

A6

**Waterford Regional Airport
& Business Park Masterplan**



Appendix A6

Waterford Regional Airport & Business Park



Masterplan

Waterford County Council



February 2011

1.0 Introduction

Waterford Airport and Business Park is located approximately 9km to the south east of the Gateway City of Waterford and 5km north east of Tramore. Since opening its doors in 1981, the Airport has, through a combination of both State and private capital investment, continually improved both the level of services available and the transport experience for its passengers. The Airport now provides a variety of passenger and general aviation services for the South East Region, and in particular caters for private business aircraft, leisure and training flights. The Airport's infrastructure also supports a range of other activities which include a Pilot Training College, an International Academy of Travel, an Irish Coastguard Sikorsky helicopter hanger, an aircraft maintenance centre and a number of small aviation related businesses. Waterford Airport intends to build on its success and provide further valuable air links to and from the South East Region, providing convenient flights for business, leisure and tourism traffic. This Master Plan provides a blueprint for the future development of the Airport and its environs, which aims to ensure that the Airport is ideally placed to play a key role in the continued development of both County Waterford and the South East Region.

The Airport Business Park is located on Light Industrial zoned lands to the immediate south of Waterford Airport. The 138 acre park has seen rapid development over the last decade and it now provides developers with the option of either serviced sites or purpose built office units. Wireless broadband services and Voice over IP (VoIP) technologies are available at the business park.

1.1 Strategic Context

Waterford Airport is a key component of the transport infrastructure in the South East Region and is central to the future development of both the County and the Gateway. The availability of convenient and increasingly frequent air services increase connectivity and assists in attracting tourists to the Region. This service and proximity to the Airport Business Park assists in attracting inward investment and harnessing competitive advantage. The completion of the M9 Motorway, the Waterford City Bypass and the improvements to the Rosslare to Cork Euro Route will result in shorter travel times to the Airport from the major urban centres in the Region (i.e. Carlow, Clonmel, Dungarvan, Kilkenny, Waterford and Wexford) thus further increasing its attractiveness.

The Airport's mission statement is:

“To serve local and regional air transport needs in the South East, providing connectivity for citizens, business users and the inbound tourist market in a safe environment, to act as a local hub for air transport activity and to act as an energiser for business activity in the region.”¹

The Council recognises the strategic importance of Waterford Airport to the future development of the County and the South East Region, its central role in increasing the critical mass of the Waterford Gateway, and the improvement to the overall connectivity of the Region.

1.2 Policy Context

The National Development Plan, in seeking to address infrastructural deficits in the National Spatial Strategy Gateway areas recognises the importance of the upgrading of facilities at Waterford Airport. As such, with the aid of Transport 21 and Air Transport Sub-Programme funding, Waterford Regional Airport plc aims to further enhance their service base through engaging in ambitious capital investment programmes. These programmes include the extension of the runway to accommodate jet aircraft and the development of cargo facilities to support local industry. These developments will allow the airport to access a range of additional business opportunities, reduce its dependency on Government support and enhance its potential to attract additional investment and employment opportunities to the area.

The Regional Planning Guidelines for the South East Region (RPGs) supports the future expansion and upgrading of airport infrastructure together with improvements to the accessibility of the Airport, including by public transport and the development of economic and commercial business are also recognised. It is an objective of the guidelines to deliver enhanced regional accessibility via air services, building particularly on the important regional asset of Waterford Airport and its associated infrastructure.

The Waterford Planning, Land Use and Transportation Strategy (PLUTS) views the Airport as a regional asset which has the capacity to provide direct air links between the South East and major

¹ Waterford Airport Going Further, Draft Business Plan, July 2009

airline hubs in the UK and Europe. The strategy sees the diversification of the role of the Airport as a key facilitator to its future success.

1.3 Airport and Business Park Development

Waterford Airport opened in December 1981 with a 1,200 metre runway that could accommodate single and twin-engine light aircraft. The Airport now has a runway that is 1,433 metres long and 30 metres wide, and is classed as a Code 2 facility in terms of the International Civil Aviation Organisation (ICAO) Annex 14 standards. There are 2 aprons at the Airport, one serving the Sea Air Rescue Facility and one adjacent to the Terminal building. There are 200 car parking spaces directly adjacent to the Terminal building.

Aer Arann has been the main flight carrier at the Airport since 2003. With the 4 destinations of Birmingham, London Luton, Lorient and Manchester, the Airport strives to serve both local and regional transport needs and to act as an energiser for business activity in the region. With this increase in destination locations available to customers, the airport facilitated 143,645 passengers in 2008, which represented a 24% increase on 2007 figures, and an even greater increase on previous years.

The genesis of the Business Park was due to its location adjacent to the Airport. It was proposed to channel development into the Park which would benefit from the close proximity of the airport. To acknowledge the existing development, the area was zoned for Light Industrial use in the 2005 County Development Plan. The Business Park area has since been increased with a number of permissions granted in the last Plan period. The total area of the Business Park is 138.6 hectares. To date, a variety of uses have been permitted within the industrial park. These uses include manufacturing, warehousing, office, light industry and heavy industry. These uses are primarily of a low added value and have little, if any, connection with the Airport. There is a need to refocus the type of development which is channelled into this area.

1.4 Infrastructure

1.4.1 Wastewater

There is no public sewerage scheme in the area. Wastewater is treated on site and stormwater is attenuated and disposed of by the developers.

There have been a number of issues with stormwater in the Business Park in the recent past, as much of the adjoining land is below the level of high tide therefore resulting in flooding. An existing drain/sluice follows the natural topography south under Barnaboy Bridge to the Tramore backstrand, where it disperses. Planning permission has been granted for a dry pond for water attenuation to the northern end of the water sluice/drain.

1.4.2 Water

The Airport and Business Park is served by the East Waterford Water Supply. It is considered that there is sufficient capacity to serve the development of the area. For emergency requirements, a supply of water is drained from the public supply over a 2 week period and is stored on site. This gradual extraction from the public water supply is necessary to ensure sufficient capacity or pressure to supply the Airport or Business Park in the event of an emergency.

1.4.3 Energy Supply

The ESB operates a 20kv power line along the route of the R875 & R685 and along part of the R708 adjacent to the site. There is also a 38kv network line running from Tramore to Butlerstown. The proximity of 3 no. 100kv stations at Butlerstown, Killoteran and Waterford suggests a reasonably reliable electricity supply to the industrial lands. There is currently no gas supply serving the Industrial Park. A feasibility study into the possible connection of the Airport and Business Park into the National gas supply network would be welcomed by the Council.

1.4.4 Road Network

The Airport and Business Park is served by the R708, which connects the R685 Tramore/Dunmore Road to the south to the Waterford Ring Road to the north. They are located 9km from Waterford City and Bellview Port and 5km from Tramore. Rosslare Port and Cork Port are located 85km and 137km away, respectively.

The Airport Road (R708) has been realigned resulting in substantial improvements in terms of accessibility and road safety. Whilst the R685 (link road from Tramore) is narrow and substandard for the purpose of serving a regional airport and business park, there are proposals for its upgrading under the Ballinattin masterplan.

There are currently no public transport links to the Airport or Business Park.

1.4.5 Broadband

A feasibility study into the possible fibre optic connection to the metropolitan network would be welcomed by the Council.

1.5 Constraints on Development

Appendix 1 provides details on the control zones surrounding the Airport. It is the policy of the Council to protect the Airport and surrounding lands from inhibiting or non-compatible development. To this end, the development of lands in the vicinity of the Airport for industrial/commercial development must be mindful of its location adjacent to the Airport so as not to obstruct the safe and effective operation of the Airport function. The restrictions set out in Appendix 1 will apply to any applications for development within the Airport Control Zones.

To further enhance the safety of residents in the area, the Council supports the establishment of Public Safety Zones at Waterford Airport.

1.6 Development Strategy

1.6.1 Waterford Regional Airport

The Council supports the development objectives of Waterford Regional Airport plc for the future development of the airport which are to:

- Increase the competitiveness of the South East Region and promote the balanced development of the Region in accordance with the National Spatial Strategy;
- Promote the accessibility and attractiveness of the Region for both business and inbound tourism;
- Improve transport infrastructure for South East Region; and
- Provide and promote cargo facilities to support industry and inward investment in the Region.

Waterford Regional Airport plc proposes to extend the current runway from 1,433 metres to 1,850 metres and in the longer term to 2,288 metres, and to expand the size to the terminal building to handle increased passenger numbers. All future development works will be designed to ensure full compliance with both the Irish Aviation Authority and international aviation safety standards. The airport also intends to develop facilities for visiting and locally based aircraft.

As the Airport develops and there is a subsequent increase in demand for surface transport facilities, the Council in conjunction with Waterford Regional Airport plc will liaise with bus operators to develop a public transport link between Waterford City and the Airport and Business Park.

Policy Airport 1

The Council will support and co-operate with the relevant authorities, government agencies, businesses and interest groups to improve access to the Airport and to facilitate the appropriate development at the Airport.

Objective Airport 1

To assist the future expansion of services and routes at the Airport, the Council support the lengthening and widening of the runway.

1.6.2 Business Park

The type of development which has taken place to date in the Business Park has been quite mixed. There has been a gradual shift away from airport dependent enterprises to a more general industrial use. The Regional Planning Guidelines recognise that the types of industries that now offer long-term prospects for generating revenues are in the new technologies and knowledge based areas such as Information and Communications Technology, Medical Devices, Biotechnology, Pharmaceuticals, the Green Economy and Renewable Energy. There is also a need to refocus on channelling airport-related industries and those with specific locational requirements to be close to the Airport into the Business Park. However activities which would cause atmospheric obscuration, attract bird concentrations, or cause other nuisance or hazards so as to obstruct the safe and effective operation of the Airport function shall be excluded. The Council will encourage the development of industries which engaged in activities that are complementary to the role of the Airport.

1.6.3 Zoning

To allow for the future expansion of both the Airport and Business Park, 3 distinct Land Use zones have been identified: the Airport Area, the Airfield Reserve Area and the Light Industrial Area.

**Airport Area**

To provide for Airport related activities including passenger terminal buildings and services, airside retail, hotel, airport infrastructure, hangerage, storage, maintenance and ancillary facilities, park & ride, transport depot, training facilities, storage depot, warehouse, offices and light industrial/enterprise units.

**Airfield Reserve Area**

To allow for the future extension of the runway facilities and to provide for the possible future realignment of the R685 Road. This area should be reserved free from inappropriate development which may prejudice the future expansion of the Airport.

**Light Industry**

To provide for Light Industrial/Enterprise Development.

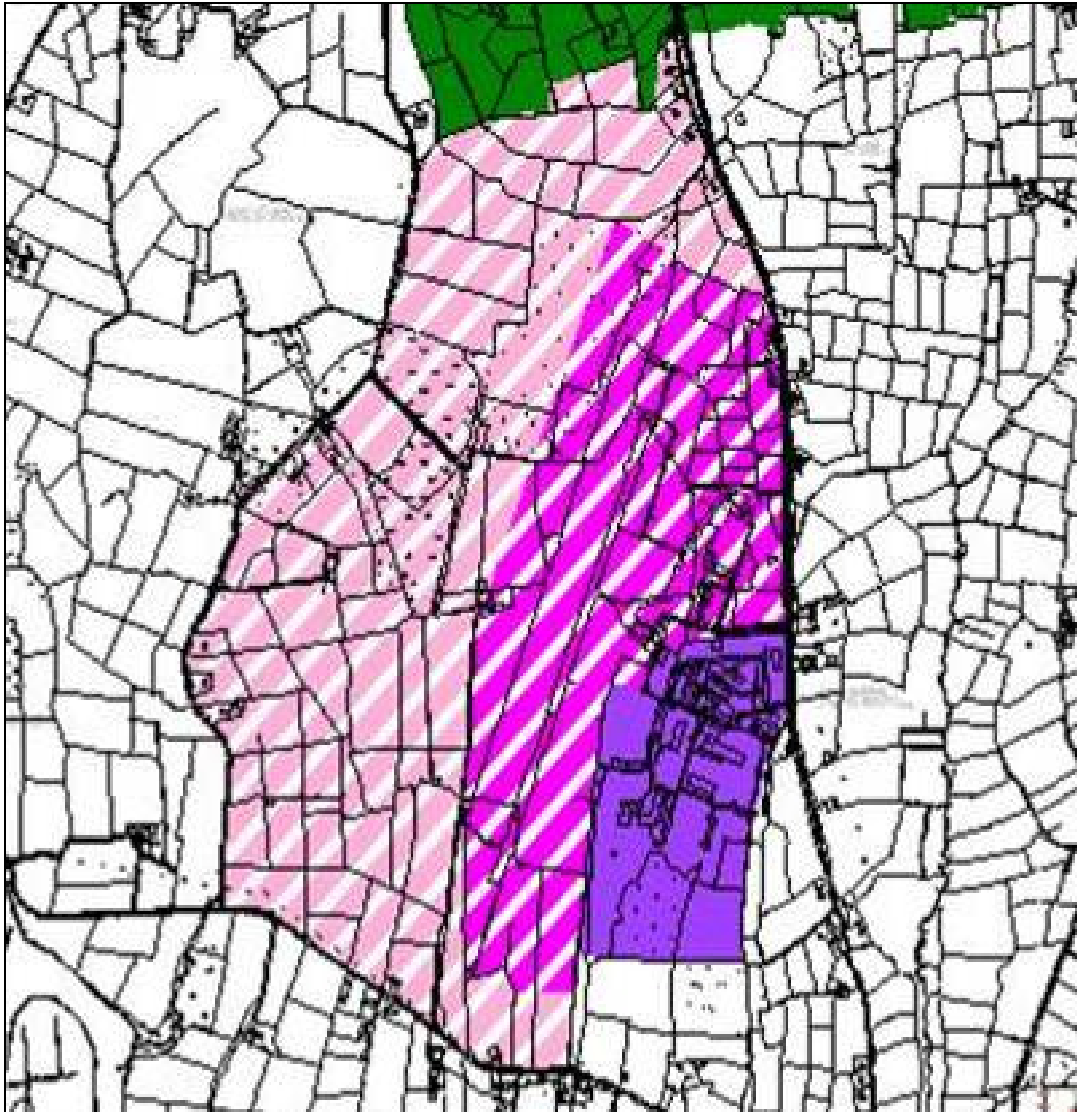


Figure 1 – Zoning Map – County Development Plan 2011-2017

1.7 Development Management

1.7.1 Design, Layout and Materials

All future development works at Airport and Business Park shall be in compliance with Appendix 1 - *Airport Control Zone – Explanatory Notes for Development Control in the Vicinity of Waterford Airport* and the Development Standards set out in Chapter 10 of the County Development Plan. In the application of this guidance material, the more stringent requirement will always apply.

1.7.2 Noise

Noise is a concern for persons living under flight paths or in close proximity to the Airport. Air noise refers to noise from aircraft in flight or on the runway during take off or after landing. Ground noise is other types of noise generated at the Airport such as the ground running of aircraft engines. To minimise both air and ground noise associated with the Airport, future planning applications should address Airport noise mitigation measures.

1.7.3 Natural Heritage

The Tramore Dunes and Back Strand are located approximately 1.2km to the south of the Airport and Business Park. This area is designated as a Special Area of Conservation (SAC), a Special Protection Area (SPA) and is also a proposed Natural Heritage Area (pNHA). In assessing both Airport and Business Park development proposals the Planning Authority will have due regard to any potential adverse impacts such proposals may have on this area.

An Appropriate Assessment will be carried out at project level to ensure that there is no negative impact on the integrity (defined by the structure and function and conservation objectives) of the Natura 2000 site at Tramore Dunes and Backstrand and that the requirements of Articles 6 (3) and (4) of the EU Habitats Directive 92/43/EEC are fully satisfied.

1.7.4 Landscaping

Landscaping is a particularly important issue for Waterford Airport and Business Park due to the exposed and elevated nature of the area. Future development proposals at the Airport and Business Park shall be required to prepare landscape management plans that reduce the visual impact of development on the landscape. For reasons of aviation safety, deterring birds from the airfield is an important landscaping consideration.

1.7.5 Referrals of Planning Applications

Applications in the vicinity of the Airport will be referred to the Irish Aviation Authority for comment to ensure that proposed development does not have adverse technical or other implications for the safety and/or normal operation of the Airport.

APPENDIX 1: AIRPORT CONTROL ZONES

The purpose of this document is to provide Waterford County Council and the public, information to ensure that the lands surrounding the airport can be protected through the application of development and land use controls, so that the operation and future development of Waterford Airport can be safeguarded. This document defines the required land use protection for lands adjacent to and surrounding the airport in terms of protection against erection of obstacles that are hazardous to aviation, the presence of features and activities that have a negative effect upon propagation of radio frequency emissions from air navigation aids which are necessary for safe and accurate navigation in the airspace of Waterford Airport, and guide proper land uses for lands potentially subject to aircraft noise.

1.0 LAND PROTECTION FROM AIRCRAFT NOISE IMPACT

1.1 Aircraft Noise & Land Use Impacts

To protect the public from the adverse effects of aircraft noise, it is important to control development of certain land uses within those lands that potentially would be subject to various levels of aircraft noise. This will protect the community by ensuring that no new land uses are permitted that could cause disturbance to residents and users of those lands.

Contours of expected levels of aircraft noise have been developed and provide an illustration of the extent and location of areas that are potentially affected by specific aircraft noise levels. The noise contours are developed on the basis of forecasted aircraft movements at the airport for a peak period of operation using the internationally recognized Integrated Noise Model (INM) developed by the US Federal Aviation Administration.

The metric for aircraft noise disturbance applied in Ireland is the LAeq model. Using the UK Planning Policy Guidance 24: Planning and Noise, and information contained within the Dublin Airport Environmental Impact Statement (prepared for the development of the proposed new North Runway at Dublin Airport) as guidance for the protection of lands subjected to aircraft noise, land use zoning requirements were established for land areas around the Waterford Airport that would be affected by various levels of aircraft noise emissions. The premise for land use zoning within the aircraft noise lands is that certain human activities can be permitted to exist, and to be developed further, where the predicted future level of aircraft noise would not cause serious noise disturbance, or result in adverse effects on the health of those living or working in areas subject to aircraft noise emissions.

Areas in which serious noise disturbance or mental health effects might be predicted to arise as a result of aircraft noise, would be classed as restricted, or even prohibited, from further development for human activities.

The following table, Table 1-1, lists the typical land uses permitted within areas affected by specific noise levels and should be read in conjunction with Map A-1.

Table 1 -1: Typical Land Uses Permitted within Specific Noise Contour Levels

Aircraft Noise Contour	Permitted Uses and Development
< 57 dBA	Residential Outdoor Recreational Facilities Commercial Public Facilities Municipal Utilities Industrial Transportation Agriculture
57-63 dBA	Limited Outdoor Recreation Facilities Commercial Limited Public Facilities Municipal Utilities Industrial Transportation Agriculture
63-69 dBA	Limited Outdoor Recreation Facilities Commercial Municipal Utilities Industrial Transportation Agriculture
> 69 dBA	Limited Outdoor Recreation Facilities Limited Commercial Municipal Utilities Industrial Transportation Agriculture

Guidance on aircraft noise and land uses within lands around an airport that prevail in the UK specifies that development should not occur in a noise contour band where predicted noise levels could be greater than 72 dBA. Noise modelling carried out for Waterford Airport, based on forecasted air traffic levels, suggests that this level of aircraft noise emission would not affect any of the lands outside the airport, and would be confined to the immediate area of the runway.

2.0 OBSTACLE LIMITATION SURFACES PROTECTION

2.1 Definition of Protected Obstacle Limitation Surfaces

Ireland has adopted the Standards and Recommended Practices of the International Civil Aviation Organization (ICAO) to control the existence and erection of obstacles to aviation that might endanger aircraft in flight. Under regulations established for this purpose, all public airports are to be safeguarded against erection of obstacles in accordance with Obstacle Limitation Surfaces

(OLS) that restrict or prohibit obstacles around an airport, and especially within the safety-critical areas off the ends of the runway that serve to protect the runway approach and take-off operations.

The OLS are imaginary planes that define the maximum allowable height of obstacles within the approach and take-off areas of the runway (Approach and Take-Off Surfaces), along the sides of a runway strip (Transitional Surfaces), and for a distance around the airport (Inner Horizontal and Conical Surfaces). No obstacles are permitted to penetrate these surfaces unless a valid safety case can be made ensuring that aircraft will not be in danger should an obstacle protrude through the OLS.

The OLS specifications reflect the code of the runway, whether the runway has instrument guidance for approach and landing, and whether that guidance is provided in the vertical plane or not. In the case of Waterford Airport, the ultimate runway is classed as an ICAO Code 4 Runway with a precision instrument approach, which means that the protection required by means of the

Obstacle Limitation Surfaces is defined as outlined below². (The OLS referred to in this section as necessary for the protection of Waterford Airport are also illustrated in Map A-2.)

² The limits of the OLS are defined in Annex 14 to the Chicago Convention on International Civil Aviation, to which Ireland is a signatory state.

Runway Approach Surface – Runway 03 (Southern Approach Area):

- Commences 60m beyond the location of the displaced runway threshold for Runway 03, with an initial width of 300m
- Comprises three sections:
 - 1st Section: Length 3000m, sloping upward at 2% from 26.15m ASL at the runway up to 86.15m ASL at the end of the first section.
 - 2nd Section: Length 3600m, sloping upward at 2.5% from 86.15m ASL to 176.15m ASL.
 - 3rd Section: Length 8400m, horizontal at 176.15m ASL.
- The Approach Surface diverges at 15% from its original width of 300m along its entire length of 15,000m.

Runway Approach Surface – Runway 21 (Northern Approach Area):

- Commences 60m beyond the location of the displaced runway threshold for Runway 21, with an initial width of 300m
- Comprises three sections:
 - 1st Section: Length 3000m, sloping upward at 2% from 40.15m ASL at the runway surface to 100.15m ASL at the end of the first section
 - 2nd Section: Length 3600m, sloping upward at 2.5% from 100.15m ASL to 190.15m ASL
 - 3rd Section: Length 8400m, horizontal at 190.15m ASL
- The Approach Surface diverges at 15% from its original width of 300m along its entire length of 15,000m

Runway Take-Off Surface – Runway 03 (Northern Take-Off Area):

- Commences 60m beyond the Runway 21 threshold with an initial width of 180m
- Slopes upward at 2% from an elevation of 40.15 m ASL at the runway surface to 340.15m ASL.
- Diverges at a rate of 12.5% until a final width of 1200m is achieved, and thereafter maintains a final width of 1200m.
- Take-off surface has an overall length of 15,000m.

Runway Take-Off Surface – Runway 21 (Southern Take-Off Area):

- Commences 60m beyond the Runway 03 threshold with an initial width of 180m
- Slopes upward at 2% from an elevation of 26.15m ASL at the runway surface to 326.15m ASL
- Diverges at a rate of 12.5% until a final width of 1200m is achieved, and thereafter maintains a final width of 1200m.
- Take-off surface has an overall length of 15,000m

Transitional Surfaces:

- Have a lower edge established along the runway strip and along the edges of the Approach Surfaces
- Slope upward and outwards at a rate of 14.3% (1:7) from the edge of the runway strip for a vertical height of 45m above the elevation of the lowest threshold.
- The top of the Transitional Surfaces lie in the Inner Horizontal Surface at 71.15m ASL.

Inner Horizontal Surface:

- A horizontal plane located 45m above the lowest runway threshold having a radius of 4000m from each runway end;
- The elevation of the Inner Horizontal Surface for Waterford Airport is set at 71.15m ASL.

Conical Surface:

- The Conical Surface rises from the edge of the Inner Horizontal Surface for a vertical height of 100m above the elevation of the IHS.
- The Conical Surface for Waterford Airport has a lower edge elevation of 71.15m ASL rising at a slope of 5% to a top elevation of 171.15m ASL around its periphery.

2.2 Instrument Approach and Missed Approach Protection

In addition to the established OLS surfaces and the obstacle protection required for them, the instrument approach procedures in place at an airport also have a need for protection against

the effects of obstacles on flight operations. The obstacle surfaces applicable to an instrument approach based on an instrument landing system (as exists at Waterford Airport) are, for the most part, coincidental with the Annex 14 OLS. However, the ILS Missed Approach and ILS Transitional Surfaces protect a greater area of airspace than the basic Annex 14 OLS, and these establish additional obstacle protection surfaces for the runway. These surfaces are included in the OLS chart attached – Map A-2.

The airport must apply the ICAO Annex 14 OLS for the purposes of airport licensing and certification, and apply the ILS protection surfaces on top of these in order to protect the integrity of the ILS instrument approach established for Runway 21 at Waterford Airport.

The obstacle protection surfaces required to protect the ILS Approach have the following characteristics:

ILS Approach Surface:

- The ILS approach surface is coincidental with the established Annex 14 OLS surface for the airport, as described above.

ILS Missed Approach Surface:

- Commences 900m from the approach runway threshold;
- Has an initial width equal to the runway strip (300m);
- Slopes upward at a rate of 2.5% from 26.15m ASL to 326.15m
- Achieves a final length of 12,000m; and
- Diverges on both sides at a rate of 17.48% for a length of 1800m. thereafter, a 25% divergence is applied.

ILS Transitional Surface:

- Is established between the approach and missed approach surfaces, along
- the edge of the runway strip;
- Slopes upward at a rate of 14.3% (1:7); and
- Achieves a final height of 326.15m ASL

2.3 Obstacle Limitation Surface Protection

In the following section the required obstacle protection areas at and around Waterford Airport, and the limitations to be applied on the maximum height of obstacles existing or erected within these areas, are defined.

It should be noted that while the OLS establish the maximum elevation to which an obstacle may be erected within the various OLS areas, this does not mean that it is always safe to erect obstacles to the maximum permitted elevation, or to erect any obstacles. A proliferation of obstacles, even when fully compliant with the OLS, would be undesirable in the vicinity of an airport. Where an application is made to erect an obstacle within one of the protected OLS areas, reference will be made to the Irish Aviation Authority so that an aeronautical assessment may be made of the effect that such an obstacle may have on the safety of flight operations at the airport.

Map A-2 illustrates the location and extent of the required obstacle limitation surfaces, within which assessment and control of obstacles is required under the applicable aviation regulations.

2.3.1 Sections 1 & 2 (Inner Horizontal Surface)

Within this zone the following are not permitted:

1. Buildings or structures exceeding the maximum height of the Inner Horizontal surface (71.15m ASL);
2. Facilities that may attract wildlife, especially birds, due to the proximity of low altitude aircraft operations

NOTE: No building or structure exceeding 25m in height should be erected within this area without consultation with the airport.

2.3.2 Sections 3 & 4 (Conical Surface)

Within this zone the following are not permitted:

1. Building or structures that exceed the allowable maximum elevation at a specified point in the conical surface as defined in Section 2.0.

2. Facilities that may attract wildlife, especially birds, due to the proximity of low altitude aircraft operations.

NOTE: No building or structure exceeding 40m in height should be erected within this area without consultation with the airport.

2.3.3 Sections 5 & 6 (Approach & Take-Off Surfaces – Sloping Sections)

Within this zone the following are not permitted:

- 1 Building or structures that exceed the maximum allowable elevation at a specified point within the approach or take-off surfaces as defined in Section 2.0;
- 2 Facilities that may attract wildlife, especially birds, due to the proximity of low altitude aircraft operations;
- 3 Buildings and structures constructed in compliance with the obstacle limitations of these surfaces may still pose a hazard to aircraft operations and all planning applications for buildings within the airport approach and take-off areas should be assessed in consultation with the airport.
- 4 Facilities that would increase the severity of an aircraft incident or accident, even though these facilities do not in themselves pose a safety hazard to aircraft operations. For example, sporting complexes that would accommodate large numbers of visitors should not be located within an approach or take-off area, even if the height of the structure is not in violation of the OLS.

NOTE: Noise contours and their associated uses should also be consulted when assessing land use for lands lying within Sections 5 and 6.

2.3.4 Sections 7 & 8 (Approach & Take-Off Surfaces – Horizontal Section)

Within this zone the following are not permitted:

- 1 Building or structures that exceed the elevation of the horizontal section of the approach surface.
- 2 Buildings or structure exceeding 15m in height should not be erected within this area without consultation with the airport.
- 3 Buildings and structures that may affect visibility or operations but which are constructed adjacent to but outside these areas may still pose a hazard to aircraft operations. Any

application for planning permission for lands on the edges of, but immediately adjacent to, the approach and take-off areas should be referred to the airport for consideration as to their potential impact on flight safety.

- 4 Facilities that may attract wildlife, especially birds, due to the proximity of low altitude aircraft operations should not be permitted.

2.3.5 Sections 9 & 10 (Transitional surfaces)

Within this zone the following are not permitted:

- 1 Buildings or structures that exceed the permitted elevation of the transitional surfaces should not be permitted in these areas;
- 2 Buildings or structures that exceed 25m in height should not be erected beneath a runway transitional surface;
- 3 Facilities that may attract wildlife, especially birds, due to the proximity of low altitude aircraft operations should not be permitted within an area restricted by a runway transitional surface

2.3.6 Sections 11 & 12 (ILS Transitional Surfaces)

Within this zone the following are not permitted:

1. Buildings or structures that exceed the permitted elevation of the ILS transitional surfaces.

2.3.7 Sections 13 & 14 (ILS Missed Approach Surface)

Within this zone the following are not permitted:

- 1 Buildings or structures in a location that results in their top elevation exceeding the permitted obstacle limitation surface for the ILS Missed Approach operation.

3.0 PUBLIC SAFETY ZONES

Public Safety Zones (PSZs) are areas beyond the ends of airport runways in which some form of land use control is deemed to be necessary in order to protect the public against the accident risk arising from overflying aircraft failing to remain airborne and impacting inside the high risk areas off the ends of a runway. The zones themselves are defined by contours of

individual risk and are created by computer modelling to map individual third party risk exposure for the nature and level of aircraft operations forecast for any particular runway, as well as the frequency of crash accidents and their consequences. Land uses within the Public Safety Zones are required by law to be controlled by planning authorities.

The shape of the PSZ is reflective of an “inverted triangle” due to the method in which risk is calculated and mapped. The base of the triangle is located along the runway threshold and represents a larger area of land due to the greater risk of an accident closer to the end of a runway. The tip, or apex, of the triangle is located farthest from the runway and represents the least amount of land protection due to the lower level of accident risk arising in this area.

Map A-3 displays the PSZ contours applied for Waterford Airport.

The Public Safety Zones developed for Waterford Airport do not have any major development located within the two risk contour bands. The land beyond the ends of the runway is mostly used for agricultural purposes with sporadic dwellings and farm structures. As the implementation of the Public Safety Zones are not retro-active, existing dwellings are permitted to remain within the PSZ.

4.0 PROTECTION FOR NAVIGATIONAL AIDS

Waterford Airport currently has an instrument approach system that comprises an Instrument Landing System (ILS) localizer and glidepath installation. It is proposed in the future that a VHF Omni-directional Range (VOR) would be located at the airport in place of the existing obsolete non-directional beacon. This would function to provide approach guidance for Runway 03, and for initial approach guidance for aircraft to establish a straight-in final approach for the ILS approach to Runway 21. The electromagnetic energy broadcast from the localizer and glidepath installations is susceptible to interference from electrical discharge and presence of large metallic objects in close proximity to the antennae. As these instruments are used for navigational guidance in critical phases of flight, the environment surrounding the antennae structures must be protected from electromagnetic interference.

The following guidelines are provided for protection of navigational aids

4.1 Instrument Landing System

4.1.1 ILS Localizer

The ILS localizer requires a safeguarded area that comprises 2 parts, with the following characteristics and restrictions:

Part A: Within a circle 75m radius centred on the localizer array

- No objects higher than 1.2m;

Part B: Within a rectangle 365m x 610m centred on the localizer array

- No metallic objects higher than 1.2m
- No objects higher than 2.5m

4.1.2 Glidepath Antenna

The ideal safeguarding for the glidepath antenna is a triangular shaped area commencing at the antenna array, extending out to a distance of 1500m towards the landing aircraft, and diverging at 150 from the origin. The area should be free of all metallic objects, power lines, telephone lines, and roads. However, this may not always be achievable and, as a result, a minimum clear distance of 600m is stipulated in front of the glidepath antenna.

4.1.3 VHF Omni-directional Range

The VOR will require an object-free area of 300m radius centred on the VOR. This area cannot include any natural or man-made objects. However, any existing object that cannot be relocated outside this radius will require study to ensure that the object does not cause electromagnetic interference or obscures the VOR transmission in critical directions used for air navigation.

5.0 Establishment of Laser Protected Flight Zones

Laser protected flight zones are established around an airport in accordance with ICAO Annex 14 to mitigate the effect of laser operations on low flying aircraft.

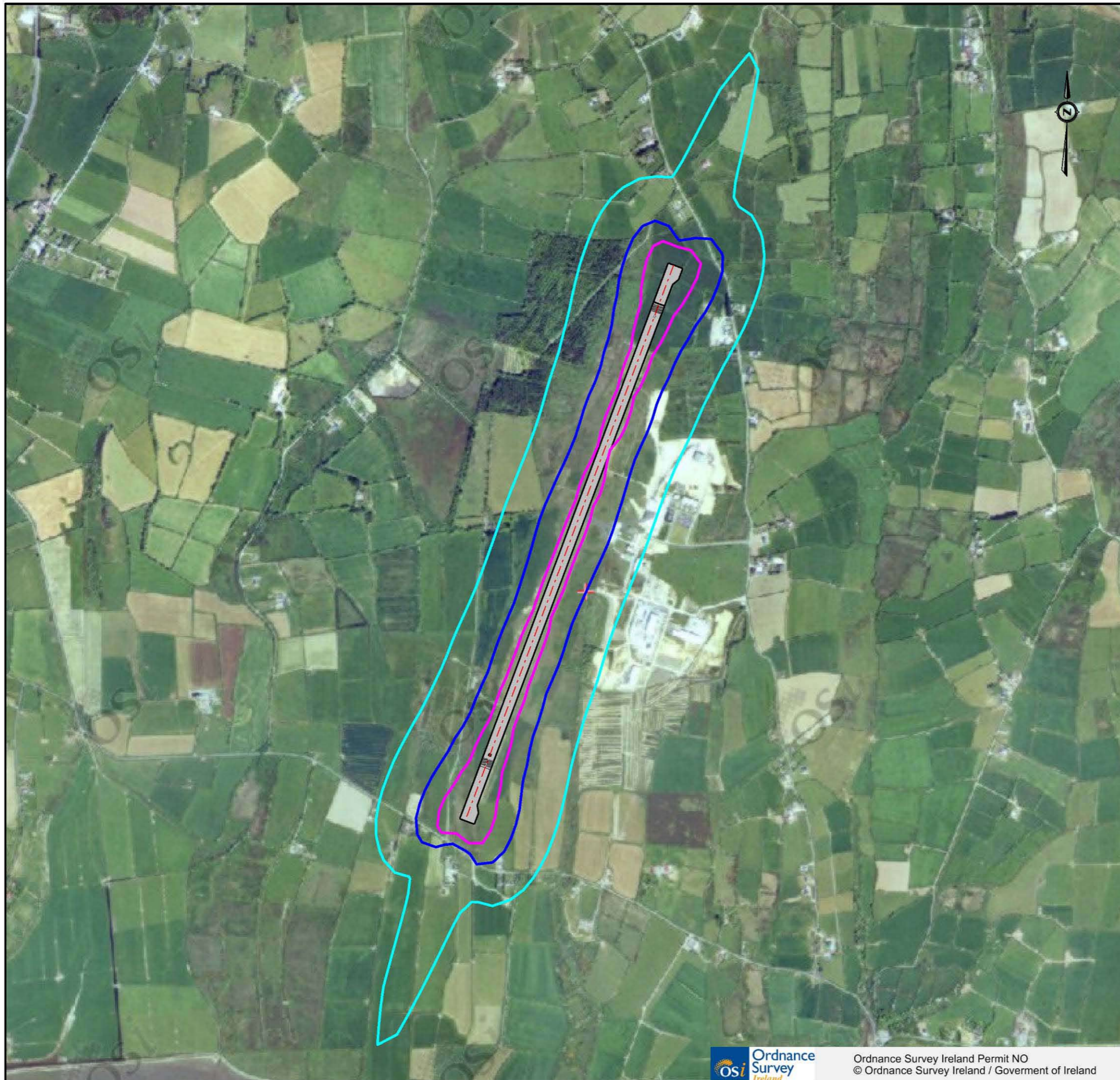
There are three zones located around the airport:

- Laser-Beam Free Flight Zone (LFFZ): Laser irradiance level to not exceed 50nW/cm^2
- Laser-Beam Critical Flight Zone (LCFZ): Laser irradiance level to not exceed $5\mu\text{W/cm}^2$
- Laser-Beam Sensitive Flight Zone (LSFZ): Laser irradiance level to not exceed $100\mu\text{W/cm}^2$

Map A-4 illustrates the dimensions of the protected flight zones for Waterford Airport.

The dimensions vary depending on the type of zone. Both the LFFZ and the LCFZ have defined dimensions stated in the aviation safety regulations, however the LSFZ is determined based on the area surrounding the airport.

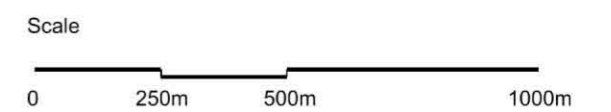
Laser operations may be conducted within these areas so long as the irradiance of the laser does not exceed the stated value for the flight zone. Notification to the airport and the IAA of laser operations may also be required. The airport may be required to issue a NOTAM should it be deemed that laser operations may affect critical areas of flight, regardless of the laser irradiance level.

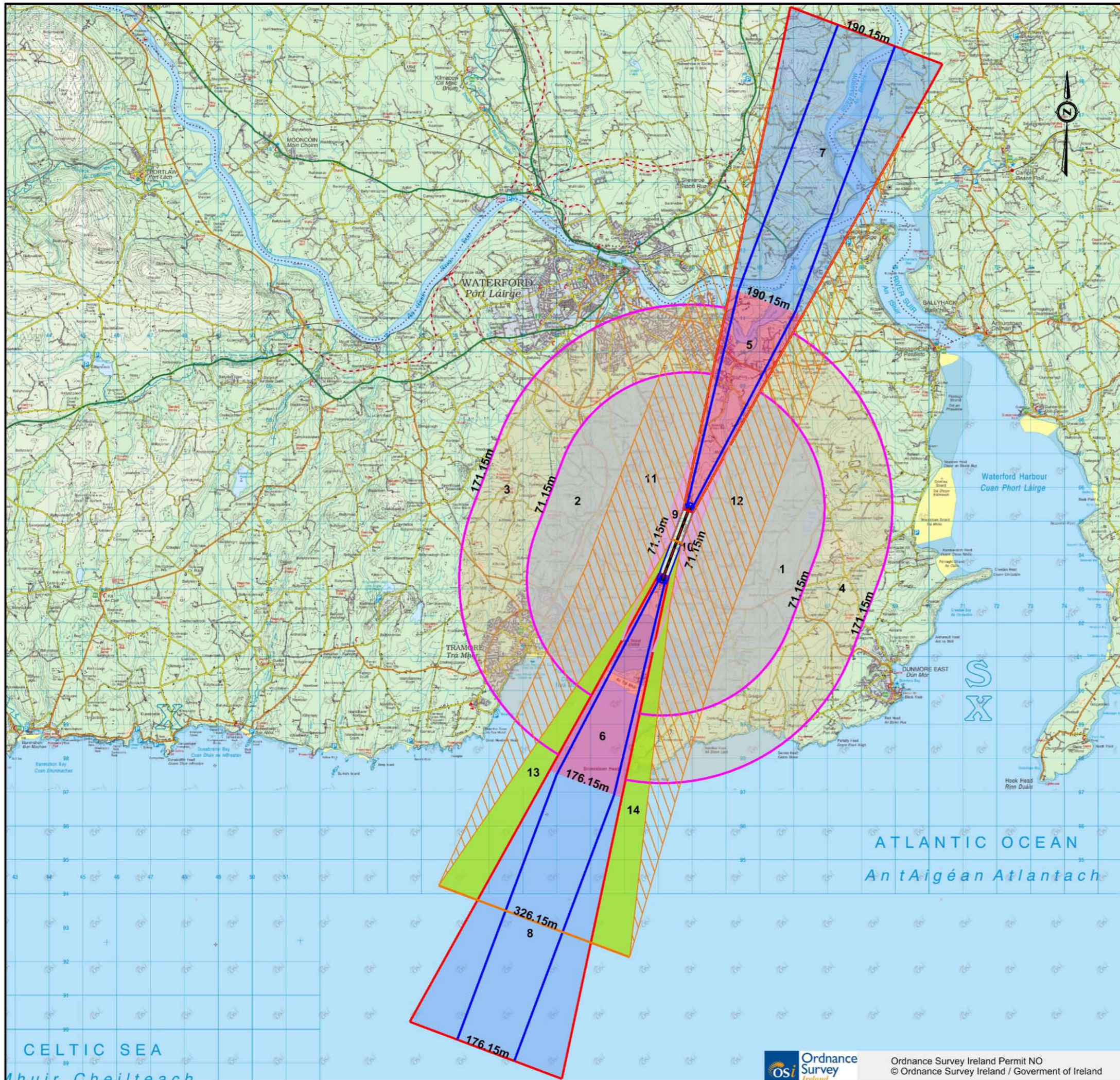


Legend








-  57 LAeq
-  63 LAeq
-  69 LAeq

Map A1
 Waterford Airport
 Waterford Airport
 LAeq Noise Contours



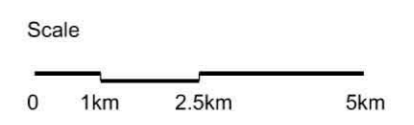


Legend

-  1 & 2 Inner Horizontal Surfaces
Maximum Elevation 71.15m
-  3 & 4 Conical Surfaces
Maximum Elevation 171.15m @ 5%
-  Approach & Take-Off Surfaces @ 2%
5 ~ Maximum Elevation 190.15m
6 ~ Maximum Elevation 176.15m
-  Horizontal Approach Surfaces
7 ~ Maximum Elevation 190.15m
8 ~ Maximum Elevation 176.15m
-  9 & 10 Transitional Surfaces
Maximum Elevation 71.15m
-  11 & 12 ILS Transitional Surfaces
Maximum Elevation 326.15m
-  13 & 14 ILS Missed Approach Surfaces
Maximum Elevation 326.15m



Map A2
Waterford Airport

Waterford Airport
Safeguarding

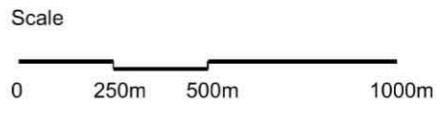




Legend

-  Boundary of area subject to Individual Risk of 1 in 10,000 per year or greater
-  Boundary of Public Safety Zone subject to Individual Risk of 1 in 100,000 per year or greater

Map A3
 Waterford Airport
 Waterford Airport
 Public Safety Zones





Map A4
 Waterford Airport
 Waterford Airport
 Laser Beam Protection Areas

