	Number of dwellings in band, 10 mppa 2030	Beneficial or adverse change	Change in Noise Level, dB Potential Impact Classification: Negligible 0 – 2 dB	Minor 2 – 3 dB	Moderate 3 – 6 dB	Substantial 6 – 9 dB	Very Substantial >9 dB
Substantial	**60**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	1	0	0
Very Substantial	**65 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		40	Beneficial	10	10	20	0	0
		70	Adverse	40	10	3	0	0

Future (10 mppa in 2030) vs Future (12 mppa in 2030)

The impact of ground noise on residential receptors assuming that the Proposed Development proceeds and Bristol Airport continues to grow to 12 mppa by 2030 compared to if it was constrained to 10 mppa in 2030 will give rise to the effects given in **Table 6A.68** for the daytime and **Table 6A.69** for the night-time. The small number of receptors that do not experience any change in noise between two scenarios are given in these tables in the "beneficial" receptor column.

Table 6A.68 Dwellings exposed to absolute noise and change in noise, 10 mppa 2030 to 12 mppa 2030, daytime

Subjective description of impact	Contour band dB $L_{Aeq,16h}$	Number of dwellings in band, 12 mppa 2030	Beneficial or adverse change	Change in Noise Level, dB Potential Impact Classification: Negligible 0 – 2 dB	Minor 2 – 3 dB	Moderate 3 – 6 dB	Substantial 6 – 9 dB	Very Substantial >9 dB
Negligible	**50 (LOAEL)**	60	Beneficial	30	7	30	3	0
		10	Adverse	20	0	0	0	0
Minor	**55**	0	Beneficial	0	0	0	0	0
		3	Adverse	3	0	0	0	0
Moderate	**60 (SOAEL)**	0	Beneficial	0	0	0	0	0
		1	Adverse	1	0	0	0	0
Substantial	**65**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0

Subjective description of impact	Contour band dB $L_{Aeq,16h}$	Number of dwellings in band, 12 mppa 2030	Beneficial or adverse change	Change in Noise Level, dB Potential Impact Classification				
				Negligible	Minor	Moderate	Substantial	Very Substantial
				0 – 2 dB	2 – 3 dB	3 – 6 dB	6 – 9 dB	>9 dB
Very Substantial	**70 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		60	Beneficial	30	7	30	3	0
		10	Adverse	30	0	0	0	0

Table 6A.69 Dwellings exposed to absolute noise and change in noise, 10 mppa 2030 to 12 mppa 2030, night-time

Subjective description of impact	Contour band dB $L_{Aeq,8h}$	Number of dwellings in band, 10 mppa 2030	Beneficial or adverse change	Change in Noise Level, dB Potential Impact Classification				
				Negligible	Minor	Moderate	Substantial	Very Substantial
				0 – 2 dB	2 – 3 dB	3 – 6 dB	6 – 9 dB	>9 dB
Negligible	**45 (LOAEL)**	80	Beneficial	30	6	30	3	0
		30	Adverse	30	0	0	0	0
Minor	**50**	0	Beneficial	0	0	0	0	0
		2	Adverse	2	0	0	0	0
Moderate	**55 (SOAEL)**	0	Beneficial	0	0	0	0	0
		2	Adverse	1	0	0	0	0
Substantial	**60**	0	Beneficial	0	0	0	0	0
		1	Adverse	1	0	0	0	0
Very Substantial	**65 (UAEL)**	0	Beneficial	0	0	0	0	0
		0	Adverse	0	0	0	0	0
Total		80	Beneficial	30	6	30	3	0
		30	Adverse	30	0	0	0	0

Assessment of road traffic noise effects

General

To assess the effects of road traffic noise arising from the impacts that have been described in **Section 0**, the assessment criteria set out in Chapter 5 have been applied. The effects arise because of both the absolute noise level experienced at a receptor as well as the change in noise level that occurs through the introduction of the Proposed Development.

Consideration is given below to how the impacts resulting from a change in the road traffic noise conditions are likely to affect residential and non-residential receptors for the following scenarios:

- 2017 Baseline vs Future 10 mppa in 2030;
- 2017 Baseline vs Future 12 mppa in 2030; and
- Future 10 mppa in 2030 vs 12 mppa in 2030.

The assessment compares road traffic noise effects for residential receptors for each of the comparisons above.

Baseline (2017) vs Future (10 mppa in 2030)

The impact of road traffic noise on residential receptors assuming that the Proposed Development does not proceed and Bristol Airport continues to grow to its current permitted capacity of 10 mppa by 2030 will give rise to the effects given in **Table 6A.64**. The small number of receptors that do not experience any change in noise between two scenarios are given in this table in the "beneficial" receptor column.

Table 6A.70 Dwellings exposed to absolute noise and change in noise, 2017 to 10 mppa 2030

				Change in Noise Level, dB Potential Impact Classification			
Subjective description of impact	**Contour band dB $L_{A10,18h}$**	**Number of receptors in band, 10 mppa 2030**	**Beneficial or adverse change**	**Negligible 0.0 – 2.9 dB**	**Minor 3.0 – 4.9 dB**	**Moderate 5.0 – 9.9 dB**	**Substantial >10.0 dB**
Negligible	**55 (LOAEL)**	0	Beneficial	0	0	0	0
		40	Adverse	40	0	0	0
Minor	**60**	0	Beneficial	0	0	0	0
		50	Adverse	50	0	0	0
Moderate	**68 (SOAEL)**	0	Beneficial	0	0	0	0
		20	Adverse	20	0	0	0
Substantial	**70**	0	Beneficial	0	0	0	0
		10	Adverse	10	0	0	0
Very Substantial	**75 (UAEL)**	0	Beneficial	0	0	0	0
		4	Adverse	0	0	0	0
Total		0	Beneficial	0	0	0	0
		100	Adverse	100	0	0	0

Baseline (2017) vs Future (12 mppa in 2030)

The impact of road traffic noise on residential receptors assuming that the Proposed Development proceeds and Bristol Airport continues to grow to 12 mppa by 2030 will give rise to the effects given in **Table 6A.71**. The small number of receptors that do not experience any change in noise between two scenarios are given in this table in the "beneficial" receptor column.

Table 6A.71 Dwellings exposed to absolute noise and change in noise, 2017 to 12 mppa 2030

			Change in Noise Level, dB Potential Impact Classification				
Subjective description of impact	**Contour band dB $L_{A10,18h}$**	**Number of receptors in band, 12 mppa 2030**	**Beneficial or adverse change**	**Negligible 0.0 – 2.9 dB**	**Minor 3.0 – 4.9 dB**	**Moderate 5.0 – 9.9 dB**	**Substantial >10.0 dB**
Negligible	**55 (LOAEL)**	0	Beneficial	0	0	0	0
		40	Adverse	40	0	0	0
Minor	**60**	0	Beneficial	0	0	0	0
		50	Adverse	50	0	0	0
Moderate	**68 (SOAEL)**	0	Beneficial	0	0	0	0
		20	Adverse	20	0	0	0
Substantial	**70**	0	Beneficial	0	0	0	0
		10	Adverse	20	0	0	0
Very Substantial	**75 (UAEL)**	0	Beneficial	0	0	0	0
		4	Adverse	0	0	0	0
Total		0	Beneficial	0	0	0	0
		100	Adverse	100	0	0	0

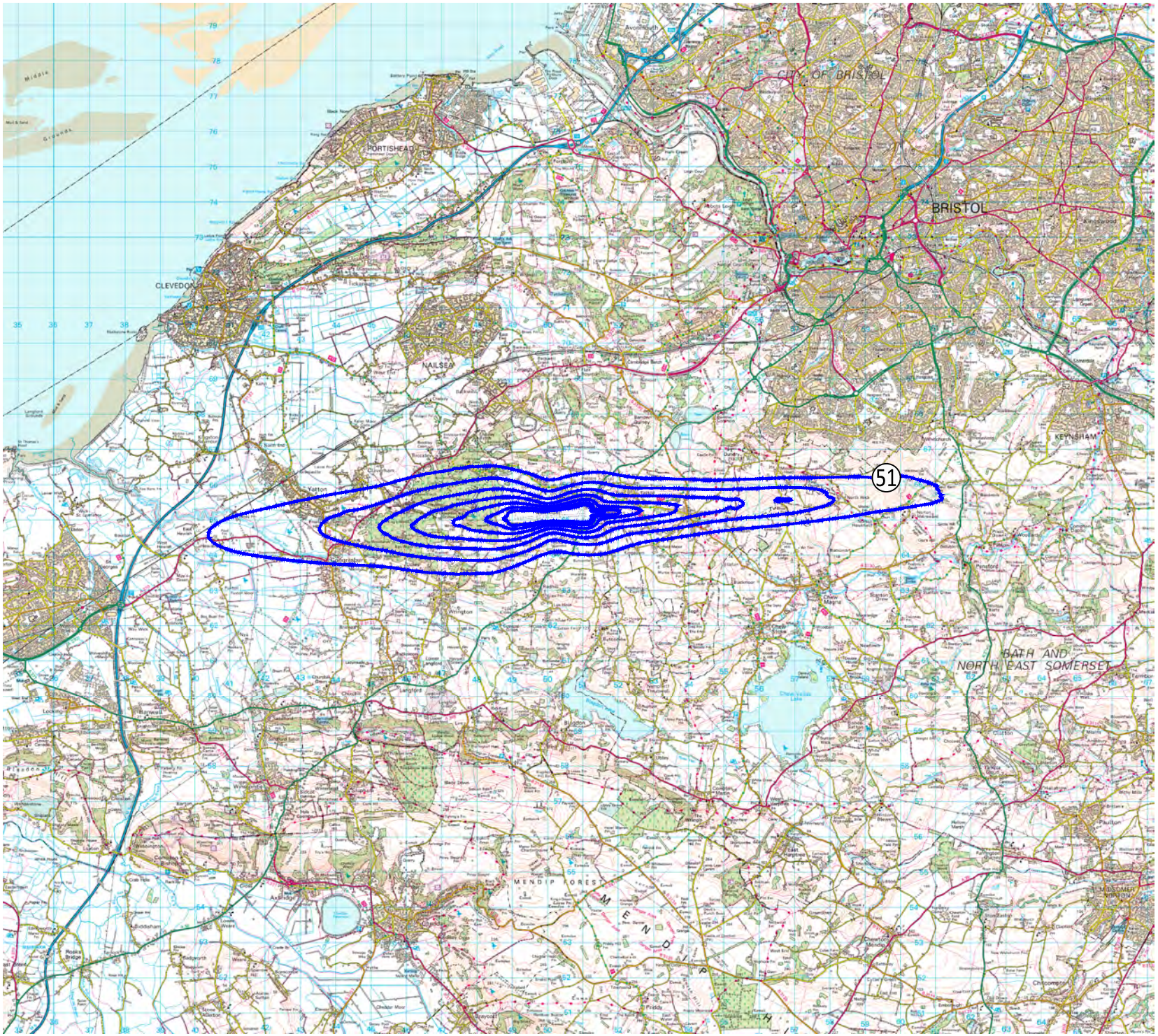
Future (10 mppa in 2030) vs Future (12 mppa in 2030)

The impact of road traffic noise on residential receptors assuming that the Proposed Development proceeds and Bristol Airport continues to grow to 12 mppa by 2030 will give rise to the effects given in **Table 6A.6872.** The small number of receptors that do not experience any change in noise between two scenarios are given in these tables in the "beneficial" receptor column.

Table 6A.72 Dwellings exposed to absolute noise and change in noise, 10 mppa 2030 to 12 mppa 2030

				Change in Noise Level, dB Potential Impact Classification			
Subjective description of impact	**Contour band dB $L_{A10,18h}$**	**Number of receptors in band, 12 mppa 2030**	**Beneficial or adverse change**	**Negligible 0.0 – 2.9 dB**	**Minor 3.0 – 4.9 dB**	**Moderate 5.0 – 9.9 dB**	**Substantial >10.0 dB**
Negligible	**55 (LOAEL)**	4	Beneficial	0	0	0	0
		40	Adverse	40	0	0	0
Minor	**60**	0	Beneficial	0	0	0	0
		50	Adverse	50	0	0	0
Moderate	**68 (SOAEL)**	0	Beneficial	0	0	0	0
		10	Adverse	20	0	0	0
Substantial	**70**	0	Beneficial	0	0	0	0
		20	Adverse	20	0	0	0
Very Substantial	**75 (UAEL)**	0	Beneficial	0	0	0	0
		4	Adverse	0	0	0	0
Total		4	Beneficial	0	0	0	0
		100	Adverse	100	0	0	0

Appendix 6B
Noise Figures



LEGEND:

Air Noise Contours,
51 to 69 dB $L_{Aeq,16h}$ in 3 dB steps

Rev	Date	Description	Initials

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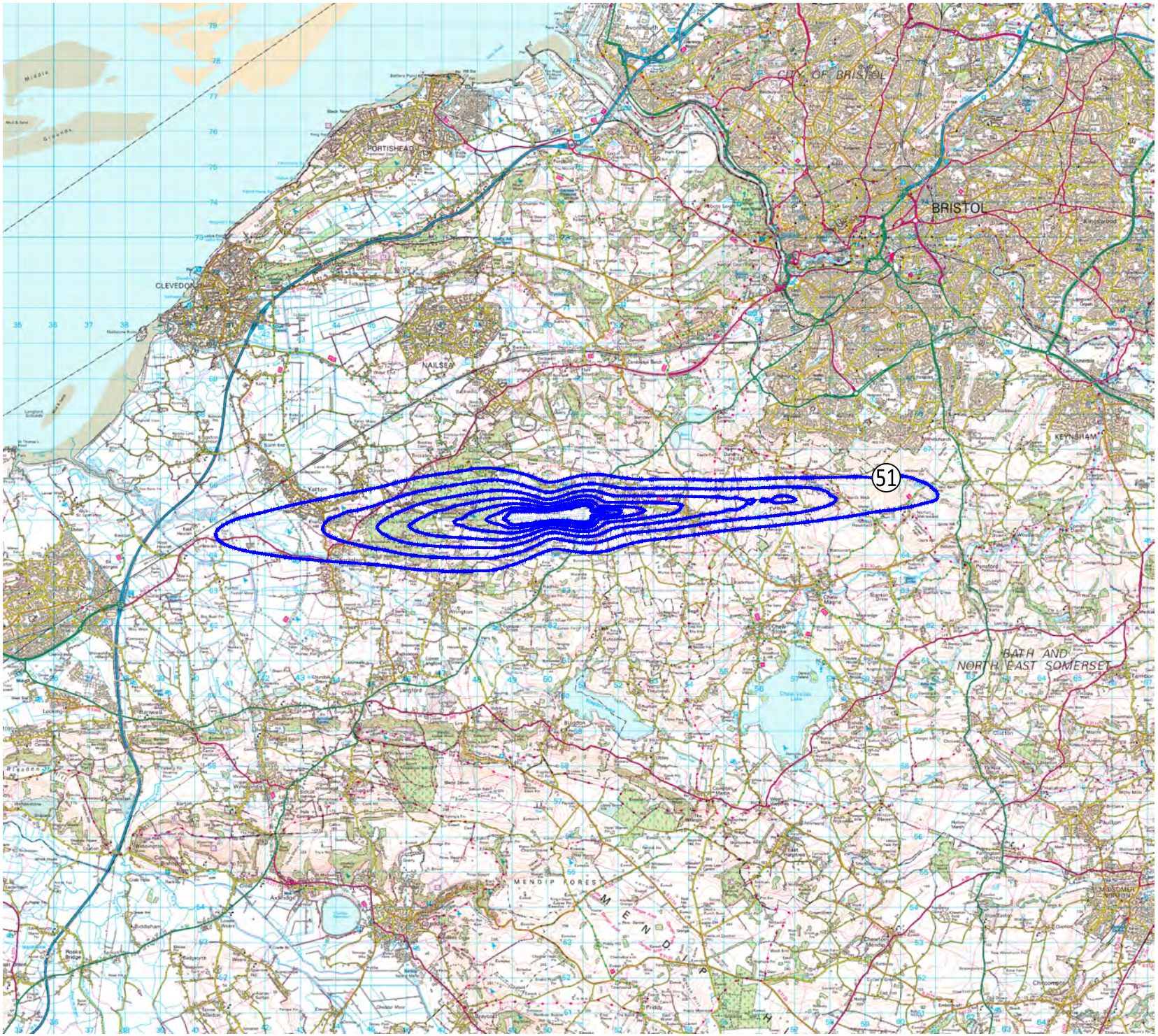
Figure 6A.1
10mppa 2024 Air Noise Contours
Summer $L_{Aeq,16h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

A11339_03_DR001_2.0



LEGEND:

Air Noise Contours,

51 to 69 dB $L_{Aeq,16h}$ in 3 dB steps

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Figure 6A.2
12mppa 2030 Air Noise Contours
Summer $L_{Aeq,16h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

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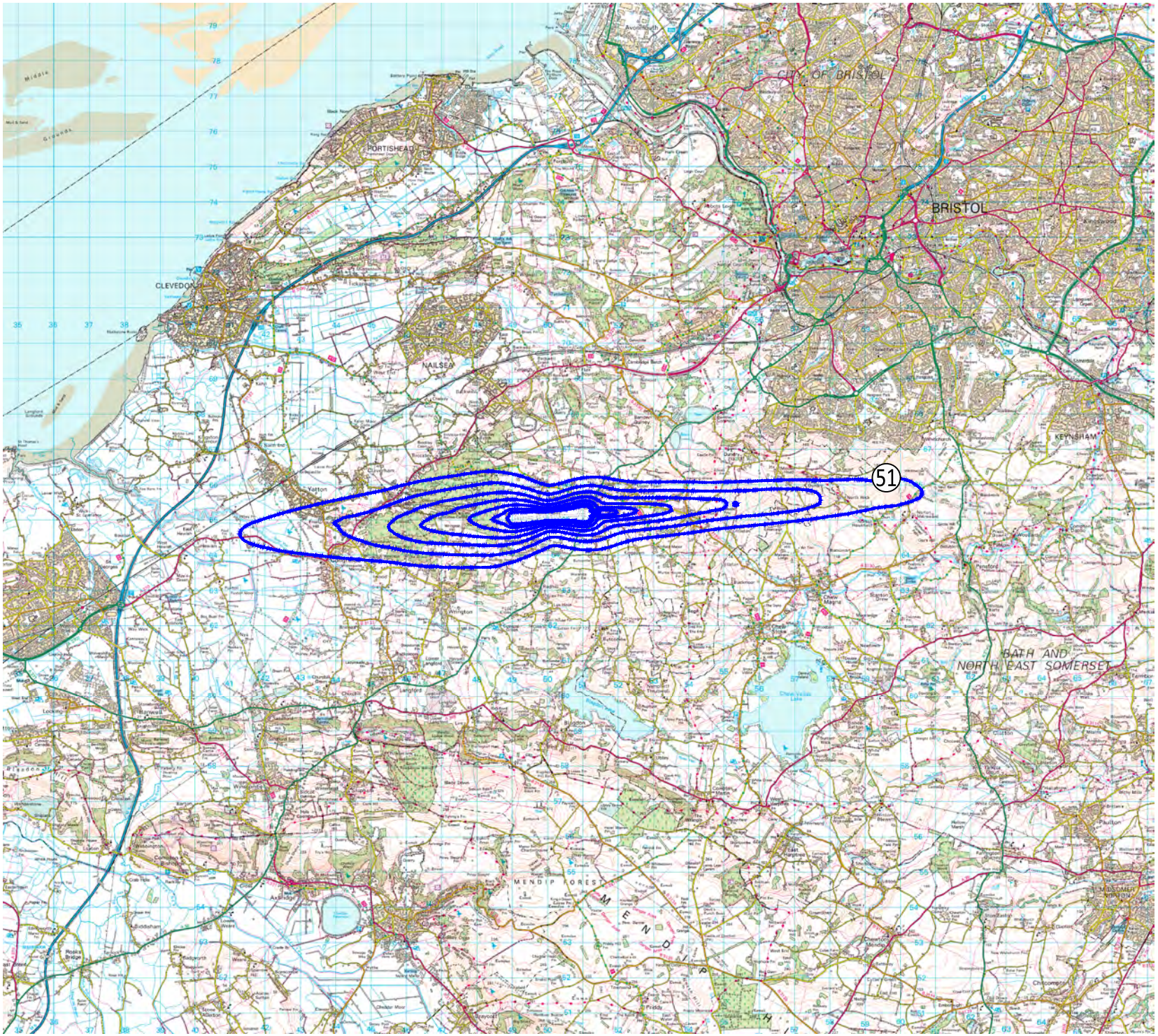

LEGEND:

Air Noise Contours,
51 to 69 dB $L_{Aeq,16h}$ in 3 dB steps

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Figure 6A.3
10mppa 2030 Air Noise Contours
Summer $L_{Aeq,16h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

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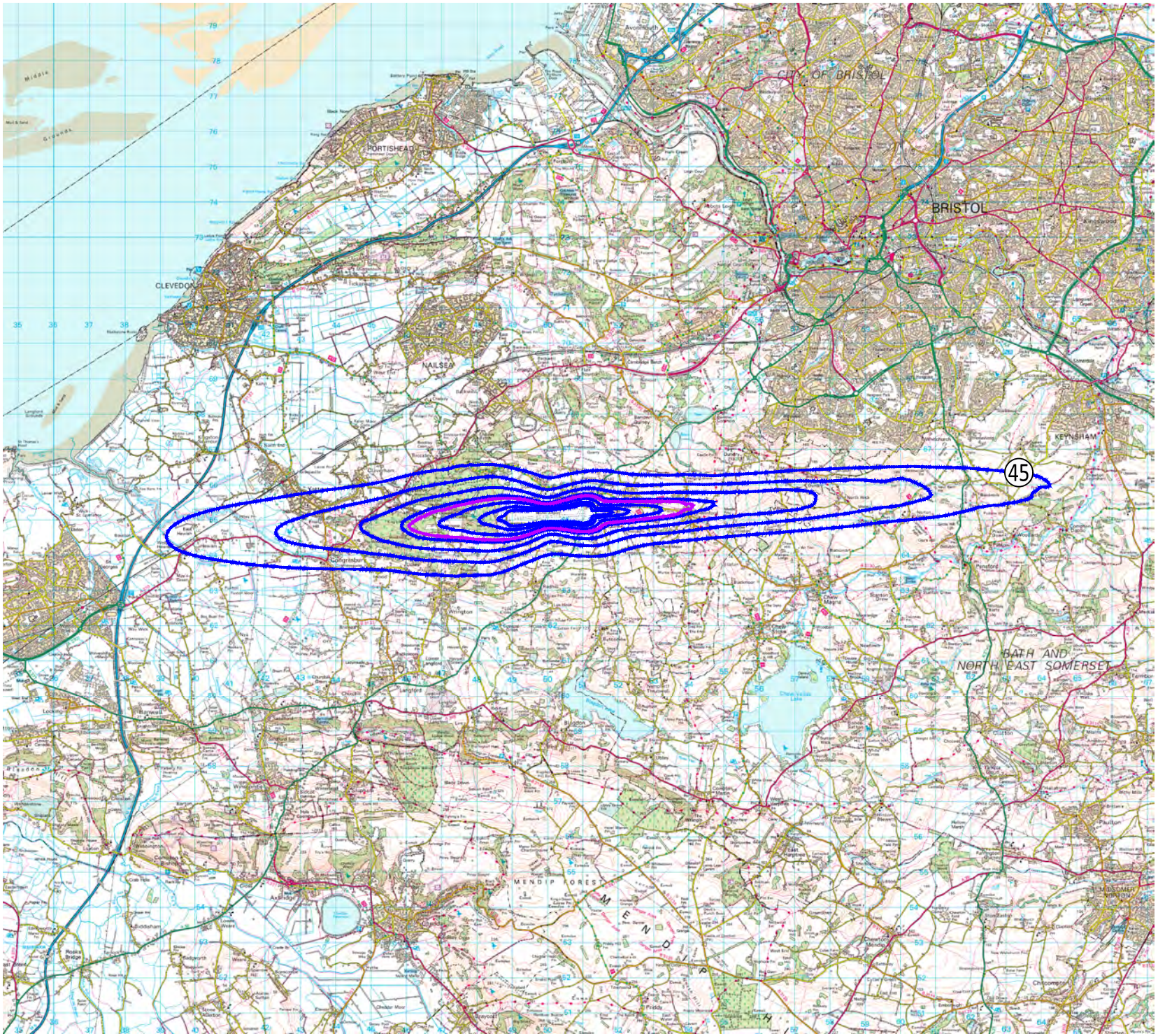

LEGEND:

Air Noise Contours,

45 to 63 dB $L_{Aeq,8h}$ in 3 dB steps

55 dB $L_{Aeq,8h}$

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Figure 6A.4
10mppa 2024 Air Noise Contours
Summer $L_{Aeq,8h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

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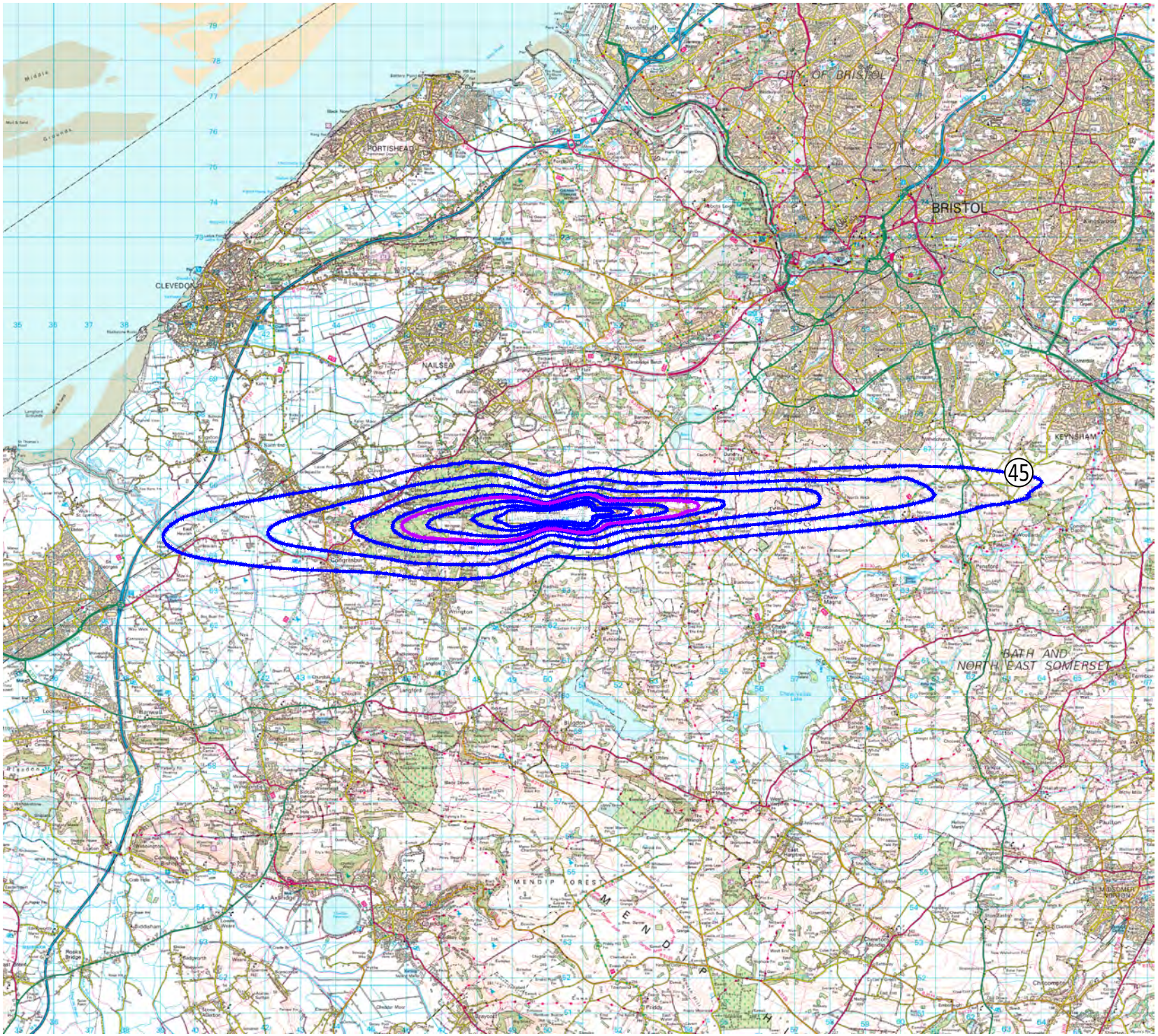

LEGEND:

Air Noise Contours,

45 to 63 dB $L_{Aeq,8h}$ in 3 dB steps

55 dB $L_{Aeq,8h}$

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Figure 6A.5
12mppa 2030 Air Noise Contours
Summer $L_{Aeq,8h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

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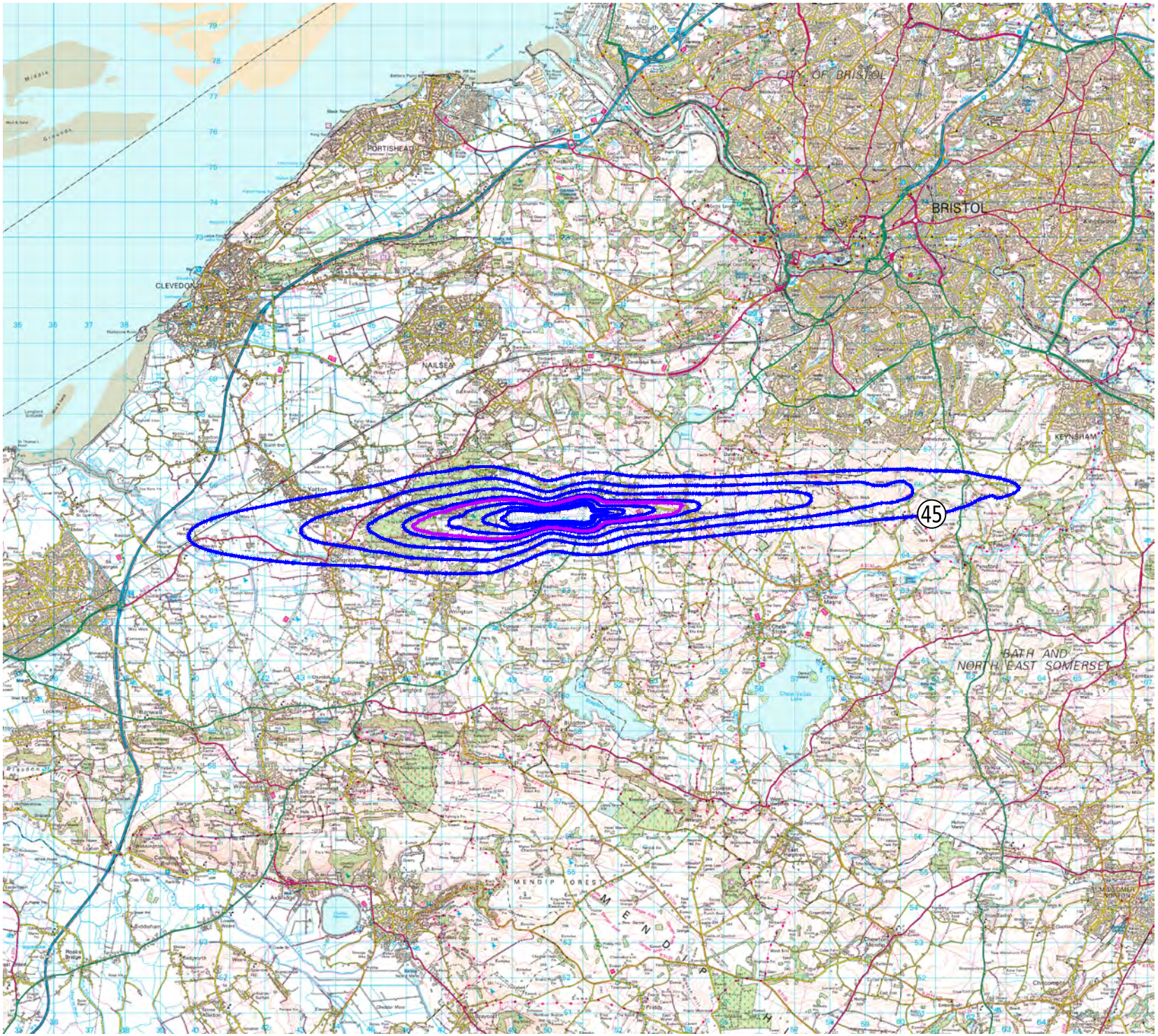

LEGEND:

Air Noise Contours,

45 to 63 dB $L_{Aeq,8h}$ in 3 dB steps

55 dB $L_{Aeq,8h}$

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Figure 6A.6
10mppa 2030 Air Noise Contours
Summer $L_{Aeq,8h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

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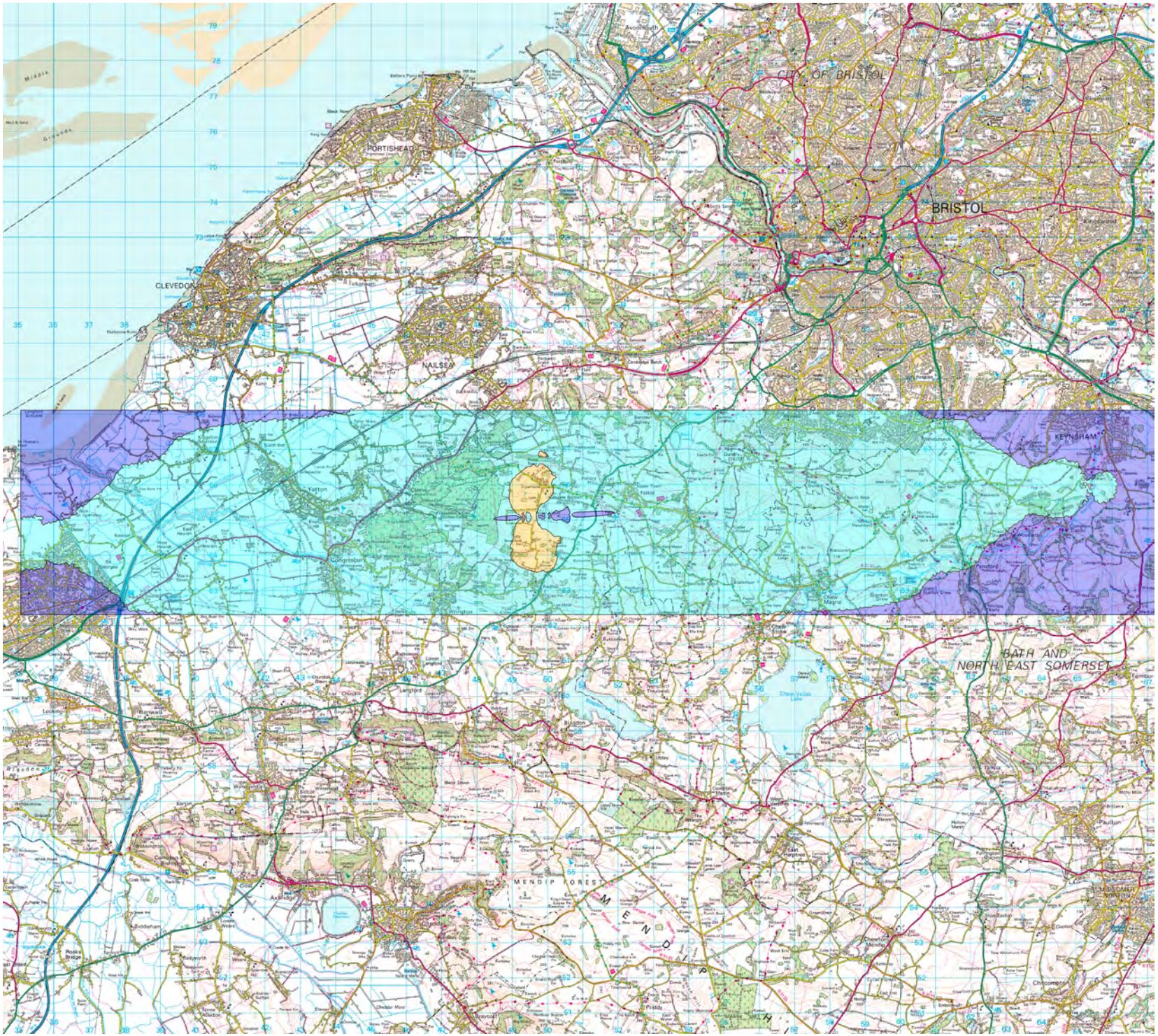

LEGEND:

Air Noise Difference Contours,
$L_{Aeq,30m}$ 23:00 - 23:30

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

Rev	Date	Description	Initials

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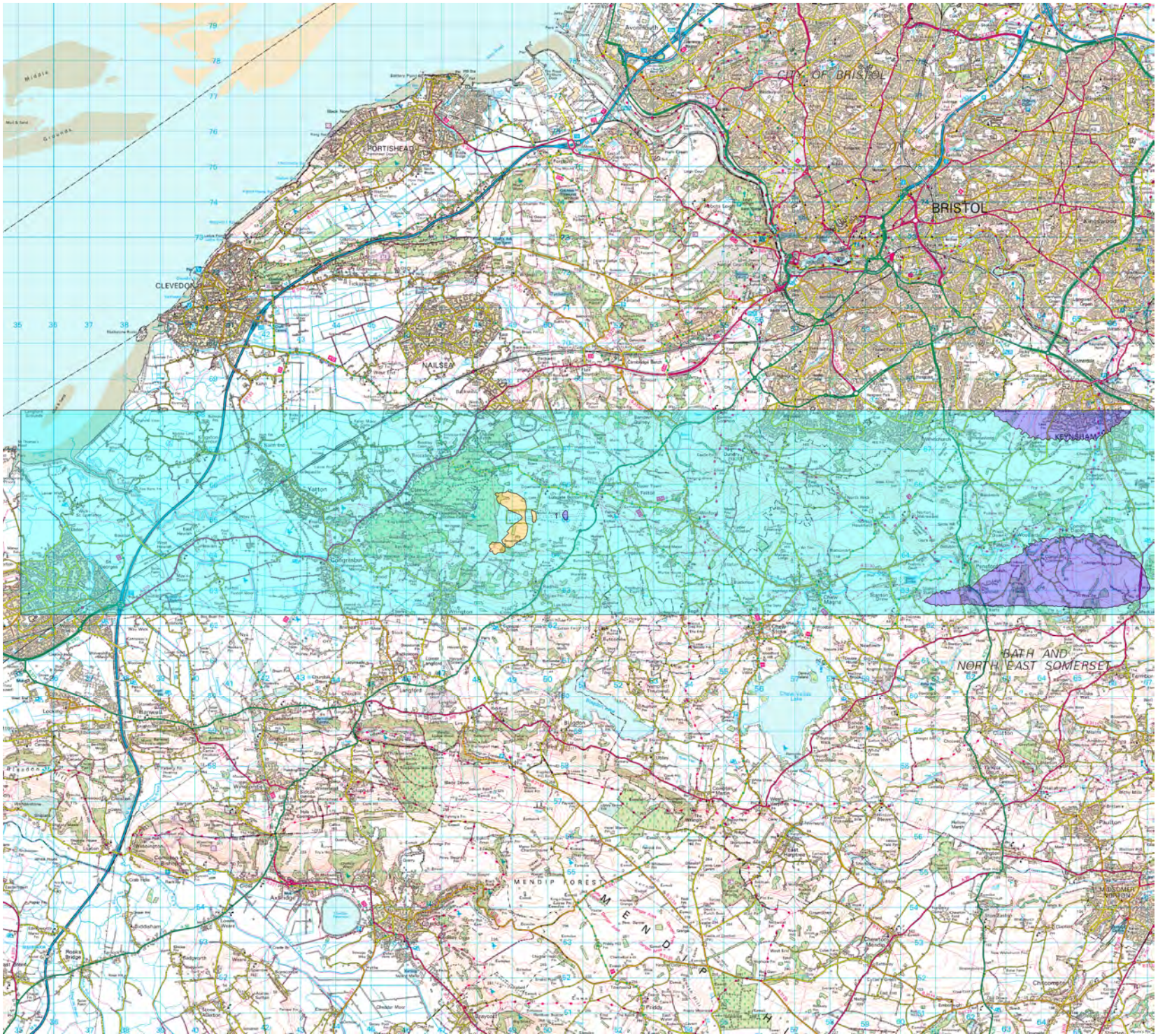
Figure 6A.7
Difference Contours 23:00 - 23:30
10mppa 2024 vs 10 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

A11339_03_DR007_2.0



LEGEND:

Air Noise Difference Contours,
$L_{Aeq,6.5h}$ 23:30 - 06:00

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

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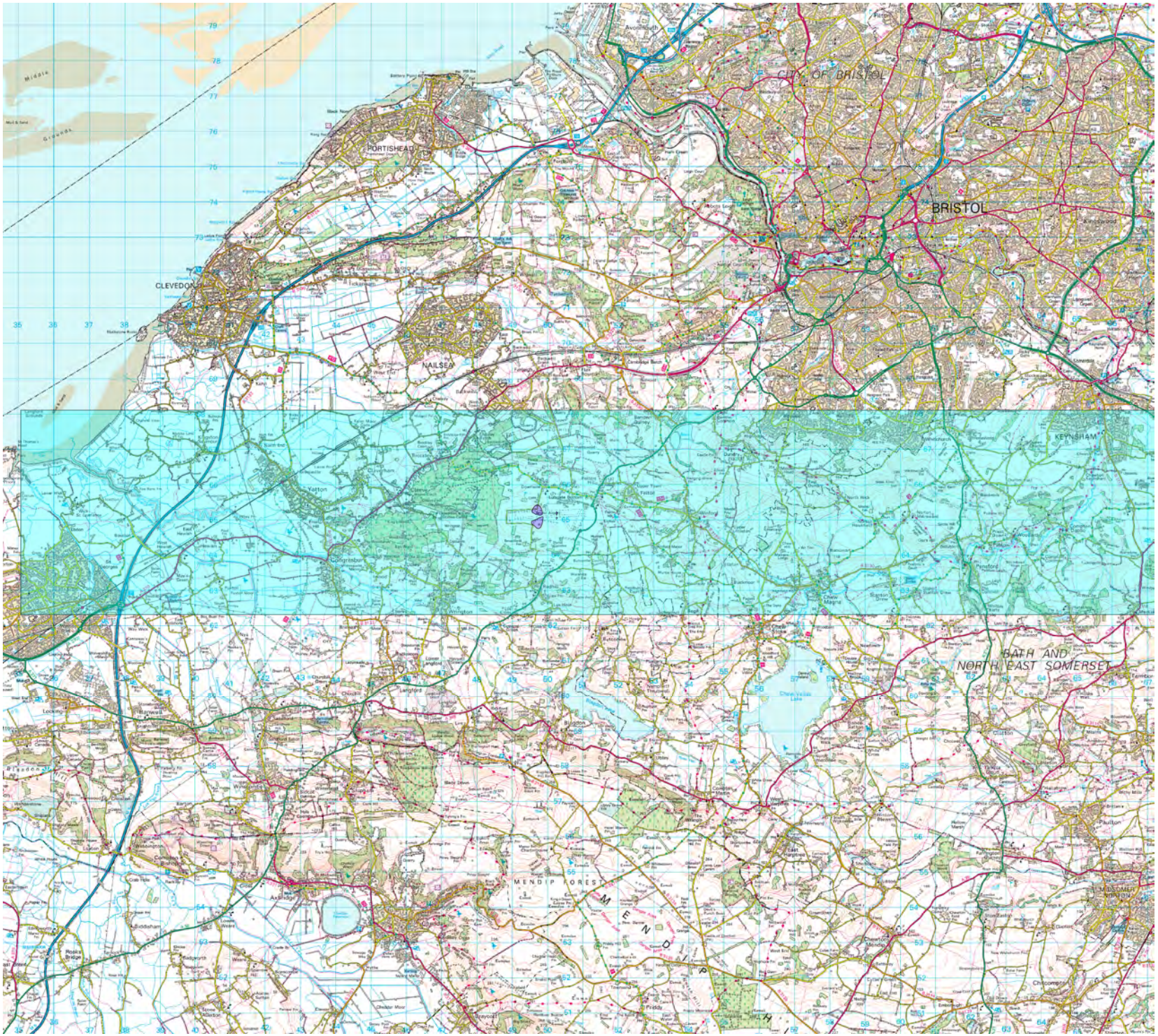
Figure 6A.8
Difference Contours 23:30 - 06:00
10mppa 2024 vs 10 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

A11339_03_DR008_2.0



LEGEND:

Air Noise Difference Contours,
$L_{Aeq,1h}$ 06:00 - 07:00

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

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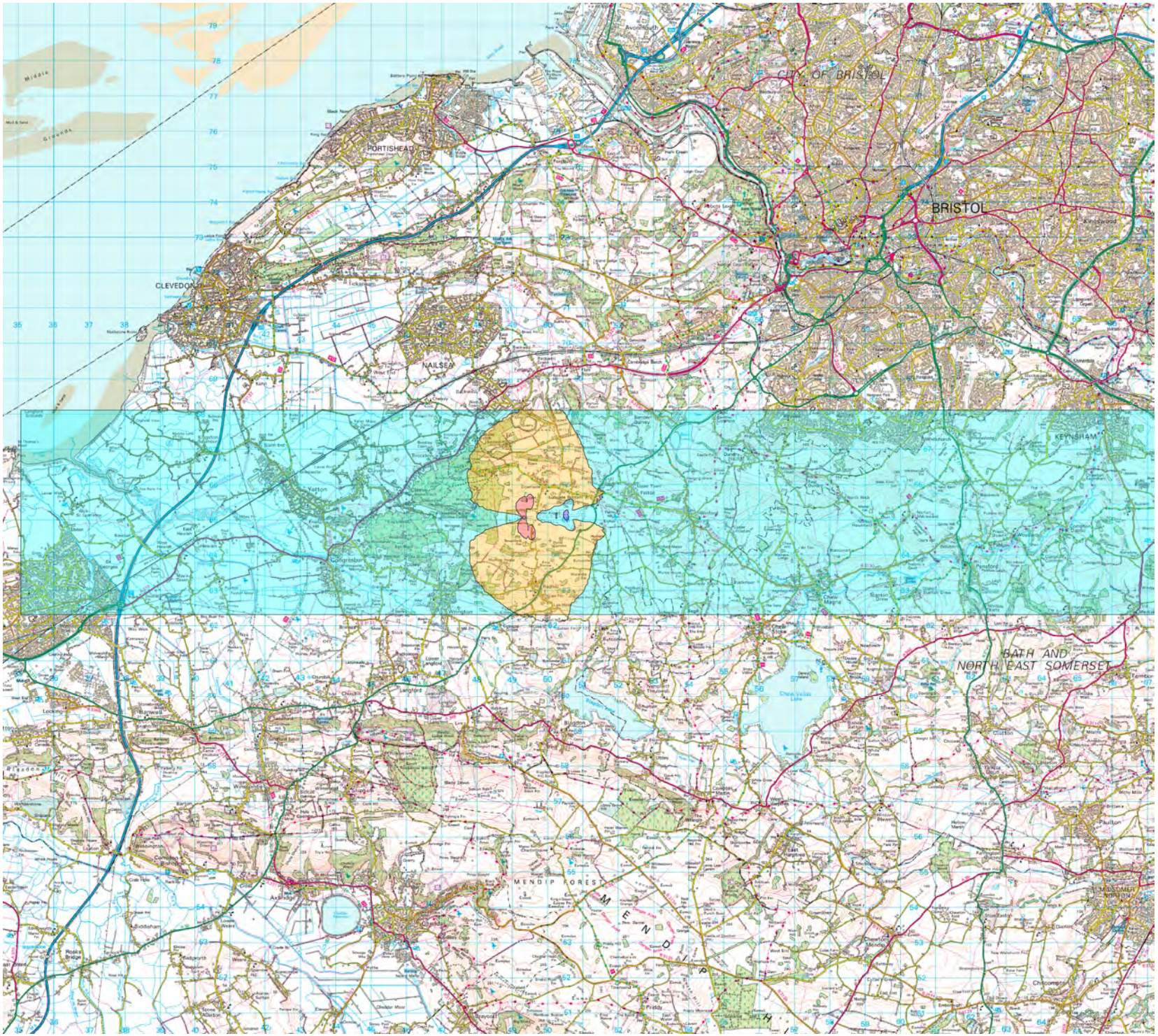
Figure 6A.9
Difference Contours 06:00 - 07:00
10mppa 2024 vs 10 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

A11339_03_DR009_2.0



LEGEND:

Air Noise Difference Contours,
$L_{Aeq,30m}$ 23:00 - 23:30

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

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Figure 6A.10
Difference Contours 23:00 - 23:30
10mppa 2024 vs 12 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

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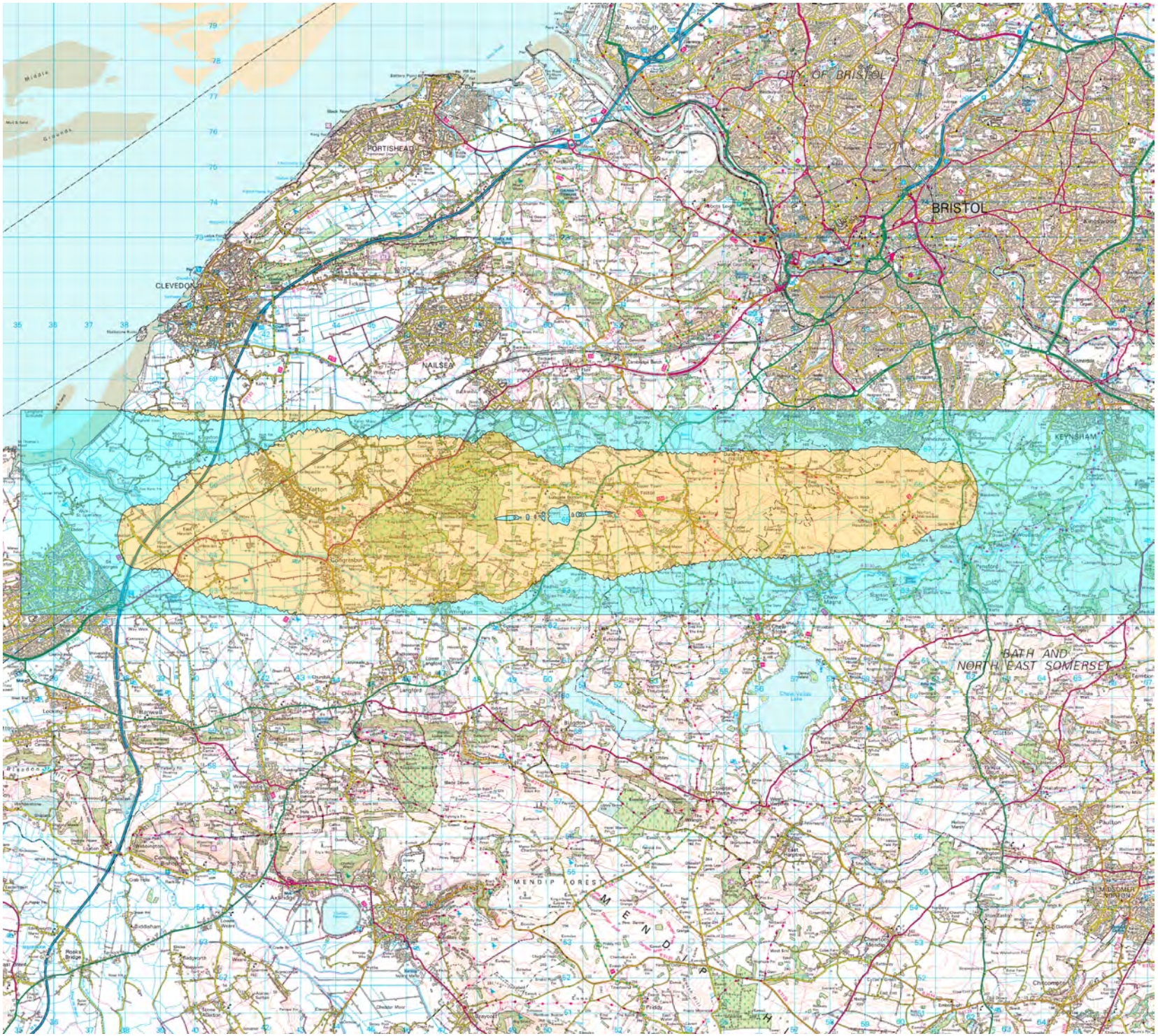

LEGEND:

Air Noise Difference Contours,
$L_{Aeq,6.5h}$ 23:30 - 06:00

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

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Figure 6A.11
Difference Contours 23:30 - 06:00
10mppa 2024 vs 12 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

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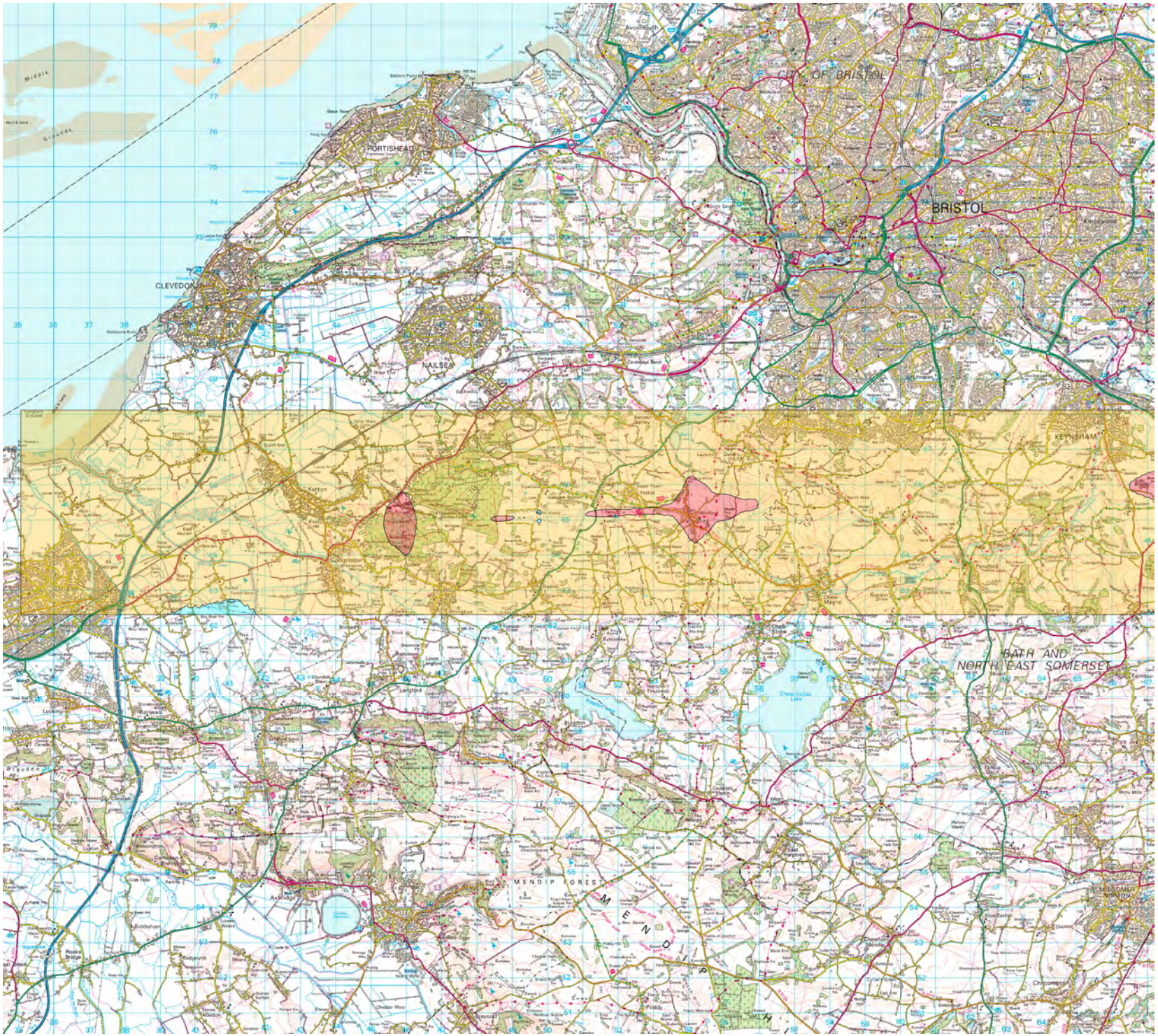

LEGEND:

Air Noise Difference Contours,
$L_{Aeq,1h}$ 06:00 - 07:00

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

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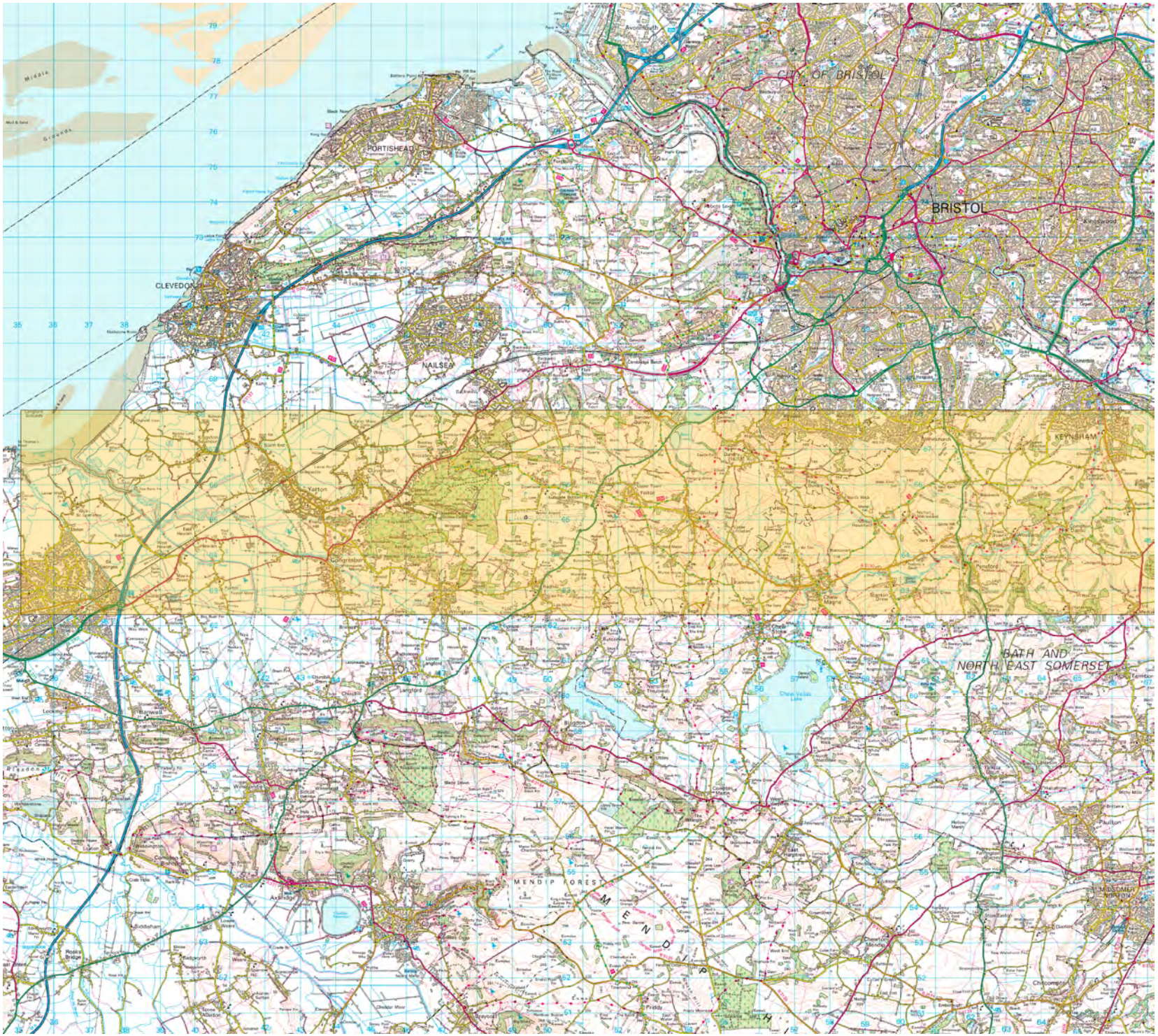
Figure 6A.12
Difference Contours 06:00 - 07:00
10mppa 2024 vs 12 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

A11339_03_DR012_2.0



LEGEND:

Air Noise Difference Contours,
$L_{Aeq,30m}$ 23:00 - 23:30

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

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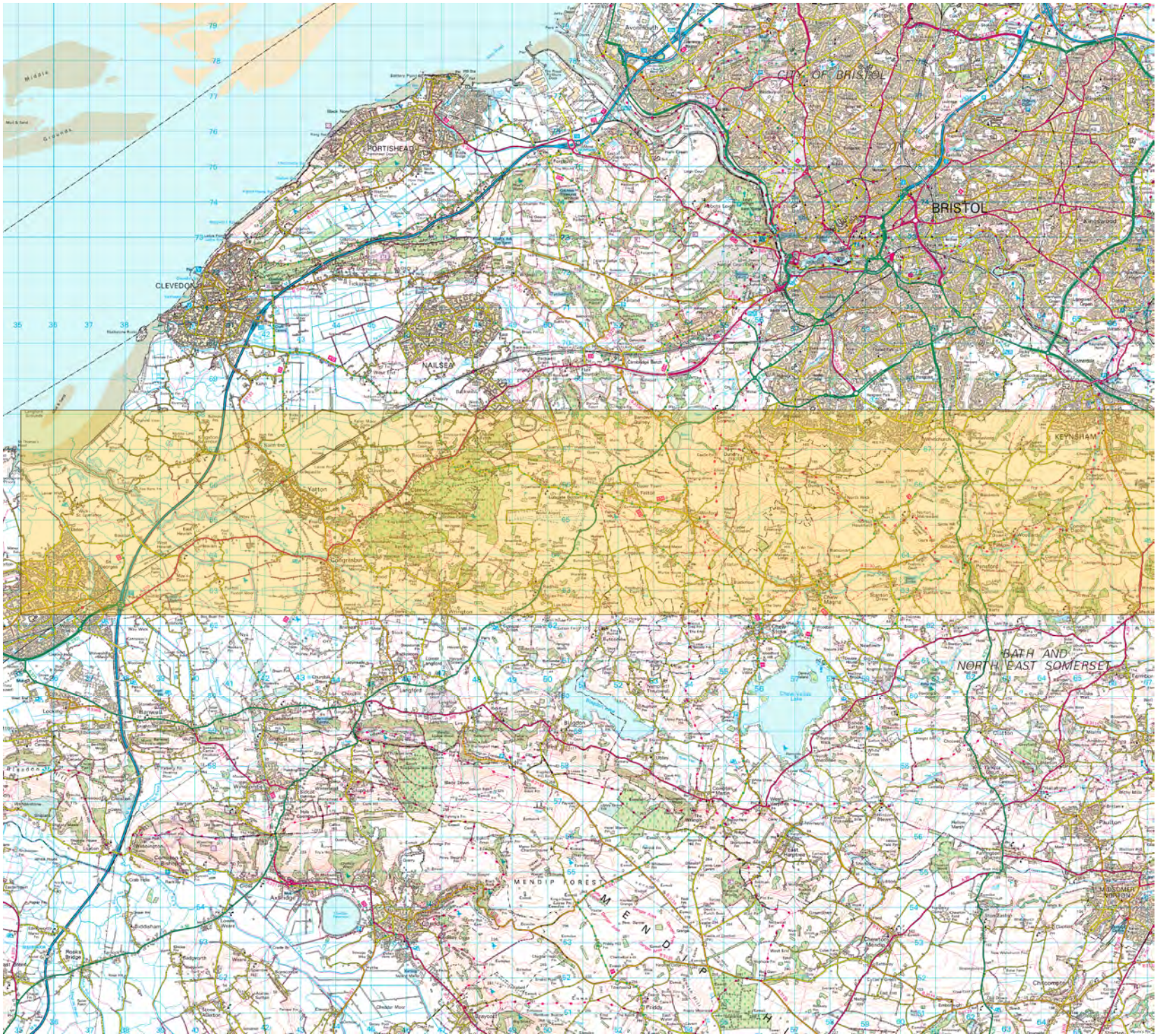
Figure 6A.13
Difference Contours 23:00 - 23:30
10mppa 2030 vs 12 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

A11339_03_DR013_2.0



LEGEND:

Air Noise Difference Contours,
$L_{Aeq,6.5h}$ 23:30 - 06:00

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

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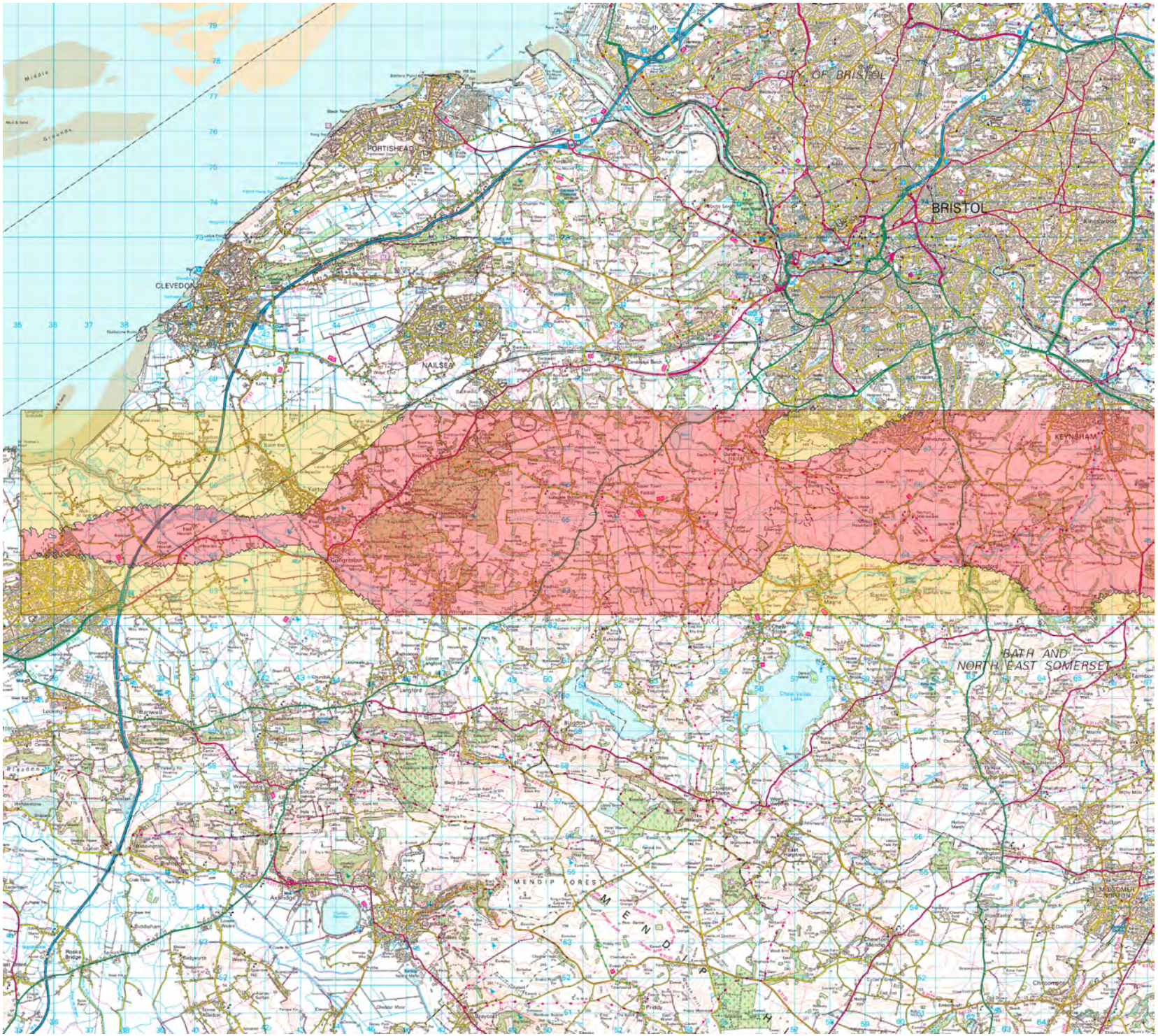
Figure 6A.14
Difference Contours 23:30 - 06:00
10mppa 2030 vs 12 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

A11339_03_DR014_2.0



LEGEND:

Air Noise Difference Contours,
$L_{Aeq,1h}$ 06:00 - 07:00

- -2 dB to -1 dB
- -1 dB to 0 dB
- 0 dB to 1 dB
- 1 dB to 2 dB

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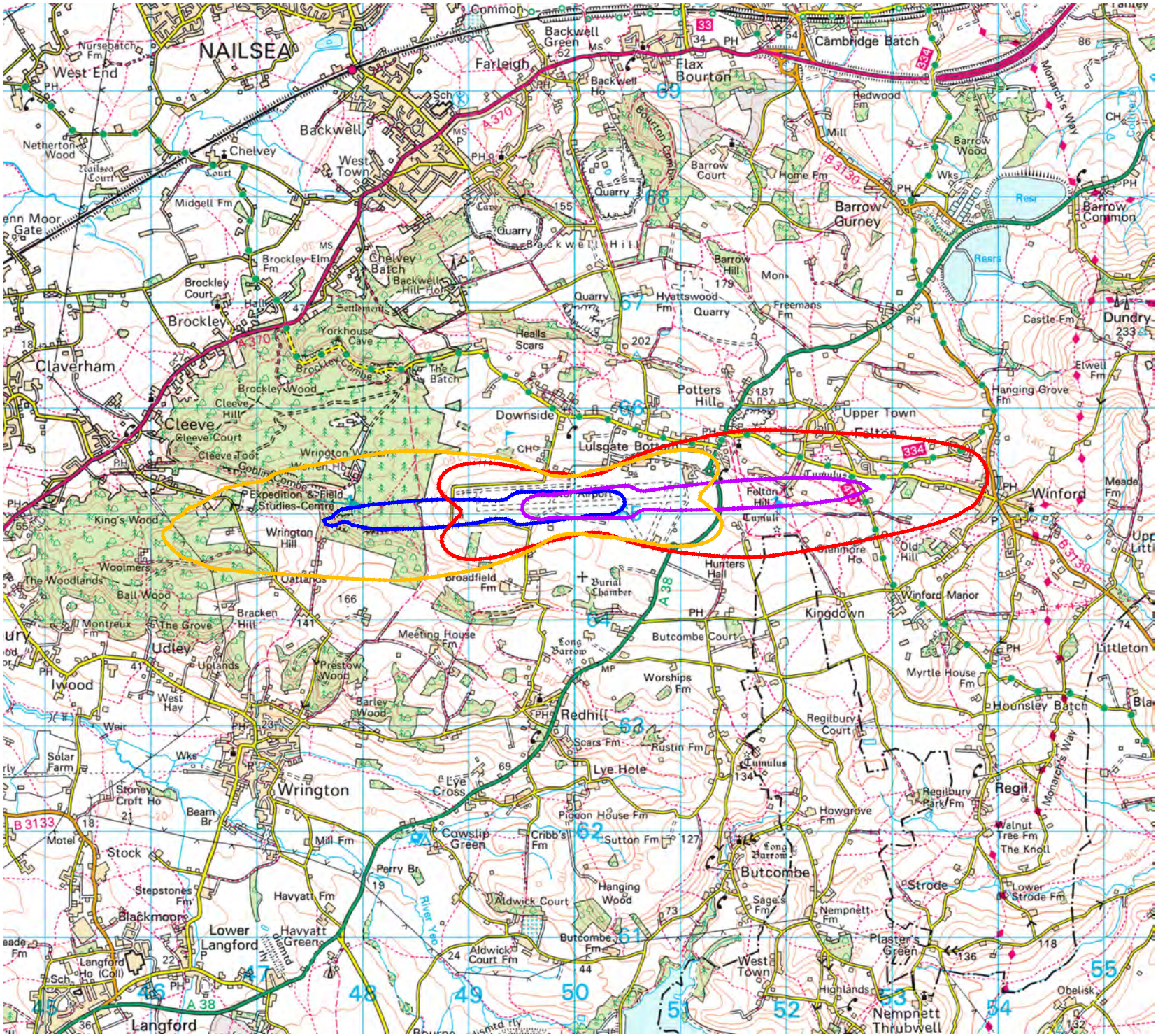
Figure 6A.15
Difference Contours 06:00 - 07:00
10mppa 2030 vs 12 mppa 2030

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:150000@A4

Drawing No:

A11339_03_DR015_2.0



LEGEND:

90 dB SEL Air Noise Contours

- Runway 09 Arrivals
- Runway 27 Arrivals
- Runway 09 Departures
- Runway 27 Departures

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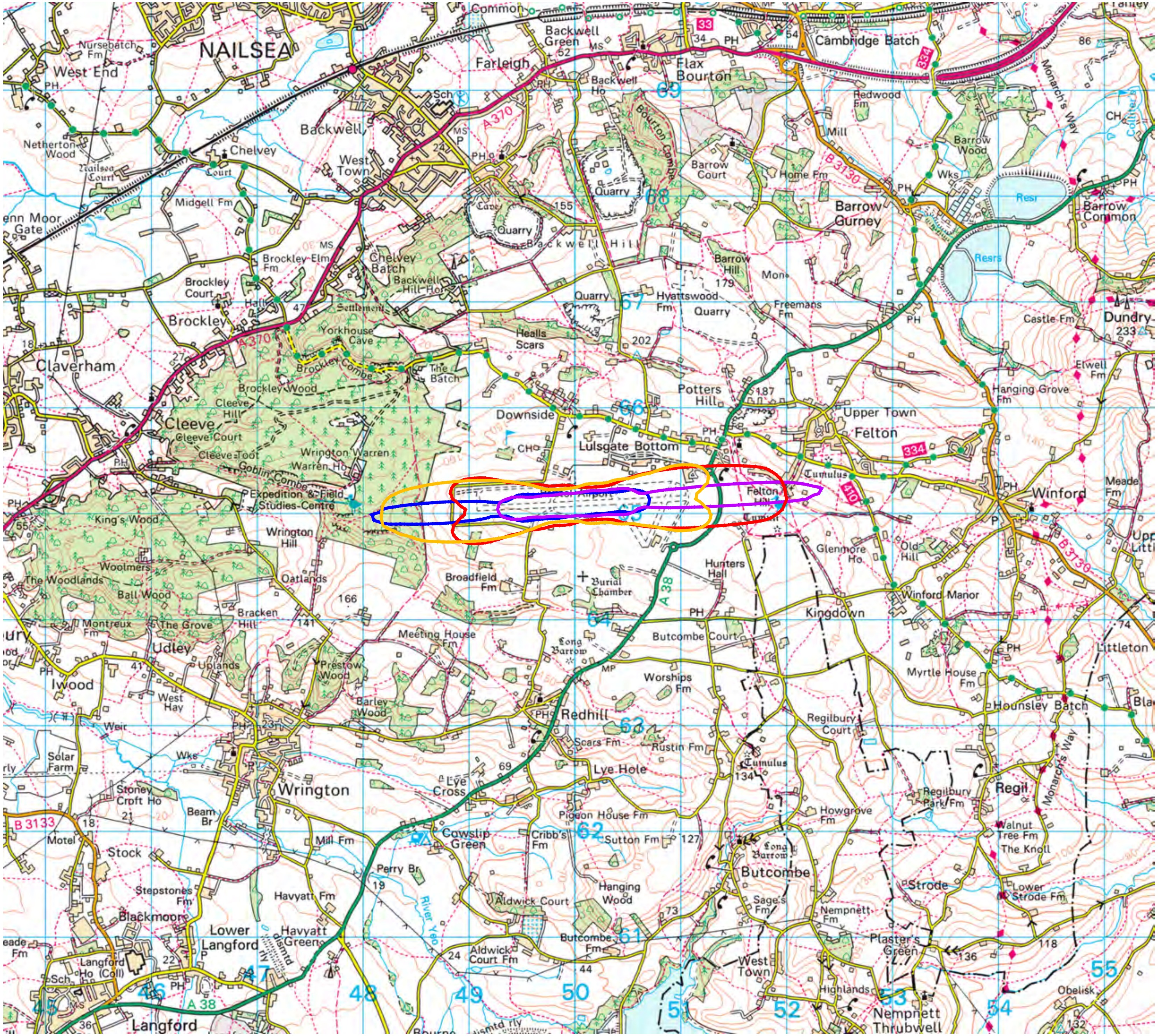
Figure 6A.16
SEL Air Noise Contours
Airbus A321neo

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:50000@A4

Drawing No:

A11339_03_DR016_2.0



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LEGEND:

90 dB SEL Air Noise Contours

- Runway 09 Arrivals
- Runway 27 Arrivals
- Runway 09 Departures
- Runway 27 Departures

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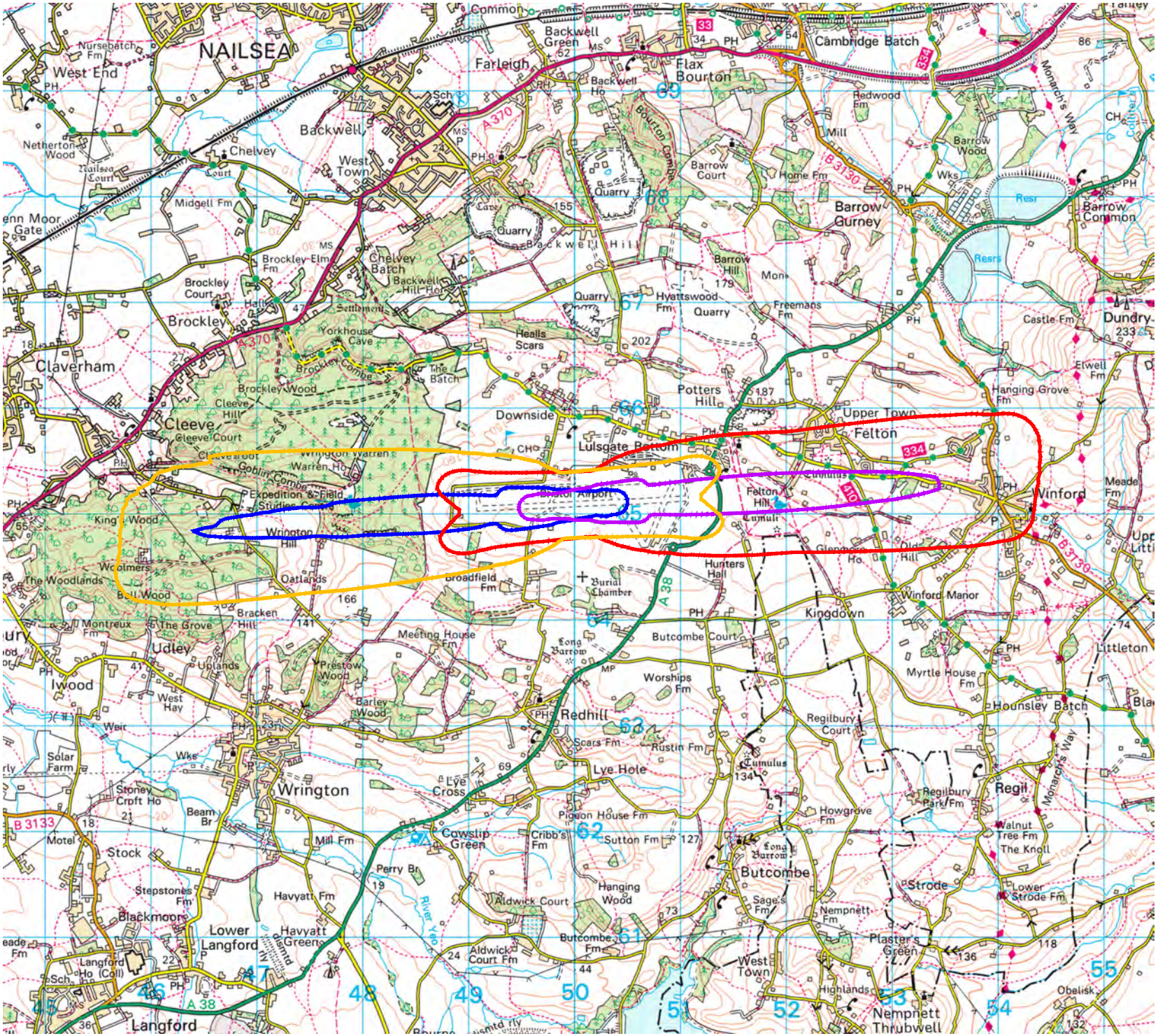
Figure 6A.17
SEL Air Noise Contours
Boeing 737 MAX 8

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:50000@A4

Drawing No:

A11339_03_DR017_2.0



LEGEND:

80 dB L_{Amax} Air Noise Contours

- Runway 09 Arrivals
- Runway 27 Arrivals
- Runway 09 Departures
- Runway 27 Departures

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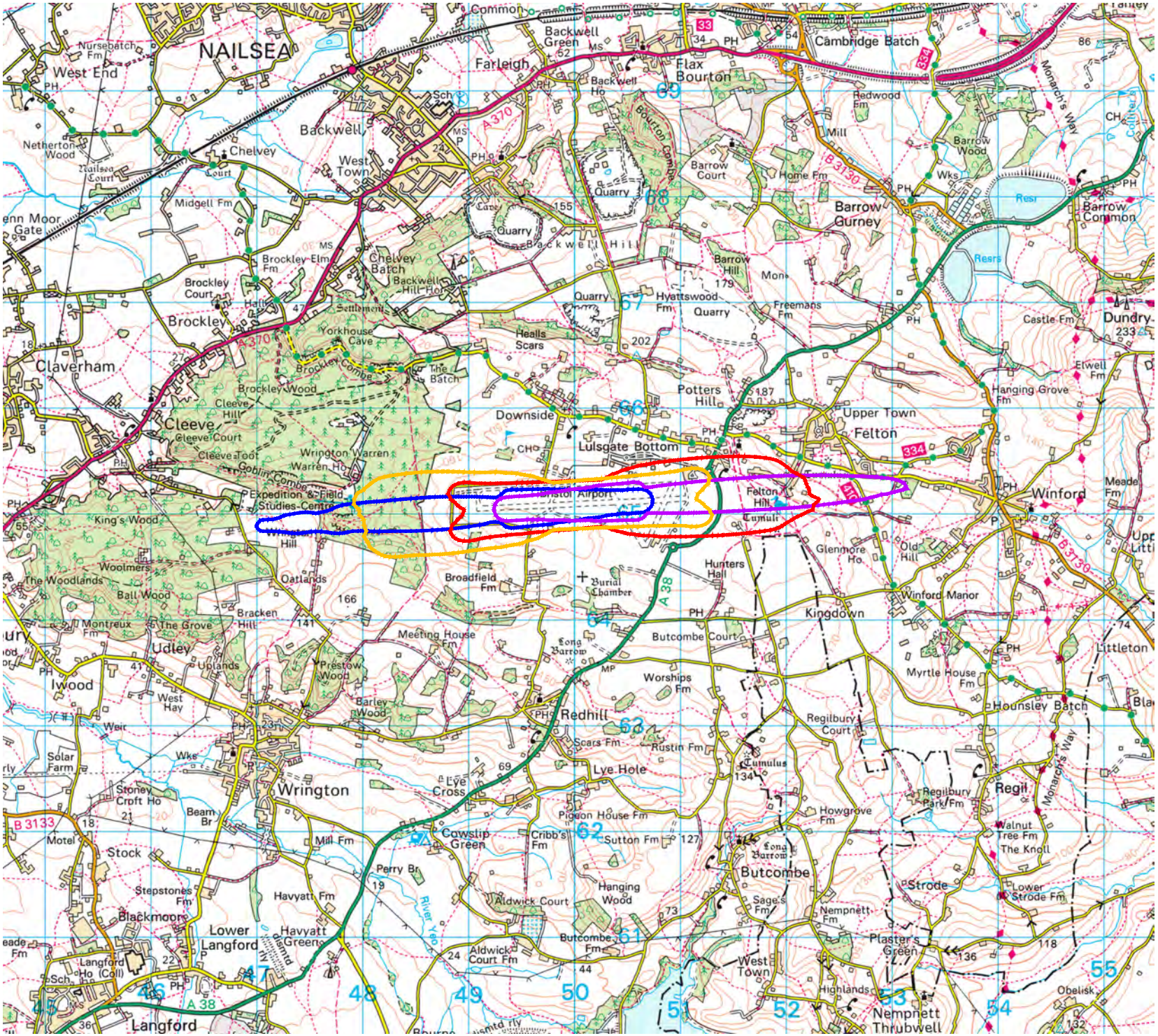
Figure 6A.18
L_{Amax} Air Noise Contours
Airbus A321neo

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:50000@A4

Drawing No:

A11339_03_DR018_2.0



LEGEND:

80 dB L_{Amax} Air Noise Contours

- Runway 09 Arrivals
- Runway 27 Arrivals
- Runway 09 Departures
- Runway 27 Departures

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Figure 6A.19
L_{Amax} Air Noise Contours
Boeing 737 MAX 8

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:50000@A4

Drawing No:

A11339_03_DR019_2.0

LEGEND:

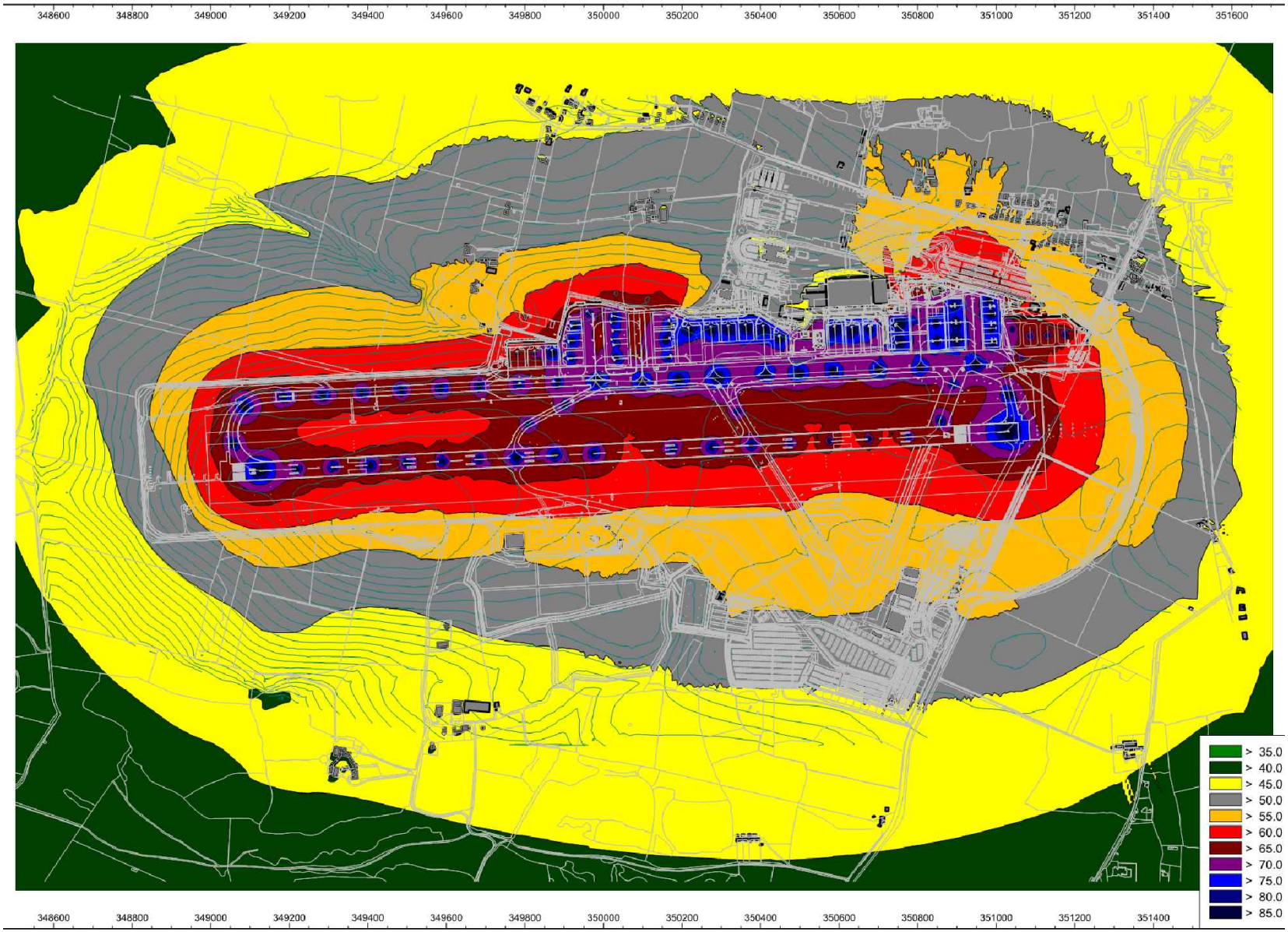

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Figure 6A.20
10mppa 2030 Ground Noise Contours
$L_{Aeq,16h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:15000@A4

Drawing No:

A11339_04_DR001_2.0

LEGEND:

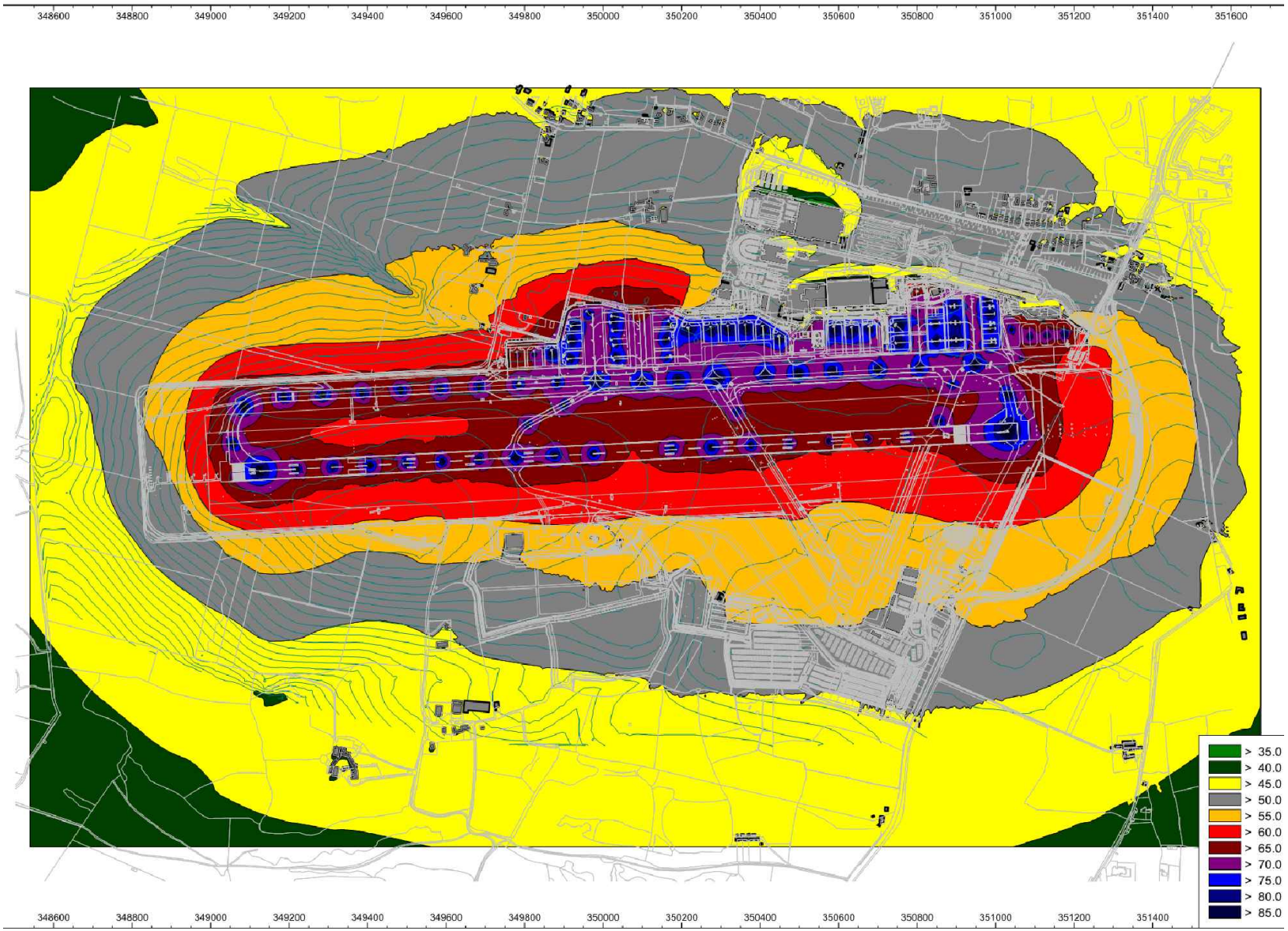

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Figure 6A.21
12mppa 2030 Ground Noise Contours
$L_{Aeq,16h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:15000@A4

Drawing No:

A11339_04_DR002_2.0

LEGEND:

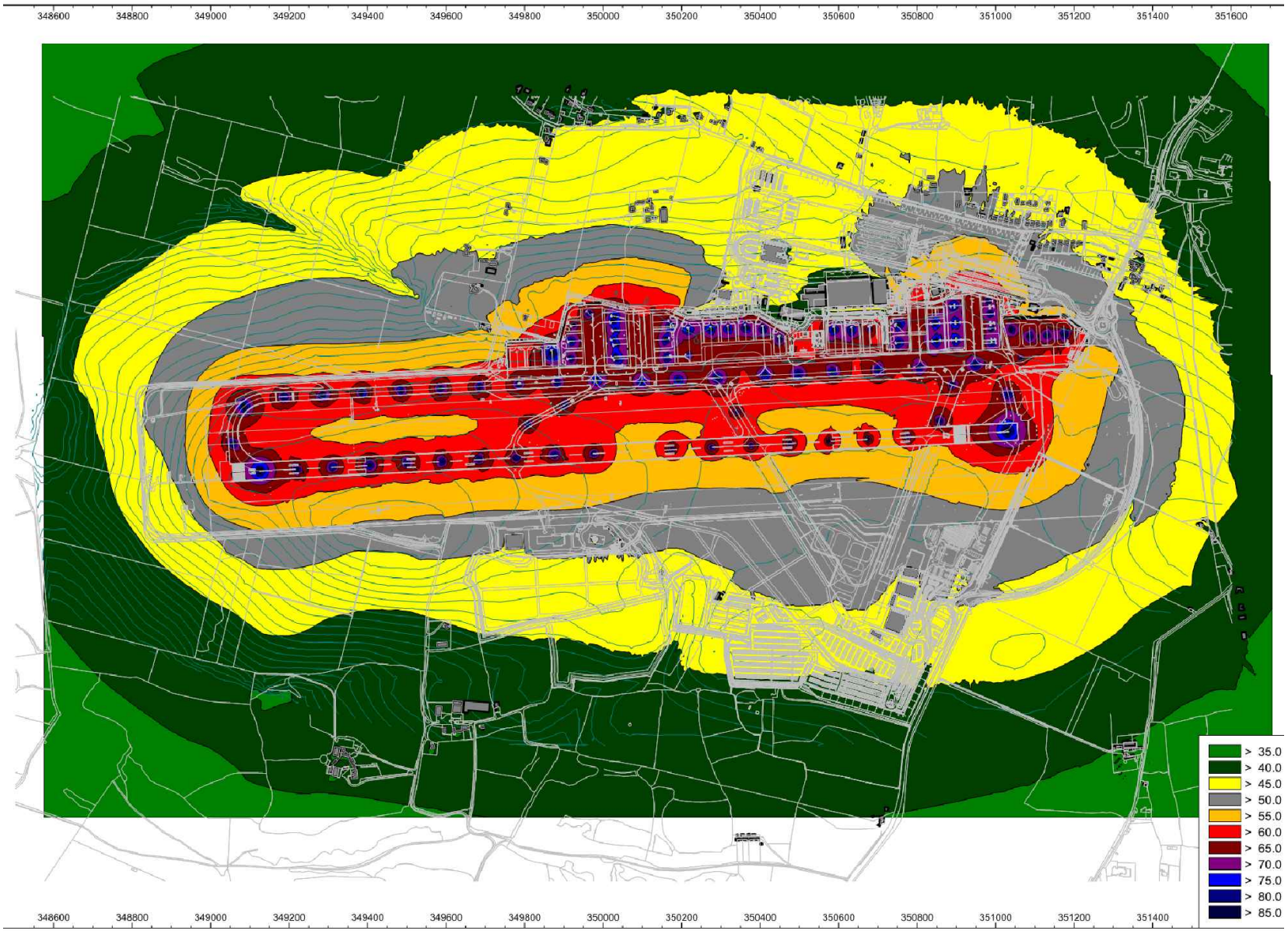

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Figure 6A.22
10mppa 2030 Ground Noise Contours
$L_{Aeq,8h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:15000@A4

Drawing No:

A11339_04_DR003_2.0

LEGEND:

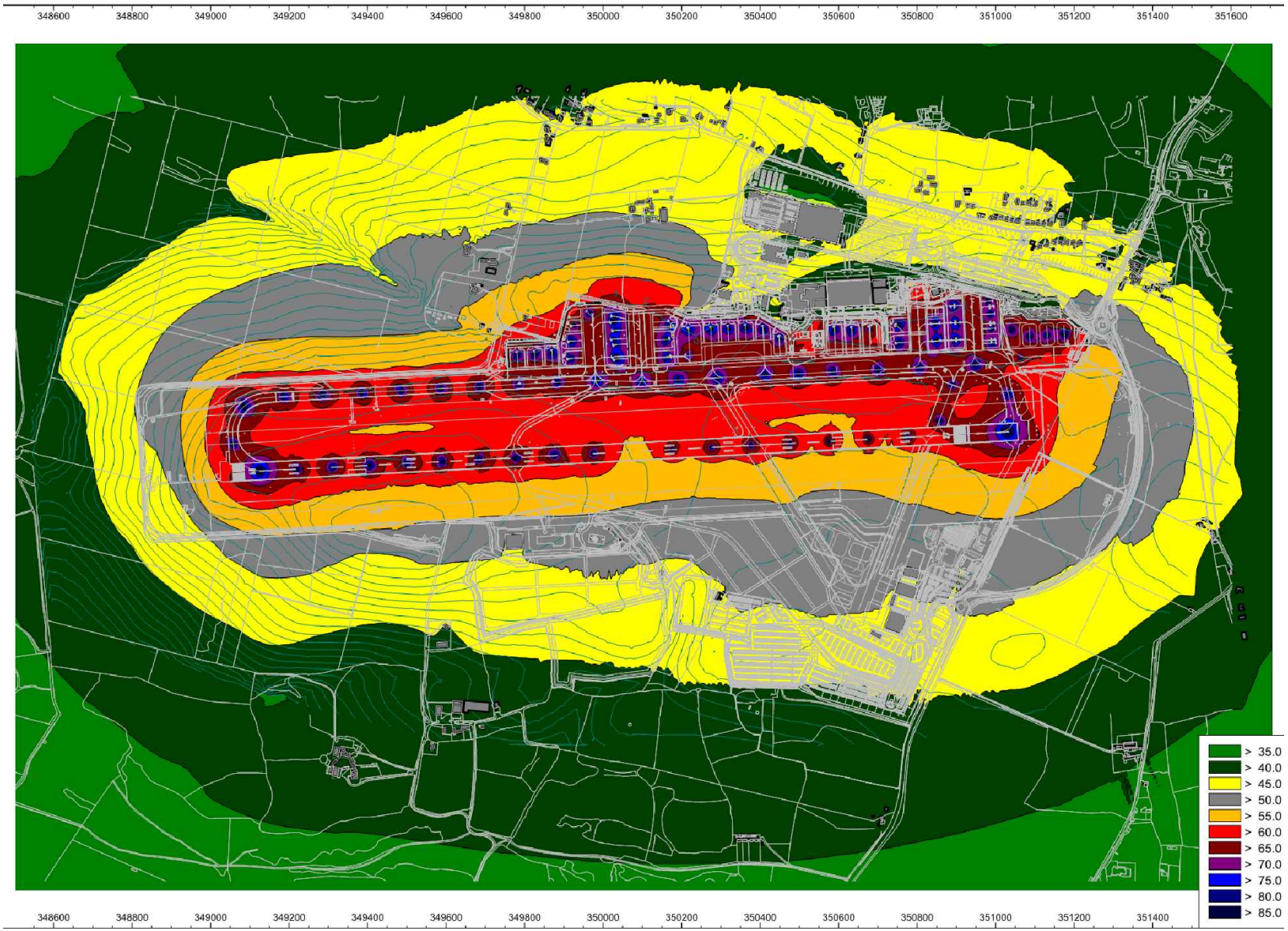

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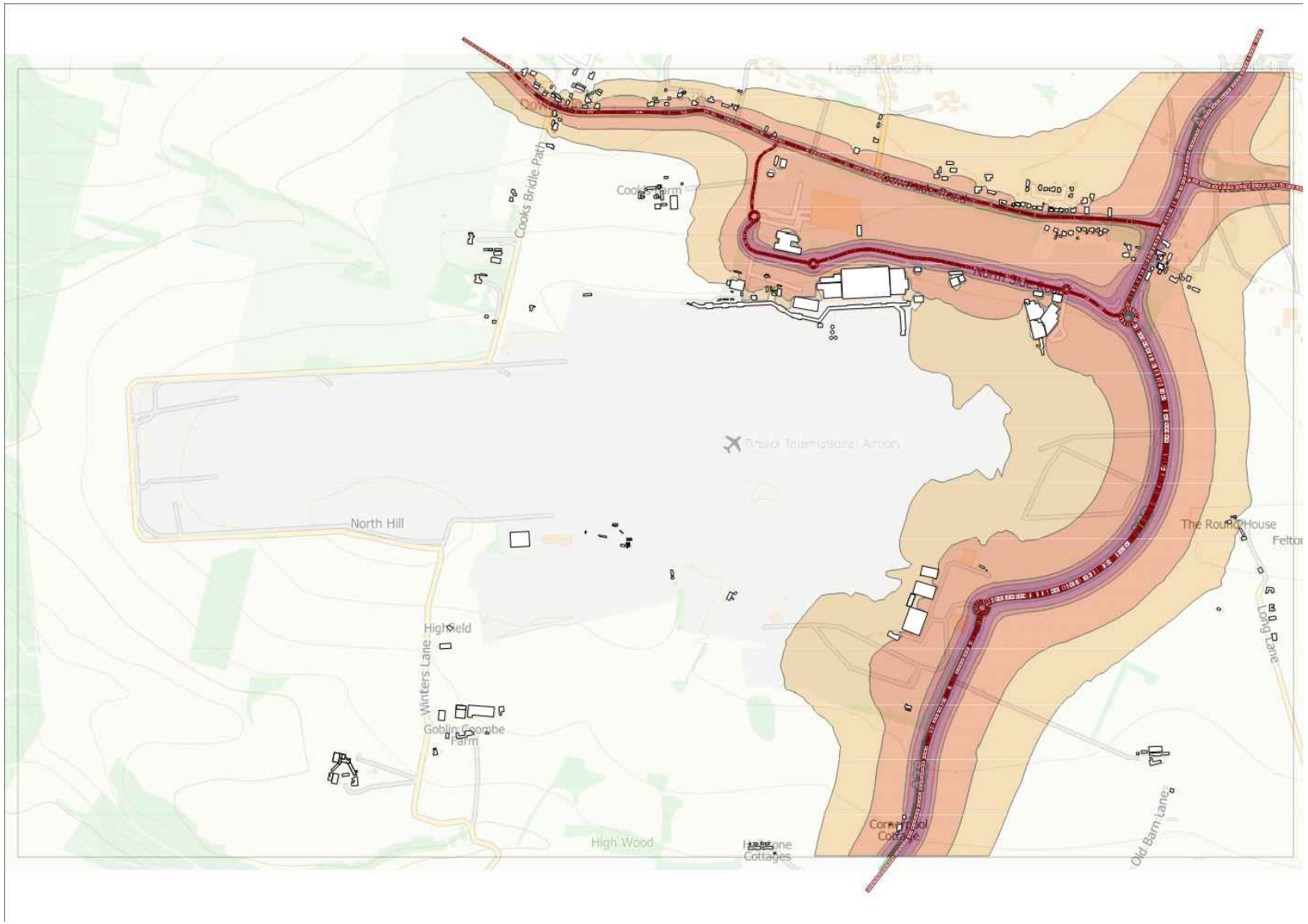
Figure 6A.23
12mppa 2030 Ground Noise Contours
$L_{Aeq,8h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:15000@A4

Drawing No:

A11339_04_DR004_2.0



LEGEND:

$L_{A10,18h}$ Road Traffic Noise Contours,

- 55-60 dB
- 60-68 dB
- 68-70 dB
- 70-75 dB
- ≥ 75 dB

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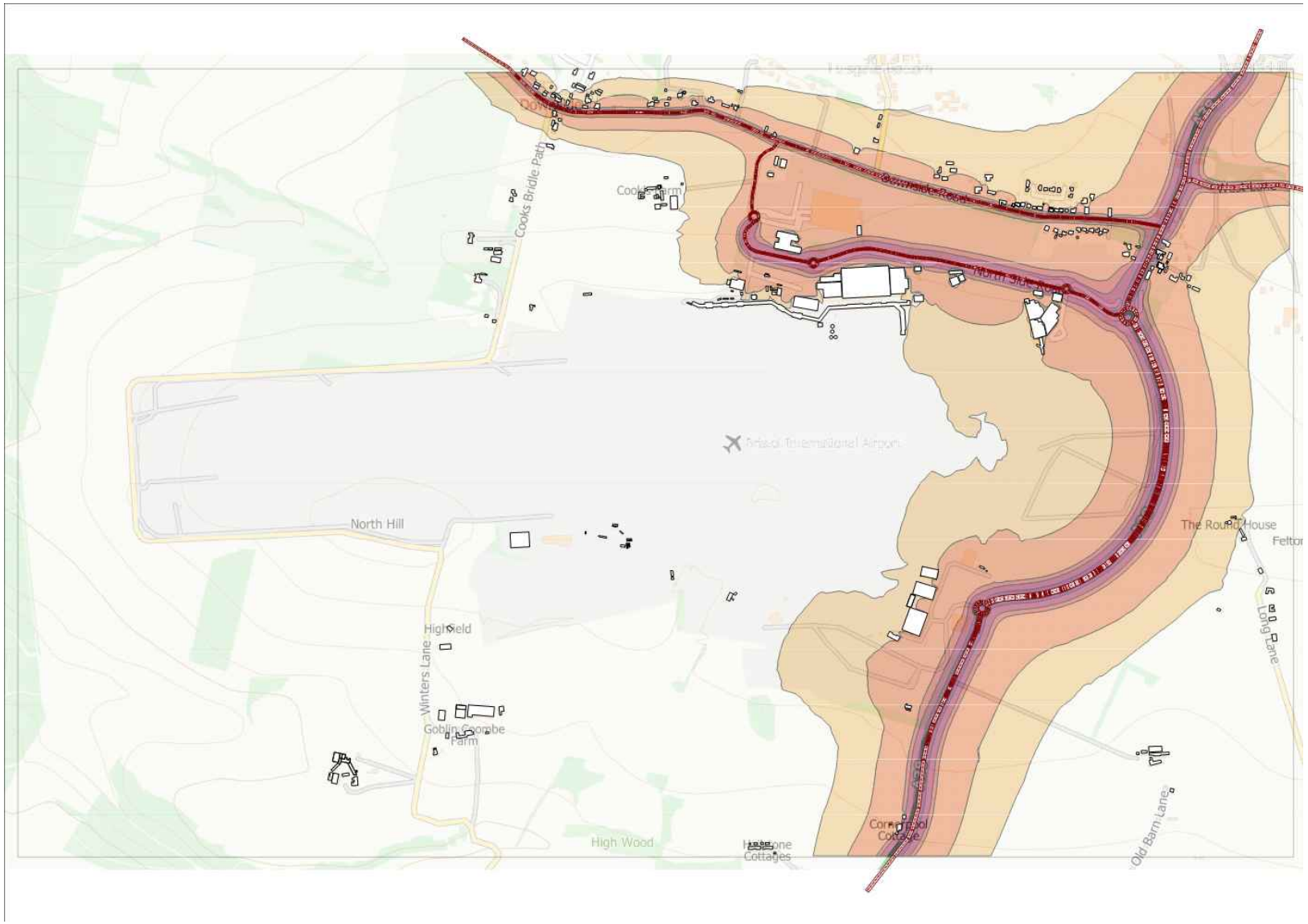
Figure 6A.24
0mppa 2030 Road Traffic Noise Contours
$L_{A10,18h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:15000@A4

Drawing No:

A11339_05_DR001_2.0



LEGEND:

$L_{A10,18h}$ Road Traffic Noise Contours,

- 55-60 dB
- 60-68 dB
- 68-70 dB
- 70-75 dB
- ≥ 75 dB

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Figure 6A.25
12mppa 2030 Road Traffic Noise Contours
$L_{A10,18h}$

DRAWN: MP CHECKED: NW

DATE: November 2020 SCALE: 1:15000@A4

Drawing No:

A11339_05_DR002_2.0