

18. AVIATION

Executive Summary

The potential impacts of the proposed development on aviation and radar in the surrounding area have been assessed and the technical reports are appended to this chapter. This assessment has included military and civil interests. The relevant navigation aids are located on or near Campbelltown Aerodrome. These are a Non-Directional Beacon (NDB); a Doppler Very High Frequency Omni-Range (DVOR); and Distance Measuring Equipment (DME).

There are **no significant impacts** anticipated on these navigation aids, following technical assessment in accordance with industry practice and the appropriate guidance (see References and appendices at the end of this chapter).

An aerodrome physical safeguarding assessment has been carried out for Campbelltown Aerodrome, due to its proximity to the proposed development. This was completed in accordance with the methodology published by the Civil Aviation Authority (CAA) and has shown that the turbines would breach the Outer Horizontal Surface (OHS) associated with the airport. This is the only Obstacle Limitation Surface (OLS) to be affected. This breach is not considered significant because the terrain at the proposed development location breaches the OHS; the existing Tangy I and II turbines currently breach the OHS; therefore, **no significant increase in impact** is predicted as a result of the proposed development.

No increase in minimum sector altitudes would be required as a result of the proposed development. The missed approach procedure for aircraft approaching runway 11 has been considered in accordance with International Civil Aviation Organisation (ICAO) guidance, **no impact** on this procedure is predicted based on the technical assessment (see Appendix 17.3 to this chapter).

No significant impacts on radar installations or military low flying are predicted due to the location of the proposed development. Since no significant impacts are predicted, no mitigation requirements have been identified.

18.1 Introduction

18.1.1 This chapter considers the potential effects on aviation associated with the construction, operation and decommissioning of the proposed development. The specific objectives of the chapter are to:

- describe the baseline, with specific consideration of the existing wind developments (Tangy I and II);
- describe the assessment methodology and significance criteria used in completing the impact assessment;
- describe the potential effects, including direct, indirect and cumulative effects;
- describe the mitigation measures proposed to address likely significant effects; and
- assess the residual effects remaining following the implementation of mitigation.

18.1.2 The assessment has been carried out by Pager Power Limited in accordance with International Civil Aviation Organisation (ICAO) requirements.

18.1.3 This chapter is supported by:

- Appendix 18.1: Aviation and Radar Risk Assessment; and
- Appendix 18.2: Instrument Flight Procedure Assessment.

18.2 Scope of Assessment

Project Interactions

18.2.1 The proposed development will introduce new physical structures (turbines) in the area, that are larger than the existing ones at the site. Large structures can affect aviation infrastructure in predominantly two ways, because they can:

- present a collision risk for aircraft; and
- block and/or reflect radio signals from radar installations and other navigation aids.

Study Area

18.2.2 The Study Area for aviation issues is defined by individual impacts. For aerodrome physical safeguarding, which is protection against collision risks, the study area is approximately 20 kilometres (km) from any proposed turbine. For en-route radar, the Study Area extends to more than 100 km from the proposed development. Appendix 18.1 contains the technical report that identifies the relevant installations that have been considered.

18.2.3 The installations that have required the most assessment are located at or near Campbeltown Aerodrome, within 10 km of the proposed development.

Scoping and Consultation

18.2.4 The applicant has consulted with relevant aviation stakeholders as described in Table 18.1.

| Consultee and Date | Summary of Response | Comment/Action Taken |
|---|---|---|
| Defence Infrastructure Organisation (DIO) 22/05/2017 | The MOD has no objection to the proposal. In the interests of air safety, the MOD will request that the development should be fitted with MOD accredited 25 candela omnidirectional red lighting or infrared lighting with an optimised flash pattern of 60 flashes per minute of 200ms to 500ms duration at the highest practicable point. | Visible lighting, as agreed with Highlands and Islands Airport Limited (HIAL) will be included on cardinal (T1, T8 and T11) turbines. |

| Table 18.1: Consultation Responses | | |
|---|--|--|
| Consultee and Date | Summary of Response | Comment/Action Taken |
| | Defence Infrastructure Organisation Safeguarding wishes to be consulted and notified of the progression of planning applications to verify that it will not adversely affect defence interests." | |
| NATS Safeguarding | No response received to scoping request. | This chapter presents an assessment of potential aviation effects. |
| Civil Aviation Authority | No response received to scoping request. | This chapter presents an assessment of potential aviation effects. |
| Highlands and Islands Airports Limited 19th March 2018 | HIAL confirmed that the proposal is acceptable subject to steady red 32 candela omnidirectional lighting being fitted to cardinal turbines T1, T8 and T11. | Lighting strategy agreed with HIAL. |

Effects to be Assessed

18.2.5 Table 18.2 sets out the assessed effects. Appendices 18.1 and 18.2 present the technical reports containing the assessment.

| Table 18.2: Effects to be Assessed | |
|---|---|
| Installation / Feature | Potential Effect |
| Campbeltown Aerodrome Obstacle Limitation Surfaces (OLSs) | An OLS is an imaginary surface that is defined in three dimensions at a licensed aerodrome. Multiple OLSs are defined for safety purposes. Infringement of an OLS can signify a potential collision risk. |
| Doppler Very High Frequency Omni-Range (DVOR) | There is a DVOR, which is a navigation aid, located near Campbeltown Aerodrome. Wind turbines can block or reflect the signals emitted from a DVOR, impacting its effectiveness. |
| Distance Measuring Equipment (DME) | There is a DME, which is a navigation aid, located near Campbeltown Aerodrome. Wind turbines can block or reflect the signals emitted from a DME, impacting its effectiveness. |
| En-Route Radar | En-Route radar throughout the UK are operated and safeguarded by NATS, formerly National Air Traffic Services. The specific radar that have been assessed are Tiree and Lowther Hill. Wind turbines can block or, more importantly, reflect radar signals. This can cause radar clutter and/or bearing errors along with other issues under particular circumstances. |
| Instrument Flight Procedures (IFPs) | The published procedures at Campbeltown Aerodrome have been assessed. In particular, the missed approach procedure for aircraft approaching from the east has been considered in detail, because aircraft following this procedure would pass nearest the proposed development. |
| Minimum Safe Altitudes (MSA) | The MSA for an aircraft is influenced by the elevation of nearby obstacles. It is necessary to consider the effect of tall structures on MSAs. |

| Table 18.2: Effects to be Assessed | |
|---|--|
| Installation / Feature | Potential Effect |
| Military Low Flying | The Ministry of Defence (MOD) carries out military low flying for training purposes over the United Kingdom. Some areas are more sensitive than others, within the most critical areas the presence of over-ground obstacles must be carefully managed for safety reasons. |

Effects Scoped Out of Assessment

18.2.6 Table 18.3 sets out the effects that have been scoped out of assessment.

| Table 18.3: Effects Scoped Out of Assessment | | |
|---|--|---|
| Installation / Feature | Potential Effect | Reason for Scoping Out |
| On-airfield radar (used for air traffic control) | Radar clutter could occur due to reflection of the radar signal by wind turbines. | On-airfield radar for managing traffic at a particular aerodrome are typically safeguarded against wind developments within 30 km. In the case of military aerodromes, this range can be extended. There is no on-airfield radar in the vicinity of the proposed development that would require assessment. |
| Meteorological radar | Meteorological radar, used for monitoring and predicting precipitation levels, can be affected by wind turbines reflecting and/or blocking the radar signal. | Meteorological radar installations are typically safeguarded against wind developments within 30 km. There is no meteorological radar in the vicinity of the proposed development that would require assessment. |

18.2.7 Effects arising from the process of decommissioning have been scoped out since they are of a similar nature to construction issues, but of a smaller scale and shorter duration. However, the results of decommissioning (i.e. the removal of the proposed development) are taken into account in assessing ongoing and operational effects where appropriate.

18.3 Methodology

Overview

18.3.1 The potentially affected installations have been identified based on a database of infrastructure, published sources and inspection of relevant aviation maps. This highlighted the aerodromes, radar installations, navigation aids and military low flying zones that require consideration.

18.3.2 Technical assessments were carried out using sophisticated computer modelling and a digital terrain database. The relevant guidance from the Civil Aviation Authority (CAA) and the International Civil Aviation Organisation (ICAO) was followed (see References at the end of this chapter and the technical assessments within the appendices).

18.3.3 The results of the technical assessments have been made available to the relevant stakeholders for discussion purposes.

Method of Baseline Characterisation

Desk Surveys

18.3.4 The primary sources of information for the technical assessments were:

- Pager Power’s database of installations – continuously updated based on stakeholder consultation, field surveys and official publications;

- NATS Aeronautical Information Package – which includes coordinate information for navigation aids at licensed aerodromes;
- the applicant’s provided information pertaining to the existing and consented developments at the proposed development location; and
- relevant aviation charts.

18.3.5 The technical analysis has been informed by:

- a digital terrain database – based on OSGB 36 datum that is interpolated by a sophisticated weighted algorithm;
- radar line of sight analysis that includes earth curvature and atmospheric refraction; and
- safeguarding criteria specified within CAA and ICAO publications (see References at the end of this chapter and the appendices).

Field Survey Techniques

18.3.6 No field surveys were required as part of the analysis.

Effects Evaluation Methodology (NB this is still under methodology subheading)

Receptor sensitivity

18.3.7 Each receptor has been designated a sensitivity based on its ability to absorb change. Table 18.4 defines the sensitivity categories that have been applied.

| Table 18.4: Receptor Sensitivity Categories | |
|--|---|
| Sensitivity | Definition |
| Very High | Very high importance and rarity, international scale and very limited potential for substitution. |
| High | High importance and rarity, national scale, and limited potential for substitution. |
| Medium | High or medium importance and rarity, regional scale, limited potential for substitution. |
| Low | Low or medium importance and rarity, local scale. |
| Negligible | Very low importance and rarity, local scale. |

Impact Magnitude

18.3.8 The magnitude of each potential impact has been classified based on the findings of the technical analysis. Table 18.5 defines the magnitude categories that have been applied. Effects have been considered in the context of the existing developments at the site (Tangy I and II).

| Table 18.5: Impact Magnitude Categories | |
|--|---|
| Magnitude | Definition |
| Major | Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. |
| Moderate | Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. |
| Minor | Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one or more key characteristics, features or elements. |

| Table 18.5: Impact Magnitude Categories | |
|--|---|
| Magnitude | Definition |
| Negligible | Very minor loss or detrimental alteration to one or more characteristics, features or elements. |
| No Change | No loss or alteration of characteristics, features or elements; no observable impact. |

Effects Significance

18.3.9 The combination of receptor sensitivity and impact magnitude determines the overall impact significance, as shown in Table 18.6. Moderate, Major and Substantial effects are considered to be significant under the EIA Regulations.

| Table 18.6: Significance of Impact | | | | | |
|---|------------------|-------------------|--------------|-----------------|--------------|
| Sensitivity | Magnitude | | | | |
| | No Change | Negligible | Minor | Moderate | Major |
| Negligible | Negligible | Negligible | Minor | Minor | Minor |
| Low | Negligible | Minor | Minor | Minor | Moderate |
| Medium | Negligible | Minor | Minor | Moderate | Major |
| High | Negligible | Minor | Moderate | Major | Substantial |
| Very High | Negligible | Minor | Moderate | Major | Substantial |

Assessing Cumulative Effects

18.3.10 The proposed development was considered in isolation – however the effects of the existing developments and the consented development were considered as part of the overall assessment.

Limitations of Assessment

18.3.11 All analysis is desk-based, no site surveys have taken place. This does not significantly affect the certainty of the results because the information sources are reliable and have, where appropriate, been cross-checked using multiple sources.

18.3.12 The assessment of the missed approach procedure (see Appendix 18.2) has been undertaken in accordance with the available appropriate guidance. HIAL may require an external assessment from the CAA to confirm the findings at a later stage.

18.4 Baseline Conditions

Current Baseline

Context

18.4.1 The existing Tangy I and II developments are operational at the proposed development location. This means there are currently twenty-two operational turbines with a tip height of 75 metres above ground level at the proposed development location.

18.4.2 The potential impact of the proposed development has been considered in the context of the existing turbines. This is appropriate because the goal is to capture any increase in impact caused by the proposed development relative to the existing baseline.

Designations

18.4.3 There are no relevant designations that affect the aviation analysis.

Future Baseline

18.4.4 No predicted changes to the current baseline have been incorporated into the analysis.

Summary

18.4.5 A summary of the receptors identified as being sensitive to the proposed development and which have been ‘scoped-in’ to the assessment are given in Table 18.7, together with the justification for inclusion:

| Table 18.7: Summary of Receptor Sensitivity | | |
|--|--------------------|---|
| Receptor | Sensitivity | Justification |
| Campbeltown Aerodrome Outer Horizontal Surface | Medium | This OLS is constructed to minimise potential collision risks and extends over the proposed development area. |
| Campbeltown Aerodrome DVOR | Medium | Navigation aids at this range can be affected by large wind turbines. |
| Instrument Flight Procedures | Medium | The presence of large obstructions near IFPs requires assessment to minimise risk to aircraft. |
| NATS DME | Medium | Navigation aids at this range can be affected by large wind turbines. |
| NATS Lowther Hill Radar | Medium | Radar performance can be affected by wind developments, the NATS Lowther Hill radar provides coverage in the area of the proposed development. |
| NATS Tiree Radar | Medium | Radar performance can be affected by wind developments, the NATS Tiree radar could provide coverage in the area of the proposed development. |
| Minimum Sector Altitudes | Medium | An MSA is affected by the elevation of obstacles in the area, MSAs are defined at the proposed development location. |
| Military Low Flying | Low | Military Low Flying takes place throughout the UK and potential effects due to large obstructions must be assessed. The ‘low’ sensitivity has been assigned based on the importance categories defined by the MOD for wind developments specifically. In other locations within the UK the sensitivity would be higher. |

18.5 Effects Evaluation

Basis of Assessment

Proposed Development Characteristics

- The technical analysis has been undertaken based on a turbine tip height of up to 149.9 metres above ground level.
- All assessments have been undertaken based on the ‘bare-earth’ case i.e. without consideration of screening from trees or buildings. This is the most conservative approach, particularly for radar line of sight assessments because additional obstructions would reduce the predicted impact of the proposed development.

Mitigation Measures

- No significant direct effects are predicted and consequently no mitigation is required.

Additional Good Practice

- 18.5.1 It is good practice to liaise with the relevant stakeholders, in this case HIAL and MOD, during the construction phase, where relevant. For example, the presence of tall cranes etc. should be communicated to HIAL and MOD when construction works are started.

Effects on Campbeltown Aerodrome Outer Horizontal Surface

Receptor Sensitivity – Campbeltown Aerodrome OHS

- This receptor sensitivity is classified as ‘**Medium**’.
- Infringements of an OHS can be operationally accommodated, in particular as the terrain itself at the proposed development location infringes the OHS.

Construction Effects – Campbeltown Aerodrome OHS

- 18.5.2 The impact magnitude during construction is classified as ‘**Minor**’. The terrain at the proposed development location infringes the OHS, as do the 22 existing Tangy I and Tangy II wind turbines. By definition, any turbine components or construction equipment at the site will comprise a further breach of this surface. However, this is highly unlikely to affect the aerodrome operationally because the situation will not be materially different than the current baseline.
- 18.5.3 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Ongoing and Operational Impacts on Campbeltown Aerodrome OHS

- 18.5.4 The impact magnitude during operation is classified as ‘**Minor**’. The terrain at the proposed development location infringes the OHS, as do the 22 existing Tangy I and Tangy II wind turbines. The proposed development will breach this surface by a greater margin than the existing turbines. However, this is highly unlikely to affect the aerodrome operationally because the situation will not be materially different than the current baseline.
- 18.5.5 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Secondary Effects on Campbeltown Aerodrome OHS

- 18.5.6 Secondary effects are not predicted.

Predicted Cumulative Effects on Campbeltown Aerodrome OHS

- 18.5.7 The effects of the proposed development have been considered in isolation.

Summary of Effects on Campbeltown Aerodrome OHS

- 18.5.8 The infringement of the OHS is not significant and does not require mitigation.

Effects on Campbeltown Aerodrome DVOR

Receptor Sensitivity

- This receptor sensitivity is classified as ‘**Medium**’.
- DVOR beacons emit radio signals that can be blocked or reflected by obstructions, including terrain. Such beacons are tolerant to certain levels of obstruction in the surrounding environment, for example the elevated terrain in the direction of the proposed development.

Construction Effects

- 18.5.9 The impact magnitude during construction is classified as ‘**Minor**’. There are no published procedures at Campbeltown Aerodrome that are reliant on the DVOR. Furthermore, the potential impact of the proposed development is only marginally greater than the impact of the existing turbines. Overall, the presence of the proposed development would not give rise to a significant change from the baseline conditions.
- 18.5.10 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Ongoing and Operational Impacts – Campbelltown Aerodrome

18.5.11 The impact magnitude during operation is classified as ‘**Minor**’. There are no published procedures at Campbelltown Aerodrome that are reliant on the DVOR. Furthermore, the potential impact of the proposed development is only marginally greater than the impact of the existing turbines. Overall, the presence of the proposed development would not give rise to a significant change from the baseline conditions.

18.5.12 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Secondary Effects on Campbelltown Aerodrome DVOR

18.5.13 Secondary effects are not predicted.

Predicted Cumulative Effects on Campbelltown Aerodrome DVOR

18.5.14 The effects of the proposed development have been considered in isolation.

Summary of Effects on Campbelltown Aerodrome DVOR

18.5.15 The infringement of the OHS is not significant and does not require mitigation.

Effects on Campbelltown Aerodrome Instrument Flight Procedures

Receptor Sensitivity – Campbelltown Aerodrome IFP

- This receptor sensitivity is classified as ‘**Medium**’.
- This is because any impacts that conflict with IFP safeguarding rules require the IFP to be changed.

Construction Effects – Campbelltown Aerodrome IFP

18.5.16 The impact magnitude during construction is classified as ‘**Negligible**’. This is because the proposed development will not conflict with the safeguarding criteria for the IFPs at Campbelltown Aerodrome.

18.5.17 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Ongoing and Operational Impacts on Campbelltown Aerodrome IFP

18.5.18 The impact magnitude during operation is classified as ‘**Negligible**’. This is because the proposed development will not conflict with the safeguarding criteria for the IFPs at Campbelltown Aerodrome.

18.5.19 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Secondary Effects on Campbelltown Aerodrome IFP

18.5.20 Secondary effects are not predicted.

Predicted Cumulative Effects on Campbelltown Aerodrome IFP

18.5.21 The effects of the proposed development have been considered in isolation.

Summary of Effects on Campbelltown Aerodrome IFP

18.5.22 The proposed development’s impact on the IFP is not significant and does not require mitigation.

Effects on NATS DME

Receptor Sensitivity – NATS DME

- This receptor sensitivity is classified as ‘**Medium**’.
- DME beacons emit radio signals that can be blocked or reflected by obstructions, including terrain. Such beacons are tolerant to certain levels of obstruction in the surrounding environment, for example the elevated terrain in the direction of the proposed development.

Construction Effects – NATS DME

18.5.23 The impact magnitude during construction is classified as ‘**Minor**’. The terrain at the proposed development location infringes the OHS, as do the 22 existing Tangy I and Tangy II wind turbines. By definition, any turbine components or construction equipment at the site will comprise a further breach of this surface. However, this is highly unlikely to affect the aerodrome operationally because the situation will not be materially different than the current baseline.

18.5.24 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Ongoing and Operational Impacts on NATS DME

18.5.25 The impact magnitude during operation is classified as ‘**Minor**’. The elevated terrain in the direction of the proposed development will already affect the DME’s performance. The potential impact of the proposed development is only marginally greater than the impact of the existing turbines. Overall, the presence of the proposed development would not give rise to a significant change from the baseline conditions.

18.5.26 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Secondary Effects on NATS DME

18.5.27 Secondary effects are not predicted.

Predicted Cumulative Effects on NATS DME

18.5.28 The effects of the proposed development have been considered in isolation.

Summary of Effects on NATS DME

18.5.29 The impact on the NATS DME is not significant and does not require mitigation.

Effects on NATS Lowther Hill Radar

Receptor Sensitivity – NATS Lowther Hill Radar

- This receptor sensitivity is classified as ‘**Medium**’.
- Radar are designed to operate in a dynamic environment. The NATS En-Route radar network is able to accommodate many obstructions (including wind developments) within its areas of coverage.
- The NATS Lowther Hill Radar can therefore be described as having moderate capacity to absorb change without significantly altering its present character.
- The NATS Lowther Hill Radar comprises a Primary Surveillance Radar (PSR) and a collocated Secondary Surveillance Radar (SSR). The SSR would not be affected due to the separation distance, and the assessment has focussed on the PSR.

Construction Effects – NATS Lowther Hill Radar

18.5.30 The impact magnitude during construction is classified as ‘**Negligible**’. Any effects on the radar would be caused by the spinning rotor of a turbine within radar line of sight. Whilst the turbines are not rotating, there will be no perceptible impact on the radar.

18.5.31 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Ongoing and Operational Impacts on NATS Lowther Hill

18.5.32 The impact magnitude during operation is classified as ‘**Negligible**’. Only one of the sixteen turbines is predicted to be within radar line of sight by a margin of less than two metres. Due to the separation distance of more than 100 kilometres, perceptible impacts are not predicted.

18.5.33 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Secondary Effects on the NATS Lowther Hill Radar

18.5.34 Secondary effects are not predicted.

Predicted Cumulative Effects on the NATS Lowther Hill Radar

18.5.35 The effects of the proposed development have been considered in isolation.

Summary of Effects on the NATS Lowther Hill Radar

18.5.36 The potential impact on the NATS Lowther Hill Radar is not significant and does not require mitigation.

Effects on NATS Tiree Radar

Receptor Sensitivity – NATS Tiree Radar

- This receptor sensitivity is classified as '**Medium**'.
- Radar are designed to operate in a dynamic environment. The NATS En-Route radar network is able to accommodate many obstructions (including wind developments) within its areas of coverage.
- The NATS Tiree Radar can therefore be described as having moderate capacity to absorb change without significantly altering its present character.
- The NATS Tiree Radar comprises a Primary Surveillance Radar (PSR) and a collocated Secondary Surveillance Radar (SSR). The SSR would not be affected due to the separation distance, and the assessment has focussed on the PSR.

Construction Effects – NATS Tiree Radar

18.5.37 The impact magnitude during construction is classified as '**Negligible**'. Any effects on the radar would be caused by the spinning rotor of a turbine within radar line of sight. Whilst the turbines are not rotating, there will be no perceptible impact on the radar.

18.5.38 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Ongoing and Operational Impacts on NATS Tiree Radar

18.5.39 The impact magnitude during operation is classified as '**Negligible**'. The NATS Tiree Radar will not have radar line of sight to the proposed development and no impacts are predicted.

18.5.40 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Secondary Effects on the NATS Tiree Radar

18.5.41 Secondary effects are not predicted.

Predicted Cumulative Effects on the NATS Tiree Radar

18.5.42 The effects of the proposed development have been considered in isolation.

Summary of Effects on the NATS Tiree Radar

18.5.43 The potential impact on the NATS Lowther Hill Radar is not significant and does not require mitigation.

Effects on Minimum Sector Altitudes

Receptor Sensitivity – Minimum Sector Altitudes

- This receptor sensitivity is classified as '**Medium**'.
- An MSA is designed to ensure an aircraft maintains sufficient clearance above obstacles in the area. If this clearance cannot be maintained, the MSA must increase.

Construction Effects – MSA

18.5.44 The impact magnitude during construction is classified as '**Negligible**'. The MSA to the north of Campbeltown Aerodrome is between 3,700 and 4,000 feet above mean sea level. The maximum turbine blade tip within the proposed development will be approximately 1,212 feet above mean sea level. The required clearance is 300 metres (984 feet). No turbine components or cranes are predicted to affect the MSA during construction.

18.5.45 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Ongoing and Operational Impacts on MSA

18.5.46 The impact magnitude during construction is classified as '**Negligible**'. The MSA to the north of Campbeltown Aerodrome is between 3,700 and 4,000 feet above mean sea level. The maximum turbine blade tip within the proposed development will be approximately 1,212 feet above mean sea level. The required clearance is 300 metres (984 feet).

18.5.47 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Secondary Effects on MSA

18.5.48 Secondary effects are not predicted.

Predicted Cumulative Effects on MSA

18.5.49 The effects of the proposed development have been considered in isolation.

Summary of Effects on MSA

18.5.50 No impacts on the MSA are predicted and no mitigation is required.

Effects on Military Low Flying

Receptor Sensitivity – Military Low Flying

- This receptor sensitivity is classified as '**Low**'.
- Military Low Flying takes place throughout the UK. In some areas, such as Tactical Training Areas, obstacles must be very carefully managed, and development of tall structures can be highly restricted. By contrast, the area containing the proposed development is not a high priority for Military Low Flying.
- The Military Low Flying areas can therefore, in this context, be described as tolerant of change without detriment to its character.

Construction Effects – Military Low Flying

18.5.51 The impact magnitude during construction is classified as '**Negligible**'. The proposed development is located in a 'low priority low flying area less likely to raise concerns'. Furthermore, the existing turbines at the site location are not affecting Military Low Flying, and the MOD responded to the scoping consultation to confirm no objection to proposals for sixteen turbines with a height of 149.9 metres at the proposed development location.

18.5.52 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Ongoing and Operational Impacts on Military Low Flying

18.5.53 The impact magnitude during construction is classified as '**Negligible**'. The proposed development is located in a 'low priority low flying area less likely to raise concerns'. Furthermore, the existing turbines at the site location are not affecting Military Low Flying, and the MOD responded to the scoping consultation to confirm no objection to proposals for sixteen turbines with a height of 149.9 metres at the proposed development location.

18.5.54 The resulting significance of impact, in accordance with Table 18.6, is **Minor** and **not significant**.

Predicted Secondary Effects on Military Low Flying

18.5.55 Secondary effects are not predicted.

Predicted Cumulative effects on Military Low Flying

18.5.56 The effects of the proposed development have been considered in isolation.

Summary of Effects on Military Low Flying

18.5.57 No impacts on Military Low Flying are predicted and no mitigation is required.

18.6 Monitoring

18.6.1 No monitoring requirements have been identified.

18.6.2 No mitigation monitoring requirements have been identified, because no mitigation measures are required.

18.7 Summary

18.7.1 No significant aviation impacts are predicted. No mitigation requirement has been identified.

18.7.2 Table 18.8 summarises the assessment results for each receptor.

| Table 18.8: Summary of Assessment Findings | | | | |
|---|--------------------|----------------------------|-------------------------------|-------------------------------|
| Receptor | Sensitivity | Magnitude of Impact | Significance of Impact | Mitigation Requirement |
| Campbeltown Aerodrome Outer Horizontal Surface | Medium | Minor | Minor | None |
| Campbeltown Aerodrome DVOR | Medium | Minor | Minor | None |
| Instrument Flight Procedures | Medium | Negligible | Minor | None |
| NATS DME | Medium | Minor | Minor | None |
| NATS Lowther Hill Radar | Medium | Negligible | Minor | None |
| NATS Tiree Radar | Medium | Negligible | Minor | None |
| Minimum Sector Altitudes | Medium | Negligible | Minor | None |
| Military Low Flying | Low | Negligible | Minor | None |

18.8 References

- Civil Aviation Authority (2014), CAP 168 Licensing of Aerodromes, Edition 10.
- Civil Aviation Authority (2017), CAP 777 Licensing of Aerodromes, Version 4.
- Civil Aviation Authority (2016), CAP 764 Policy and Guidelines on Wind Turbines, Version 6.
- ICAO (2006), Procedures for Air Navigation Services, Aircraft Operations, Volume II. Construction of VISUAL AND Instrument Flight Procedures, Fifth Edition.
- NATS AIP (digital resource, various publication dates).

