

Inverness Airport ACP noise assessment

Methodology

Noise contours have been calculated using the latest version of the INM noise model (7.0d) for the following scenarios to meet the requirements of CAP 725:

- 57-72 dBA Leq contours for the current (2013) situation;
- 57-72 dBA Leq contours for year 2013 with the airspace change;
- 57-72 dBA Leq contours for the forecast year 2019 with the airspace change;
- 80 and 90 dBA SEL footprints for the noisiest and most frequent aircraft types operating at night, for the current and post-implementation scenarios.

Leq contours

The Leq contours were based on traffic samples supplied by Inverness Airport for a typical easterly day (10 July 2013) and westerly day (12 July 2013). Information on the ATS route flown (where applicable) was also provided. Based on these two days of data, ERCD modelled an average westerly and easterly day, and then derived the results for the average summer day by employing a typical Inverness Airport runway modal split of 70% Runway 23 / 30% Runway 05. All helicopter movements were excluded from the modelling.

Representative current departure and arrival tracks in the vicinity of the airport were supplied by Inverness Airport. Based on this information, an average track for each route was estimated for the purposes of modelling. Airspace procedure designers *Davidson Ltd* supplied the proposed nominal departure and arrival tracks. Default INM lateral dispersions were assumed for the departure routes and standard INM profiles for all departures and arrivals.

The effects of the surrounding topography were modelled using *Meridian 2 Gridded Heights* terrain data obtained from Ordnance Survey.

Inverness Airport advised that the estimated growth in traffic is expected to be 3% per annum for scheduled traffic and 10% per annum for GA traffic. The 2013 traffic sample was therefore scaled up accordingly to generate noise contours for the forecast year 2019.

SEL footprints

80 and 90 dBA SEL footprints have been produced for the noisiest and most frequent aircraft types that operate at night (11pm-7am), for the current and post-implementation scenarios. From the 2013 traffic data sample provided, the noisiest aircraft at night is the Embraer 170-200 (E175) whilst the most frequent type at night is the Saab 340 (SF34) twin turboprop aircraft.

As with the Leq contours, the effects of the surrounding topography were modelled using *Meridian 2 Gridded Heights* terrain data obtained from Ordnance Survey.

Results

Leq contours

The year 2013 current situation noise contours are shown in **Figure N1**. The estimated areas, populations and households are summarised in **Table N1** below. The population database used was a 2012 update of the 2001 Census supplied by CACI Ltd. The count of population and households was found to be zero for all contour levels.

The results for the 2013 contours with the airspace change are shown in **Figure N2** and **Table N2**, and for the forecast 2019 contours also with the airspace change, in **Figure N3** and **Table N3**. The effect of the airspace change on the 2013 contours is insignificant, with the same zero population and household counts as before. The area of the 2019 forecast 57 dBA contour increases by 33% from 2013, but again there are no people located within the contours.

Table N1 Inverness 2013 current situation Leq contours - areas, populations and households

Contour (dBA)	Area (km ²)	Population	Households
57	1.5	0	0
60	0.8	0	0
63	0.5	0	0
66	0.3	0	0
69	0.2	0	0
72	0.1	0	0

Table N2 Inverness 2013 with airspace change Leq contours - areas, populations and households

Contour (dBA)	Area (km ²)	Population	Households
57	1.5	0	0
60	0.8	0	0
63	0.5	0	0
66	0.3	0	0
69	0.2	0	0
72	0.1	0	0

Table N3 Inverness forecast 2019 with airspace change Leq contours - areas, populations and households

Contour (dBA)	Area (km ²)	Population	Households
57	2.0	0	0
60	1.1	0	0
63	0.6	0	0
66	0.4	0	0
69	0.2	0	0
72	0.1	0	0

Note: Populations and households are given to the nearest 50.

SEL footprints

SEL footprints have been generated for each of the current and proposed departure and arrival routes on Runways 05 and 23. Separate diagrams are provided for each runway direction and aircraft type as follows:

- Noisiest type E175 on Runway 05 – **Figure N4**
- Noisiest type E175 on Runway 23 – **Figure N5**
- Most frequent type SF34 on Runway 05 – **Figure N6**
- Most frequent type SF34 on Runway 23 – **Figure N7**

There are differences in shape of the 80 dBA SEL footprints between the current and proposed departure routes from Runway 05 (**Figure N4**). It should be noted that the N560D north and W6D routes from Runway 05 follow the same track in the area of interest for the current scenario, thus the E175 footprints for these two routes are identical. The proposed N560D north and W6D routes are also the same in the area of interest, thus the resulting SEL footprints on these two new routes are identical. E175 arrival footprints for Runway 05 remain the same following the airspace change because the same track is followed in the vicinity of the airport.

There are also differences in shape of the 80 dBA SEL footprints between the current and proposed departure routes from Runway 23 (**Figure N5**). It should be noted that for Runway 23 the proposed N560D north and W6D routes follow the same track within the area of interest, thus the E175 footprints on these two new routes are identical. The arrival footprints for Runway 23 are unaffected by the airspace change because the same track is followed in the vicinity of the runway.

There is no perceptible difference between the SF34 departure SEL footprints for the current routes (**Figures N6 and N7**). They are also almost identical to the SF34 SEL footprints on the proposed routes. Arrival SEL footprints for the SF34 are also unchanged for each of the runway directions.

The estimated areas, populations and households (to the nearest 50) within the SEL footprints are summarised in **Table N4** for the E175 and **Table N5** for the SF34.

The proposed N560D south route from Runway 05 produces a reduction in population count for the E175 80 dBA SEL footprint. Decreases in population count are also seen for the E175 80 dBA SEL footprints on the new N560D south and W6D routes from Runway 23. Otherwise there are no changes to the population and household counts for the E175 SEL footprints.

The airspace change does not produce any changes to the population and households counts for the SF34 SEL footprints.

Table N4 Embraer 170 (E175) SEL footprints – areas, populations and households

SEL (dBA)	CURRENT			WITH AIRSPACE CHANGE		
	Area (km ²)	Population	Households	Area (km ²)	Population	Households
Runway 05 departures - N560D north						
80	12.6	100	50	12.7	100	50
90	1.9	0	0	1.9	0	0
Runway 05 departures - N560D south						
80	13.1	150	50	12.8	100	50
90	1.9	0	0	1.9	0	0
Runway 05 departures – W6D						
80	12.6	100	50	12.7	100	50
90	1.9	0	0	1.9	0	0
Runway 05 arrivals						
80	6.8	100	50	6.8	100	50
90	0.6	0	0	0.6	0	0
Runway 23 departures – N560D north						
80	12.7	50	50	12.9	50	50
90	1.9	0	0	1.9	0	0
Runway 23 departures - N560D south						
80	13.4	150	50	12.9	50	50
90	1.9	0	0	1.9	0	0
Runway 23 departures – W6D						
80	12.6	100	50	12.9	50	50
90	1.9	0	0	1.9	0	0
Runway 23 arrivals						
80	6.7	< 50	< 50	6.7	< 50	< 50
90	0.6	0	0	0.6	0	0

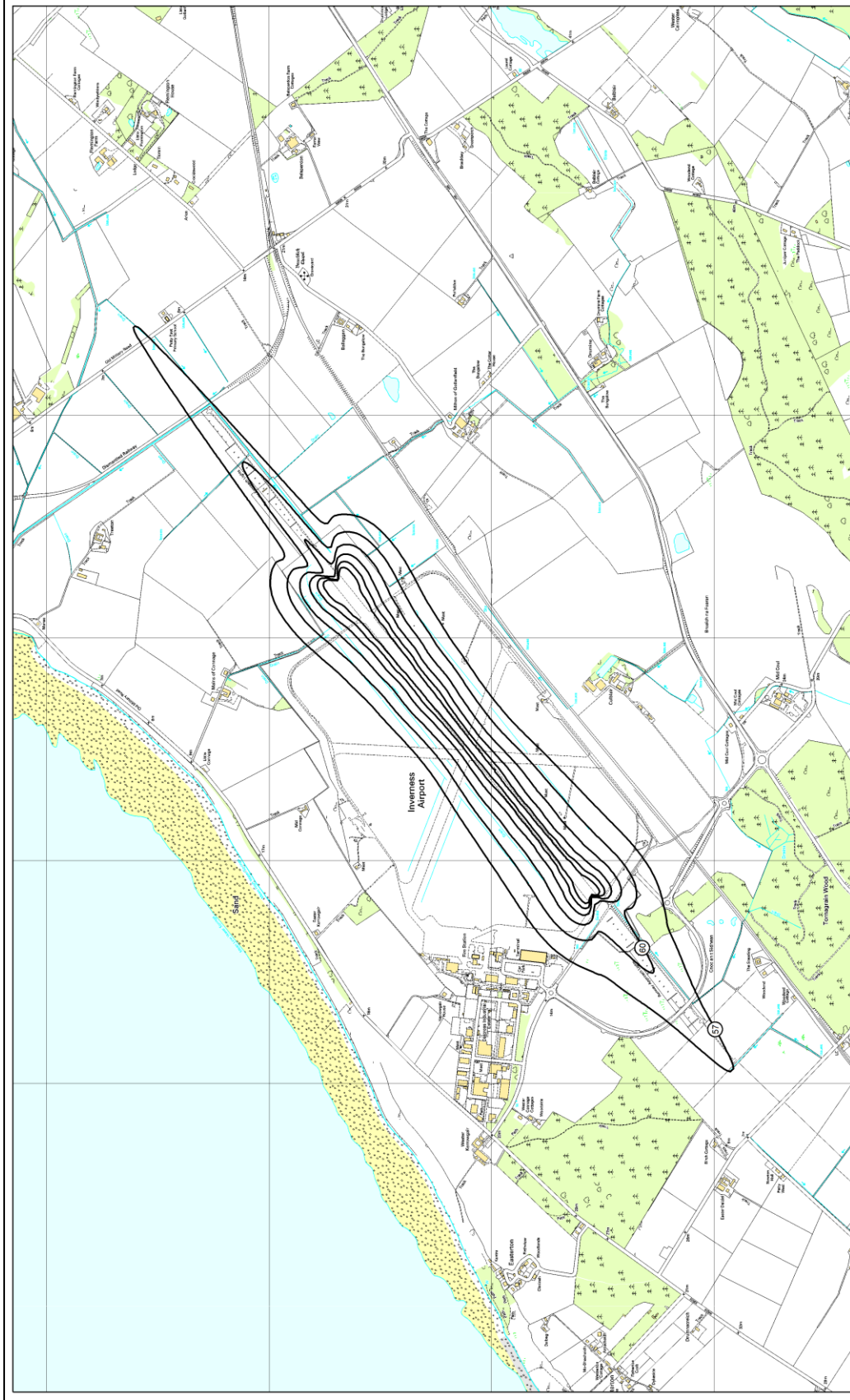
Note: Populations and households are given to the nearest 50.

Table N5 Saab 340 (SF34) SEL footprints – areas, populations and households

SEL (dBA)	CURRENT			WITH AIRSPACE CHANGE		
	Area (km ²)	Population	Households	Area (km ²)	Population	Households
Runway 05 departures - N560D north						
80	5.9	< 50	< 50	5.9	< 50	< 50
90	1.3	0	0	1.3	0	0
Runway 05 departures - N560D south						
80	6.0	< 50	< 50	5.9	< 50	< 50
90	1.3	0	0	1.3	0	0
Runway 05 departures – W6D						
80	5.9	< 50	< 50	5.9	< 50	< 50
90	1.3	0	0	1.3	0	0
Runway 05 arrivals						
80	2.2	0	0	2.2	0	0
90	0.1	0	0	0.1	0	0
Runway 23 departures – N560D north						
80	6.0	0	0	5.9	0	0
90	1.3	0	0	1.3	0	0
Runway 23 departures - N560D south						
80	5.9	0	0	5.9	0	0
90	1.3	0	0	1.3	0	0
Runway 23 departures – W6D						
80	5.9	0	0	5.9	0	0
90	1.3	0	0	1.3	0	0
Runway 23 arrivals						
80	2.2	< 50	< 50	2.2	< 50	< 50
90	0.1	0	0	0.1	0	0

Note: Populations and households are given to the nearest 50.

Figure N1 Inverness 2013 Leq noise contours (current situation)



0 0.5 1 km

INVERNESS AIRPORT
Year 2013 summer day 57-72 dBA Leq contours (current situation)
Modal split 70% SW / 30% NE

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Figure N2 Inverness 2013 Leq noise contours (with airspace change)

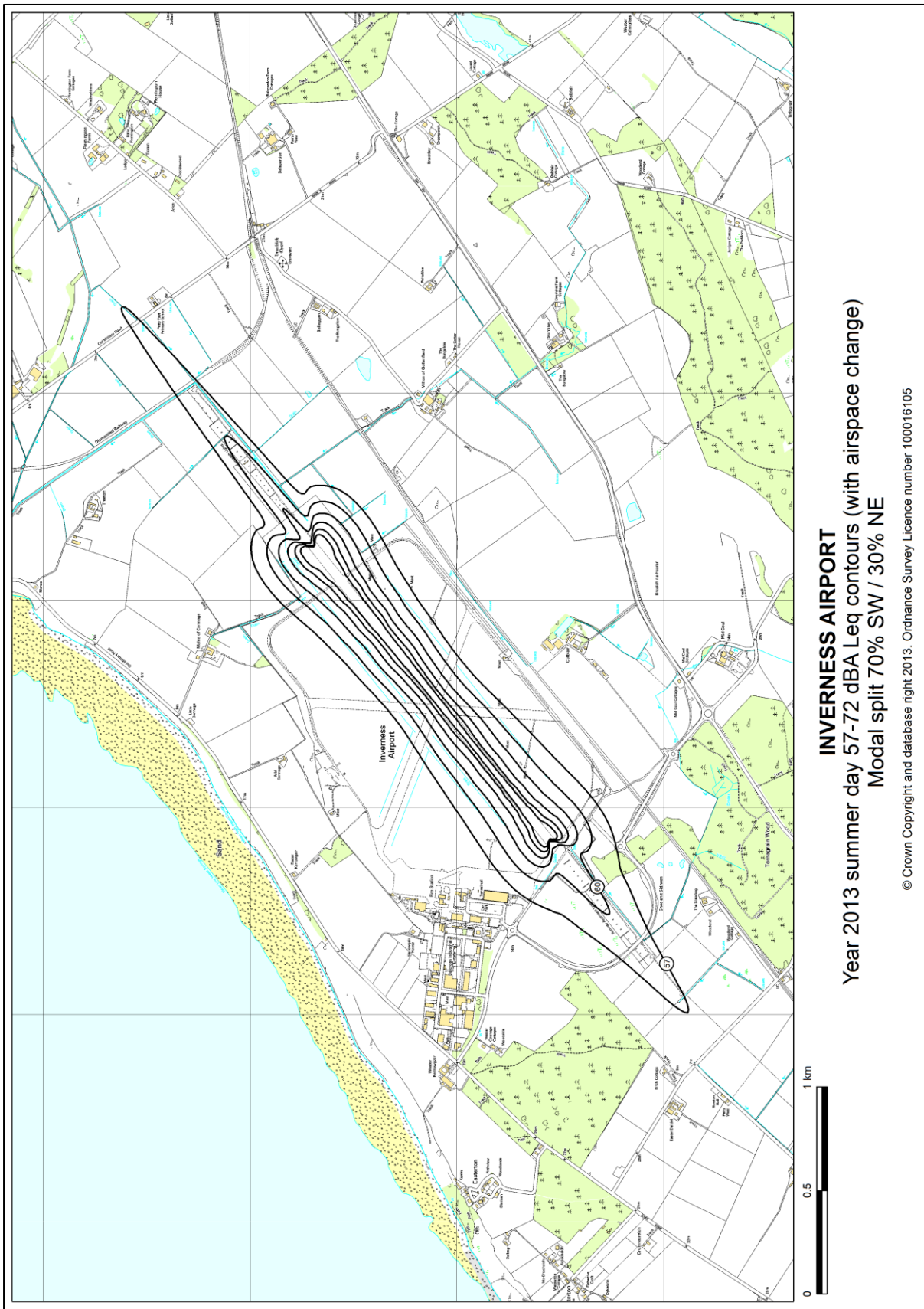
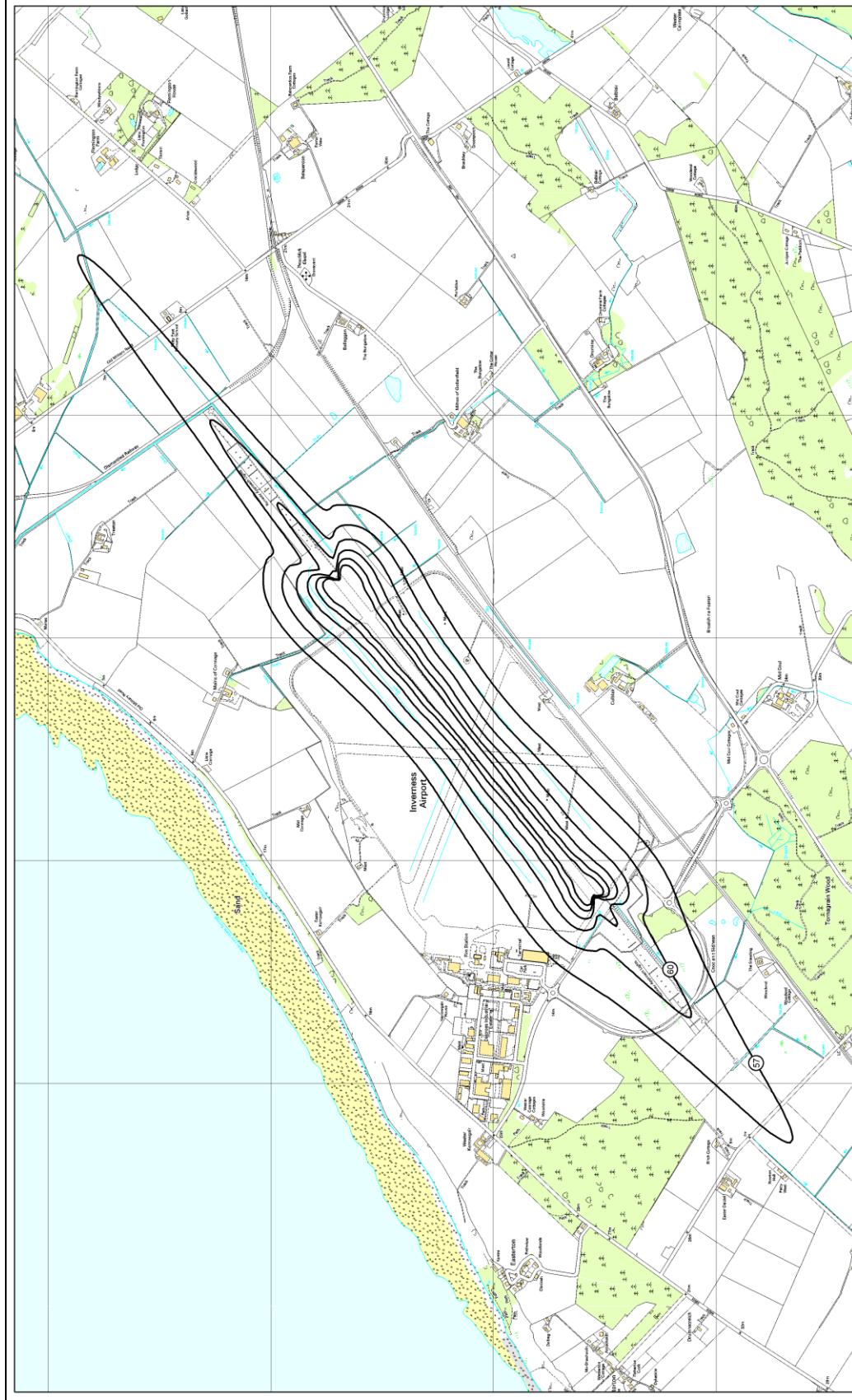


Figure N3 Inverness forecast 2019 Leq noise contours (with airspace change)

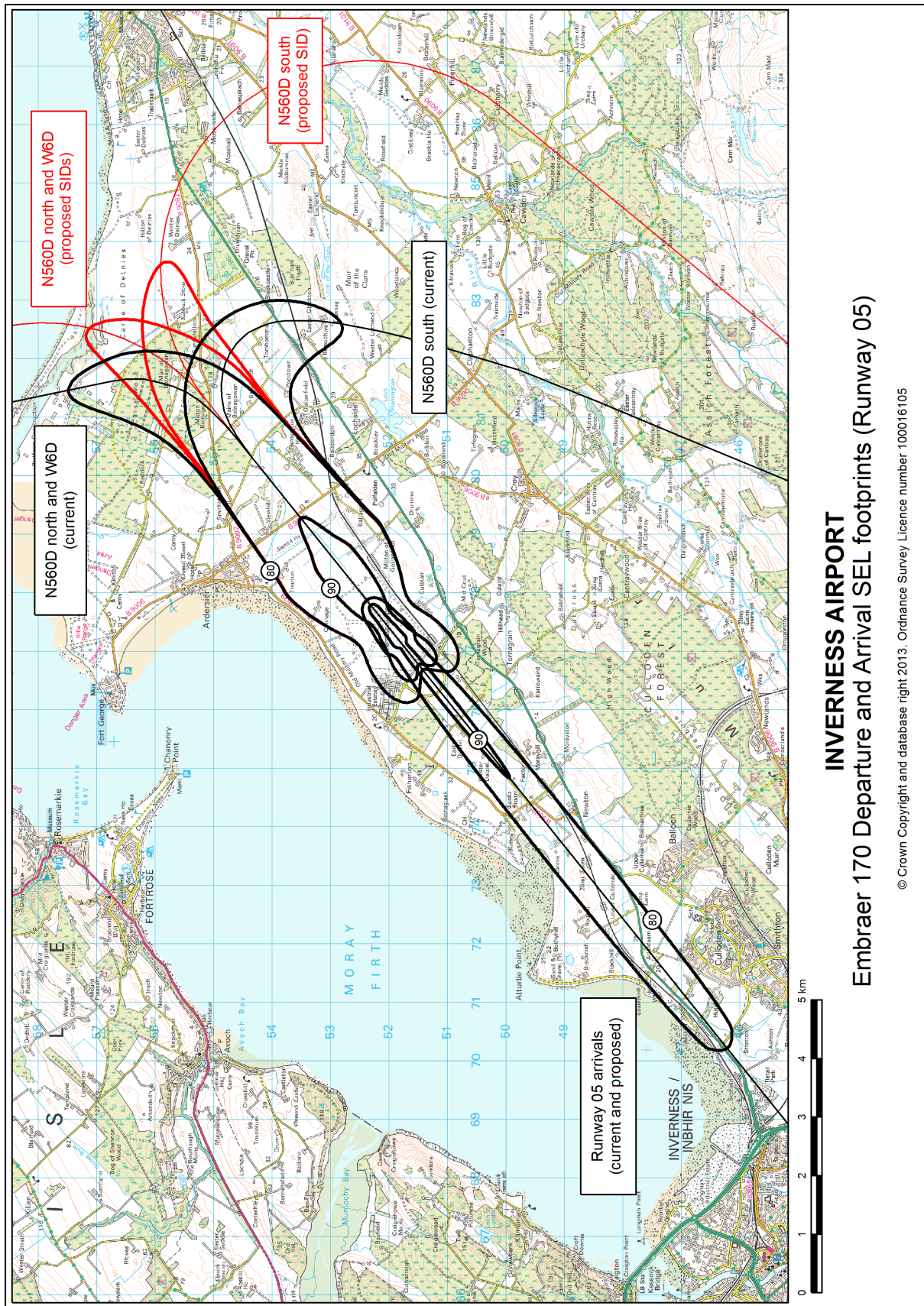


0 0.5 1 km

INVERNESS AIRPORT
Forecast year 2019 summer day 57-72 dBA Leq contours (with airspace change)
Modal split 70% SW / 30% NE

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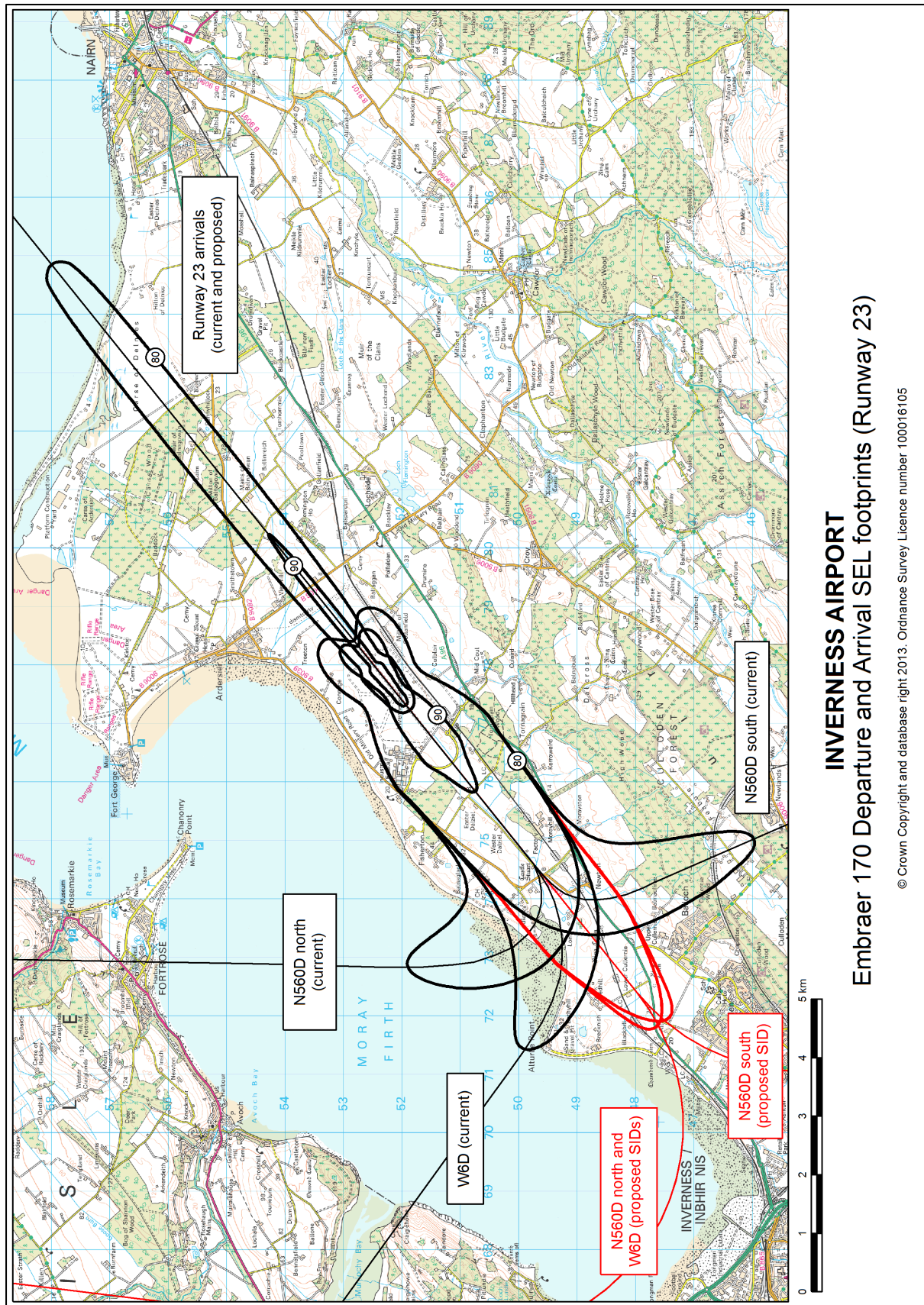
Figure N4 E175 SEL footprints for Runway 05



INVERNESS AIRPORT
Embraer 170 Departure and Arrival SEL footprints (Runway 05)

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Figure N5 E175 SEL footprints for Runway 23

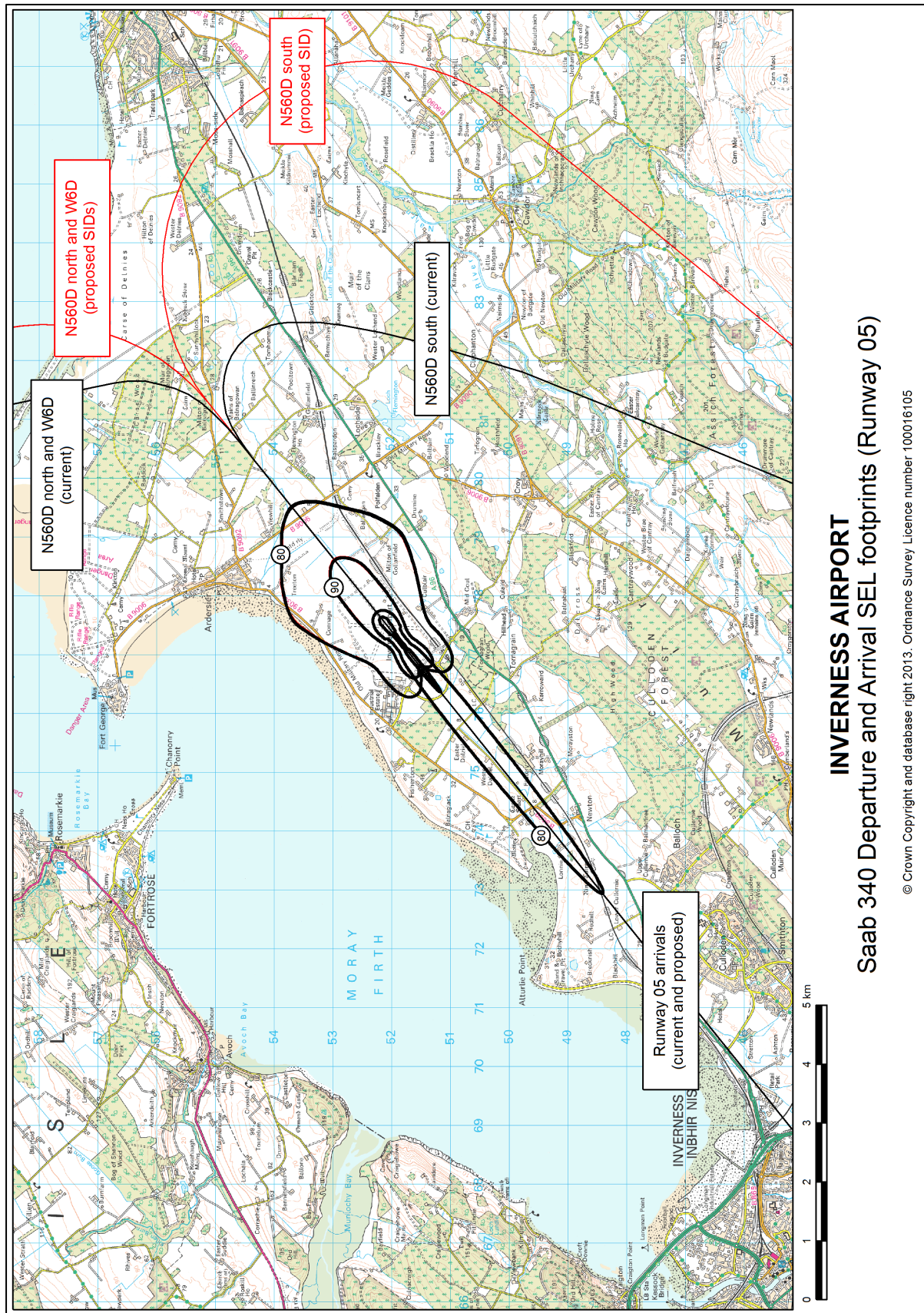


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Embraer 170 Departure and Arrival SEL footprints (Runway 23)

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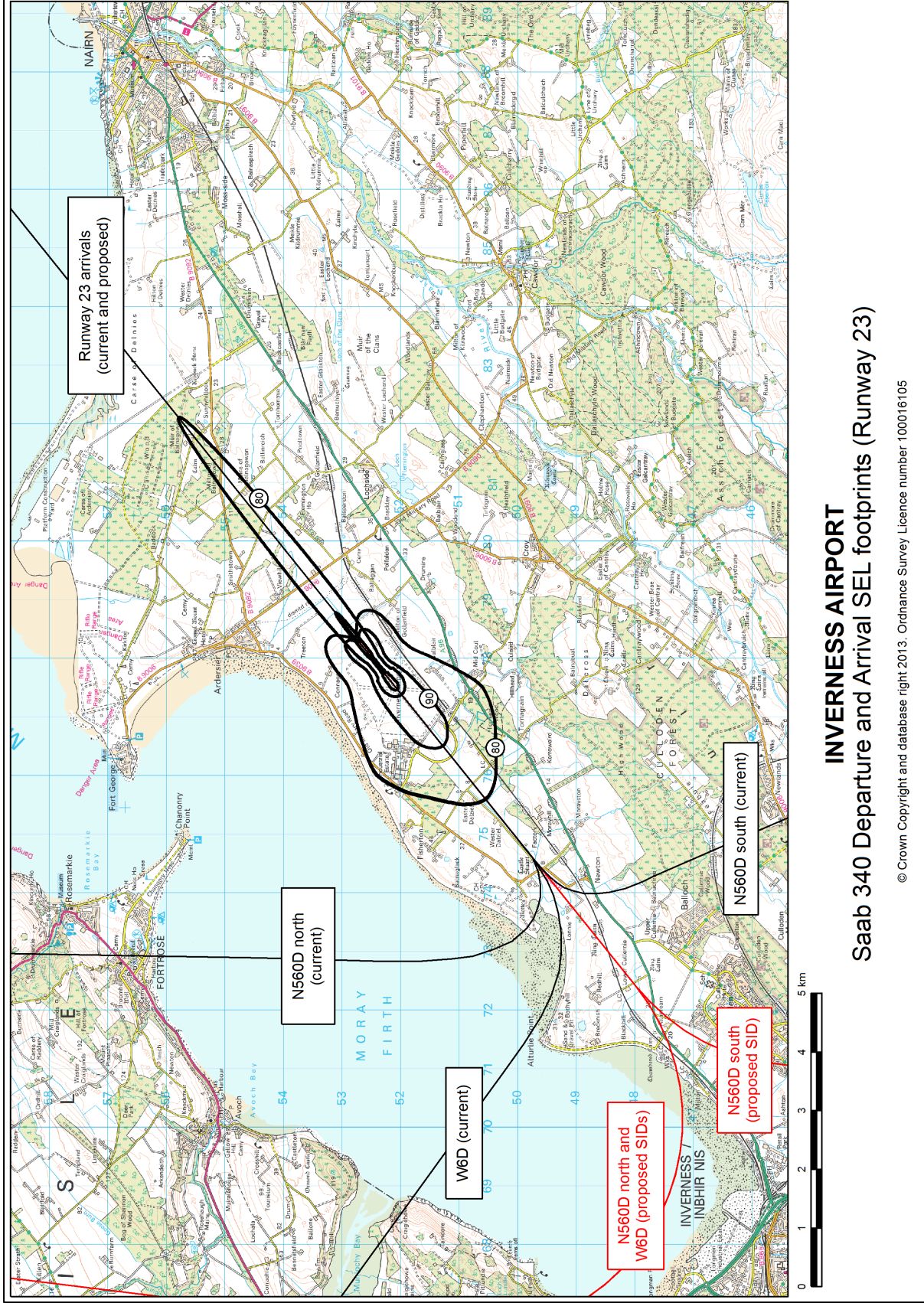
Figure N6 SF34 SEL footprints for Runway 05



INVERNESS AIRPORT
Saab 340 Departure and Arrival SEL footprints (Runway 05)

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Figure N7 SF34 SEL footprints for Runway 23



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Saab 340 Departure and Arrival SEL footprints (Runway 23)

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