Title of Airspace Change Proposal	**Stansted Airport – Introducing RNP1 (RF) SIDs**
Change Sponsor	**London Stansted Airport**
SARG Project Leader	[redacted]
Case Study commencement date	**22 February 2016**
Case Study report as at	**9 November 2016**
File Reference	**G:\Airspace Change Process\ACPs\Stansted Airport RNP1 SIDs ACP**

Instructions

In providing a response for each question, please ensure that the 'Status' column is completed using the following options:

- **Yes**
- **No**
- **Partially**
- **N/A**

To aid the SARG Project Leader's efficient Project Management it may be useful that each question is also highlighted accordingly to illustrate what is:

resolved Green **not resolved** Amber **not compliant** Red as part of the AR Project Leader's efficient project management.

1.	Introduction	
	This report describes the environmental considerations relevant to the proposal to introduce two PBN (Performance Based Navigation) SIDs (Standard Instrument Departure) at London Stansted Airport ("Stansted"). The SIDs are replications of existing conventional SIDs and therefore the proposal is considered against the CAA's extant policy for PBN SID replications.[1] The sponsor's key objective is to reduce the number of people overflown by departing aircraft by implementing the two SIDs. The Airspace Change Proposal (ACP) has been submitted by Stansted Airport Ltd. This assessment is based upon information presented in the proposal document entitled "Introducing RNP1 (RF) SIDs - Airspace Change Proposal" (February 2016), plus associated consultation material and subsequent information received as the result of queries raised with the sponsor following submission of the ACP. Notably this includes the following: • Consultation document "Performance Based Navigation – New innovative technology to reduce the impact of aircraft noise on communities around Stansted Airport" • Trial Report – "RNP1 (RF) Trial" (May 2015) • Consultation Feedback Report – "Introducing RNP1 (RF) SIDs" (January 2016)	

2.	Guidance to the CAA	Status
2.1	**Is the proposal consistent with Government policy and/or guidance from Government to the CAA?**	**Yes**
	Guidance issued to the Civil Aviation Authority sets[2] out a framework for the environmental objectives that the CAA must consider when assessing airspace change proposals. In addition to these objectives, there may be other legitimate operational objectives, such as the overriding need to maintain an acceptable level of air safety, the desire for sustainable development or to enhance the overall efficiency of the UK airspace network, which need to be considered alongside these environmental objectives. The Government looks to the CAA to determine the most appropriate balance between these competing characteristics.	

[1] Policy Statement – Guidance on PBN SID Replication for Conventional SID Replacement (19 August 2013)
[2] DfT, Guidance to the Civil Aviation Authority on Environmental Objectives Relating to the Exercise of its Air Navigation Functions, January 2014

	Flights over National Parks and AONBs are not prohibited by legislation[3] as a general prohibition against over-flights would be impractical. Government policy focuses on minimising the over-flight of more densely populated areas below 7,000 feet (amsl), but balances this with CO_2 emissions between 4,000 and 7,000 feet (amsl). However, where it is practical to avoid over-flight of National Parks and AONBs below 7,000 feet (amsl), the Guidance asks that the CAA encourages this.

3.	Rationale for the Proposed Change	Status
3.1	**Does the rationale for the ACP include environmental reasons?**	**Yes**
	The proposal's stated key objective is to reduce the number of people overflown, and by inference thereby reduce the number of people affected by aircraft noise. The sponsor's trial report states that: • "The objective of the RNP1[4] (RF[5]) SID design was to replicate the existing standard SID as closely as possible to enable concentration of the departing aircraft as close to the centre of the existing SID as possible." • The proposal document states that: "The purpose of the trial was to reduce the number of people directly overflown by departing aircraft through improving the accuracy that these departing aircraft can navigate immediately after departure." The trial report also sets out the rationale for choosing the two SIDs selected for replication out of a possible six conventional SIDs at the airport.	

[3] National Parks and Access to the Countryside Act 1949, National Parks (Scotland) Act 2000, and "Duties on relevant authorities to have regard to the purposes of National Parks, Areas of Outstanding Natural Beauty (AONBs) and the Norfolk and Suffolk Broads Guidance Note", Defra 2005.
[4] Required Navigational Performance of 1 Nautical Mile
[5] Radius-to-Fix

4.	Nature of the Proposed Change	Status
4.1	**Is it clear how the proposed change will operate, and therefore what the likely environmental impacts will be?**	**Yes**

The proposal seeks to introduce two new RNP1 SIDs, that replicate two existing conventional SIDs. Those two existing conventional SIDs will be retained – they are not being replaced by the RNP1 SIDs.

The two replicated SIDs:

1. Clacton 8R SID from Runway 22 (replicated by CLN1E RNP1 SID) - The maximum difference in distance between the conventional SID and the RNP1 SID is 340m, which occurs in the latter half of the turn. Otherwise the nominal track of the RNP1 SID closely replicates the nominal track of the conventional SID. This 340m difference means that the nominal track of the RNP1 SID is further away from Hatfield Heath but closer to Hatfield Broad Oak, though the nominal track continues to lie between these two communities rather than directly overhead either.

2. Detling SID from Runway 04 (DET1D RNP1) - The maximum difference in distance between the conventional SID and the RNP1 SID is 180m, which occurs in the first half of the turn. Otherwise the nominal track of the RNP1 SID closely replicates the nominal track of the conventional SID.

The sponsor states that the two RNP1 SIDs are replications of the related conventional SIDs. On the basis of the evidence presented in the trial report and the proposal, this seems a reasonable conclusion, however the final view on whether or not the new SIDs are indeed replications as defined in the CAA policy[6] is a matter for the CAA's Airspace, ATM & Aerodromes (AAA) Dept rather than this environmental report. Based upon the trial report, the CAA was able to confirm that the RNP1 designs can be considered as replications of the related conventional SIDs. This environmental report has therefore been completed on the basis that the CAA policy on PBN replications of conventional SIDs applies.

The anticipated impacts are based upon the results of a trial of the RNP1 SIDs which was undertaken by a sub-set of the aircraft that operate from the airport. The proposal assumes that the sample of aircraft that flew the SIDs during the trial was representative of all the aircraft that would fly the RNP1 SIDs if implemented and therefore that the results are indicative of what will happen if the RNP1 SIDs are introduced permanently. The trial has continued after the preparation of the trial report and since its publication additional aircraft operators have become trial participants. The sponsor has confirmed that the results to date from those additional operators are consistent with the results presented in the trial report and that therefore there is no evidence from those additional operators that the trial report results should

[6] Policy Statement – Guidance on PBN SID Replication for Conventional SID Replacement (19 August 2013)

not continue to be accepted as a good representation of the anticipated impact on traffic patterns. The most notable additional trial participant is Ryanair which joined the trial in mid-June 2016 for the R22 (Clacton) SID. Ryanair is the largest operator at Stansted Airport. The results to date for Ryanair show that its aircraft can fly the new SID with a high degree of accuracy, displaying performance that is consistent with other trial participants.

The sponsor has measured the impact of the improved track-keeping accuracy resulting from the RNP1 SIDs in terms of people that are "directly overflown". This does not directly reflect the noise impact, but instead makes the general assumption that reducing the number of people directly overflown will naturally reduce the number of people that experience noise (or at least lessen the level of noise for those people that were previously directly overflown). However, when using a population count of residents that are "directly overflown" it is important to understand that a location does not have to be directly overflown in order to experience noise from aircraft. Aircraft can be some distance from a location and still be audible and indeed some residents may still consider themselves to be overflown when in fact aircraft may not be directly overhead. Therefore some caution should be used if a "directly overhead" measure is being used to explain a change in noise impact.

The counter to a reduction in people directly overflown is that some of those people that continue to be directly overflown (i.e. those beneath or close to the RNP1 SID nominal track) will be overflown more often than previously due to the concentration of departure tracks (as a result of more accurate track-keeping), and therefore may experience an increase in noise impact.

Whilst the consultation and proposal do make it clear that not all aircraft will use the RNP1 SIDs (e.g. because they are not equipped to do so, or not approved to do so), it does not give an indication of how many (or what proportion) of flights are expected to use the new SIDs, in order to better understand the likely impact in terms of being directly overflown. The anticipated usage of the SIDs if implemented was clarified with the sponsor and is considered further in Sections 5.2 and 13.1 below.

Another aspect that needs to be considered when understanding the likely impacts of this proposal is a separate, recent Airspace Change Proposal (LAMP Phase 1A – Module A) that approved the switch during daytime of traffic that was using the R04 Detling SID onto the R04 Clacton SID. This means that there will be much fewer aircraft using the proposed R04 RNP1 Detling SID than had been using the existing R04 conventional Detling SID. Both the Clacton and Detling R04 SIDs have a common flightpath until they reach an area approximately at Broxted (north east of the airport) when they start to diverge. Up to that point they share the same, "straight out", flightpath.

RNP1 SID Trial

The trial began in May 2013 with the objective of enabling aircraft to avoid overflight of several local communities. This objective is stated as being in line with Government policy, notably the Aviation Policy Framework (March 2013), and specifically the sponsor cites this extract from paragraph 3.31 of that document:

"Consistent with its overall policy to limit and where possible reduce the number of people adversely affected by aircraft noise, the Government believes that, in most circumstances, it is desirable to concentrate aircraft along the fewest possible number of specified routes in the vicinity of airports and that these routes should avoid densely populated areas as far as possible."

Between 4-16 departures per day used the RNP1 SIDs during the trial (an average of 5-6 flights per day), and the trial report prepared by the sponsor is based upon data collected between May 2013 and November 2014. The trial initially only included easyJet as the sole operator but subsequently included several others – German Wings, FEDEX, UPS, AtlasAir, Global Supply Systems, Pegasus and Fayair – who have collectively flown the two RNP1 SIDs using a range of aircraft. The trial currently remains ongoing and was joined in June 2016 by Ryanair. The sponsor has confirmed that it feels the sample of operators and aircraft are representative of the full fleet that operate from the airport and that therefore the trial results are an accurate reflection of the anticipated traffic pattern if the SIDs are implemented permanently and if the a large proportion of aircraft on that departure use the RNP1 SIDs.

Historically, below 4,000ft (the altitude at which aircraft can be tactically vectored) the majority of aircraft have been within the NPR swathe – in excess of 99% of traffic on all departure routes at the airport – and these flights have been dispersed across the full 3km of the swathe. The track-keeping performance, based on the trial results, was good in that aircraft demonstrated a greater ability to fly closer to the RNP1 SIDs than the conventional SIDs, i.e. it demonstrates a concentration effect on the traffic patterns, about the nominal track of the SIDs.

Clacton RNP1 SID – trial results
Images 7 and 9 in the trial report show that the dispersion of aircraft (below 4,000ft, the altitude at which they could be tactically vectored) on the outside of the turn was typically up to +300m (with a few aircraft wider than this) whilst aircraft on the inside of the turn appear to have a closer adherence than this to the SID (generally most aircraft within -150m). The trial indicated that 98.3% of flights were within a 400m swathe at Gate 7 (the location at which tactical vectoring is occurring), but that swathe was not centred on the SID; it was -100m to +300m (i.e. 100m inside the turn, 300m outside the turn).

Detling RNP1 SID – trial results
Images 15, 16 and 18 in the trial report show that the dispersion of aircraft on the outside of the turn and below 4,000ft, (the altitude at which they could be tactically vectored) was typically up to -250m (with a few aircraft wider than this). On the inside of the turn, the dispersion that reflects the majority of aircraft was typically up to +200m. The trial indicated that 99.9% of flights were within a 460m swathe at Gate 7 (the location at which tactical vectoring is occurring).

The trial report concludes that in excess of 98% of flights were within a 400m swathe. The 400m swathe for each RNP1 SID that was defined for the purpose of the population counts is centred on the mean track of the tracks generated by aircraft participating in the trial.

4.2	**Have alternative options been considered, and have the environmental impact of each alternative been assessed?**	**No**
	Alternative options were not considered as the express purpose of the trial and the resulting proposal is to introduce RNP1 SIDs that are as close a replication of the equivalent conventional SIDs as possible. And having noted this aim, there are unlikely to be alternative PBN technologies that would deliver similar track keeping performance to that demonstrated.	

5.	**Noise**	**Status**
5.1	**Has the noise impact been adequately assessed?**	**Yes**
	As noted in Section 4.1 above, the CAA's PBN Replication Policy applies to this proposal, and so no L_{eq} contours or SEL footprints are required in support of the consultation or proposal. However, paragraph 11.3 of the Policy Statement states that the consultation should include "information to explain (and possibly illustrate) the anticipated noise impact beyond the L_{eq} noise contours and SEL footprints". Additionally, the nature of this proposal means that the overall exposure of any individual or community to noise on the ground is not anticipated to increase to a level that exceeds 57dB $LA_{eq\ 16\ hour}$, where the increase in the level of exposure to noise in itself exceeds 3dB as a result of the change proposed, and for that reason any increase in noise levels experienced by residents that are overflown more often is not deemed to be significant. <u>Noise from aircraft up to 4,000ft</u> The sponsor has opted to portray the impact in terms of a population count of those people "directly overflown". This count is based upon a 3km NPR swathe (as an indicator of the spread of aircraft on the existing conventional SIDs) and a swathe of 400m centred on the mean track of the RNP1 tracks from the trial (as an indicator of the spread of aircraft on the RNP1 SIDS), both up to an altitude of 4,000ft at which point the NPR terminates and Air Traffic Control (ATC) can choose to tactically vector aircraft off the SID. As noted in 4.1 above, some caution should be exercised when using this indicator as a measure of noise impact – whilst aircraft may remain within a swathe (whether that be a 3km NPR swathe or a 400m RNP1 swathe) their noise is still likely to be experienced to some degree by residents outside the swathe. <u>Noise from aircraft between 4,000ft and 7,000ft</u> Whilst the population counts for residents "directly overflown" can be used as a measure of impact for aircraft up to 4,000ft, they do not portray the impact from aircraft above 4,000ft. Aircraft <u>can</u> be tactically vectored by ATC when they have climbed to an altitude of 4,000ft, but that does not mean they <u>will</u> be vectored in	

	all cases. The track diagrams provided in support of the proposal, and as part of the consultation, show that there continues to be concentration of traffic on the RNP1 SIDs above an altitude of 4,000ft. This means that some residents may experience an increase in noise impact from aircraft between 4,000ft and 7,000ft – though any such increase in this impact will not be significant.	
5.2	**Has the noise impact been adequately presented in the consultation and the submitted proposal?**	**Partially**
	The consultation material included the trial report. The noise impact has been adequately presented in terms of the impacts from aircraft up to an altitude of 4,000ft, as far the CAA's PBN Replication Policy requires. The sponsor has additionally chosen to portray the impact in terms of the number of people that will be directly overflown less often though has arguably not given the same degree of transparency to the counter-effect, namely that some people will be directly overflown more often [covered further below]. In terms of the impacts from aircraft at altitudes between 4,000ft and 7,000ft, the sponsor has not explicitly commented on these in the consultation, yet did present track diagrams that showed the dispersion of traffic above 4,000ft [covered further below]. Generally the consultation and proposal documents incorrectly identify the Noise Preferential Route (NPR) swathe as being the actual NPR itself. The NPR is the intended flight path, which should also match the SID. NPRs usually terminate at an altitude 4,000ft; once an aircraft has achieved this altitude it can be tactically vectored by Air Traffic Control (ATC). The swathe (or "corridor") is that area defined for assessing how accurately aircraft have been able to adhere to the NPR. This mis-description would not have fundamentally affected consultees' understanding of the proposal, but it does have an impact on the question of whether or not the NPR needs to be modified if the two new RNP1 SIDs are implemented permanently. As noted above, whilst the consultation material does explain that the greater accuracy of aircraft using the RNP1 SIDs will mean that some people will be directly overflown less often, it is not as transparent about the counter-effect, namely that some people will be directly overflown more often due to the greater accuracy (and therefore greater concentration) of aircraft using the RNP1 SIDs. The table at Appendix 1 of this report summarises the population counts used by the sponsor in its consultation. It supports the statement made in the consultation that 85% of people will be overflown less often, but it also illustrates that the remaining 15% will be overflown more often. This equates to approximately 700 people in total (500 on the Clacton SID from Runway 22 and 200 people under the Detling SID from Runway 04.) The new SIDs will not replace the conventional SIDs, and some aircraft will continue to use the conventional SIDs even if the RNP1 SIDs are approved and implemented permanently. This means that the overall spread of traffic is likely to remain the same upon implementation until such time that all aircraft on those two departure routes are using the RNP1 SIDs. Upon implementation, a degree of concentration will	

occur, but this will depend upon the proportion of aircraft that use the RNP1 SIDs – and equally that means that any increase in noise impact for those residents closest to the new RNP1 SIDs will be dependent upon the number of aircraft using the new SID.

The estimated usage of the two RNP1 SIDs is outlined in Section 13 of this report (Traffic Forecasts). These estimates from the sponsor indicate that traffic on the Runway 22 Clacton SID will become noticeably more concentrated upon implementation but are based upon the assumption that all those aircraft that are capable of flying the RNP1 SIDs will do so from the outset. Based upon the latest information, it remains unclear to what extent the largest operator at Stansted (Ryanair) will fly the RNP1 SIDs and for that reason it is also unclear what the scale of concentration and noise impact will be upon implementation., Based on trial results to date, any departing aircraft that are capable of flying the RNP1 SIDs are expected to do so with a high degree of accuracy.

However, the usage of the Runway 04 Detling SID is expected to be small due to the fact that few aircraft currently use this SID following the LAMP (London Airspace Management Programme) 1A Airspace Change Proposal which was implemented in February 2016. The current usage of the SIDs affects the weight placed upon the sponsor's assessment of the reduction in residents that will be overflown, specifically for the assessment of the impact from the Runway 04 Detling SID. With very few departures using this SID (both now and after implementation) the impact in terms of "overflight" is likely to be negligible, and so it is recommended that the estimated reduction for this SID (see Appendix 1) of 1,200 residents to 200 residents is not included as a consideration in this ACP.

There is no explicit illustration in the consultation material or the trial report of the anticipated impacts of traffic between 4,000ft and 7,000ft – whilst the track diagrams do show the spread of traffic at altitudes greater than 4,000ft, there is no apparent consideration of any possible changes to traffic patterns or the resulting noise impacts. At most, the material explains that from 4,000ft aircraft can be tactically vectored by ATC (i.e. taken off the SID) and that there will not be any changes to vectoring procedures and practices. The diagrams from the trial do appear to show that between 4,000ft and 7,000ft:

- Some aircraft continue to be vectored above 4,000ft whilst a proportion of aircraft continue to remain on the SID;
- Because the traffic is concentrated on the RNP1 SID below 4,000ft, any aircraft that remain on the SID above 4,000ft tend to remain concentrated;
- This means that even if vectoring procedures and practices do not change, it would appear that there is likely to be a change in traffic patterns due to increased concentration and therefore there may be a change in noise impact from traffic between 4,000ft and 7,000ft[7];
- No new areas appear to be overflown between 4,000ft and 7,000ft; instead, the effect of concentration is likely to mean that some locations will be directly overflown less often, whilst some areas (typically beneath the SID or close to it) will be directly overflown more often;

[7] However, the effect of concentration of traffic patterns on noise impacts diminishes as altitude increases. This is illustrated in Figure A1, Annex A of CAA publication CAP1378, "Performance-based Navigation - Airspace Design Guidance: Noise mitigation considerations when designing PBN departure and arrival procedures".

	• The increase in noise for any locations that are overflown at these altitudes more often would not be a significant increase – such locations are well beyond the 57 dBA L_{eq} contour and any noise increase would not bring the location within that contour.

6.	Emissions	Status
6.1	**Has the impact on CO_2 emissions been adequately assessed?**	**Yes**
	Based upon the CAA's PBN Replication Policy, there is no requirement to assess CO_2 emissions. This is based on the expectation that with a replicated SID, aircraft will not encounter any material increase or decrease in track mileage, and therefore there will be no material change in the amount of fuel burned or CO_2 emitted.	
6.2	**Has the impact on CO_2 emissions impact been adequately presented in the consultation and the submitted proposal?**	**Yes**
	As noted in 6.1 above, there is no requirement to present an assessment of the impact upon CO_2 emissions.	

7.	Local Air Quality	Status
7.1	**Has the impact on Local Air Quality been adequately assessed?**	**Yes**
	Based upon the CAA's PBN Replication Policy, there is no requirement to assess the impact on Local Air Quality (LAQ). This is based on the expectation that with a replicated SID, there will be no change to an aircraft's flight profile or fuel burn below 1,000ft, and therefore there will be no material change in emission volume or dispersion that will have a material impact upon LAQ.	
7.2	**Has the impact on Local Air Quality been adequately presented in the consultation and the submitted proposal?**	**Yes**
	As noted in 7.1 above, there is no requirement to present an assessment of the impact upon LAQ.	

8.	Tranquillity	Status

8.1	**Has the impact on tranquillity been adequately considered?**	**Yes**
	There is no requirement in the CAA's PBN Replication Policy to consider the impact on tranquillity. However, this proposal does not change the traffic pattern above any Area of Outstanding Natural Beauty (AONB) of National Park below an altitude of 7,000ft.	
8.2	**Has the impact on tranquility been adequately presented in the consultation and the submitted proposal?**	**Yes**
	As noted in 8.1 above, there is no requirement to consider the impact upon tranquillity.	

9.	**Visual Intrusion**	**Status**
9.1	**Has the impact of visual intrusion been adequately considered?**	**Yes**
	There is no requirement in the CAA's PBN Replication Policy to consider the impact on visual intrusion. However, this proposal does not change the traffic pattern above any Area of Outstanding Natural Beauty (AONB) of National Park below an altitude of 7,000ft.	
9.2	**Has the impact of visual intrusion been adequately presented in the consultation and the submitted proposal?**	**Yes**
	As noted in 9.1 above, there is no requirement to consider the impact upon tranquillity.	

10.	**Biodiversity**	**Status**
10.1	**Has the impact upon biodiversity been adequately considered?**	**Yes**
	There is no requirement in the CAA's PBN Replication Policy to consider the impact on biodiversity. However, the anticipated environmental impacts from this Airspace Change Proposal are very unlikely to have any impact upon biodiversity.	
10.2	**Has the impact upon biodiversity been adequately presented in the consultation and the submitted proposal?**	**Yes**
	As noted in 10.1 above, there is no requirement to consider the impact upon tranquillity.	

11.	Continuous Descent Approaches	Status
11.1	**Has the implementation of, or greater use of, CDAs been considered?**	**N/A**
	This proposal only affects departing aircraft therefore consideration of CDAs is not relevant in this case.	

12.	Impacts Upon National Parks and/or AONBs	Status
12.1	**Does the proposed change have an impact upon any National Parks or Areas of Outstanding Natural Beauty (AONBs)?**	**No**
	The statutory purposes of National Parks are to conserve and enhance their natural beauty, wildlife, and cultural heritage and to promote opportunities for the understanding and enjoyment of their special qualities by the public. The statutory purpose of AONBs is to conserve and enhance the natural beauty of their area. In exercising or performing any functions in relation to, or so as to affect, land in National Parks and AONBs, the CAA is required to have regard to these statutory purposes under s.19 and Schedule 2 of the Civil Aviation Act 1982. This duty was re-stated in the revised Air Navigation Guidance issued in 2014. This duty was also reiterated in the Aviation Policy Framework (March 2013) which stated "the CAA has legal duties to have regard to the purposes of National Parks and Areas of Outstanding Natural Beauty and must therefore take these into account when assessing airspace changes." Whilst recognising this duty it is also true that flights over National Parks and AONBs are not prohibited by this legislation as a general prohibition against over-flights would be impractical. This proposal is not expected to change the traffic patterns above any AONBs or National Parks below an altitude of 7,000ft.	

13.	Traffic Forecasts	Status
13.1	**Have traffic forecasts been provided, are they reasonable, and have these been used to reflect the future impact of the proposal?**	**Yes**

	There is no requirement to provide traffic forecasts as part of the environmental assessment under the CAA's PBN Replication Policy. However, in order to fully understand the potential noise impact, it is useful to have an estimate of the number of flights that are expected to use the two RNP1 SIDs if they are implemented. Whilst the consultation material did not provide estimates of usage, the sponsor has subsequently provided estimates in support of the proposal. Usage of the Runway 22 Clacton RNP1 SID is estimated to be 85%+ of flights on that SID (approx 110 of 130 departures per day). However, this anticipated usage is based upon an expectation of the full participation of those Ryanair flights that are capable of flying the new SID. To date, there is no clear indication as evidenced by the airline that it will use the SID to the fullest extent and therefore it remains unclear as to what proportion of the fleet that uses Stansted is likely to use the proposed SID. Usage of Runway 04 Detling RNP1 SID is estimated to be only a few flights per day. This is the result of the change implemented as part of the LAMP 1A ACP, which switched departures on the R04 Detling SID to the R04 Clacton SID, with the result that if the new RNP1 SID was introduced, the sponsor estimates that only 2-3 flights per day (out of an average of six per day) would use the R04 Detling RNP1 SID.

14.	Consultation	Status
14.1	**If undertaken, has evidence of non-aviation stakeholder consultation been provided?**	**Yes**
	Consultation was launched on 1 September 2015 and ended on 27 November 2015. It was publicly available on the sponsor's website, and was publicised in local media. There were a number of responses from non-aviation stakeholders including several parish councils.	
14.2	**Has account been taken of the results of the environmental factors raised by consultees or has evidence been provided to indicate why this has not been possible?**	**Yes**
	The sponsor has provided evidence that they have considered the environmental factors raised by respondents. No changes were made to the proposal as a result of the feedback received by respondents – primarily because the aim of the proposal is to introduce a PBN replication of two existing conventional SIDs, and the proposed design already achieved that objective. Notable factors and comments from respondents are detailed below: 1. The consultation feedback document highlights that some respondents had the view that they are supportive of the change providing there would not be a "disproportionate and unbearable noise impact upon the minority of losers". The sponsor's reply, as set out in that feedback document was : "With any airspace change, there are in most cases winners and losers. A number of responses welcomed the introduction	

of RNP1 but were concerned this would have a disproportionate effect on the minority of losers. There are no new routes proposed and no new areas will be overflown at low level. London Stansted Airport operates a noise insulation scheme to support those who are most impacted by aircraft noise. The Airport has already committed to reviewing its noise insulation scheme as part of the Sustainable Development Plan consulted on during 2014."

This response from the sponsor doesn't explicitly acknowledge that some people will be overflown more often, or what the extent of that impact will be. There is an implication that those affected might be considered when the airport reviews its compensation scheme, but there is no commitment to do so.

2. A request from some respondents to specifically revise the NPR in order to move aircraft away from the community of High Easter. The sponsor replies that this aspect is out of scope, noting that changing the flight paths such that aircraft overfly more densely populated areas is contrary to Government policy, and that aircraft above 4,000ft (which is the case for the majority of aircraft in the vicinity of High Easter) are able to be vectored by ATC and will continue to be so if the change is implemented.

3. Some respondents suggested that the width of the NPR swathes should be reduced to reflect the concentration of traffic using the RNP1 SIDs. The sponsor has replied to explain that the width of the NPR swathes are decided by the Secretary of State for Transport.

4. The sponsor confirms that the objective of the trial and proposal was to improve compliance of the SID and therefore also the NPR, and for that reason no other option (such as redesigning routes) was considered.

5. In the context of responding to a consultee, the sponsor explains in the Consultation Feedback Report that "above 4,000ft, the results of the trial have shown the usual spread of traffic through ATC vectoring".

Additionally, the sponsor has provided a further and subsequent consultation response from the Hatfield Heath Parish Council (dated 14 March 2016). This letter re-iterates the council's complaint about the small number of flights on the trial, and the council's dispute of any claim by the sponsor for an anticipated noise benefit for Hatfield Heath. The council requests that noise impacts are re-assessed once the RNP1 SIDs are implemented and a greater number of aircraft are using them. The sponsor subsequently met with representatives of the Parish Council on 11 July 2016 to discuss the PC's letter and to explain the results of the trial and the number of flights.

15.	Compliance with CAP 725	Status
15.1	**Have all environmental assessment requirements specified in CAP 725 been met, where applicable?**	**Yes**
	Yes – but in addition it is the CAA's PBN SID Replication Policy requirements that are relevant for this proposal.	

16.	Other Aspects	Status
16.1	**Are there any other aspects of the ACP, that have not already been addressed in this report, that may have a bearing on the environmental impact?**	**No**
	None	

17.	Recommendations	Status
17.1	**Are there any recommendations for the Post-Implementation Review?**	**Yes**
	Sponsor to provide: • Track diagrams that enable a comparison between pre- and post-implementation traffic patterns for aircraft up to 7,000ft. The diagrams should portray both traffic dispersion and extent of any concentration (i.e. a density plot of traffic). • Figures for usage of both RNP1 SIDs, and comparison to the usage of the remaining conventional SIDs. It would be very useful to gauge the actual change in noise impacts for certain key communities that are affected by these two departure routes. Spot point noise modelling (L_{max}) could be undertaken for representative aircraft types, for each community, that compare the typical noise levels for flights that are directly overhead (I.e. those that are on the conventional SIDs) against typical noise levels for aircraft that are no longer directly overhead (i.e. those that are on the RNP1 SIDs). Note that this recommendation is for noise modelling rather than noise monitoring.	

18.	Government Approval	Status
18.1	**Is the approval of the Secretary of State for Transport required in respect of the environmental impact of the airspace change proposal?**	**No**

	Approval is not required in terms of the Airspace Change Proposal (because its likely environmental impacts will not be significant), but the CAA should notify the Secretary of State if the decision is to approve the proposal because the new RNP1 SIDs differ slightly from the existing conventional SIDs, and therefore the NPR for no longer matches the SID centreline entirely. Whilst the actual difference (as noted earlier in 4.1 above) is modest and the aircraft using the new SIDs are very likely to be well within the current 3km wide NPR swathe, the Secretary of State should be notified that, in line with the Air Navigation Guidance[8], they should consider the need to create a new NPR to match the new RNP1 SIDs (either as soon as feasible, or when such time as the conventional SIDs are withdrawn). The existing NPR will remain as the existing conventional SIDs will also remain. The Air Navigation Guidance does not indicate a degree of difference between a SID and NPR that is acceptable other than if the change produces a significant detrimental environmental impact. However it does advise in Section 5.9 that: "when SIDs are developed, redesigned or replicated, consideration must be given to realigning any associated NPRs so that they reflect appropriately the SID being implemented or amended." Equally the Guidance notes (in 5.10i) that it is satisfactory for an NPR to be consistent with the SID even if it is not coincident with it. Based on the degree of difference between the nominal tracks of the RNP1 SIDs and the NPR, it is reasonable to conclude that they are consistent. Realigning the NPR would not change any of the impacts under consideration for this proposal, and none of the impacts in this proposal are deemed to be significantly detrimental. However, in the interests of transparency and the guidance within the Air Navigation Guidance, the CAA should formally notify the Secretary of State that a difference would be created as a result of implementing these two SIDs, such that the Secretary of State can then decide if the NPR also needs to be modified in due course. Sections 5.11-5.14 and 6.2-6.5 of the Air Navigation Guidance are also relevant.

[8] DfT, Guidance to the Civil Aviation Authority on Environmental Objectives Relating to the Exercise of its Air Navigation Functions, January 2014

19.	Conclusions	
19.1	**Can an overall environmental benefit be demonstrated (or justified/supported)?**	**No**
	The 2014 Air Navigation Guidance no longer requires an overall environmental benefit to be demonstrated unlike the previous version which did have such a requirement. Due to the lack of clarity with regards to the usage of the R22 SID by the largest operator at Stansted, it is not possible to anticipate the likely environmental impacts, particularly noise, at this stage. However, if it became clearer that the anticipated usage of the R22 SID was in line with the sponsor's previous estimate (namely 85%+ of flights on that departure route would use the RNP1 SID), the anticipated environmental impacts of this proposal would be: • An estimated total of 4,300 people to be directly overflown less often by aircraft below an altitude of 4,000ft. • An estimated total of 700 people to be directly overflown more often by aircraft below an altitude of 4,000ft. • Some locations (those beneath or close to the RNP1 SIDs) are likely to be directly overflown more often by aircraft at altitudes between 4,000ft and 7,000ft though other locations are likely to be directly overflown less often by aircraft at these altitudes; • There will be no other anticipated environmental impacts – CO_2 emissions, Local Air Quality, tranquillity, visual intrusion, biodiversity. The R04 SID is currently used infrequently and this would also be the case if the proposed RNP1 SID on this route is implemented. For that reason any impacts arising from greater accuracy (concentration) on this route are likely to be minimal and have therefore been given no weight in this assessment. The Secretary of State should be advised of the minor difference between the new RNP1 SIDs and the existing NPR, in order to consider whether or not new/revised NPRs are required that mirror the RNP1 SIDs.	

Outstanding Issues		
Serial	**Issue**	**Action Required**
1		
2		

Additional Compliance Requirements (to be satisfied by Change Sponsor)	
Serial	**Requirement**
1	
2	

Environmental Assessment Sign-off/Approval	Name	Signature	Date
Environmental Assessment completed by:	[redacted] **(Principal, Environment)**		9 November 2016
Environmental Assessment approved by:	[redacted] **(Programme Head – Environment)**	[redacted]	13 January 2017
Programme Head - Environment Comments: None			

Appendix 1

Summary of population counts as presented in the consultation – swathes terminate at an altitude of 4,000ft

Population counts are rounded to the nearest 50

	22 Clacton – population within swathe (i.e. "directly overflown")	%	04 Detling - population within swathe (i.e. "directly overflown")	%	Total - population within swathe (i.e. "directly overflown")	%
NPR swathe – 3km wide	3,800	100	1,200	100	5,000	100
RNP1 SID swathe – 400m wide	500	13	200	17	700	14
Reduction in population directly overflown	**3,300**	**87**	**1,000**	**83**	**4,300**	**86**