

Hawke's Bay Airspace Review – Airways Submission Background

PBN Implementation was originally scheduled for November 2018 but was delayed multiple times due to a range of factors, including the COVID pandemic, and is now planned for November 2023.

Concurrent to PBN Implementation, the Civil Aviation Authority (CAA) have scheduled Airspace Reviews for the relevant regions each year. Airways held consultation meetings in 2018 to present the proposed PBN procedures and the proposed airspace to support their implementation. Following feedback from various local stakeholders the concepts were revised over 2018, culminating in the Airways airspace submission to CAA in December 2018 (Version 5).

PBN Implementation was delayed (and Airways' airspace submission withdrawn) prior to CAA completing consultation with local stakeholders at that time. The submission was presented again in December 2019, before again being withdrawn in early 2020 (first COVID lockdown). Subsequent COVID-related delays meant the submission was only presented again to CAA in December 2022, following consultation meetings in November 2022. CAA called for other stakeholder submissions by 18 January 2023 and reviewed them after that date.

HBECAC submission

One submission received by CAA, and forwarded to Airways and others for comment, was made by Hawke's Bay and East Coast Aeroclub (HBECAC). This submission opposed several aspects of the Airways' submission, particularly the airspace overhead and near Hastings (Bridge Pa) aerodrome. CAA requested Airways review this submission to accommodate the HBECAC suggestions where possible and to assist CAA in their decision-making process.

This document outlines the reviews undertaken in this area, the options considered while doing so, and the compromises required to accommodate the HBECAC suggestions to reduce the required airspace in the vicinity of Hastings (below, copied from their submission):

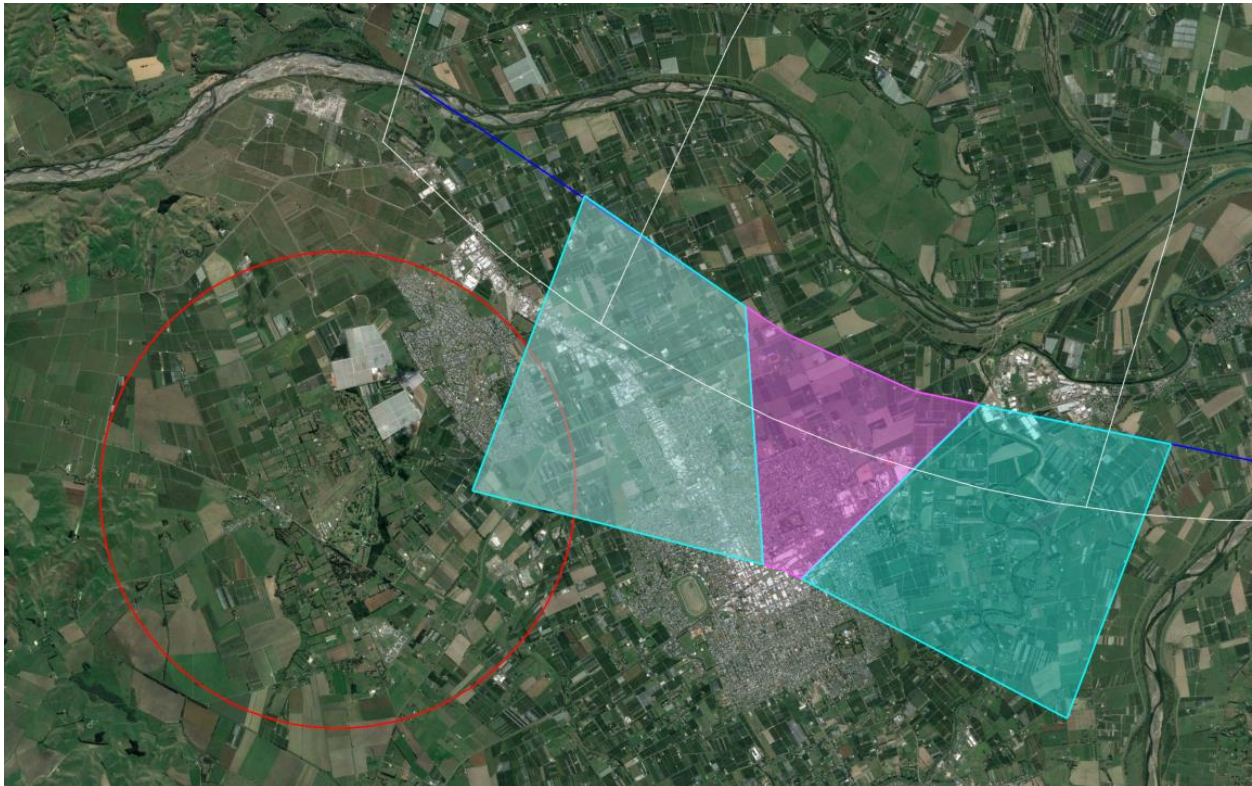
- *The removal of the VOR/DME Arc for 34, or a note on the Approach plate to the effect that parts of the approach are not fully contained within controlled airspace. (As has been done in Hamilton with the approaches from TAYLA and BUDEN).*
- *Removal of the VOR Cat C Base Turn Approach, or a note to the effect on the Approach plate that this approach is not contained within controlled airspace.*
- *RNAV and VOR departures out of Napier to the south routing via NOSAM, rather than via SOBET (which goes directly overhead Hastings) and SHAKA. At present the standard route clearances to Wellington and Christchurch out of Napier go via NOSAM. This tracking keeps all IFR traffic departing to the south out of Napier well laterally spaced from Hastings Aerodrome. Should revised RNAV tracking to the south of Napier still be required the lateral spacing away from Hastings Aerodrome and preservation of airspace over Hastings Aerodrome for departures to the south could still be maintained by shifting SHAKA to the west, and SOBET to the east.*
- *SHAKA to the west: shift SHAKA to the western side of the Ngaruroro River. To keep the climb gradient inside controlled airspace the CTR would have to be extended to the south west in this small area, or the 2000ft TMA start on the northern / north western side of the Ngaruroro River.*
- *SOBET to the east: shift SOBET east to a line going overhead Longlands, so that the climb gradient that required the 2000ft section of airspace was contained in the 1500ft CTA*

- There is precedent for this scenario elsewhere: at Hamilton the fully contained RNP Zs (both runways) are the default approaches, with RNP Ys and VOR/DMEs that are annotated as “airspace containment not assured” available on pilot request (and mostly used by training flights).

Review process

Airways and Aeropath started our assessment with determining the *bare minimum* of airspace required to contain an RNP RWY34 approach, without consideration for any other IFPs.

It was quickly determined that the HBECAC request for all airspace within a 2NM radius of NZHS to remain with a lower limit of 2500 ft would not be possible – the image below shows airspace volumes with 2000 ft lower limit (blue) and an airspace volume with 1500 ft lower limit (magenta) required to contain the proposed RNP RWY34, with a 2NM radius circle in red around NZHS.



Attention then turned to trying to reduce or remove the 1500 ft airspace volume, so that only airspace volume/s with lower limit 2000 ft were required south of the CTR, reducing complexity and the amount of controlled airspace as much as possible.

Aeropath investigated increasing the descent profile on the RNP RWY34 to check at what gradient the 1500 ft airspace volumes would be unnecessary, and from this point considered using the existing CTR/D boundary (rather than the proposed, if possible, as this would assist in reducing the need for small and complex airspace volumes while retaining a well-known airspace boundary that has been in place for many years.

Aeropath determined that, in combination with using the existing CTR boundary, **a gradient of 3.2° on the RNP RWY34 would be necessary to remove all need for airspace volume/s with lower limit 1500 ft.** This would require further work to ensure design criteria were met, certification would be possible, and of course consultation with users would be needed to ensure the 3.2° profile would be acceptable.

Aeropath then returned to the 3.1° profile and determined that it was *very close* to being contained within the existing CTR boundary – **only a small shift of the southern boundary (229m, 0.12NM) of the CTR would be required to eliminate any airspace volume/s with lower limit 1500 ft.**

Consideration was then given to a 3.1° profile *without* moving the CTR/D boundary the necessary 0.12NM, and whether this could be deemed contained – however this would not align with the Aeropath NOTOD or exposition document and would require consultation and safety assessment to justify, which could be difficult to complete within the required timeframe.

Finally, consideration was given to other IFPs, in particular to the RWY16 departures, which aside from the RWY34 approaches are the procedures most likely to be affected by a change in airspace boundaries to the south. Fortunately, **initial assessment indicates these departures will not require a higher than standard (>5%) published climb gradient for airspace containment**, so will be largely unaffected if the suggested alternative is adopted.

Airways Suggested Alternative

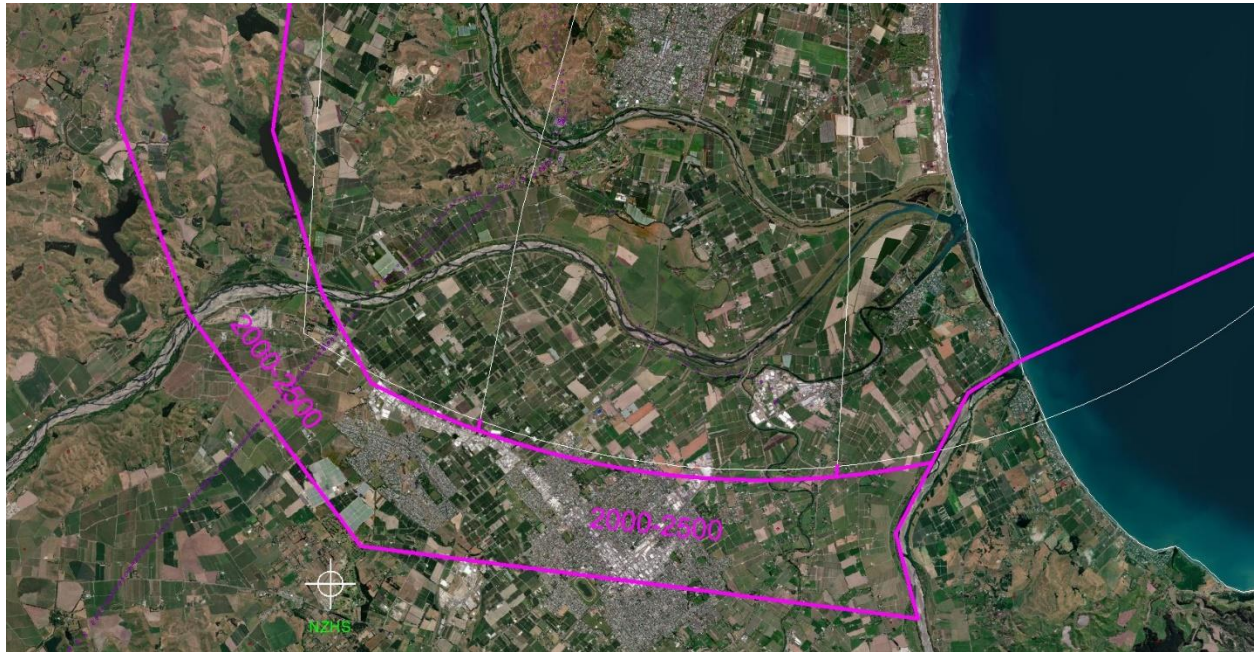
Following these investigations, Airways suggest the following as a compromise that may address some of the HBECAC concerns while still providing adequate protection for IFR flights operating at Napier.

- **Retain the existing VOR/DME RWY34.** This IFP will not be fully contained but is already annotated as such. Note also that while containment will not be assured, as there is more airspace around the CTR/D, this approach will be *closer* to full containment than it is currently. This aligns with not just the current situation but also the current airspace containment requirements as per the Aeropath NOTOD so can already be deemed acceptable to CAA.
- **Design the new RNP RWY34 with a 3.1° descent gradient.** This is a less severe gradient than 3.2° and is more likely to be acceptable to operators, and there are many examples of 3.1° profiles across the country (including the new RNP RWY16 at NZNR).
- **Re-draw the airspace to the south of NZNR to accommodate these design changes.** This will require:
 - **Expanding the southern CTR/D boundary by 0.12NM** and blending this with the other CTR/D proposed boundaries in the Airways submission.
 - **Creating the new CTA/D boundaries with lower limit of 2000 ft to the south of NZNR.**
 - **Removing the CTA/D boundaries with lower limit 1500 ft to the south of NZNR.**

The following actions should be considered by CAA prior to the final acceptance of this revised airspace:

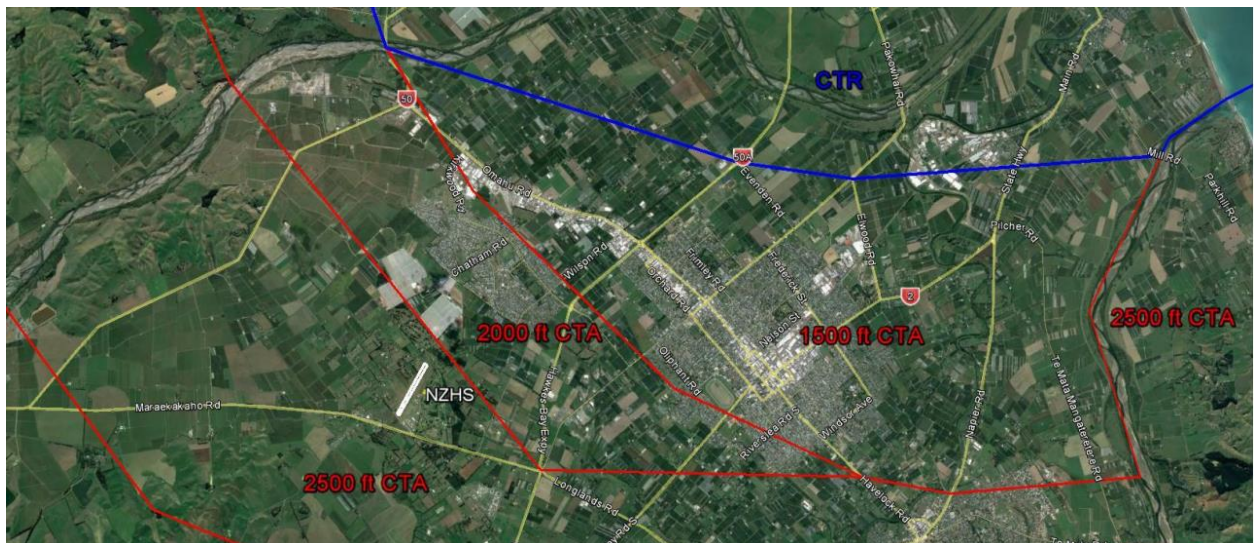
- **Consultation with IFR operators at NZNR should be considered, to ensure the 3.1° profile is acceptable.** Possible stakeholders who might regularly fly these IFPs in future include Air New Zealand, RNZAF, Massey Aviation, Skyline Aviation and Air Hawke's Bay.
- **Consultation with local stakeholders (particularly VFR operators) should be considered with regards to the expanded CTR/D boundary to the south,** as this constitutes a small increase in required controlled airspace in that area, when the Airways submission had been proposing a small decrease.

Suggested alternative airspace boundaries



Should the suggestions on the previous page be adopted, the graphic above shows what the alternative airspace boundaries could look like. Current submission below for comparison.

- The magenta lines show the proposed new airspace, the thin white lines show the existing airspace/instrument sector (and see graphic below for current Airways submission).
- The CTR/D boundary is pushed further south than the Airways submission, slightly further than the existing CTR boundary. This is then blended on the eastern and western sides to join the other airspace boundaries proposed.
- The airspace volume with lower limit 2000 ft starts in the east following a prominent geographic feature (Tukituki River), wraps around the southern CTR/D boundary to join the required airspace to the west, and is significantly smaller than previously proposed (note the racecourse sits just outside this airspace volume – in the current submission below it sits centrally).
- **No airspace with 1500 ft lower limit to the south of the CTR/D is necessary in this scenario.**



Airways responses to HBECAC submission suggestions

Airways responses to HBECAC suggestions below in red.

- *The removal of the VOR/DME Arc for 34, or a note on the Approach plate to the effect that parts of the approach are not fully contained within controlled airspace. (As has been done in Hamilton with the approaches from TAYLA and BUDEN).*
- *Removal of the VOR Cat C Base Turn Approach, or a note to the effect on the Approach plate that this approach is not contained within controlled airspace.*

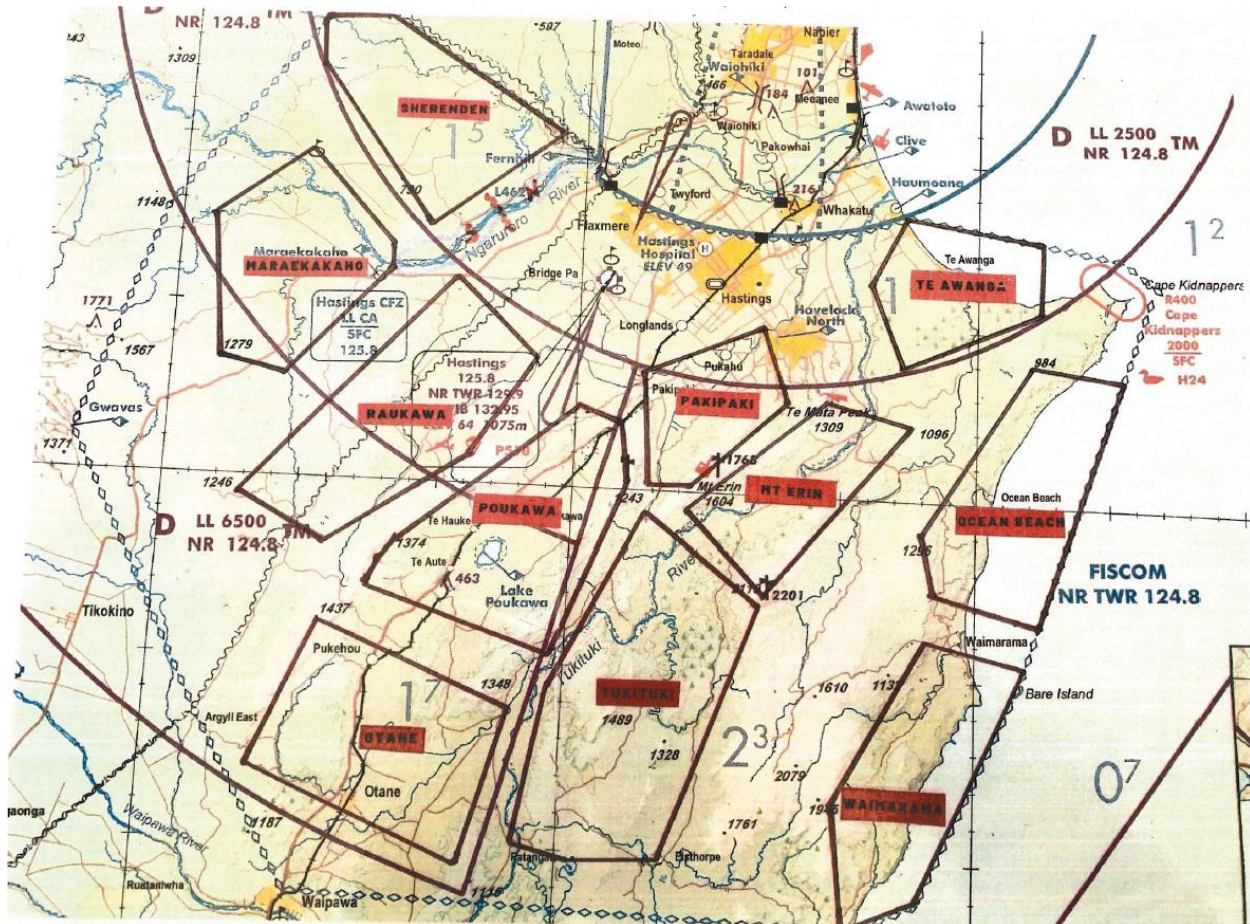
The above two suggestions are incorporated into this review document and formed the basis for the review and eventual Airways suggested alternative.

- *RNAV and VOR departures out of Napier to the south routing via NOSAM, rather than via SOBET (which goes directly overhead Hastings) and SHAKA. At present the standard route clearances to Wellington and Christchurch out of Napier go via NOSAM. This tracking keeps all IFR traffic departing to the south out of Napier well laterally spaced from Hastings Aerodrome. Should revised RNAV tracking to the south of Napier still be required the lateral spacing away from Hastings Aerodrome and preservation of airspace over Hastings Aerodrome for departures to the south could still be maintained by shifting SHAKA to the west, and SOBET to the east.*
- *SHAKA to the west: shift SHAKA to the western side of the Ngaruroro River. To keep the climb gradient inside controlled airspace the CTR would have to be extended to the south west in this small area, or the 2000ft TMA start on the northern / north western side of the Ngaruroro River.*
- *SOBET to the east: shift SOBET east to a line going overhead Longlands, so that the climb gradient that required the 2000ft section of airspace was contained in the 1500ft CTA*

The above three suggestions were noted, however Aeropath investigations indicate that moving the SIDs will not affect the airspace over head NZHS, and an increase in climb gradient would be a better option to explore first (which is not expected to be required anyway).

REVISION – Additional airspace change to accommodate HBECAC training area

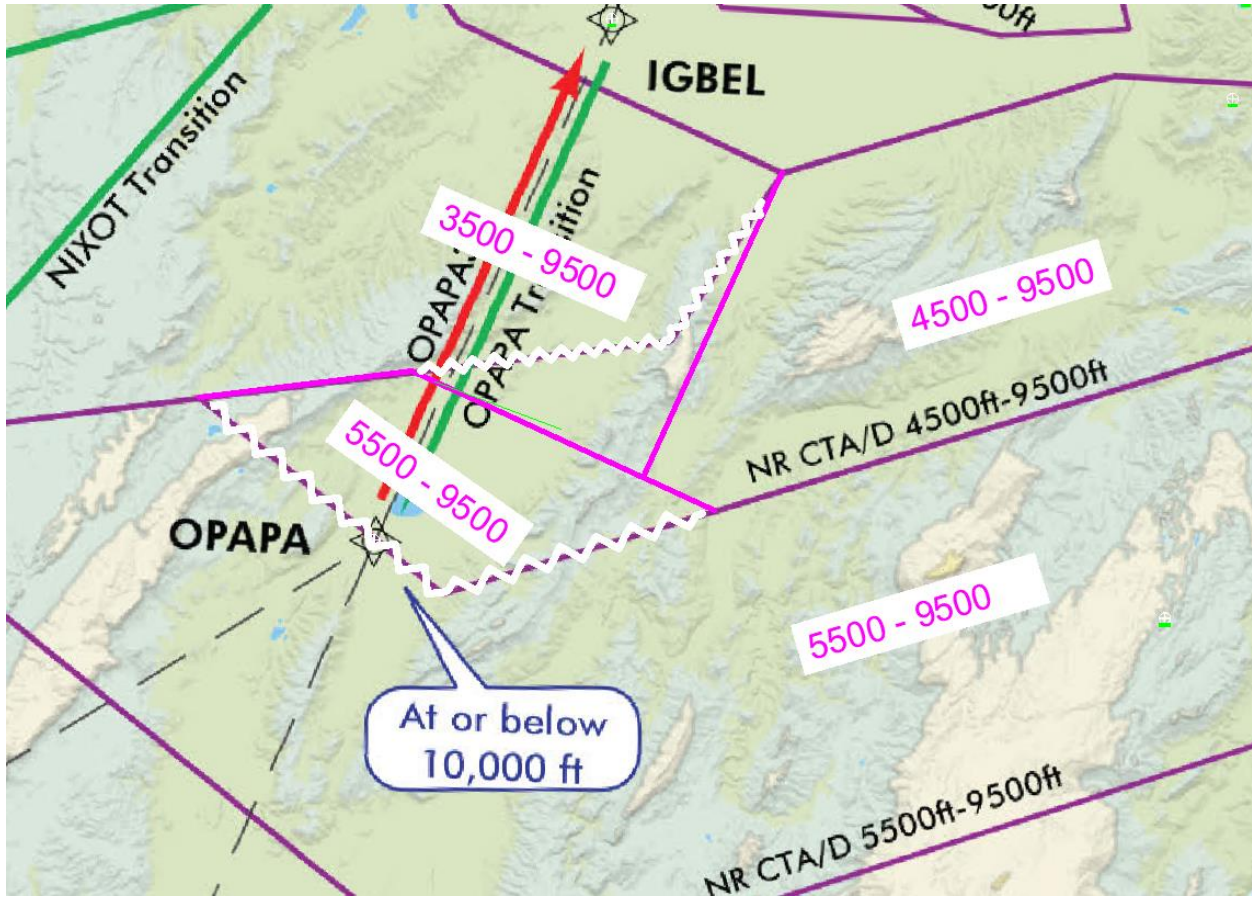
Following initial consultation with HBECAC to present the above proposal, a second area of the Airways submission that was requested to be reconsidered was the area overhead Lake Poukawa VRP, to the southwest of Hastings. The reason for this is the VFR training areas that HBECAC operate outside controlled airspace (see graphic below, with the Poukawa area in the centre).



Airways reviewed the airspace and were able to propose the following small amendments, which HBECAC consider to be an improvement as the airspace overhead the Poukawa training area will have less controlled airspace and only two levels (3500 ft and 5500 ft) rather than the three levels proposed in Airways' original submission (3500 ft, 4500 ft and 5500 ft).

- A small expansion of the 3500 ft CTA/D is necessary, so as to have minimal impact on the required climb gradients for IFR departures off runway 16 at NZNR
- The 5500 ft CTA/D is expanded overhead Lake Poukawa
- The 4500 ft CTA/D is truncated – some becomes 3500 ft, the majority 5500 ft CTA/D

See graphic on next page for the changes.



Overall this constitutes a slight reduction in controlled airspace, and the only impact to IFR flights will be a small increase in the required climb gradient for airspace containment on some of the RW16 SIDs at NZNR – expected to be in the region of 5.4% until 6000 ft.

For these reasons Airways also propose the amendment of the previously submitted airspace boundaries above Lake Poukawa.

Changes to CTR and CTA Version 5 Definitions (changes in red)

NR CTR

All that airspace bounded by a straight line from;

S39° 18' 56.33" E177° 00' 35.60" to;

S39° 28' 36.79" E177° 01' 34.02" to;

S39° 34' 02.34" E177° 00' 59.31" to;

S39° 35' 45.84" E176° 56' 38.63" Northern bank Tukituki River Mouth to;

S39° 36' 09.09" E176° 55' 52.89" Northern bank Tukituki River to;

S39° 36' 20.39" E176° 55' 46.35" Western end Mill Rd bridge over Tukituki River to;

S39° 37' 01.03" E176° 55' 22.06" to;

That airspace bounded by the arc of a circle of 10.12 NM radius centred on S39° 27' 14" E176° 52' 08" NR VOR/DME to;

S39° 36' 21.01" E176° 46' 31.40" to;

S39° 35' 16.21" E176° 45' 40.70" to;

~~S39° 36' 34.55" E176° 51' 44.83" Intersection Pakowhai Rd - Elwood Rd to;~~

~~S39° 36' 24.63" E176° 50' 14.51" Roundabout intersection Napier Hastings Express Way - Evenden Rd to;~~

~~S39° 35' 16.01" E176° 45' 40.03" SH bridge over Ngaruroro River to;~~

S39° 33' 20.90" E176° 44' 48.90" to;

S39° 29' 56.36" E176° 45' 13.19" to;

S39° 20' 43.94" E176° 45' 35.32" to;

S39° 17' 26.78" E176° 49' 24.29" to;

S39° 17' 01.90" E176° 55' 25.36" to;

S39° 18' 56.33" E177° 00' 35.60"

Vertical limits: SFC to 2500 ft

Classification: Class D

ATC Authority: NR Tower 124.8

~~NR CTA 1500 ft South of NR~~

~~All that airspace bounded by a straight line from;~~

~~S39° 36' 20.39" E176° 55' 46.35" Western end Mill Rd bridge over Tukituki River to;~~

~~S39° 37' 54.13" E176° 54' 50.29" to;~~

~~S39° 39' 33.77" E176° 55' 30.51" to;~~

~~S39° 39' 44.07" E176° 53' 02.08" Intersection Crosses Road Napier Road to;~~

~~S39° 39' 34.04" E176° 51' 52.40" Roundabout intersection St.Georges Rd Havelock Rd to;~~

~~S39° 38' 40.80" E176° 49' 25.24" to;~~

~~S39° 36' 41.73" E176° 46' 47.61" factory buildings on Omahu Road to;~~

~~S39° 35' 16.01" E176° 45' 40.03" SH bridge over Ngaruroro River to;~~

~~S39° 36' 24.63" E176° 50' 14.51" Roundabout intersection Napier Hastings Express Way Evenden Rd to;~~

~~S39° 36' 34.55" E176° 51' 44.83" Intersection Pakpwhai Rd Elwood Rd to;~~

~~S39° 36' 21.82" E176° 55' 51.57" Mill Rd bridge over Tukituki River~~

~~Vertical limits: 1500 ft to 2500 ft~~

~~Classification: Class D~~

~~ATC Authority: NR Tower 124.8~~

NR CTA 2000 ft

All that airspace bounded by a straight line from;

S39° 20' 43.94" E176° 45' 35.32" to;

S39° 29' 56.36" E176° 45' 13.19" to;

S39° 33' 20.90" E176° 44' 48.90" to;

S39° 35' 16.01" E176° 45' 40.03" SH bridge over Ngaruroro River to;

S39° 36' 21.01" E176° 46' 31.40" then;

That airspace bounded by the arc of a circle of 10.12 NM radius centred on S39° 27' 14" E176° 52' 08" NR VOR/DME to;

S39° 37' 01.03" E176° 55' 22.06" to;

S39° 37' 54.13" E176° 54' 50.30" to;

S39° 38' 54.66" E176° 55' 14.72" to;

S39° 38' 19.90" E176° 46' 27.79" to;

~~S39° 36' 41.73" E176° 46' 47.61" factory buildings on Omaha Road to;~~

~~S39° 38' 40.80" E176° 49' 25.24" to;~~

~~S39° 39' 34.04" E176° 51' 52.40" Roundabout intersection St. Georges Rd Havelock Rd to;~~

~~S39° 39' 29.90" E176° 47' 40.62" Roundabout intersection Maraekakaho Rd Paki Paki Rd to;~~

S39° 35' 36.22" E176° 43' 37.74" to;

S39° 33' 16.28" E176° 42' 23.00" to;

S39° 21' 47.84" E176° 43' 49.76" to;

S39° 20' 43.94" E176° 45' 35.32"

Vertical limits: 2000 ft to 2500 ft

Classification: Class D

ATC Authority: NR Tower 124.8

NR CTA 3500 ft

All that airspace bounded by a straight line from;

S39° 10' 14.98" E176° 58' 05.66" to;

S39° 12' 44.20" E177° 01' 35.73" to;

S39° 17' 36.25" E176° 43' 53.89" to;

S39° 19' 54.68" E176° 41' 22.34" to;

S39° 31' 36.73" E176° 37' 37.25" to;

S39° 35' 51.59" E176° 38' 47.28" to;

S39° 39' 53.33" E176° 42' 37.95" to;

S39° 41' 54.99" E176° 48' 57.61" to;

S39° 46' 32.03" E176° 46' 31.75" to;

S39° 45' 06.11" E176° 41' 58.35" to;

~~S39° 44' 28.49" E176° 46' 55.68" to;~~

S39° 45' 36.59" E176° 37' 56.21" to;

S39° 46' 34.96" E176° 30' 12.63" to;

S39° 45' 09.17" E176° 27' 42.86" to;

S39° 40' 20.59" E176° 25' 59.25" to;

S39° 33' 29.19" E176° 25' 16.15" to;

S39° 26' 45.07" E176° 32' 26.57" to;

S39° 18' 31.64" E176° 37' 28.29" to;

S39° 15' 00.7" E176° 40' 56.7" Te Pohue VRP to;

S39° 10' 14.98" E176° 58' 05.66"

Vertical limits: 3500 ft to 9500 ft

Classification: Class D

ATC Authority: NR Tower 124.8

NR CTA 4500 ft south of NR

All that airspace bounded by a straight line from;

S39° 40' 19.55" E177° 00' 15.03" to;

S39° 43' 43.01" E176° 59' 57.56" to;

~~S39° 46' 56.92" E176° 47' 51.07" to;~~

~~S39° 46' 32.03" E176° 46' 31.75" to;~~

~~S39° 48' 21.45" E176° 42' 44.78" to;~~

~~S39° 45' 36.59" E176° 37' 56.21" to;~~

~~S39° 44' 28.49" E176° 46' 55.68" to;~~

S39° 41' 54.99" E176° 48' 57.61" to;

S39° 40' 15.84" E176° 55' 16.45" Intersection Te Mata Rd-Waimarama Rd-River Rd to;

S39° 40' 19.55" E177° 00' 15.03"

Vertical limits: 4500 ft to 9500 ft

Classification: Class D

ATC Authority: NR Tower 124.8

NR CTA 5500 ft south of NR

All that airspace bounded by a straight line from;

S39° 43' 43.01" E176° 59' 57.56" to;

S39° 49' 50.35" E176° 59' 23.36" to;

S39° 53' 49.22" E176° 45' 23.77" to;

S39° 53' 29.35" E176° 42' 16.38" to;

S39° 46' 34.96" E176° 30' 12.63" to;

S39° 45' 06.11" E176° 41' 58.35" to;

S39° 46' 32.03" E176° 46' 31.75" to;

S39° 46' 56.92" E176° 47' 51.07" to;

~~S39° 45' 36.59" E176° 37' 56.21" to;~~

~~S39° 48' 21.45" E176° 42' 44.78" to;~~

S39° 43' 43.01" E176° 59' 57.56"

Vertical limits: 5500 ft to 9500 ft

Classification: Class D

ATC Authority: NR Tower 124.8

All other airspace volumes are unchanged and remain as per the Airways Version 5 submission.