Section 3 Baseline Environment Description

3.1 Introduction

The environmental baseline of Arklow Town and Environs is described in this section. This baseline together with the Strategic Environmental Objectives, which are outlined in Section 4, is used in order to identify, describe and evaluate the likely significant environmental effects of implementing the Draft Development Plan and in order to determine appropriate monitoring measures.

The environmental baseline is described in line with the legislative requirements encompassing the following components – biodiversity, flora and fauna, population, human health, soil, water, air and climatic factors, material assets, cultural heritage, landscape and the interrelationship between these components. A description is also included of the likely effects upon each environmental component under a do-nothing scenario i.e. the likely evolution of the environment without the implementation of the Arklow Town and Environs Development Plan.

The Arklow Town and Environs Development plan is a joint plan prepared under the administration of Arklow Town Council and Wicklow County Council. The plan area is located to the south east of the county and east of the N11 National Primary Route and borders the Irish Sea. The Arklow Town and Environs area to which the plan relates is indicated in Figure 3.1 below. The area of land within the jurisdiction of Arklow Town Council is located within the blue boundary line on lands coloured in a light blue. The section of the plan (Arklow Environs) located within the jurisdiction of Wicklow County Council is located on the lands coloured light green and within the red boundary line.

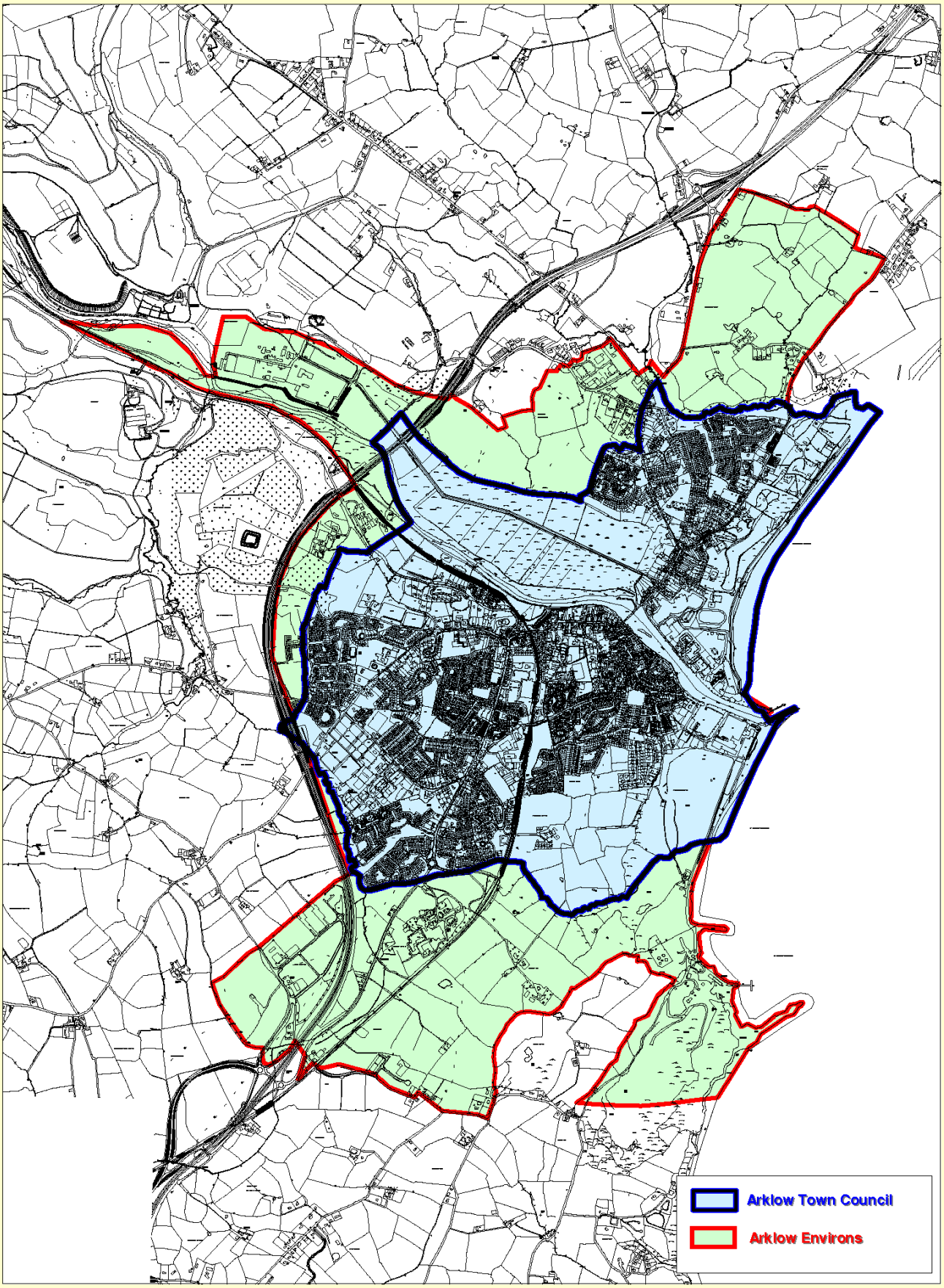
3.2 Description of Arklow Town and its Environs

Arklow is situated along the south east coast of Wicklow originally forming as a Viking settlement in the ninth century. The town is situated at the mouth of the River Avoca the longest river entirely within County Wicklow. The town is divided by the river, which is crossed by the Nineteen Arches bridge, a stone arch bridge linking the south or main part of the town with the north part, called Ferrybank.

Arklow is designated as a large growth town II[3] with a population 11,759 in 2006 and a projected population of 19,000 up to 2016 and 23,000 up to 2022. The current population makes Arklow the 4th largest settlement in the County of Wicklow. The topogrpahy of the plan area is relatively low lying with areas in close proximity to the river bank being subject to periodic flooding over a number of years. Heavy storms in 2000 & 2010 caused severe flooding in Lower Main Street, South Quay and Ferrybank.

[3] Large Growth Towns as designated in the Regional Planning Guidelines and the Wicklow County Development Plan are most likely to be successful in attracting a concentration of major employment-generating investment and should have the high accessibility/connectivity and will therefore require a location on a main radial / orbital road intersection and high quality rail service. These centres should be economically self-sustaining, with a population, including its catchment, which is able to support facilities such as a high quality secondary (and sometimes tertiary) education service, a small hospital or polyclinic-type facility of sufficient size to provide non-specialised medical care and a comparison retail centre.

Figure 3.1 – Existing Arklow Town and Environs Development Boundary



3.3 Biodiversity Flora and Fauna

3.3.1 Introduction

Most habitats in the Arklow Town and Environs area have been impacted upon to varying degrees by human beings over time. The clearing of vegetation centuries ago resulted in the replacement of an amount of the natural habitats with semi-natural, low biodiversity habitats. However, a number of important natural and semi-natural habitats remain within and adjacent to the study area.

3.3.2 General Description

CORINE Land Cover mapping classifies land cover under various headings. CORINE land cover mapping for the study area is shown on Figure 3.2 CORINE Land Classification 2006. The Corine land cover mapping 'changes' from 2000 to 2006 identify pockets of land to the north and south west of the town area, which have been developed during this time and are classified as Discontinuous Urban Fabric.

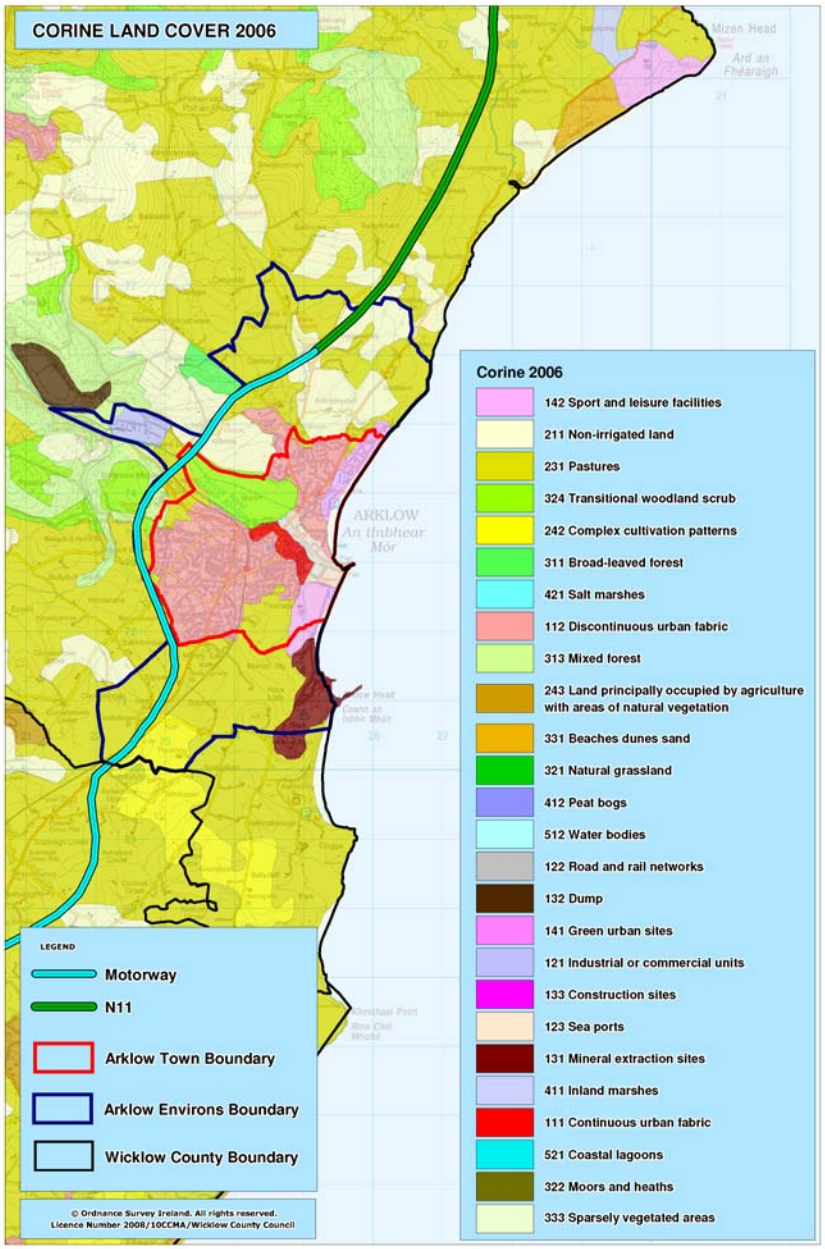
The most common land cover headings which are identified across the area include Pastures and Non-irrigated agricultural land, which are most prevalent in the northern and southern sections of the plan area. The original settlement pattern along the southern portion of the Avoca Estuary is classified as continuous Urban fabric with the expansion of this area to the north and south of the River Valley being classified as discontinuous Urban Fabric. Land cover headings such as Sea Ports and Sports and leisure facilities are attributed to different areas along the coast toward the eastern boundary of the plan area.

Chapter 17 of the County Development Plan designates Arklow Town and it environs as an 'Urban Area' of low vulnerability. Chapter 18 of the County Development Plan "Coastal Zone Management" identifies coastal zones within the County. Cell 11 comprises the coastal area within the boundaries of the Arklow Environs and Arklow Town plans. This cell is described as having long sandy beaches along most of the cell, with the central harbour area the location of intensive residential and industrial development and the southern end marked by Arklow Rock. The Arklow Sand Dunes at Seabank to the north and the area around Arklow Rock – Askintinny are designated pNHAs.

The objectives for cell 11 are as follows:

1. To enhance the visual, recreational and natural amenities of the Arklow coastal area, in accordance with the policies and objectives set out in the Arklow Environs LAP and the Arklow Town Plan. (to be amalgamated through this Development Plan process).
2. To facilitate the development and enhancement of visitor and recreational facilities along the coastal area, particularly walking routes, car parking areas, signage, changing / toilet facilities and water based clubs.
3. To support and facilitate the development of marine and shipping activity in Arklow, particularly the recreational use of the existing harbour / marina and the development of a roll on-roll off port at the existing Roadstone jetty.

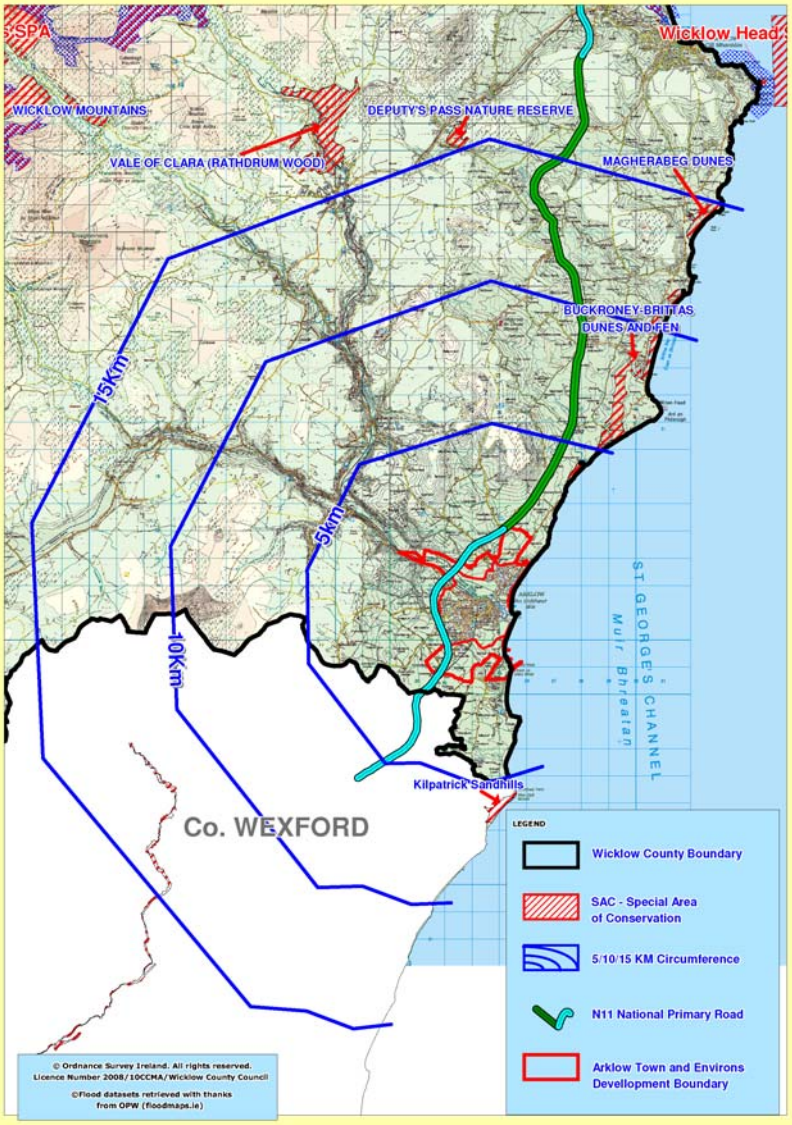
Figure 3.2 – Corine Land Cover Mapping 2000



3.3.3 Designations

There are no Natura 2000[4] sites within, adjacent to or immediately downstream of the Plan area. The closest SAC's are Kilpatrick Sandhills located c.5km to the south of the plan boundary and Brittas Bay "Buckroney Dunes and Fen" situated c. 2.5km from the most northerly boundary of the plan area.

Figure 3.3 Natura 2000 sites



[4] The 1992 Habitats Directive seeks to establish Natura 2000, a network of protected areas including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) - throughout the European Union. SACs are designated and protected under the under the Habitats Directive due to their conservation value for habitats and species of importance in the European Union while SPAs are designated and protected under the 1979 Birds Directive (European Council Directive on the Conservation of Wild Birds 79/409/EEC). Both Directives are transposed into Irish law through various Habitats Regulations.

3.3.4 Natural Heritage Areas

Natural Heritage Areas (NHA's) are designated due to their national conservation value for ecological and/or geological/geomorphological heritage. They cover nationally important seminatural and natural habitats, landforms or geomorphological features, wildlife plant and animal species or a diversity of these natural attributes.

There are 3 proposed Natural Heritage Areas (pNHA's) within the Arklow Town and Environs Development Plan area these are;

- Arklow Town Marsh situated adjacent to the Avoca Estuary - site code 001931
- Arklow Sand Dunes situated along the northern coast of the plan area - site code 001746 and
- Arklow Rock – Askintinny situated along the southern coast of the plan area site - code 001745
- The Avoca River Valley NHA is situated just to the west of the Plan area.

The following descriptions of each of these habitats are taken from the National Parks and Wildlife Services site synopsis.

3.3.5 Arklow Town Marsh

This site is now the principal wetland area in Arklow. It is a large marsh located north of the Avoca estuary on the perimeter of Arklow town. A disused roadway bisects the site from east to west.

Much of the site is dominated by Reeds (Phragmites australis), with Creeping Bent Grass (Agrostis stolonifera) and Valerian (Valeriana officianalis) common in places. On the southern side, numerous scattered bushes of Willow (Salix spp.) are growing among the Reeds, forming a scrub in places. Drier areas are characterised by large tussocks of Tufted Hair Grass (Deschampsia caespitosa). Other plants present include Soft Rush (Juncus effusus), Iris (Iris pseudacorus), Skullcap (Scutellaria galericulata), Lesser Pond Sedge (Carex acutiformis) and several other Sedges (Carex spp.).

Wet grassy areas with extensive stands of Water Horsetail (Equisetum fluviatile) occur on the northeast margin, with Creeping Bent Grass (Agrostis stolonifera), Spike Rush (Eleocharis palustris), Meadowsweet (Filipendula ulmaria) and Rushes (Juncus articulatus & J. conglomeratus) present.

The scarce Broad-leaved Cottongrass (Eriophorum latifolium) has been recorded growing on this site.

Much of the Willow (Salix spp.) has been defoliated, possibly due to atmospheric pollution from the nearby fertilizer factory.

The importance of this site is that it is a good example of a relatively large wetland, despite the impacts of atmospheric pollution and its proximity to Arklow town. The presence of at least one scarce plant species increases the interest of the site.

3.3.6 Arklow Sand Dunes

This coastal site is located just north of Arklow town and comprises mainly a sand dune system. A low ridge of fore-dunes, stabilized by Marram Grass (Ammophila arenaria), runs parallel to the shore. Sea Holly (Eryngium maritimum) and Sea Bindweed (Calystegia soldanella) are also present.

Behind the low fore-dunes are the larger fixed dunes, which have been vegetated for a long time. In addition to Marram Grass, other grasses are common, notably Red Fescue (Festuca rubra). Bracken (Pteridium aquilinum) is locally abundant, also Common Restharrow (Ononis repens), Kidney Vetch (Anthyllis vulneraria), Lady's Bedstraw (Galium verum), Pyramidal Orchid (Anacamptis pyramidalis), Sheep's-bit (Jasione montana) and Eyebright (Euphrasia spp.). Burnet Rose (Rosa pimpinellifolia) is found on the more mature dunes.

The western side of the sand dune system is bounded by a fairly steep slope which provides an 'amphitheatre-like' backdrop to the dunes and beach. The clay slopes are covered in a low scrub made up mostly of Hawthorn (Crataegus monogyna) and Blackthorn (Prunus spinosa).

At the southern end of the site is a small, but good example of wet woodland. The main tree is Alder (Alnus glutinosa) and there is a well-developed ground flora, which includes Water Dropwort (Oenanthe crocata), Angelica (Angelica sylvestris) and Water Horsetail (Equisetum fluviatile).

There is also a transitional grassy area dominated by False Oat (Arrhenatherum elatius), which although not of great interest in itself, connects the dune system to the woodland.

Although the site is small and vulnerable to pressures from the adjacent amenity sites, it is important as an example of a sand dune system which is relatively intact and showing the stages of dune development from the early fore dunes to mature fixed dunes.

3.3.7 Arklow Rock Askintinny

This coastal site is located just south of Arklow, Co. Wicklow. Arklow Rock is an Ordovician volcanic intrusion, which forms a knoll of rhyolite. A large quarry, which is still being worked, has been cut into the rock. The sandy beach and cliffs south of Arklow Head form part of the site.

Heath vegetation extends from Arklow Rock to Arklow Head. This is characterised by Gorse (Ulex europaeus), Bracken (Pteridium aquilinum), Honeysuckle (Lonicera peryclimenum), Brambles (Rubus fruticosus agg.) and Broom (Cytisus scoparius). The scarce Greater Broomrape (Orobanche rapum-genistae), a parasitic species which grows on the roots of Gorse and Broom, grows here. A legally protected plant, Birds'-foot (Ornithopus perpusillus) is quite common in the area. It is a species of dry and gravelly places and is confined to the south and east coasts of Ireland. There are some grassy fields within the site but these are not intensively managed and in places are reverting back to heath.

The heath merges into exposed rock and scree at Arklow Rock. An interesting and uncommon lichen community indicative of metal rich siliceous rocks is found here. At the south end of the quarry, the steep rock face supports breeding Fulmars and Raven. The very rare and legally protected fern, Lanceolate Spleenwort (Asplenium billotii), grows at the edge of the quarry but has not been recorded since 1970.

Steep rocky cliffs occur south of Arklow Head. Soil pockets in the rock support coastal cliff plants such as Sea Pink (Armeria maritima), Sea Plantain (Plantago maritima), English Stonecrop (Sedum anglicum) and Wild Thyme (Thymus praecox). Small numbers of Fulmars nest in slopes. A dune system occurred here but has been completely eroded within the last 20 years. Some recent fore dune deposits have accumulated at the base of the clay slopes.

The site also includes a small ravine with Willow (Salix atrocinerea) and Hazel (Corylus avellana).

3.3.8 The Avoca River Valley

While the Avoca River Valley is not directly situated within the plan boundary it does border the plan area and therefore should be taken into consideration in assessing the impacts of the Draft Plan.

The Avoca River Valley is a large mixed woodland located in the valleys of the Avoca and Aughrim rivers, both of which flow through the site and on towards the estuary at Arklow.

The steep slopes of these deep valleys contain both coniferous and deciduous woodland. The best examples of relatively pure deciduous woods are found around Shelton Abbey, with several other smaller areas throughout the site. Oak (Quercus petraea) is the dominant tree species, with Ash (Fraxinus excelsior), Beech (Fagus sylvatica) and Birch (Betula pubescens) locally abundant. In places there is a well developed shrub layer of Hazel (Corylus avellana), Holly (Ilex aquifolium) and Honeysuckle (Lonicera periclymenum). The ground flora is variable and is usually predominated by Wood Rush (Luzula sylvatica) or Bluebells (Hyacinthoides non-scripta). Other species present include Lords and Ladies (Arum maculatum), Wood Sorrel (Oxalis acetosella), Wood Anemone (Anemone nemorosa) and Wood Sanicle (Sanicula europea). Ferns are abundant and include Buckler Fern (Dryopteris dilitata), Male Fern (Dryopteris felix-mas) and Soft Shield Fern (Polystichum setiferum).

A large area of the site consists of broadleaved woods, which have been underplanted with a variety of conifers. Here, the understorey is generally similar to the broadleaved woods, but as the conifers become more abundant the ground flora becomes less diverse with Ivy (Hedera helix), Brambles (Rubus agg.) and some Ferns replacing the other species.

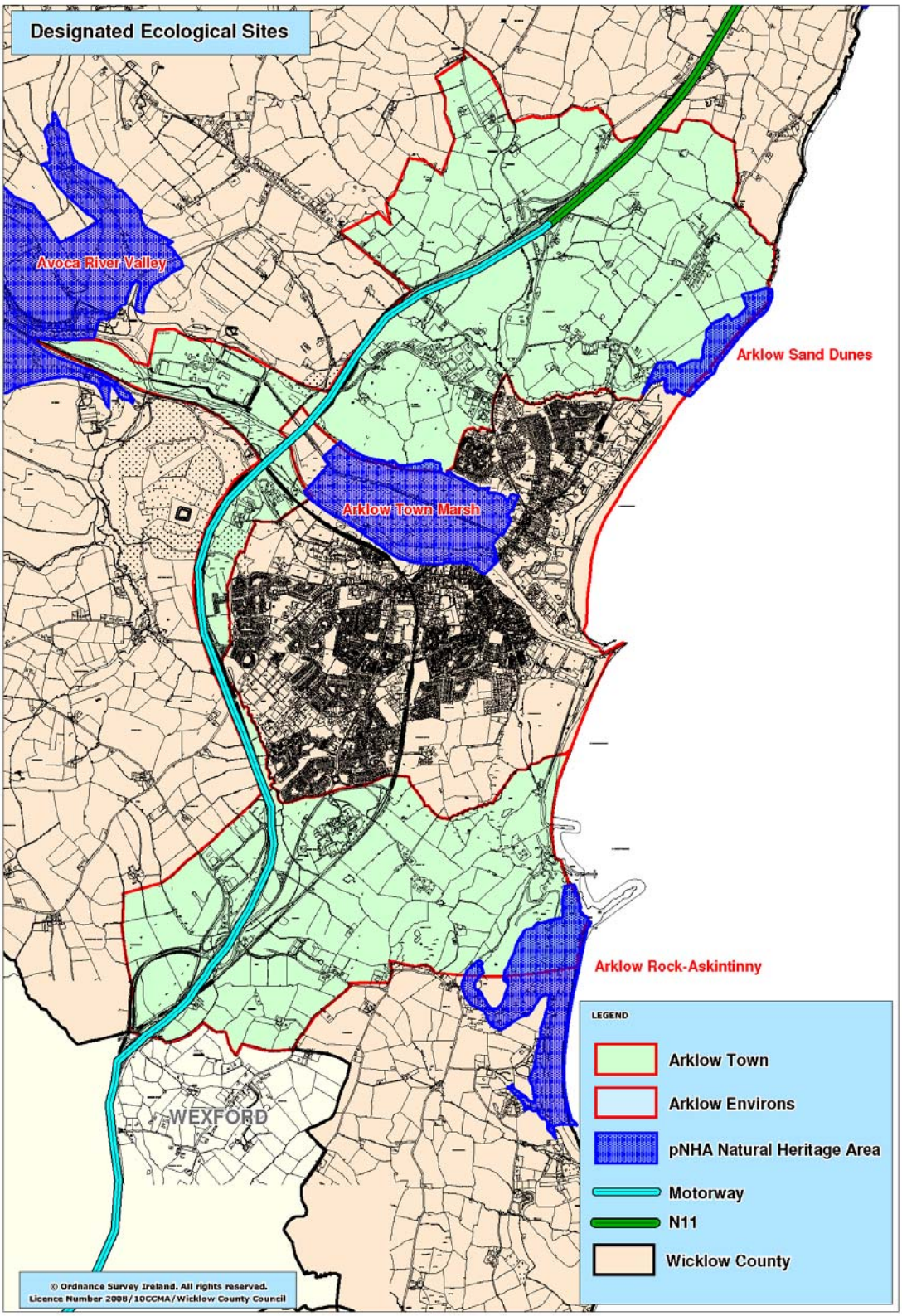
There are a few blocks of commercial conifer plantations throughout the site, managed for forestry. Small areas of wet woodland with Alder (Alnus glutinosa), Willow (Salix atrocinerea) and Birch (Betula pubescens) occur on the lower gradients adjacent to the rivers.

A study on the birds of this area has shown the commonest species to be Goldcrest, Robin, Wren, Coal Tit and Chaffinch. The rare Redstart has also been recorded.

This area has been subject to great disturbance from the mines at Avoca, the planting of conifers and from air pollution emanating from the fertiliser factory downstream, near Arklow. The eastern part of the site has been more affected by pollution than the western end.

It remains however, a site of considerable importance as it contains good examples of deciduous woodland with a typical flora and fauna and some rare species occurring. These areas are remnants of more extensive deciduous woodland coverage throughout these valleys and it is important to conserve this dwindling resource.

Figure 3.4 Natural Heritage Areas



3.3.9 Ecological Connectivity

Article 10 of the Habitats Directive recognizes the importance of ecological networks as corridors and stepping-stones for wildlife, including for migration, dispersal and genetic exchange of species of flora and fauna. The Directive requires that ecological connectivity and areas of ecological value outside the Natura 2000 network of designated ecological sites are maintained and it recognises the need for the management of these areas through land use planning and development policies. Ecological networks are important in connecting areas of local biodiversity with each other and with nearby designated sites so as to prevent islands of habitat from being isolated entities. Ecological networks are composed of linear features, such as treelines, hedgerows, rivers and canals, which provide corridors or stepping stones for wildlife species moving within their normal range. They are particularly important for mammals, especially for bats and small birds.

3.3.10 Urban Habitat Mapping Study

The Arklow Urban Habitat Study provides baseline information on the flora, fauna and habitats of "green sites" within the Arklow Town Area in order to inform the decision-making processes involved in the future uses of these sites. The study provides information, which alongside management guidelines and recommendations, aims to assist the future planning and management of the identified areas in order to prevent negative impacts to sensitive sites.

The Arklow Urban Habitat Mapping study[5] was carried out in 2008 with a number of objectives in mind;

- To create habitat maps and vegetation surveys for the Arklow Urban Area,
- Identify local important biodiversity sites
- Identify linkages between unidentified biodiversity areas and the surrounding countryside.
- Use of data to make recommendations on conservation priorities.
- To develop a user-friendly set of habitat management guidelines
- To facilitate future research.

The study involved the identification and mapping[6] of 31 habitats located within the Arklow Area. Of the 31 habitat sites surveyed 12 sites were considered to be of high value/locally important for the following reasons:

[5] Arklow Urban Habitat Mapping, Prepared by MERC Consultants on behalf of Wicklow County Council and The Heritage Council, November 2008.
[6] Please refer to Figure 3.2 below.

Site 2: Situated to the South West of the plan area along the N11 comprising a small stream, which formed part of a corridor network along the town boundary that was considered to be species rich.

Site 3: Located to the south west of the town boundary comprising an old graveyard species rich in an urban environment.

Site 4: Situated to the South West of the plan area along the N11 comprising an agricultural field with a small stream running along its boundary. Considered to be of medium value due to the presence of native and non-native tree species.

Site 6: Situated to the south west of the town boundary comprising agricultural lands divided by species rich hedgerows and margins.

Site 8: An amenity park area/managed public space of medium value due to the existing bird species.

Site 9: The Templerainy River was considered to be of high value acting as a corridor for birds and other wildlife.

Site 19: Situated to the south of the town boundary with a high conservation value due to the presence of a series of hedgerows forming a corridor for nesting birds.

Site 25: Situated to the north west of the town boundary on the opposite side of the N11 comprising amenity grassland. Site of high importance due to the presence of an extensive hedgerow.

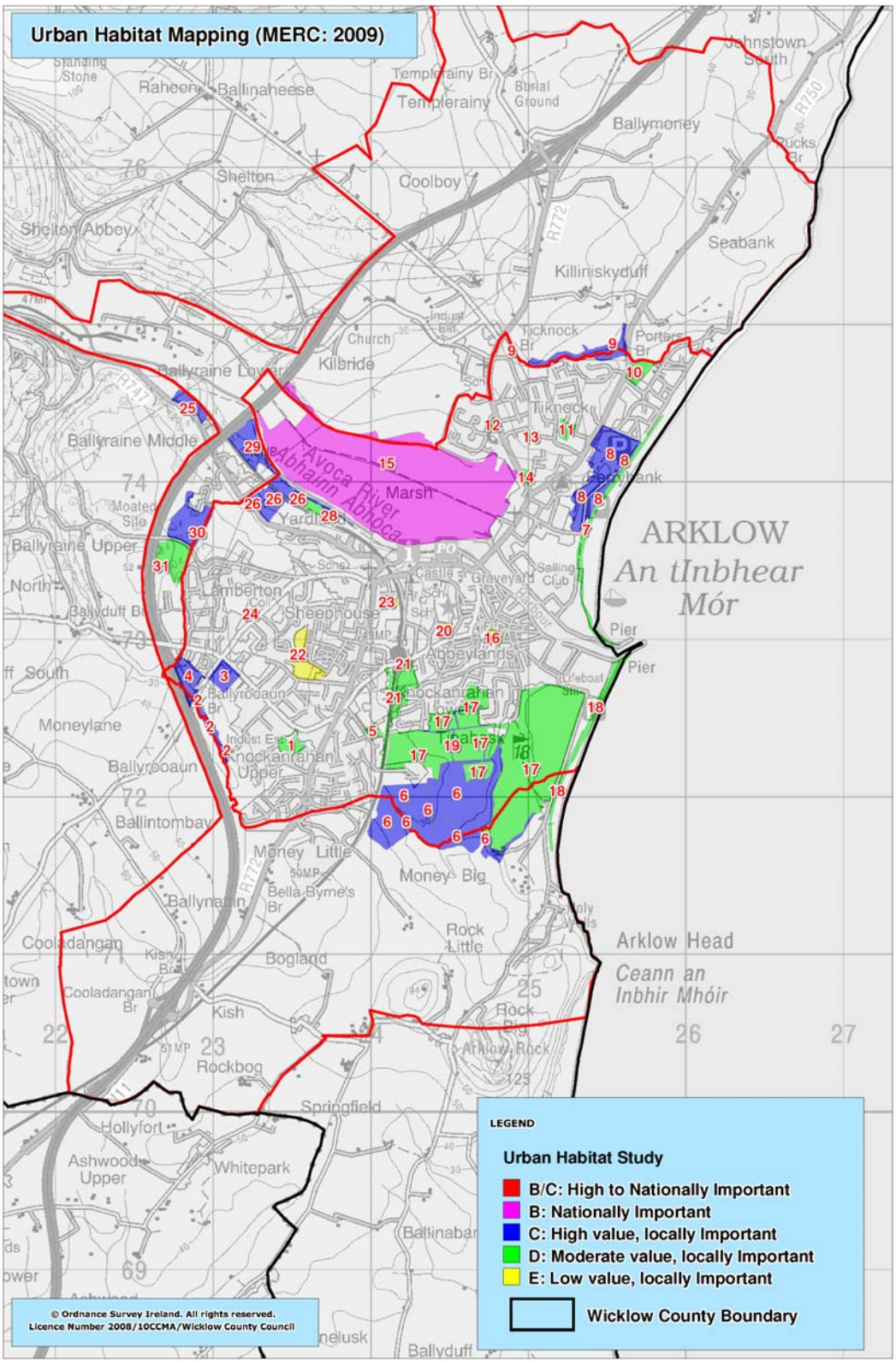
Site 26: Rough grasslands surrounding Arklow GAA of medium conservation value due to the presence of a series of hedgerows.

Site 28: continuation of site 26 above.

Site 29: Situated along the banks of the Avoca River comprising mixed broadleaved woodlands providing a good mix of tree species and acting as a wildlife corridor along the northern banks adjoining Arklow Marsh pNHA.

Site 30: Situated to the west of the town along the N11 comprising a semi-natural woodland of mixed tree species with species rich ground flora.

Figure 3.5 Urban Habitat Mapping (MERC: 2008)



As can be seen from the brief site descriptions above there are a number of ecological corridors situated throughout the plan area. The most important of these are considered to be the water based corridor areas situated along the local rivers and streams namely the Avoca River, Templerainy River and their tributaries.

Existing Environmental Problems

Infrastructure and water quality - Arklow Town and its Environs does not currently benefit from the use of a wastewater treatment facility. While permission has been granted for a treatment facility to cater for a population equivalent of 18,000 the construction phase of this infrastructure has yet to begin. The current network has a number of outfalls directly connected to the Avoca River which if continued will negatively impact on the water quality status of the Avoca River Valley and its tributaries which is likely to be impacting upon aquatic biodiversity, flora and fauna to the extent where certain fish populations or macro-invertebrates cannot be supported as they are not tolerant to serious pollution.

Designated Sites and connectivity – Arklow Marsh is a natural wetland within Arklow Town, which acts as a natural flood plain during peak flood periods. Developments pressures in and surrounding the marsh area have the potential to adversely impact on the drainage patterns in this area directly impacting on the species within this site and indirectly impacting on ecological connectivity.

Ecological networks throughout the plan area have been adversely impacted upon by the development of infrastructure such as roads which result in the habitat fragmentation as well as by the development of housing necessitating the removal of hedgerows or development which occurs along the edges of inland surface waters.

Terrestrial Biodiversity, Flora and Fauna - Over time, ongoing road and building developments within the study area have impacted upon biodiversity and flora and fauna with semi-natural habitats replaced by artificial surfaces as indicated by the discontinuous urban fabric shown on Figure 3.2.

With regard to terrestrial flora and fauna, all greenfield development in the area causes an impact - the replacement of natural and semi natural habitats with artificial surfaces results in loss of flora and fauna and therefore adversely impacts upon this environmental component. The significance of the impact of greenfield development depends on whether individual greenfield developments result in the loss of habitats or species of importance together with the cumulative amount of habitats and species lost and fragmented as a result of all greenfield developments. It is noted that development of brownfield sites and re-development can also have impacts on terrestrial flora and fauna.

Evolution of Biodiversity, Flora & Fauna in the absence of a Town and Environs Development Plan:

In the absence of a Development Plan for the Arklow Town and Environs area development would have no guidance as to where to be directed and planning applications would be assessed on an ad-hoc/individual basis with flora and fauna, habitats and ecological connectivity only being protected by a number of generic strategic actions relating to biodiversity flora and fauna with no local level focus.

3.4 Population and Human Health

3.4.1 Population

Arklow town's population has been increasingly modestly since 1991, with annual increases in the range of 1.5 % – 2%, increasing to around 4% per annum between 2002 and 2006.

Population – Arklow Town

Year	1971	1981	1986	1991	1996	2002	2006
Population	6,948	8,646	8,388	7,987	8,557	9,993	11,759

(Source: CSO Census of population)

Having regard to Arklow's designation as a Large Growth Town in the Regional Planning Guidelines for the Greater Dublin Area and the Wicklow County Development Plan, Arklow and its environs is targeted to grow up to 2022 at a faster rate than over the past number of years. In particular, the population target of 19,000 in 2016 will require a growth rate of c. 6% per annum between 2006 and 2016.

Population targets – Arklow Town & Environs

Year	2016 target	2022 target
Population	19,000	23,000

(Source: Wicklow draft County Development Plan 2010)

The 2006 Census revealed a total of 4,270 households in Arklow 'town', equating to an average household size of 2.75, which was below the County average of 2.89. It is estimated that there are currently (March 2010) 5,246 housing units in the entire settlement, the additional number being made up of (a) additional units completed post 2006 and (b) units in the 'environs' area, which would not have been considered part of the 'town' in the Census, but are included in the new development plan area.

It is estimated that by 2016 average household size in Wicklow will have declined to 2.56. Assuming this same household size for Arklow and its environs, there would be a need for 7,420 dwelling units in the settlement by 2016. Further declines to 2022 will necessitate a total housing stock in the region of 10,000 units to meet the 2022 population target. Although the proposed new plan will have a lifespan up to 2017, it will make provision for the future growth of Arklow and its environs up to 2020. Therefore the new development plan will be required to make provision for nearly 4,000 new housing units.

3.4.2 Human Health

With regard to human health, impacts relevant to the SEA are those, which arise as a result of interactions with environmental vectors i.e. environmental components such as air, water or soil through which contaminants or pollutants, which have the potential to cause harm, can be transported so that they come into contact with human beings.

Human health has the potential to be impacted upon by environmental vectors including water, soil and air. Hazards or nuisances to human health can arise as a result of exposure to these vectors and incompatible landuses.

In particular the development of the plan area in the absence of a wastewater treatment works has the potential to adversely impact on human health through water (including bathing waters) and air pollution. The provision of individual treatment works serving single and multi-unit developments where inadequate maintenance and management of such systems takes place has the potential to adversely impact on groundwater's and potential drinking supplies.

Flooding within the town area also has the potential to adversely impact on Human Health placing increased demands on drainage systems and existing infrastructure. This has the potential to impact on water supplies through contamination and air quality arising from the overloading of existing wastewater treatment infrastructure.

These factors have been considered with regard to the description of: the baseline of each environmental component, and; the identification and evaluation of the likely significant environmental effects of implementing the plan and the alternatives.

Existing Environmental Problems

There is a lack of waste water treatment plant to serve granted planning permissions in the Arklow Town and Environs area. This lack of capacity is constraining the ability of the plan to meet the projected population growth; - a significant number of residential developments have been granted planning permission in the Arklow Town area subject to restrictions which prevent construction and occupation of units until adequate sewerage, water and roads infrastructure is in place.

Septic tanks form the majority of waste water treatment systems within the Environs of Arklow Town. Such systems require continual maintenance in order to avoid pollution of groundwaters. Untreated waste from inefficient septic tanks may have significant negative effects on human health. Areas which have high numbers of septic tanks, such as Sea Bank and Kilbride alongside the existing outfalls from public network may cumulatively have potential to pollute groundwater, with consequent effects on human health.

Evolution of Population and Human Health in the absence of a Town and Environs Development Plan:

Due to the constraints regarding land availability within the administrative boundaries of Arklow Town Council, land within the Environs of Arklow Town is required to accommodate the anticipated population increases over the coming years. The occurrence of growth in areas not identified as having environments which are compatible to such land uses can result in significant adverse impacts on the environment. As there is likely to be further increases in Arklow Town and its Environs population over the coming years, there is a need to direct growth towards the most robust and away from the most sensitive environments.

This can be done by policies and objectives, which are included in a Development Plan and by zoning sufficient amounts of land in order to ensure that growth is directed towards the most compatible environments. In the absence of a Development Plan such management of growth would be unlikely to occur and would be likely to result in significant adverse impacts upon a range of environmental components including the landscape, biodiversity, flora and fauna, cultural heritage and water resources.

In the absence of a Development Plan for the area there would be no framework for the provision of infrastructure to serve existing and future development and this would be likely to delay or hinder the provision of infrastructure which would have the potential to result in impacts on environmental vectors to which humans are exposed e.g. a lack of appropriate

waste water treatment infrastructure could adversely impact upon drinking water quality and subsequently upon human health.

In the absence of a Development Plan, demographic and policy variations that have occurred over the period of the current Arklow Town Development Plan and the Arklow Environs LAP would be made more difficult to integrate into planning for the area.

3.5 Soil

3.5.1 Introduction

Soil performs many vital functions including: food and other biomass production; storage; filtration, and; transformation of many substances including water, carbon, and nitrogen. Soil has a role as a habitat and gene pool, serves as a platform for human activities, landscape and heritage and acts as a provider of raw materials. Such functions of soil are worthy of protection because of their socio-economic as well as environmental importance.

Figure 3.4 Soils[7] shows the spatial distribution of soils in the study area. The biodiversity, flora and fauna detailed under Section 3.2 are facilitated by these soils, as is an extent of agricultural land use.

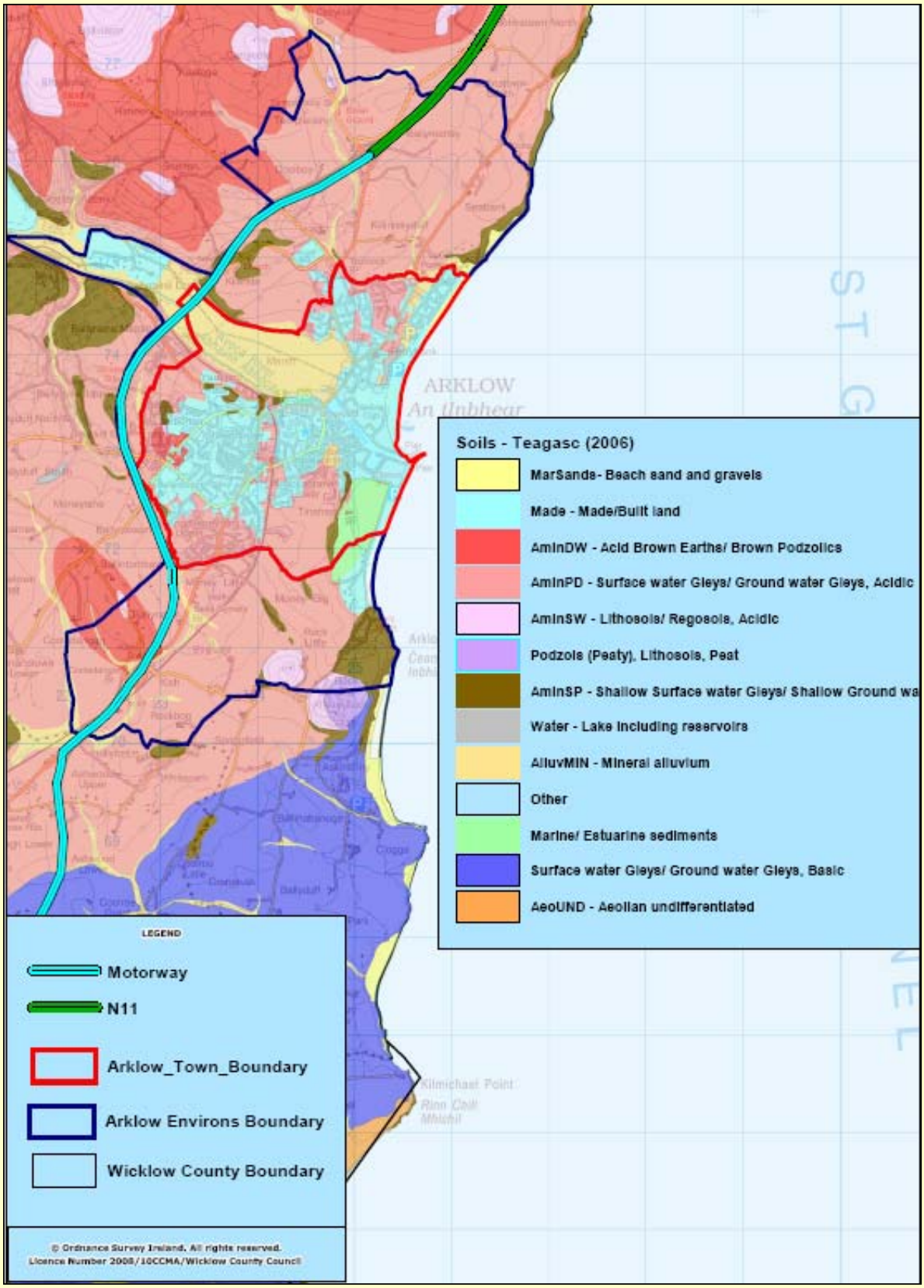
3.5.2 Soil Types

The majority of the northern and southern sections of the plan area within the Arklow Environs Area comprise surface and groundwater gley soils (coloured pink in figure 3.4). Groundwater gley soils develop where drainage is poor because the water table (phreatic surface) is high, whilst Surface-water gleying occurs when precipitation inputs at the surface do not drain freely through the ground. To the north, south and dotted throughout the plan area, shallow surface and groundwater gleys are located.

The coastal areas are classified as beach sand and gravels, which also include Arklow Marsh (coloured yellow in map 3.4). Pockets of the plan area to the east are classified as being Acid Brown Earths/Brown Podzolics (coloured red in figure 3.4). These soils often develop over relatively permeable bedrock of some kind but are also found over unconsolidated parent materials like river gravels.

[7] Teagasc, Geological Survey of Ireland, Forest Service & EPA (2006) Soils and Subsoils Class Dublin: DEHLG

Figure 3.6 Soil Types



Soils underlying the developed areas of Arklow Town and its Environs are man-made or urban soils (coloured light Blue on Figure 3.4). Urban soils are soils which have been disturbed, transported or manipulated by man's activities in the urban environment and are often overlain by a non-agricultural, man-made surface layer that has been produced by mixing, filling, or by contamination of land surfaces in urban and suburban areas.

Urban soils have a combination of characteristics that differ from natural soils. These characteristics are due to alterations in both physical and chemical soil properties that cause long term deviation from the natural state. Natural soil profiles generally tend to gradually change from one horizon to the next; however, urban soils show abrupt changes from one horizon to another depending on the construction history of the soil. Layers may drastically differ in structure, pH, texture, and properties important to plant growth such as aeration, drainage and water holding capacity. A soil's aeration and water drainage capabilities are negatively affected by compaction, which occurs as a result of overlying conditions, which include traffic and building.

Existing Environmental Problems:

Greenfield development involves the building upon and thereby sealing off of soil thus representing an environmental problem. There is potential that soil may be polluted and contaminated as a result of pollution from development, which is not serviced by appropriate waste water treatment infrastructure,[8] and from agricultural sources.

Soil erosion due mainly to surface erosion resulting from construction works and agricultural / forestry operations has major potential to impact on water quality and fishery resources.

Evolution of Soil in the absence of a Town and Environs Development Plan:

The currently proposed Soil Directive suggests encouraging the rehabilitation of brownfield sites, thus reducing the depletion of Greenfield sites. However, in the absence of a development plan there would be no framework for the direction of growth towards brownfield sites in the Arklow Town and Environs area, where such direction is appropriate. As a result Greenfield development would be likely to occur on an increased basis and would result in the building upon and thereby sealing off of the nonrenewable subsoil and soil resources.

[8] Individual wastewater treatment infrastructure which has not been properly constructed or which is not being properly managed

3.6 Water

3.6.1 The Water Framework Directive

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD has been transposed into Irish legislation by the European Communities (Water Policy) Regulations 2003 (SI No. 722 of 2003) and requires that all member states implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving good status by 2015.

For the purpose of implementing the WFD, Ireland has been divided into eight river basin districts or areas of land that are drained by a large river or number of rivers and the adjacent estuarine / coastal areas. Arklow Town and its Environs fall within the Eastern River Basin District (ERBD).

Within each River Basin District - for the purpose of assessment, reporting and management - water has been divided into groundwater, rivers, lakes, estuarine waters and coastal waters which are in turn divided into specific, clearly defined water bodies.

In order to achieve the objectives of the WFD it is necessary:

⇒ To assess the risk that water bodies may not achieve good quality status;
⇒ To identify the pressures from human activities causing this risk; and,
⇒ To develop strategies and management plans to minimise the risk.

Risk assessment procedures were developed at national level and applied across all River Basin Districts in order to analyse the impact of the pressures. The risk assessments were predictive, i.e. they examined each pressure and predicted the magnitude, which would be likely to have a negative impact.

Each water body has been assessed and classified, on the basis of human activity, whether it is at risk or not at risk of failing to achieve the WFD's objectives by 2015. The classifications used for reporting this assessment are:

⇒ **(1a)** At Significant Risk - water body is at risk of failing to meet good status in 2015
⇒ **(1b)** Probably at Significant Risk – water body is thought to be at risk of failing to meet good status in 2015 pending further investigation
⇒ **(2a)** Not at Significant Risk - the water body is expected to meet good status in 2015.

⇒ **(2b)** Probably Not at Significant Risk - water body is expected to meet good status in 2015, pending further investigation

Water bodies placed in the (1a) At Significant Risk category will need improvement to achieve the required status while water bodies in the (1b) Probably at Significant Risk category are likely to need improvement in order to achieve the required status.

3.6.2 Risk Assessment:

In terms of achieving the objectives of the Water Framework Directive the following is of note:

The **Avoca River** (from Arklow to Aughrim) is classified as being at significant risk of not achieving good status due to Point Source Pollution – Mine Risk and Groundwater Quality Risk.

The **Avoca Estuary** situated in the heart of Arklow Town and is classified as being at significant risk due to the presence of 'OSPAR' Nutrients[9].

The **Templerainy River** situated to the north of the town is classified as being at significant risk due to Point Source pollution – CSO's (Combined Sewer Overflows), Diffuse pollution – EPA diffuse model and Point/Diffuse pollution.

The **Ballyduff River** situated to the south west of the town is classified as being at significant risk due to Diffuse pollution and Point Source pollution (CSO's).

3.6.3 Eastern River Basin Management Plan

Local Authorities located in the ERBD have prepared a River Basin Management Plan with a life span of 6 years from 2009-2015. The ERBD Plan Management Plan describes the actions that are proposed to ensure the necessary protection of the district's water including Arklow's waters over the coming years. It sets out how the aims and objectives of improving and protecting water quality and ecology in the waters of each river basin district could be achieved, by means of a Programme of Measures.

[9] The presence of excessive enrichment of water with nutrients which may cause an increase in the accelerated growth of algae in the water column and higher forms of plants living on the bottom of the sea. This may result in a range of undesirable disturbances in the marine ecosystem, including a shift in the composition of the flora and fauna which affects habitats and biodiversity, and the depletion of oxygen, causing death of fish and other species. (Euthrophication)

3.6.4 Rivers, Transitional and Coastal Waters:

The Avoca River and Estuary, which dissects the entire plan area forms the main water body within the plan area. The river system begins life as two rivers, the Avonmore River and the Avonbeg River, which meet at the vale of Avoca or an area known as the “meeting of the waters” which flows directly into the Irish Sea at Arklow where it widens into a large estuary “The Avoca Estuary”. A number of streams flow along the Urban Town Boundary linking into the Avoca River with the Templerainey River located to the east of the town boundary connecting directly into the Irish Sea.

Figure 3.7 Rivers, Transitional and Coastal Water Quality

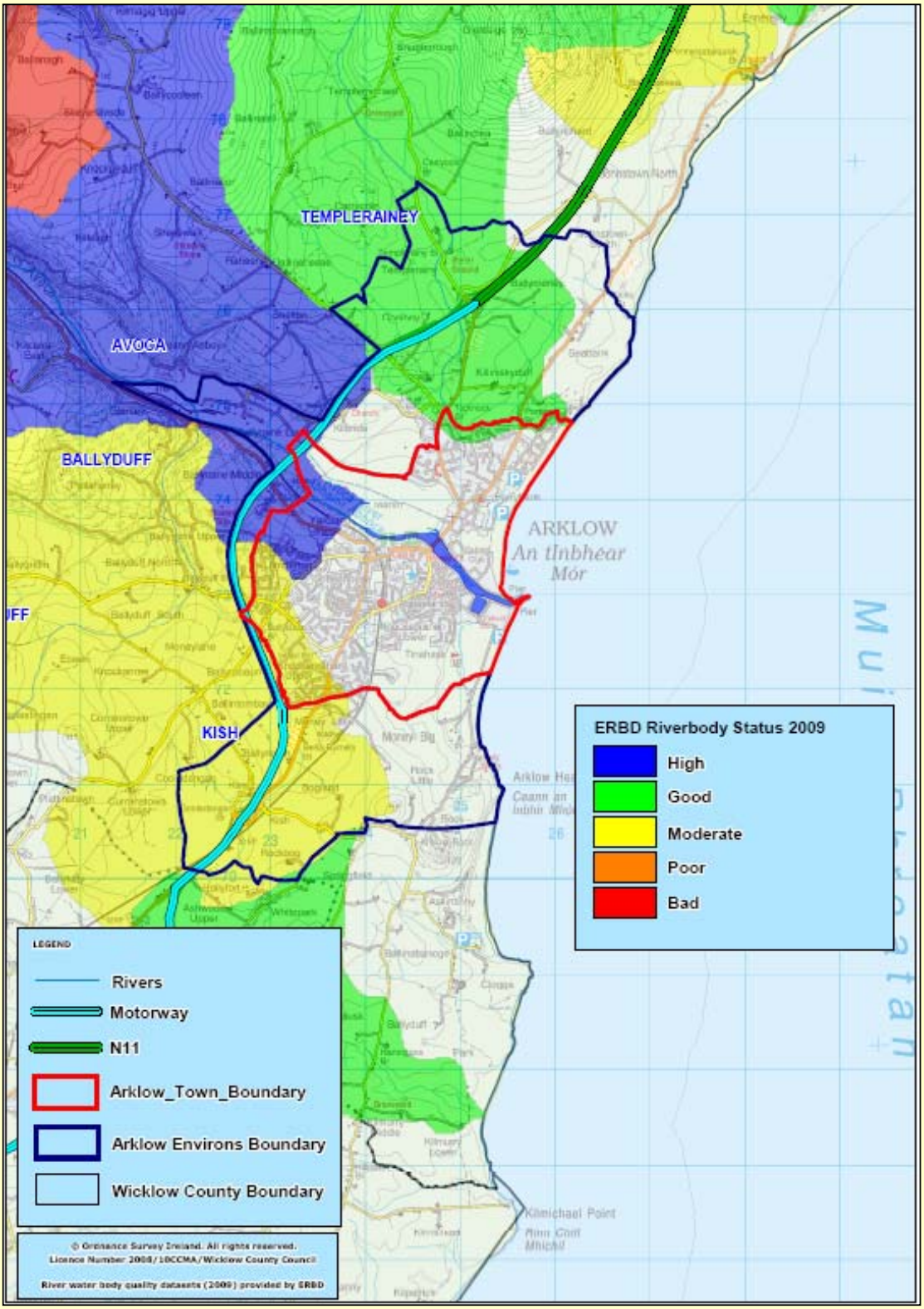
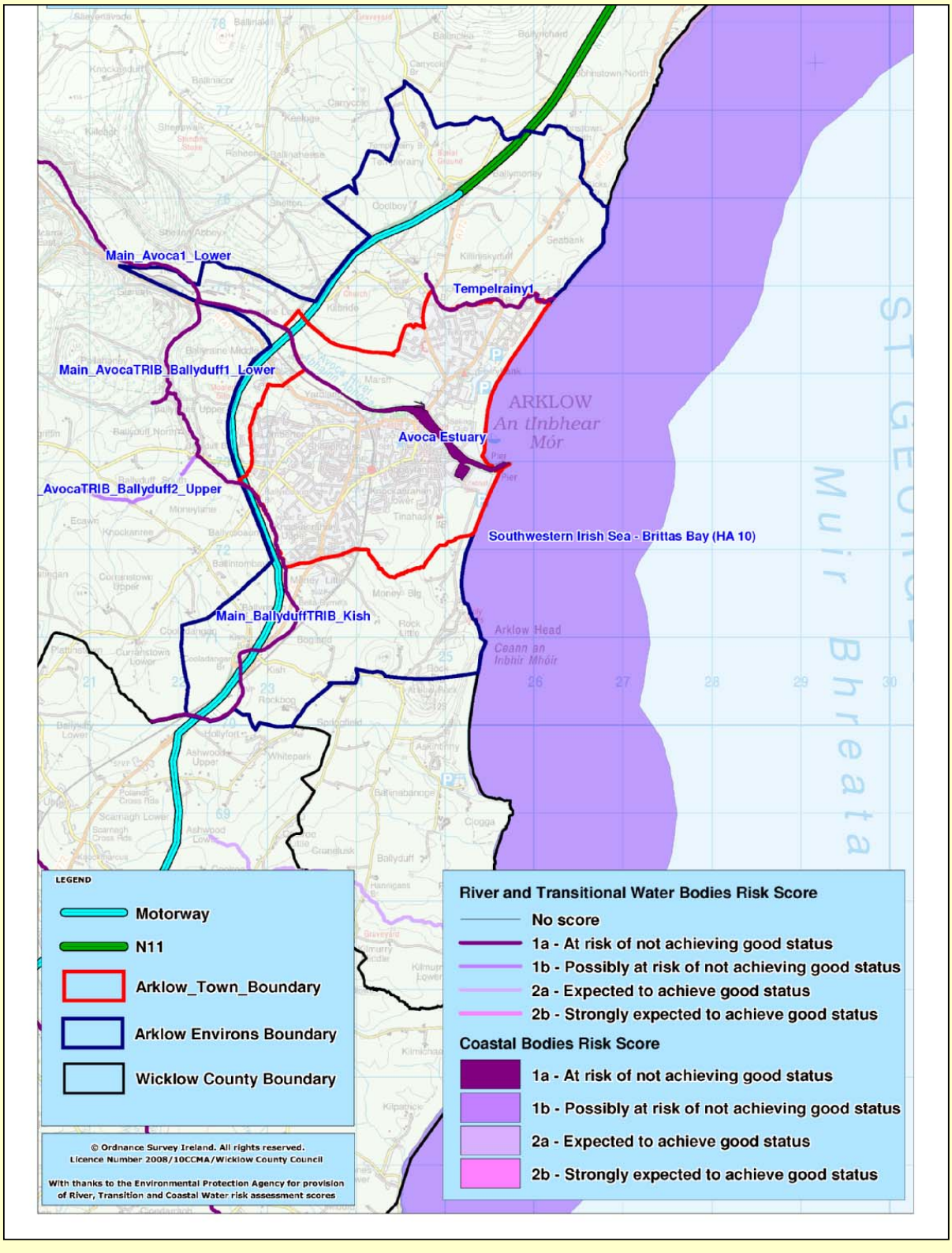


Figure 3.8 WFD Risk Assessment for Rivers, Transitional and Coastal Waters risk assessment



3.6.5 Groundwater

The Groundwater body for the Arklow Urban area is defined in the Eastern River Basin District Management Planas being of good status with an overall objective to protect, while the Wicklow Central water body (Avoca Mine[10]) is defined as being poor with an overall objective to restore to good status.

The ERBD management plan has identified the Wicklow Central (Avoca) groundwater body as a special case and is the only water body in the Eastern District where it is thought that good status cannot be achieved within the timeframes stipulated in the WFD. Treating the point source discharges to the river from the mine has been proven to be viable, but dealing with the pollutants moving through the natural fissures in the rocks and through the spoil is very much more difficult. A detailed investigative study has been recommended to further investigate the technical viability of restoration and the costs and benefits of such actions.

Arklow_Urban – is listed as being of good status but at risk of not achieving good status due to point source pollution (contaminated lands) and general ground water quality.

Wicklow Central/Avoca Mine – is listed as being of poor status and at risk of not achieving good status due to point source risk (mine risk) and general ground water quality.

3.6.6 Productivity and Vulnerability

The Geological Survey of Ireland (GSI) rates aquifers according to their vulnerability to pollution. This rating is shown on Figure 3.8 below. Aquifer vulnerability refers to the ease with which pollutants of various kinds can enter underground water. The ratings in the plan area range from Low vulnerability mainly in the northern section of the plan area to High vulnerability located in close proximity to the centre of the plan area. Areas of extreme vulnerability are sporadic through the plan area with large sections situated along the south-eastern coast and the south.

[10] Data based upon Draft RBMP Report, 22/12/2008

Figure 3.9 Groundwater Risk Assessment

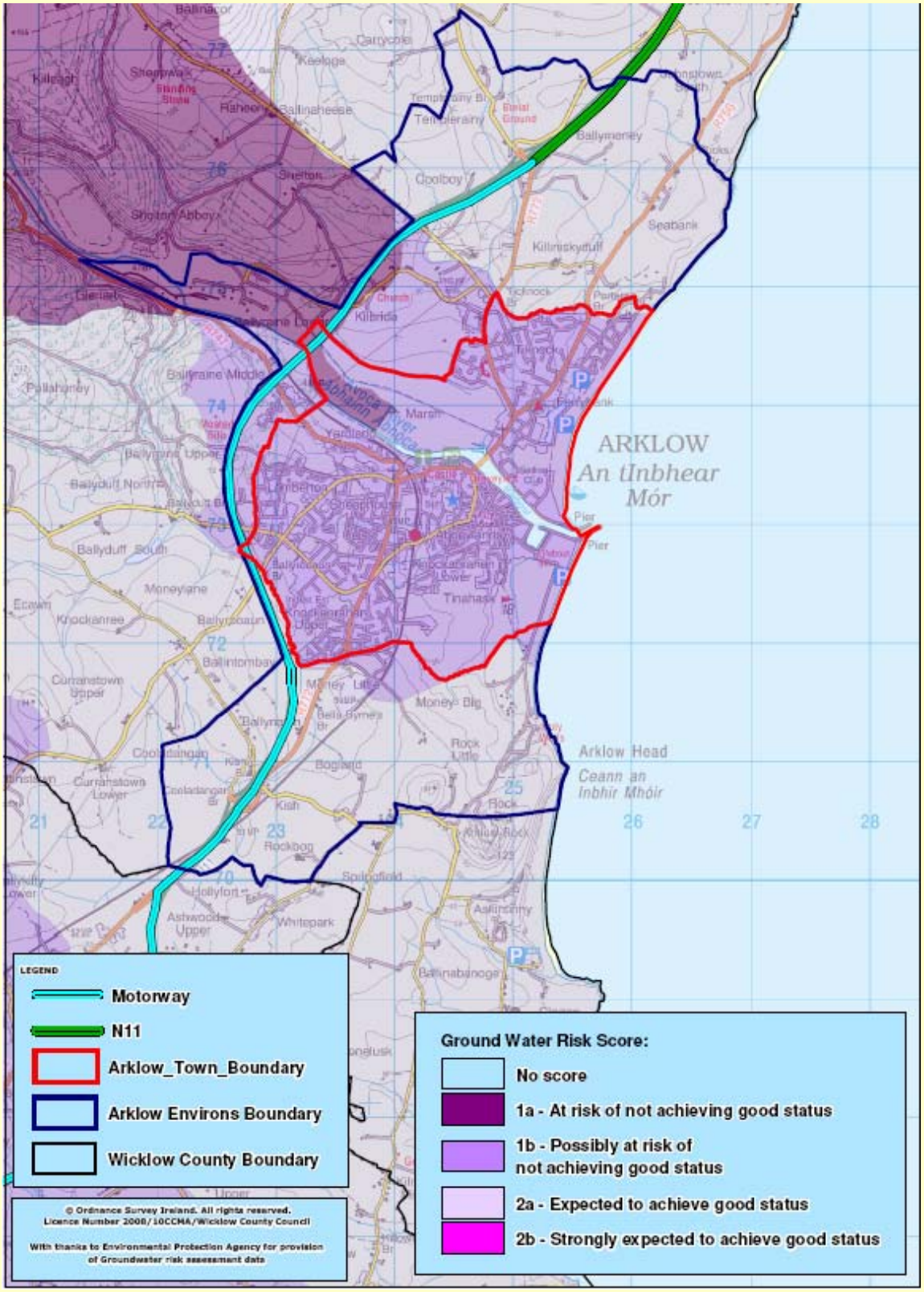
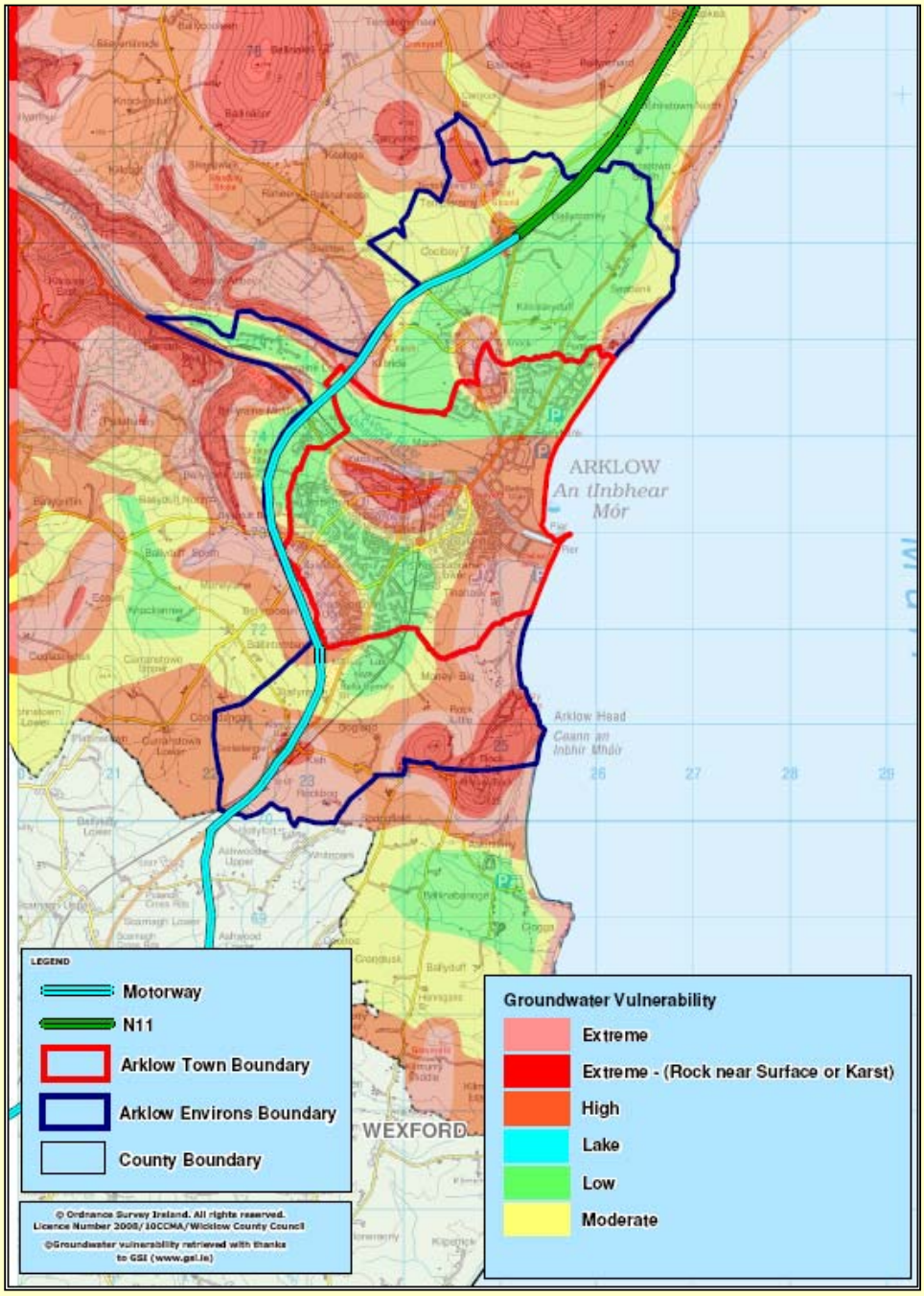


Figure 3.10 Groundwater Vulnerability



3.6.7 Water Supply

The existing water supply serving Arklow Town and Environs is produced in the water treatment works at Ballyduff. Raw water to the treatment works is sourced at two surface water locations. 1) The impounding reservoir at Ballyduff and 2) The Goldmine River at

Woodenbridge. Treated water is currently pumped from the treatment works to reservoirs at Lamberton via 3 no. rising mains.

Due to existing problems with yield and the need to accommodate the projected population growth figures for Arklow Town and Environs it is proposed to upgrade the current water supply. A number of production wells, 16 in total, have been proposed to connect into the existing network, which shall be capable of meeting the projected demand. Each of these sources have been assessed for environmental impacts. As part of this process it is intended that the existing treatment works at Ballyduff shall be decommissioned.

3.6.8 Register of Protected Areas

The WFD requires that Registers of Protected Areas (RPA) are compiled for a water bodies or part of water bodies which must have extra controls on their quality by virtue of how their waters are used by people and by wildlife. There are **no entries** to the RPA in the Plan area. The closest RPA is situated some distance to the south of the plan area at Clogga Beach.

Existing Problems

Problems with regard to water quality have the potential for significant adverse impacts upon biodiversity, flora and fauna, drinking water supplies and human health.

All water bodies - rivers, transitional and coastal - within the study area which have been included in the ERBD's Risk Assessment, with the exception of the groundwater body and have been classified as being (1b) at significant risk of failing to achieve the WFD's objectives by 2015.

With regard to the area's groundwater, a significant amount of the waters are classified as being either of extreme or high vulnerability.

The failure to provide appropriate wastewater treatment infrastructure and capacity alongside development (see Section 3.7) presents a significant potential problem, which could affect the Council's ability to meet its commitments under the WFD.

3.6.9 Flooding

Flooding is an environmental phenomenon which, as well as causing economic and social impacts, could in certain circumstances pose a risk to human health. The Avoca River catchment area and Arklow Town have been subject to periodic flooding over a number of years. Heavy storms in 2000 & 2010 caused severe flooding in Lower Main Street, South Quay and Ferrybank.

Much of the flooding in the Arklow area occurs during adverse weather conditions whereby heavy rainfall causes high river flows. Local conditions within the Arklow area including the nineteen Arch bridge and culverts - which restrict high flows, debris which cause blockages and land use changes also increase the risk of flooding.

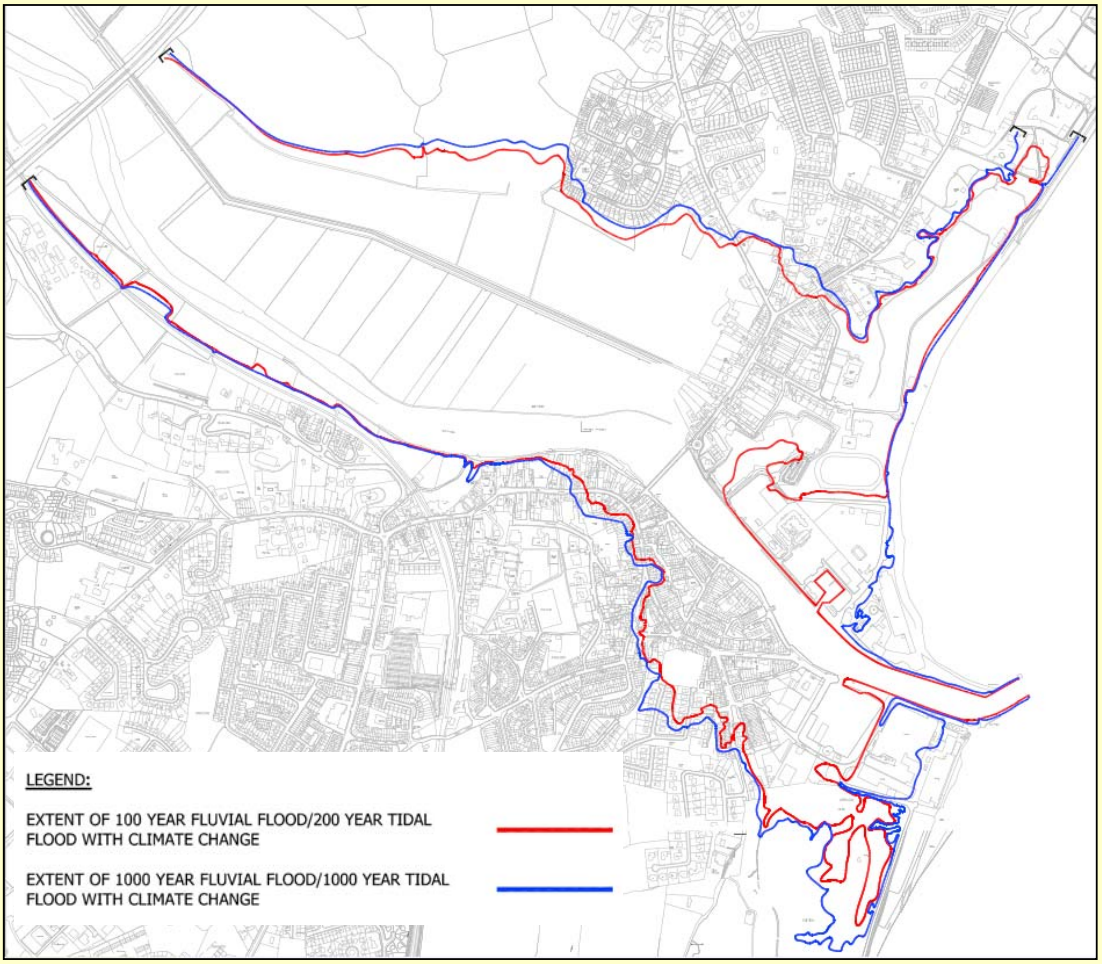
3.6.10 Developments in Flood Management in Arklow

The Office of Public Works (OPW) is the lead agency for flood risk management in Ireland. This gives the OPW a role in policy advice and coordination in addition to its operational roles. Arklow Town Council has undertaken a flood relief study and programme.

As part of this study a hydraulic model of the River Avoca through Arklow was developed to predict flood levels within the model reach under existing conditions and also to predict the flood profile under various proposed flood relief scenarios. The model reach extends from the open sea at the entrance to Arklow Harbour to approximately 200m upstream of the N11 Arklow by-pass bridge, which represents a channel reach length of 3.3km.

This study is likely to impact on the future zonings and development within the town and environs.

Figure 3.11 Flooding



3.6.11 Flood Risk Management Guidelines for Local Authorities

Newly published Guidelines from the Department of Environment, Heritage and Local Government entitled 'The Planning System and Flood Risk Management' ['The Guidelines' hereafter] require consideration of flooding to be included as part of Strategic Environmental Assessment, accordingly it is considered within this review.

In accordance with the provisions of the Flood Risk Management Guidelines two types of considerations emerge:

1/ Lands at risk of flooding that are currently zoned for development under the existing plan

2/ Lands that are proposed to be developed under the proposed draft plan

The Guidelines recommend that where flood risk assessments highlight existing, undeveloped areas which, on their own merits, were zoned for development in previous development plans but which new information indicates may now, or in the future, be at risk of flooding, that planning authorities should reconsider the zoning objective for any such lands. Furthermore specific guidelines as to the options that may be considered are provided which include:

- The Removal of the existing zoning for all types of development on the basis of the unacceptable high level of flood risk;
- A Reduction the zoned area and change or add zoning categories to reflect the flood risk; and/or replace the existing zoning with a zoning or a specific objective for less vulnerable uses;
- The Preparation of a local area plan informed by a detailed flood risk assessment to address zoning and development issues in more detail and prior to any development; and/or
- To specify, in exceptional circumstances and where the criteria of the Justification Test have been met, design of structural or non-structural flood risk management measures as pre-requisites to development in specific areas, ensuring that flood hazard and risk to other locations will not be increased or, if practicable, will be reduced.

Therefore the SEA may recommend that in compliance with the Guidelines the proposed draft plan should remove the existing zoning for all types of development on the basis of the unacceptable high level of flood risk; and replace the existing zoning with a zoning or a specific objective for less vulnerable uses.

2/ Lands that are proposed to be zoned under the proposed draft plan

The Guidelines state that 'Planning authorities will ensure development is not permitted in areas of flood risk, particularly floodplains, except where there are no suitable alternative sites available in areas at lower risk that are consistent with the objectives of proper planning and sustainable development' therefore the SEA may recommend that compliance with the Guidelines will require that certain lands should not be rezoned for development in the proposed draft Plan.

3.6.12 Future influences of flood risk

Large-scale changes in the plan area over the next 50 to 100 years, which could significantly influence flood risk and increase the magnitude and occurrence of flooding may include:

• Climate changes resulting in increased river flows and rising sea levels (see Section 3.6);

• Large-scale land use changes

• Urban development increasing the speed and volume of run-off; and
• Changes to geomorphological processes such as sediment transport, siltation and erosion.

Existing Problems

The above descriptions identify a number of sensitivities with regard to the status of water bodies within the Arklow Development Plan area. All surface waters and parts of the underlying groundwater within the plan area are "at significant risk" of not meeting the legislative water quality objectives under the Water Framework Directive. The pressures which have been identified by the ERBD in the characterisation of the water bodies within and surrounding the Plan area include:

⇒ Point Source Pollution – Mine Risk and Groundwater Quality Risk, CSO's (Combined Sewer Overflows), Diffuse pollution – EPA diffuse model and Point/Diffuse pollution
⇒ The presence of 'OSPAR' Nutrients[11].
⇒ Diffuse pollution

Evolution of Water in the absence of a Development Plan

Surface Waters

Based on the above findings from the Risk Assessment characterisation reports the main surface water bodies located within Arklow Town and its Environs would be unlikely to meet the objectives of the Water Framework Directive.

Groundwaters

The potential for groundwater pollution would be increased with the developments being served by individual wastewater treatment plants, which may not have been constructed properly or managed sufficiently to prevent groundwater pollution.

[11] The presence of excessive enrichment of water with nutrients which may cause an increase in the accelerated growth of algae in the water column and higher forms of plants living on the bottom of the sea. This may result in a range of undesirable disturbances in the marine ecosystem, including a shift in the composition of the flora and fauna which affects habitats and biodiversity, and the depletion of oxygen, causing death of fish and other species. (Euthrophication)

Flooding:

Inappropriate development on land prone to flooding would increase the effects and extent of flooding potentially causing pollution of groundwater sources (as above) impacting on water supplies.

Much of the flooding in the Arklow area occurs during adverse weather conditions whereby heavy rainfall causes high river flows.

3.7 Air and Climatic Factors

3.7.1 Introduction and Legislation

In order to protect human health, vegetation and ecosystems, EU Directives set down air quality standards in Ireland and the other Member States for a wide variety of pollutants. These pollutants are generated through fuel combustion, in space heating, traffic, electricity generation and industry and, in sufficient amounts, could affect the well being of the areas inhabitants. The EU Directives include details regarding how ambient air quality should be monitored, assessed and managed.

The principles to this European approach are set out under the Air Quality Framework Directive 1996 as transposed into Irish law under the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (SI No. 33 of 1999).

Four daughter Directives lay down limits or thresholds for specific pollutants. The first two of these directives cover: sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead; and, carbon monoxide and benzene. Two more daughter directives deal with: ozone; and polyaromatic hydrocarbons, arsenic, nickel, cadmium and mercury in ambient air.

In order to comply with these directives, the EPA measures the levels of a number of atmospheric pollutants. For the purposes of monitoring in Ireland, four zones are defined in the Air Quality Standards Regulations 2002 (SI No. 271 of 2002). The main areas defined in each zone are:

- Zone A: Dublin Conurbation.
- Zone B: Cork Conurbation.
- Zone C: Other cities and large towns comprising Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Wicklow, Naas, Carlow, Tralee and Dundalk.

• Zone D: Rural Ireland, i.e. the remainder of the State - small towns and rural areas of the country - excluding Zones A, B and C.

The Arklow Town and Environs area is located in Zone D. There is currently no ambient air quality monitoring in the Arklow Area with past monitoring stations being situated in Avondale and Bray.

Air quality in the general study area is not considered to be a significant issue.

3.7.2 Potential sources of point source emissions to Air:

IPPC Licensed Facilities:

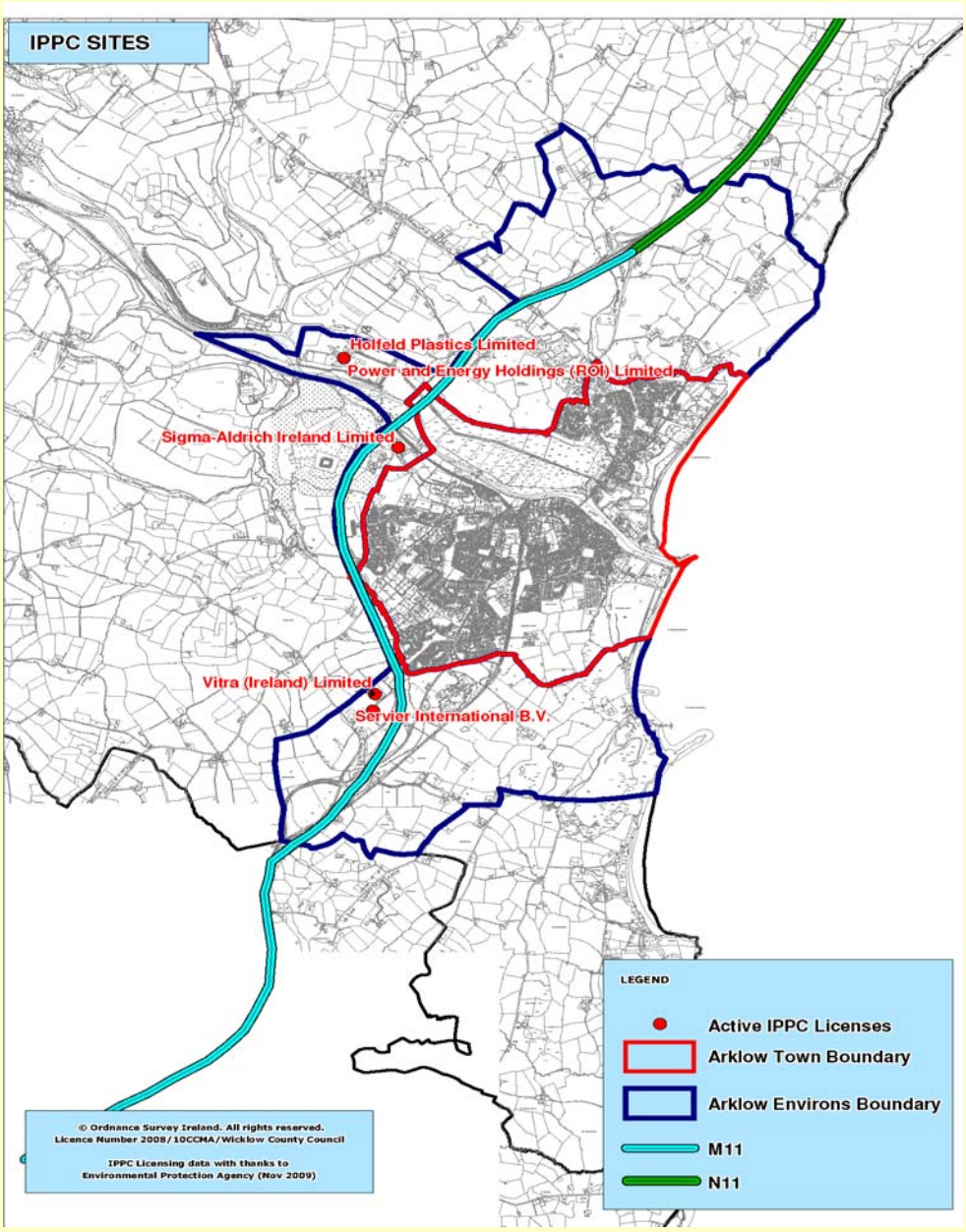
There are four active IPPC licensed facilities located within the Arklow and Environs Area.

Licence No.	Name	Location	Class of Activity	Description
P0031-01 P0031-02	Holfeld Plastics Limited	Arklow	5.5.0: Chemicals	The manufacture of artificial fertilizers
P0848-01	Power and Energy Holdings (ROI) Limited	Avoca River Park, Arklow	2.1.0: Energy	The operation of combustion installations with a rated thermal input equal to or greater than 50MW
P0089-01 P0089-02 P0089-03 P0089-04	Sigma-Aldrich Ireland Limited	Vale Road, Arklow	5.6.0: Chemicals 5.16.0: Chemicals	The manufacture of pesticides, pharmaceutical or veterinary products and their intermediates The use of a chemical or biological process for the production of basic pharmaceutical products.
P0823-01	Vitra (Ireland) Limited	IDA Business Park, Ballynattin, Arklow, County Wicklow, Wicklow.	13.4.1: Other Activities	The manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day, or with a kiln capacity exceeding 4 m3 and a setting density per kiln exceeding 300 kg/m3.
P0128-01	Servier International B.V.	Gorey Road, Arklow, Co. Wicklow, Wicklow	5.6.0: Chemicals	The manufacture of pesticides, pharmaceutical or veterinary products and their intermediates.

As can be seen from the above table the primary IPPC licensed activities being carried out relate to the manufacturing of fertilizers, pesticides, pharmaceutical and veterinary products, construction materials such as tiles, blocks bricks etc and surface coatings.

The IPPC Licensee requires that all operations on-site be carried out in a manner such that air emissions and/or odours do not result in significant impairment of, or significant interference with amenities or the environment beyond the site boundary.

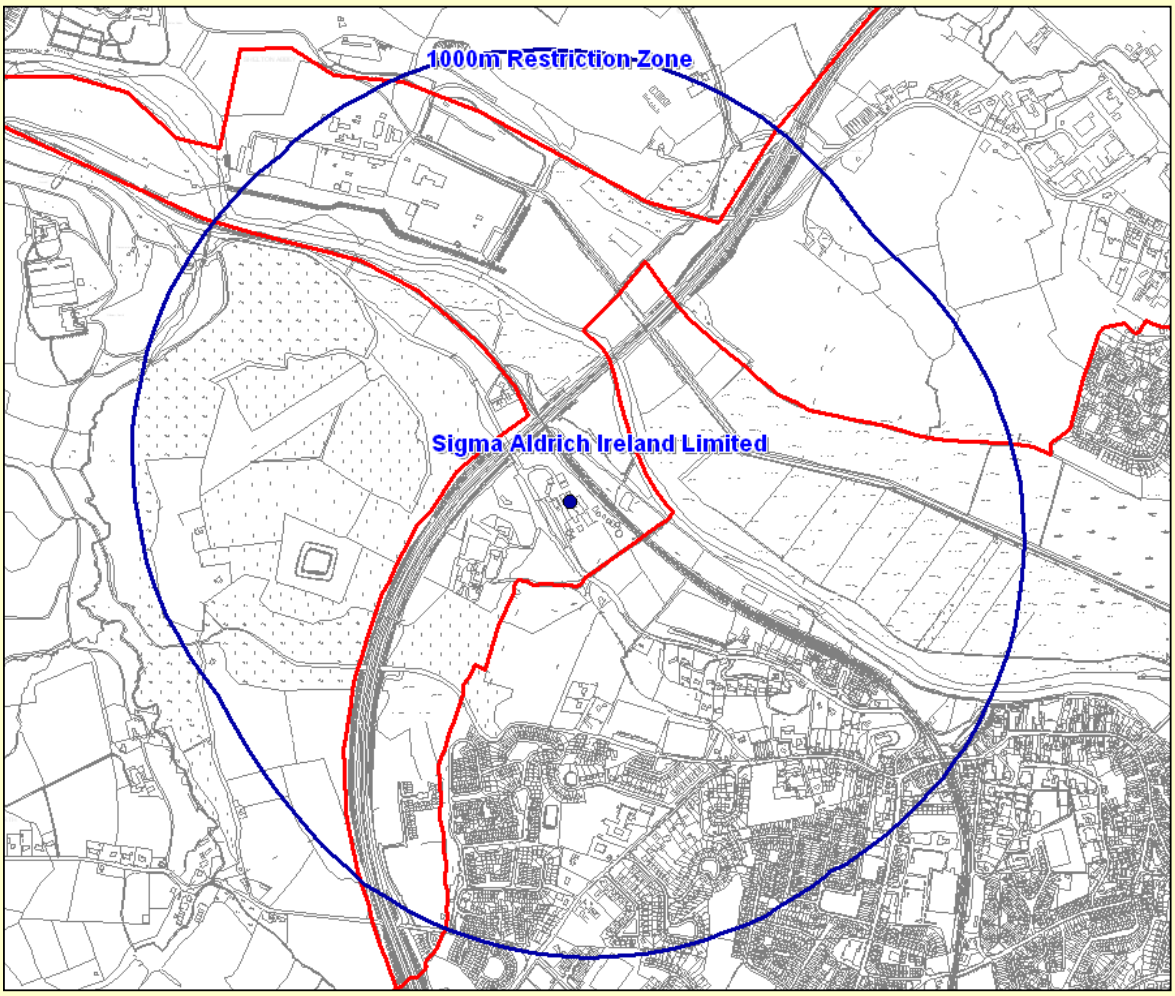
Figure 3.12 IPPC Licensed Facilities



3.7.3 Seveso Sites

The 'control of major accident hazards involving dangerous substances Directive 1996' also referred to as the Seveso II or COMAH Directive, aims to ensure that, at locations where dangerous substances are handled in quantities above specified thresholds; there will be a high level of protection for people, property and the environment. This is to be achieved by: preventing or minimising the risk of a major accident; and, taking all the necessary measures to limit the consequences of such an accident, should it occur. The Directive is transposed into Irish law through the European Communities (control of major accident hazards involving dangerous substances) Regulations 2006 (SI No. 74 of 2006) implementing Council Directive 2003/105/EC (amending Directive 96/82/EC).

Figure 3.13 Seveso - Sigma Aldrich Ireland Limited – 1000m Consultation Zone



A consultation distance of 1000m is provided for whereby the planning authority is obliged to seek technical advice from the Health and Safety Authority for all proposed developments located within this zoned.

The Seveso II Directive includes provisions in relation to land use planning. Article 12 of the Directive requires member states to ensure that the objectives of preventing major accidents and limiting the consequences of such accidents are taken into account in land use policies and/or other relevant policies. These objectives must be pursued through controls on the following:

⇒ The siting of new establishments;

⇒ Modifications to existing establishments;

⇒ Development in the vicinity of an establishment, which, by virtue of its type or siting, is likely to increase the risk or consequences of a major accident.

There is one designated Seveso site located within the Plan area. This is located at the Sigma Aldrich Ireland Limited located along the vale Road in Arklow.

3.7.4 Noise

Within the Arklow Town and Environs plan area the places most commonly affected by noise are urban areas and areas along roadsides. Noise is unwanted sound. It can seriously harm human health and interfere with daily activities at school, at work, at home and during leisure time. The main health risks of noise identified by the WHO include: pain and hearing fatigue; hearing impairment; annoyance; interferences with social behaviour; interference with speech communication; sleep disturbance and all its consequences; and performance at work and school.

The over-riding noise source within the plan area is from traffic. Streets in low lying areas that have high traffic counts as well as enclosing taller buildings are likely to have harsh sensory environments in regard to noise levels.

In addition, there are localised noise sources, which include air conditioning equipment, marine traffic, port activities, train movements and night clubs. Traffic hotspots within some of the towns are likely to have elevated levels of air pollution and noise due to traffic congestion. These hotspots are located along the main road routes - especially at intersections - and provide for a harsh sensory environment, which may impact upon human health.

The existing quarrying activities at Arklow Rock also form a source of noise pollution. The processes involved in exposing the mineral to be extracted and the actual excavation and transportation of such materials can all accumulate to form a significant adverse impact on the surrounding environment and Human Health.

Existing Air and Climatic Problems

Traffic hotspots within the urban parts of the Plan area and along the main arterial routes off the N11 are likely to have elevated levels of air pollution and noise due to traffic congestion.

Arklow's location within the commuter belt for Dublin and North Wicklow amount to a large quantity of traffic movements along the N11 that is a significant concern within the plan area. A lack of sustainable public transport linking Arklow to these areas and other settlements within the County has resulted in increased private car trips. Such linkages must be provided before public transport becomes a viable alternative to car trips. Reductions in private car movements will result in a reduction in emissions such as PM10 and NOx.

Localised air pollution incidences with regard to PM10 and PM2.5 and noise pollution are both likely to occur when demolition/construction takes place - especially in relation to PM10 if suppression techniques are not introduced

Changes in sea level and/or changes in the occurrence of severe rainfall events as a result of climate change could adversely impact upon the plan areas human beings, its biodiversity and its economy *(see also previous section on Flooding).*

In terms of the impact of various licensed industrial facilities on future development, the development of brownfield sites for mixed use development will need to have regard to any health and safety constraints imposed by existing industrial uses.

Ireland's current emissions are exceeding targets agreed in the peer review of Ireland's 2006 submission to the United Nations Framework Convention on Climate Change. It is unlikely that Ireland will meet these targets and it is likely therefore that financial penalties will be incurred. Transport related emissions continue to be the dominant growth sector.

Evolution of Air and Climatic Factors in the absence of a Development Plan

In the absence of a Development Plan there would be no framework for the location of new development and as a consequence development would be likely to occur in a piecemeal fashion, spread out across wider areas than otherwise may be the case. This would result in significant increases in travel related emissions to air.

While increases in the use of catalytic converters, cleaner fuels, better engine technology and maintenance is generally reducing the pollution omitted per motor vehicle, this reduction is probably being offset by the increase in the number of cars as well as the increase in the volume and incidences of traffic congestion. Increases in the number of cars as well as the increase in the volume and incidences of traffic congestion may lead to increases in air and noise pollution in the future.

In the absence of a Development Plan, the realisation of objectives relating to energy efficiency, renewable energy and a reduction in transport related emissions contained within the Draft Development Plan would be made more difficult.

If new development or an intensification of existing land uses were to occur in the Plan area adverse impacts upon air quality and noise levels, and resultant impacts upon human health, would be likely to arise if unmitigated.

The Draft Development Plan provides an opportunity to provide for the regeneration of certain areas within the town centre close to existing public transport linkages. This regeneration would provide for an increased population, which would be less dependent upon private modes for transportation and would therefore be likely to generate less transport related greenhouse gas emissions than populations located further away from the urban areas. In the absence of a Development Plan regeneration of the areas provided for would not be achieved and an opportunity to prevent the generation of future transport related greenhouse gas emissions would be missed.

3.8 Material Assets

3.8.1 Waste Water

Arklow Town and its Environs does not currently benefit from the use of an effluent treatment facility. The current treatment demand for the plan area is identified as being 16,997 with domestic demand being 14,447 and non-domestic demand being 2,550. The proposed Waste water treatment works for the area will cater for a population equivalent of 18,000. The Draft County Development Plan projects a population of 19,000 for the Arklow Area in 2016 and 23,000 in 2022. The construction of the Arklow main drainage scheme will remove outfalls from the Avoca River.

The immediate provision of this facility is a vital requirement in the fulfilment of the area's development requirements.

3.8.2 Drinking Water

The existing water supply serving Arklow Town and Environs is produced in the water treatment works at Ballyduff. Raw water to the treatment works is sourced at two surface water locations. 1) The impounding reservoir at Ballyduff and 2) The Goldmine River at Woodenbridge. Treated water is currently pumped from the treatment works to reservoirs at Lamberton via 3 no. rising mains.

Due to existing problems with yield and the need to serve the projected population growth figures for Arklow Town and Environs it is proposed to upgrade the current water supply. A number of production wells, 16 in total, have been proposed to connect into the existing network, which shall be capable of meeting the projected demand. Each of these sources has been assessed for environmental impacts and all boreholes are situated to the south of the Avoca River. As part of this process it is intended that the existing treatment works at Ballyduff shall be decommissioned.

There is a problem with leakage from the mains. In order to limit leakage, the Council have a works programme for leakage reduction, which is ongoing during the lifetime of the plan.

In addition to the above the absence of an adequate public wastewater treatment works capable of serving the plan area and its projected population has the potential to adversely impact on drinking water quality arsing from individual treatment plants serving new development and impacting on groundwater's within the plan area. This issue poses serious

problems for drinking water quality in the area with the existing supply being identified by the HSE (as stated earlier) as an area where further investigation or improvement is required.

3.8.3 Transport

The town of Arklow is by-passed by the N11/M11 National primary route. The old N11 road running through the centre of the town still provides the main route for local traffic and joins the N11/M11 bypass to the north and south of the town. The provision of a third interchange along this national route to the serve the population of both Arklow and to provide a connection to the south west of the county is an objective of the Wicklow County Plan 2010-2016.

The regional R747 link forms the main route, west to Aughrim and Tinahely, whilst the R750 coastal road provides an alternative route to Wicklow in the north. To the south west of the town, Coolgreaney Road, Cemetery Road and Emoclew Road form a distributor ring to the west of Wexford Road. To the east of the N11, Main Street, Abbey Street and Yellow Lane form a similar loop to the east of Wexford Road.

Below this distributor level network are secondary routes that provide through and loop access to the town centre, residential areas and other sectors of the town. At a tertiary level are mainly cul-de-sac accesses to developments.

Public transport to Arklow town is provided by: a train service through the station located to the south west of the town centre; a Bus Éireann bus service that runs approximately every two hours, connecting to Dublin and southerly towns such as Arklow and Waterford. The limited availability of public transport services is reflected in the dominance of car use as the main transportation mode.

3.8.4 Flooding

The Avoca River catchment area and Arklow Town have been subject to periodic flooding over a number of years. Heavy storms in 2000 & more recently in 2010 caused severe flooding in Lower Main Street, South Quay and Ferrybank. The Office of Public Works (OPW) is the lead agency for flood risk management in Ireland. This gives the OPW a role in policy advice and coordination in addition to its operational roles. The Council has undertaken a flood relief study and programme. The plan will need to take cognisance of the existing flooding problems in Arklow Town, which demonstrates a need for the development of surface water attentenuation mechanisms and SUDS (Sustainable Urban Drainage Systems). These

are of particular importance as part of any development proposals in areas close to existing water bodies.

3.8.5 Waste Management

The emphasis in the Plan will be to carry out waste management in conjunction with Wicklow County Council. Arklow Town Council will conform to the European Union and national waste management hierarchy in the undertaking of waste prevention, waste recycling and, energy recovery and disposal. In particular, Arklow Town Council will encourage, enable and facilitate Wicklow County Council and the implementation of the Wicklow Waste Management Plan 2006-2011 to provide recycling facilities and services in the town.

Arklow Town Council and Wicklow County Council are responsible for the operation of litter collection within the plan area. Both Councils recognise that littering and illegal dumping are serious problems. To this accord the Councils have, in cooperation with the relevant agencies, and in consultation with the public, prepared and implemented Litter Management Plans for both Arklow Town and Wicklow County. These Litter Management Plans put in place policies and initiatives to combat the problems of litter and illegal dumping. The success of these plans will be the measure of how litter pollution is controlled, alleviated and / or prevented in the plan area during its lifetime.

Existing Problems

The failure to provide a wastewater treatment plant with sufficient capacity for existing and permitted development represents a significant existing environmental problem that is likely to be adversely impacting upon the Council's ability to meet its commitments under the Water Framework Directive (see section on WFD). The construction of the new wastewater treatment plant will help to solve this problem and enable future population growth.

In order to accommodate recent and future growth, the new wastewater treatment plant, increased water supply and additional transport infrastructure etc are needed. Such infrastructural projects or programmes are likely to have significant adverse impacts on the environment if not mitigated. These projects or programmes may require environmental assessments to be carried out on them in order to prevent such impacts.

In the designation of lands for certain uses a strong recognition of the findings of the flood risk assessment must be carried out in order to ensure compliance with the Flood Risk Management Guidelines 'The Planning System and Flood Risk Management'.

Evolution of Material Assets in the absence of a Development Plan

In the absence of a development plan the provision of a waste water treatment and water supply network serving all lands within the plan area would become unfeasible with sprawled development increasing the costs and feasibility of providing such services.

The development of lands prone to flooding in the absence of relevant guidance and infrastructure would be likely to increase the occurrences and extent of flooding within the plan area.

The objectives of the Arklow land use and transportation study 2003 - prepared to provide detailed land use and transportation proposals for the future growth of the Arklow Town area, having particular regard to land-use patterns that compliment local public transport, walking and cycling - which have been taken into consideration and integrated into the Proposed Draft Development Pan which might not have been integrated into planning for the area in the absence of a Development Plan.

3.9 Cultural Assets

3.9.1 Introduction

Heritage, by definition, means inherited properties, inherited characteristics and anything transmitted by past ages and ancestors. It covers everything, from objects and buildings, to the environment. Cultural heritage includes physical buildings, structures and objects complete or in part, which have been left on the landscape by previous and indeed current generations.

The Wicklow County Development Plan 2010-2016, in line with the Planning and Development Act 2000 and Government Policy seeks to protect and conserve buildings, areas, structures and features of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

The most important items of archaeological and architectural heritage in the Arklow Area are set out in chapter 8 of the Draft Arklow Town and Environs Development Plan.

3.9.2 Archaeological Heritage

Archaeology is the study of past societies through the material remains left by those societies and the evidence of their environment. Archaeological heritage consists of such material remains (whether in the form of sites and monuments or artefacts in the sense of moveable objects) and environmental evidence. As archaeological heritage can be used to gain knowledge and understanding of the past it is of great cultural and scientific importance.

Archaeological sites and monuments vary greatly in form and date; examples include earthworks of different types and periods, (e.g. early historic ringforts and prehistoric burial mounds), megalithic tombs from the Prehistoric period, medieval buildings, urban archaeological deposits and underwater features such as wrecks. Archaeological sites may have no visible surface features; the surface features of an archaeological site may have decayed completely or been deliberately removed but archaeological deposits and features may survive beneath the surface. Such sites may sometimes be detected as crop-marks visible from the air or have their presence indicated by the occurrence of artefact scatters in ploughed land, but in other cases may remain invisible unless uncovered through ground disturbance.

Archaeology in Ireland is protected under the National Monuments Acts 1930 to 2004.

3.9.3 Monuments

The Record of Monuments and Places (RMP), was established under Section 12 of the National Monuments (Amendment Act) 1994. Structures, features objects or sites listed in this record are known as Recorded Monuments.

Monuments include: any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections; any cave, stone or other natural product, whether or not forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position; any, or any part of any, prehistoric or ancient tomb, grave or burial deposit, or, ritual, industrial or habitation site; and any place comprising the remains or traces of any such building, structure or erection, any such cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site, situated on land or in the territorial waters of the State', but excludes 'any building or part of any building, that is habitually used for ecclesiastical purposes'.

The historic core of Arklow is as a Zone of Archaeological Potential, containing known recorded monuments. Other recorded monuments occur in the townlands of Templerainey, Kilbride, Bogland and Rock Big. Burial grounds are an important part of local heritage, often containing the standing remains of sites of earlier structures and also a great diversity of animal and plant life.

Within the plan area, there are 7 entries to the Record of Monuments and Places and one Zone of Archaeological Potential.

Table 3.1 - Arklow Recorded Monuments:

RMP Number	Townland/Location	Classification
40:29	Abbeylands/ Arklow/ Ferrybank/ Marsh/ Sheephouse/ Tinnahask lower/ Yardland	Historic Town, Castle (in ruins), site of church and graveyard
40:21	Kilbride	Kilbride Church (in ruins), Grave Yard, Mausoleum
45:3	Bogland	Church and Graveyard site
45:4	Rock Big	Site of St. Iver's Holy Well
45:6	Rock Big	Lady's Holy Well
45:7	Rock Big	Site of St. Patrick's Holy Well
45:5	Rock Big	Ecclesiastical Remains/Chapel site

Figure 3.14 Recorded Monuments and Structures Overview Map

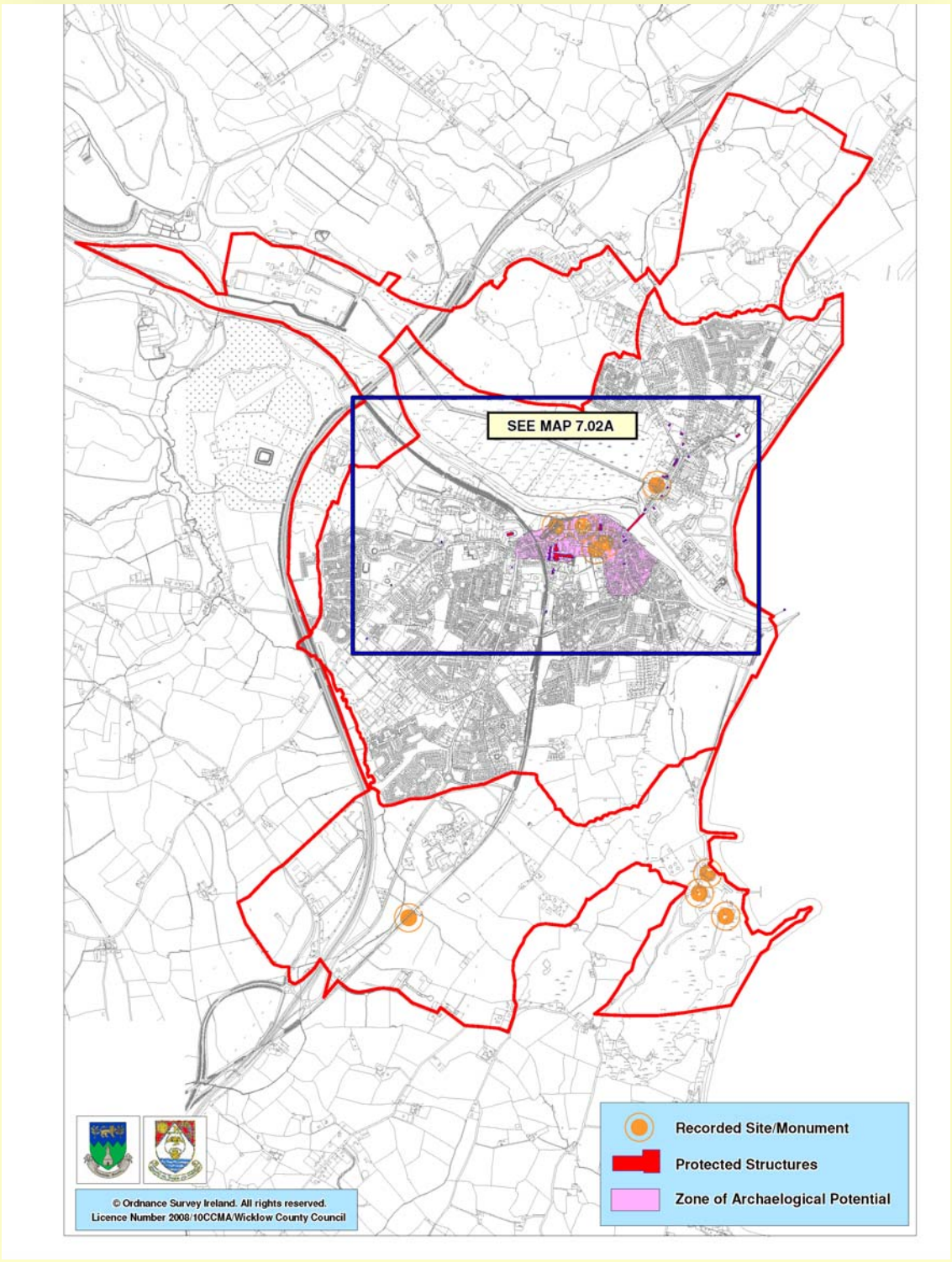
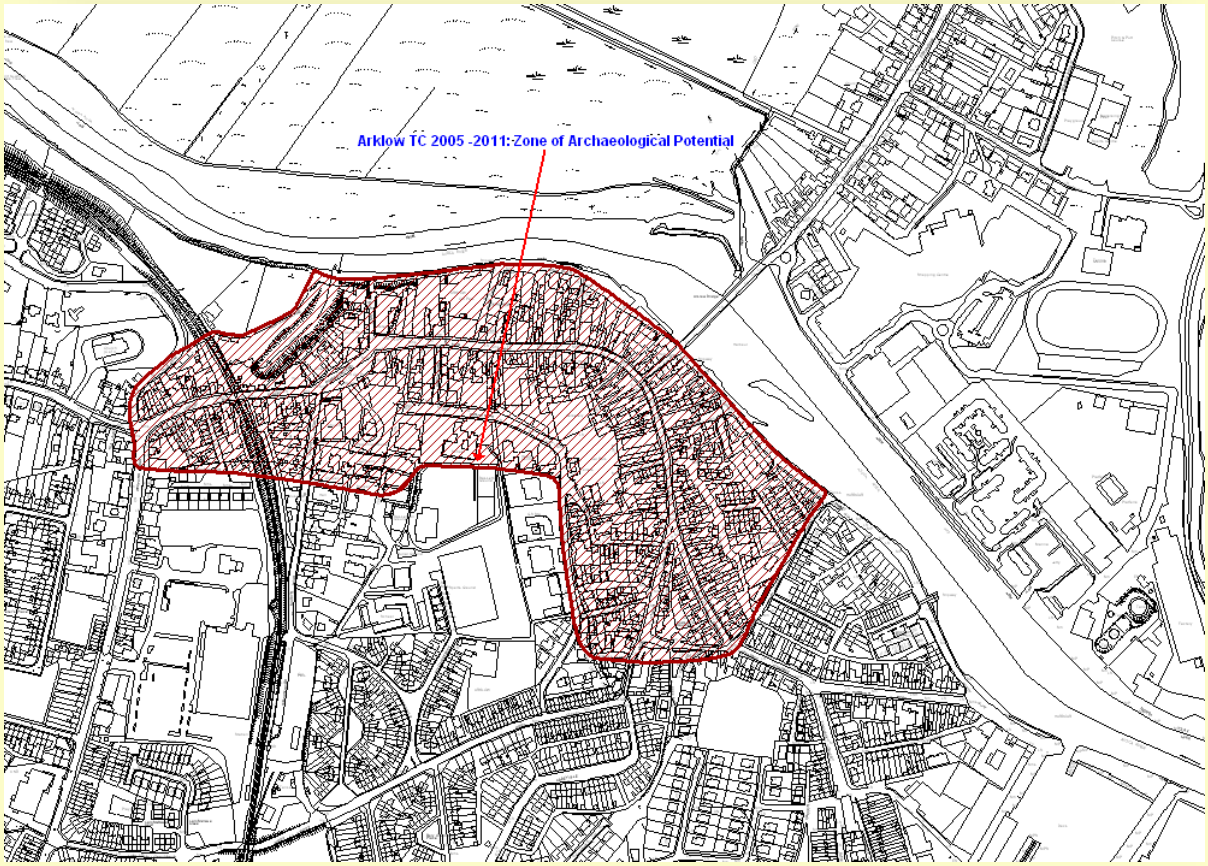


Figure 3.15 Zone of Archaeological Potential



3.9.4 Architectural Heritage

The term architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments Act 1999 as meaning all:

⇒ Structures and buildings together with their settings and attendant grounds,

⇒ Fixtures and fittings;

⇒ Groups of structures and buildings; and

⇒ Sites, which are of technical, historical, archaeological, artistic, cultural, scientific, social, or technical interest.

The Record of Protected Structures (RPS) included in the County Wicklow Development Plan is legislated for under Section 51 of the Planning and Development Act 2000 and includes a number of structures within the study area. All structures, buildings, or erections, which came into existence after 1700 A.D., can be protected through enlistment in the RPS. Protected Structures - structures enlisted on the RPS - are defined as structures, or parts of structures

that are of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social or technical point of view. The term 'structure' encompasses the interior of the structure, the surrounding land or 'curtilage' of the structure, any other structures lying within that curtilage.

There are 38 existing entries to the RPS, which have been carried forward in the Development Plan. Eight other entries to the existing RPS are proposed to be removed. There is no Architectural Conservation Areas (ACAs) designated

The NIAH is a state initiative under the administration of the DEHLG which was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Its purpose is to identify, record, and evaluate the post- 1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. It is intended that the NIAH provides the basis for the inclusion of particular structures in the RPS.

Table 3.2 - Arklow Record of Protected Structures:

Town Plan Ref Number *NIAH number (if applicable)*	Structure & Address	Description
A01 *16322001*	**St.Saviours Church** Coolgreaney Road, Arklow.	Detached multiple-bay single-storey Early English Gothic Style church, built 1899 to designs by Sir Arthur Bloomfield. The church is constructed in coursed rock-faced granite with smooth granite dressings
A02 *16322008*	**Lamberton Water Tower**, Coolgreaney Road	Detached three-stage water tower, built c.1930. The tower is constructed in reinforced concrete and comprises of a circular shaft which supports an inverted cone, which in turn supports a drum shape.
A03 *16322009*	**Lamberton Gate Lodge,** Coolgreaney Road, Arklow.	Detached two-bay one and a half-storey picturesque former gate lodge, built in 1898, and now in use as a house. The building is constructed in squared rock-faced granite with smooth granite dressings.
A04 *16322011*	**Cemetery Gate Lodge** , Emoclew Road, Arklow.	Detached three-bay single-storey Classical style gate lodge, built c.1870. The building is constructed in dressed coursed granite.
A05 *16322012*	**Bank Of Ireland**, Main Street, , Arklow.	End-of-terrace three-bay three-storey bank, built c.1880. The façade is finished in rusticated granite at ground floor level, with brick to the upper storeys, granite sill courses and granite coping to the parapet.
A06	**St.Marys and Peters Church**,	Detached seven-bay double-height Renaissance Style church, built 1861

16322014	Parade Ground, Saint Mary's Road, Arklow.	to designs by Patrick Byrne. The building is finished in ashlar granite to the front north façade and squared rubble granite elsewhere; transepts to south end of the east and west sides.
A07 *16322015*	**Fr.Michael Murphy statue**, Parade Ground, Arklow.	Statue by G. Smyth of Dublin, erected in 1898 to commemorate the centenary of the death of United Irishman Fr Michael Murphy in the 1798 Rebellion
A08 *16322020*	**1 Saint Mary's Terrace**, Saint Mary's Road.	End-of-terrace three-bay two-storey house built c.1870. The house is finished in unpainted lined render with moulded quoins. The panelled timber door is framed with pilasters with console brackets, a plain fanlight and is set within a semi-circular headed opening with heavy moulded surround with keystone motif
A09 *16322021*	**2 Saint Mary's Terrace**, Saint Mary's Road.	Terraced three-bay two-storey house built c.1870. The house is finished in unpainted lined render with moulded quoins. The panelled timber door is framed with pilasters with console brackets, a plain fanlight and is set within a semi-circular headed opening with heavy moulded surround with keystone motif
A10 *16322022*	**3 Saint Mary's Terrace**, Saint Mary's Road.	Terraced three-bay two-storey house built c.1870. The house is finished in unpainted lined render with moulded quoins. The panelled timber door is framed with pilasters with console brackets, a plain fanlight and is set within a semi-circular headed opening with heavy moulded surround with keystone motif.
11 *16322023*	**4 Saint Mary's Terrace**, Saint Mary's Road.	Terraced three-bay two-storey house built c.1870. The house is finished in unpainted lined render with moulded quoins. The panelled timber door is framed with pilasters with console brackets, a plain fanlight and is set within a semi-circular headed opening with heavy moulded surround with keystone motif
A12 *16322024*	**5 Saint Mary's Terrace**, Saint Mary's Road.	Terraced three-bay two-storey house built c.1870. The house is finished in unpainted lined render with moulded quoins. The panelled timber door is framed with pilasters with console brackets, a plain fanlight and is set within a semi-circular headed opening with heavy moulded surround with keystone motif.
A13 *16322025*	**6 Saint Mary's Terrace**, Saint Mary's Road.	Terraced three-bay two-storey former house, built c.1870, and now in use as a solicitors office. The house is finished in unpainted lined render with moulded quoins. The panelled timber door is framed with pilasters with console brackets, a plain fanlight and is set within a semi-circular headed opening with heavy moulded surround with keystone motif.
A14 *16322026*	**7 Saint Mary's Terrace**, Saint Mary's Road.	Terraced three-bay two-storey house built c.1870. The house is finished in unpainted lined render with moulded quoins. The panelled timber door is framed with pilasters with console brackets, a plain fanlight and is set within a semi-circular headed opening with a heavy moulded surround with keystone motif.
A15 *16322027*	**8 Saint Mary's Terrace,** Saint Mary's Road.	End-of-terrace three-bay two-storey house built c.1870. The house is finished in unpainted lined render with moulded quoins. The panelled timber door is framed with pilasters with console brackets, a plain fanlight and is set within a semi-circular headed opening with heavy moulded surround with keystone motif.
A16 *16322029*	**Arklow Railway Station**, Arklow.	Detached four-bay two-storey Railway Station, built 1863. The building is finished in roughcast render with surrounds to the openings; to the north and south are small lean-to and flat-roofed recent additions. The timber

		sheeted door opening on to the platform is set below a gabled bracketed roof. Window openings are flat-headed and mainly with two over two timber sash frames.
A17 *16322030*	**Navigation Beacon,** North Quay, Arklow.	Free standing tall navigation beacon set on the north quay of the Arklow harbour within the tidal estuary of the Avoca River, built in the first half of the 20th century.
A18 *16322031*	**10 Townville** St.Marys Road, Arklow	Semi-detached three-bay two-storey Domestic Revival style pair of houses, built c.1900. The houses are rendered with rusticated finish to the ground floor, dry dash finish to the first floor and with moulded quoins. Each is double-gabled
A19 *16322031*	**11 Townville** St.Marys Road, Arklow	Semi-detached three-bay two-storey Domestic Revival style pair of houses, built c.1900. The houses are rendered with rusticated finish to the ground floor, dry dash finish to the first floor and with moulded quoins. Each is double-gabled. The northern house has a panelled door with plain fanlight and both are set within a flat-headed opening; and framed with a open gabled porch supported on timber brackets. To
A20 *16322032*	**Arklow School (Former),** Saint Mary's Road	Detached four-bay two-storey former school, built 1878, and now in use as a house. The building is finished in roughcast render with a projecting two-storey gabled bay to the south side. The front door is now covered with a glazed porch addition which abuts a flat-roofed addition
A21 *16322033*	**Saint Marys and Saint Peters Convent (Apartments)** St.Marys Road, Arklow.	Detached nine-bay two-storey former convent built c.1880, and now converted to apartments. The building is constructed in squared semi-coursed basalt rubble with straw coloured brick dressings. To either side is a projecting hipped roof square bay in symmetrical arrangement. To the south is a chapel addition dating from the 1930s while to the rear north is a very long return
A22 *16322034*	**48 Main Street**, Arklow	Terraced five-bay two-storey former house, built c.1840, now in use as two shops. The façade is finished in painted render, whilst the pitched roof is slated and has a large rendered chimneystack to the east. To the ground floor are two non-identical timber shopfonts of c.1880
A23 *16322035*	**22 Main Street**, Arklow.	Terraced five-bay three-storey house, built c.1760, with shopfront insertion of c.1900. The façade is in brick with a granite base course, granite 'quoins' to the shopfront, and painted stone surrounds to the other ground floor openings, whilst the exposed section of the gabled east elevation is rendered. The pitched roof is slated and has brick chimneystacks
A24 *16322037*	**85 Lower Main Street**, Arklow.	Terraced single-bay two-storey former house, built c.1840, now is use as a shop
A25 *16322045*	**2 Bridge Street**, Arklow	Terraced two-bay two-storey shop with living quarters, built c.1880. The façade is finished in painted render whilst the pitched roof is covered in artificial slate and has rendered chimneystacks
A26 *16322046*	**Arklow Bridge** Arklow	Nineteen-arch stone built road bridge over the Avoca river, built c.1755. The bridge has a large central pier with cutwaters to both the north and south sides of the other smaller piers.
A27 *16322047*	**27 Main Street**, Arklow.	End-of-terrace five-bay two-storey house and shop, built c.1890. The façade is finished in brick with moulded string courses and small decorative moulded clay panels. The gabled east elevation is finished in unpainted render.

A28 *16322048*	**AIB 23 & 24 Main Street**, Arklow	End-of-terrace three-bay two-storey Queen Anne Revival style bank, built 1914. The symmetrical front elevation, which has a central full-height gabled projection, is finished ashlar limestone to the ground floor level and brick to the upper level, but with Giant order pilasters, upper floor window surrounds and eaves course also in limestone.
A29 *16322058*	**Aberconic Masonic Hall,** Ferrybank, Arklow.	Detached three-bay single-storey over tall basement Masonic hall, built 1903. The building is finished in roughcast render with moulded eaves course and base course. The panelled front door with lattice pane fanlight is set within a pointed arch opening with moulded stone surround.
A30 *16322059*	**58 Ferrybank,** Arklow.	End-of-terrace three-bay two-storey house/ retail unit, built c.1860. The house is finished in lined rendered with moulded quoins. The panelled front door has a decorative fanlight over and is framed with panelled pilasters with console brackets and a moulded painted surround; all is set within an elliptical-headed opening
A37 *16322074*	**Arklow Methodist Church** Ferrybank, Arklow.	Detached five-bay single-storey gable-ended Gothic style Methodist church, built c.1860. The church is rectangular in plan, with the façade finished in uncoursed rubble stone with dressed stone to the openings. The slated, steeply pitched gable-ended roof has a small octagonal spirelet to the east-facing front and a small stone chimneystack to the rear, as well as stone parapets.
A38 *16322079*	**Kynoch Lodge**, Sea Road, Arklow.	Detached multiple-bay single-storey double-pile timber-clad house, built c.1895, originally as a temporary structure. The house is rectangular in plan with a five-sided projecting bay to the north-west corner and two widely spaced canted bays to the south elevation.
A39 *16322084*	**The Cottage, Sea Road** Arklow.	Detached two-bay single-storey house, built c.1915, with later extension to the east. The building is roughly rectangular in plan but with a canted bay to the west elevation, a recessed bay to the south-east corner, and a projection to the north-east
A40 *16322086*	**National Training and Development Centre (Former national school)** Briggs Lane, Arklow.	Detached five-bay single-storey former national school, built 1892, and now in use as a National Training and Development Centre. The building is constructed in semi-coursed rubble granite with brick dressings.
A41 *16322087*	**National Training and Development Centre (Former Sunday school)** Briggs Lane, Arklow.	Detached seven-bay single-storey former Sunday School hall, built c.1890, and now in use as a National Training and Development Centre. The building is constructed in semi-coursed rubble granite with brick dressings. To the north is a recent modern lean-to addition
A42 *16322088*	**Kilbride Rectory** , Dublin Road,Arklow.	Detached three-bay two-storey house, built c.1920. The house is finished in lined render. The panelled door has multiple-pane sidelights and sits in a slightly projecting flat-roofed recent porch addition.
A43	**43 Main Street, Murphys Public House**, Arklow	Semi detached, four bay, three-storey house/ public house. The façade is finished in painted render with moulded quoins. Timber shopfront with panelled doors. The first floor windows are flat-headed and have plain timber sash frames, modern replacement windows on second floor.
A44	4 Lower Main St, 'Liam De Paor' Arklow	Two storey, two bay, terrace house now in use as a fruit and vegetable shop. Street fronted with painted render façade and a timber shopfront.

Proposed deletions of buildings from the Arklow RPS.

Plan ref/NIAH reference	Address	Description
DEL 1	1 Lower Main Street.	Hiberanian/Inkwell.
DEL 2	17 Upper Main Street, Arklow	Pharmacy/Nolans Wallpaper.
DEL3	**51 Ferrybank**, Arklow.	End-of-terrace three-bay two-storey house, built c.1850. The house is finished in unpainted lined render with moulded quoins.
DEL 4	**Grianan House, 24 Ferrybank**, Arklow.	Terraced two-bay two-storey house, built c.1880. The façade is finished in unpainted lined render with moulded surrounds to the openings, whilst the pitched roof is slated and has rendered chimneystacks.
DEL 5	**20 Ferrybank**, Arklow.	End-of-terrace three-bay two-storey house, built c.1860. The façade is finished in painted lined render with moulded quoins
DEL 6	**23 Ferrybank**, Arklow.	Terraced two-bay two-storey house, built c.1880. The façade is finished in painted lined render with moulded surrounds to the openings, whilst the pitched roof is slated and has serrated ridge tiles and rendered chimneystacks
DEL7	**22 Ferrybank**, Arklow.	Terraced three-bay two-storey house, built c.1880. The façade is finished in painted lined render with moulded surrounds to the openings, whilst the pitched roof is slated and has rendered chimneystacks.
DEL 8	**The Old Manse**, Ferrybank, Arklow.	Detached three-bay two-storey manse, built c.1860. The façade is finished in painted lined render with 'incised' quoins and moulded surrounds to the openings, whilst the pitched roof is covered in artificial slate and has rendered chimneystacks

Environmental Problems

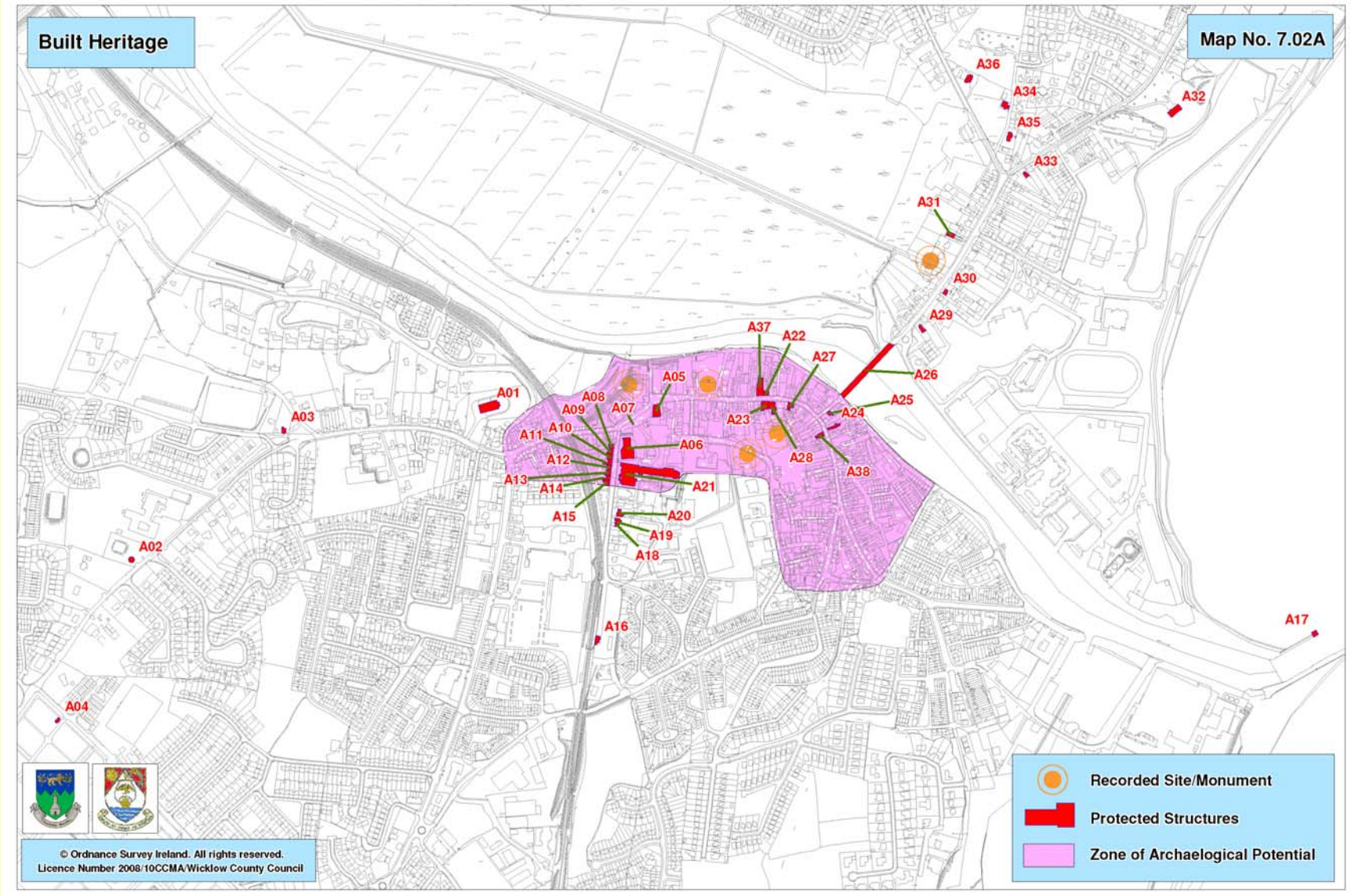
The cumulative accommodation of large-scale development within the plan area has the potential to cumulatively impact upon cultural heritage. Archaeology can be previously unknown but can be damaged through development causing ground disturbance. Development which involves material alteration or additions to protected structures can detract from the special character of the structure and its setting and has the potential to result in the loss of features of architectural or historic interest and the historic form and structural integrity of the structure are retained.

Development on sites adjoining protected monuments; places or structures can also impact upon the setting of these cultural heritage items. Encouraging and facilitating development of growth on brownfield sites will contribute to mitigating a number of the adverse impacts associated with greenfield development, however, brownfield development has the potential to significantly adversely impact upon cultural heritage - both archaeological and architectural - if unmitigated against.

Evolution of Cultural Assets in the Absence of a Development Plan

In the absence of a development plan, protection of buildings and archaeological heritage would still take place due to the continued protection afforded by the RMP and RPS. It should be noted however, that development in general would be more widely spread out, impacting on intact landscapes and protected structures and their curtilage. Retention and active use of protected structures would probably be less widespread, as development incorporating the monuments and structures on the RPS and RMP could not be easily enforced or policed.

Figure 3.16 Recorded Monuments and Structures Detail Map



3.10 Climate Change and Sustainability

Climate change refers to any change in climate over time. It causes a significant change in the average weather or climate that a region experiences and can be caused by natural factors such as variations in sunlight intensity.

The Intergovernmental Panel on Climate Change (IPCC) concluded in its 4th assessment report (2007) that warming of the climate system is unequivocal. This report was preceded by Sir Nicholas Stern's 2006 economic review estimating the cost of inaction regarding combating climate change.

For this reason it is important that Arklow Town Council and Wicklow County Council and its residents, act responsibly at a local level in order to assist in the reduction of greenhouse gas emissions - which are created primarily by the use of non-renewable fossil fuels. Holistically reducing these emissions will require implementing an overarching strategy affecting many aspects of the development of the County.

3.10.1 Greenhouse Gas Emissions

The term climate change is more generally used to refer to changes in our climate due to the build up of greenhouse gases (GHG's) in the atmosphere. In order to reduce greenhouse gas emissions the internationally agreed Kyoto Protocol established emissions reduction targets for developing countries. Ireland's emission target for greenhouse gases is to limit the increase in their combined emissions during the five-year period 2008-2012 to 13 per cent above 1990 levels.

Based on the inventory figures for 2006, the EPA estimates that Ireland's emissions in 2006 were 25.5 per cent higher than the baseline estimate that underlies Ireland's allowable emissions for the period 2008-2012, as agreed in the peer review of Ireland's 2006 submission to the United Nations Framework Convention on Climate Change.

Transport continues to be the dominant growth sector with emissions at 682,000 tonnes higher in 2006 than in 2005. This represents a 5.2% increase on 2005 levels and 165% increase on the 1990 transport emissions. Road transport accounts for 97% of the transport sector emissions. The increase in the GHG emissions from the transport sector reflects sustained increases in fuel consumption with petrol usage up 3.4% and diesel consumption up 7.9% from the previous year.

3.10.2 Potential Effects of Climate Change

Climate change is not limited to changes in temperatures or weather - it can also mean changes in the occurrence of extreme and unstable weather conditions, storms and floods, droughts and coastal erosion.

The EPA's Climate Change: Scenarios and Impacts for Ireland (2003) report identifies where vulnerability to climate change exists in Ireland and what adjustments are likely in the operation of environmental systems in response to such changes.

At a regional scale, the major effects of a sea level rise are loss of land as a consequence of increased erosion (due to changes in coastal currents and sedimentation rates) and increased risk of flooding (both at the coast and inland along major river networks during storm surge events). Flood risk would also be increased if a storm surge were coupled with intense or long duration precipitation events. Coastal floodplains are especially at risk on occasions when a high tide and storm surge coupled with a period of intense rainfall lead to a breach in the carrying capacity of the drainage network, a situation in Ireland which has become evident over the last decade and is quite common in Arklow.

Sea level rise presents itself as a serious problem for Arklow where infrastructure is at risk of inundation. In Ireland, the EPA report identifies the impacts of sea level rise will be most apparent in the major cities, including Dublin, and that these will be most vulnerable from an economic perspective. The inability of the shoreline to adjust naturally to a change in conditions in areas of dense infrastructure may exacerbate any impacts as the system tries to attain a new equilibrium between sediment erosion, transportation and deposition.

As increased temperatures will lead to greater amounts of water vapour in the atmosphere and an accelerated global water cycle, it is reasonable to expect that river catchment areas will be exposed to a greater risk of flooding. Heavier winter rain and summer storms may cause more flash flooding, causing an increase in diffuse pollution loads to waters from soil run-off or the overflow from CSOs (combined sewer overflows) and raising demand for flood controls. Summer droughts are more likely and there may be a reduction in drinking water supplies.

River flooding tends to be more common during the wetter winter months when soils are near saturation and can be exacerbated in coastal areas when interactions occur between high tides and high flows. Many of the rivers draining upland areas have a rapid or 'flashy' response to rainfall enhanced by rising topography. Steep slopes and thin soils favour rapid

flow pathways and water is rapidly transmitted to the channel network especially in urbanised catchments with extensive areas of impermeable surfaces.

The effect of a sea level rise on estuaries will tend to enlarge their vertical and horizontal extent, resulting in the penetration of tides further upstream. The outflow from rivers would be impeded as a consequence, which, in a high intensity rainfall event where runoff is high, would increase the risk of flooding.

A critical impact of climate change will be the likely changes to habitats and the flow conditions in rivers and lakes. The ERBD has been undertaking research work on the effects of abstractions on river and lake ecology to develop an understanding of the relationship between hydrology, flow, depth and habitats for key species.

Existing Problems

As has been noted above, the single greatest issues facing Arklow Town and its Environs in relation to climate change relate to the danger posed by flooding events, which will occur as a result of a changing climate. Solutions require reductions in unsustainable transport movements, and the amelioration of potential flooding events.

Traffic Emissions:

The manner in which transport emissions can be reduced is tied into the provision of high quality public transport network as an alternative to the private car providing ease of access to neighboring employment settlements such as Wicklow Town, Bray and employment opportunities in Dublin. At a micro level in Arklow itself the design and incorporation of walkable and cycle friendly urban developments needs to be accommodated.

The preservation, or creation of walking links within existing urban areas, specifically to shop(s), workplaces, schools and public transport links, along the most direct routes must be given high priority, otherwise trips by car will continue to grow. Reducing car movement at the neighbourhood level through increasing ease of pedestrian movement must be the foundation stone for an overall decrease in emissions.

Flooding:

Section 3.6 above relating to water highlights the existing problems facing Arklow in relation to flooding. Accommodation of works to address flood risks must be considered at this stage, prior to the onset of major flooding events. It should be noted that a major study is currently being undertaken in order to address flood risk in Arklow Town and develop a Flood Defence Scheme which will be subject to an Environmental Impact Assessment.

Evolution of Climate Change in the Absence of a Development Plan

Increases in the use of catalytic converters, cleaner fuels, better engine technology and maintenance is generally reducing the pollution omitted per motor vehicle. However, this reduction is probably being offset by the increase in the number of cars as well as the increase in the volume and incidences of traffic congestion. Increases in the number of cars as well as the increase in the volume and incidences of traffic congestion may lead to increases in air and noise pollution in the future.

If new dispersed development occurs in the Town and its environs, adverse impacts upon air quality and noise levels, and resultant impacts upon human health, would be likely to arise if unmitigated.

In the absence of the Plan, the realisation of objectives relating to energy efficiency, renewable energy and a reduction in transport related emissions contained within the Plan would be made more difficult.

The Plan inter alia provides an opportunity to provide for the regeneration of certain urban areas within the Town namely the Water Front Development Zone (Action Area 3) and the Town Centre opportunity sites, which are close to the existing public transport linkages. This regeneration would provide for an increased population, which would be less dependent upon private modes for transportation and would therefore be likely to generate less transport related greenhouse gas emissions than populations located further away from the urban areas. In the absence of the Plan, regeneration of these areas would not be achieved and an opportunity to prevent the generation of future transport related greenhouse gas emissions would be missed.

3.11 Landscape

3.11.1 Introduction

Landscape comprises the visible features of an area of land, including the physical elements of landforms, water bodies such as rivers, lakes and the sea, living elements of land cover including indigenous vegetation, human elements including land uses, buildings and structures, and transitory elements such as lighting and weather conditions.

The Arklow Town and Environs area is located along the south east coast of County Wicklow. The coastal situation of the plan area makes it sensitive to development alongside the Avoca River and Estuary, which dissects the plan area and connects to the Irish Sea. The topography of the lands is relatively low lying with a frequent history of flooding in particular along the northern quays.

The more Urban and Developed lands of the Development Plan are located within the jurisdiction of Arklow Town Council with the majority of the environs area containing greenfield lands which have yet to be developed.

3.11.2 Arklow Town

The more Urban section of the plan area comprises Arklow Town, which is relatively compact in terms of the location of residential development to the main street. The majority of the residential element of the town is situated to the south of the river with smaller portions being located either side of the Dublin Road to the north of the river. The main street to the south of the river along with the Bridgewater shopping centre to the north of the river, form the main retail and commercial areas within the plan area.

The topography of the Arklow Town area is relatively low lying particularly to the north of the Avoca River where flood events have previously occurred, most recently in 2010. The Water Front Development zone situated to the north and south of the original port form the largest areas for potential development within the town boundary with a large number of apartment developments having already developed within the lifetime of the previous plan. A significant portion of land to the south of the Avoca River is currently undeveloped.

Limited open space exists within the town council area given its development over time. Passive recreational facilities (not including open spaces in housing estates) include the North Beach and South Beach, the river walk, the Lake and Nature Reserve, Abbey Park and Main Street Park. The Lake and park area is a large, mainly pedestrianised area located adjacent

to the coast. The two town parks are both small in size, but are formally laid out with park benches and flower beds. The North and South beaches are also a major quasi-passive recreational facility. The existing golf course to the south of the Water Front Development Zone forms a large area of private open space in close proximity to the coast and the town itself.

Arklow is rich in natural amenity areas most notably the river Avoca, the Marsh and the North and South Beaches. The Town area also includes a landscaped river walk close to the town. The North and South Beaches and adjoining dune systems are a major amenity resource to the town. Improved water quality and improved walkways will increase their value.

3.11.3 Arklow Environs:

As mentioned above the Arklow Environs Area comprises the more rural lands in the overall plan area. The main population concentrations within the Arklow Environs area are located in the Kilbride ED: containing Seabank, Kilbride, Coolboy and Templerainy.

The Arklow Environs Area also accommodates a large amount of employment-zoned lands with optional zonings to the north at Killiniskyduff and to the south at Tinahask. These zonings were included in the previous Arklow environs plan as optional zonings for the lifetime of the plan only, and have been included in the Draft Plan as zonings for a single stand alone employment development. The Kilbride Industrial Estate to the north west contains a number and variety of businesses, many of which are promoted by IDA and Enterprise Ireland. To the south of the Environs plan area the IDA business park exists that is zoned Kish A in the current Arklow Environs Plan. Roadstone Ltd. operates at Arklow Rock in the townland of Rock Big, quarrying and producing road construction materials.

The topography of the Environs area is also quite low lying (with the exception of Arklow Rock) gradually rising from the sea to the south west of the Avoca River. In terms of passive recreational facilities in the Environs area the North and South Beach are of paramount importance.

3.11.4 Landscape Categorisation

Wicklow County Council's Landscape Characterisation section as set out in chapter 17 section 17.8 of the County Development Plan classifies landscapes in Wicklow according to their sensitivity – their ability to accommodate change or intervention without suffering unacceptable effects to character and values. The most sensitive landscapes are Areas of Outstanding Natural Beauty - which are of a very high sensitivity - and Areas of Special

Amenity - which are of a high sensitivity. Landscapes of lesser sensitivity are Rural Areas and Corridor Areas, which are both of medium sensitivity. Urban areas are classified as having a low sensitivity.

Within the study area Arklow Town and its Environs fall within the category of an Urban Area with the lands to the north and south east and outside of the plan boundary falling within the Coastal Area AONB (Area of Outstanding Natural Beauty). Lands to the immediate west of the plan boundary fall within the Corridor Zone.

Urban Area – Landscape Category

All locations designated as 'settlements' in the County settlement hierarchy are considered 'urban' areas for the purpose of landscape classification of the County Development Plan, although it is acknowledged that many of the smaller towns and villages are not 'urban' in the same sense as settlements such as Arklow.

In terms of landscape classification, these settlements including Arklow have already been deemed suitable for development (of the type allowed by the settlement strategy and the development standards of the County Development Plan) and the impacts on the wider landscape arising from such development have already been deemed as being generally acceptable. The reasoning behind this classification relates to the existing built urban environment of the majority of the plan area, which is not considered to cause any adverse visual impact on the surrounding landscape. The CDP further states that it will not be necessary for developments in urban areas to have regard to the surrounding landscape classification or to carry out landscape or visual impact assessment.

Coastal Zone Management

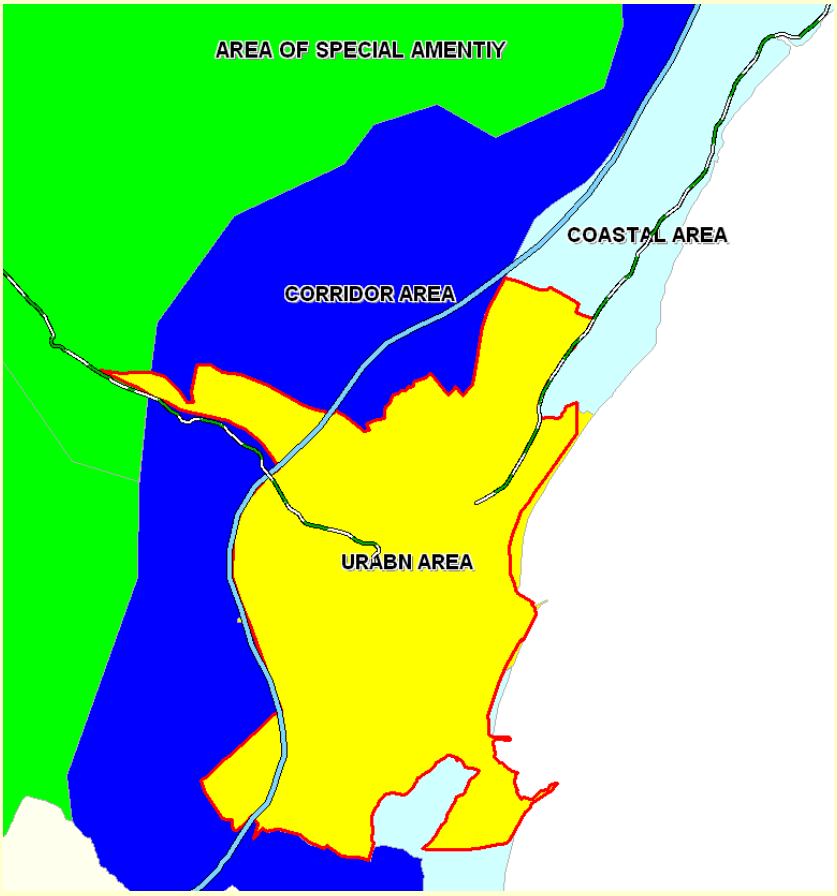
The County Development Plan 2010-2014 also includes a Coastal Zone Management plan as set out in Chapter 18. The Coastal Zone management section of the plan divides the coast of the county into a number of cells as not all coastal areas have the same characteristics or pressures.

Arklow Town and Environs fall within Cell 11 of the Coastal Zone Management plan describing this cell as having long sandy beaches with a central harbour area, the location of intensive residential and industrial development with the southern end marked by Arklow Rock. The cell description also recognizes the designation of Arklow Rock – Askintinny and Arklow Sand Dunes at Seabank as pNHA's.

The plan sets out the following objectives for Cell 11 Arklow Town and Environs:

1. To enhance the visual, recreational and natural amenities of the Arklow coastal area, in accordance with the policies and objectives set out in the Arklow Environs LAP and the Arklow Town Plan.
2. To facilitate the development and enhancement of visitor and recreational facilities along the coastal area, particularly walking routes, car parking areas, signage, changing / toilet facilities and water based clubs.
3. To support and facilitate the development of marine and shipping activity in Arklow, particularly the recreational use of the existing harbour / marina and the development of a roll on-roll off port at the existing Roadstone jetty.

Figure 3.17 Landscape Category Mapping



3.11.5 Prospects of Special Amenity or special interest

The Wicklow County Development Plan identifies one prospect in the plan area of special amenity/special interest as follows:

Prospect No.	Origin	Feature
30	R750 – regional road	Wicklow to Arklow Prospect towards the sea from the coast road

This prospect of special amenity enters the plan boundary along the R750 regional road to the north of the plan area only.

Existing Environmental Problems

Given the relatively low lying topography of the Arklow area the issue of visual impact is not considered to be significant, however the cumulative visual impact of development such as single rural dwellings to the north of the plan area along the R750 regional road at Seabank has the potential to cumulatively and adversely significantly impact upon the above listed prospect of special amenity/special interest.

Evolution of the plan in the absence of the Development Plan

In the absence of a Development Plan new developments would not be directed to the most appropriate locations and would have to be assessed on an application-by-application basis.

It is likely that in the absence of a Development Plan for Arklow Town and its Environs there would be no framework directing housing developments to appropriate locations or requiring certain mitigation measures for developments located in more sensitive landscapes. It is likely that one off housing applications would increase, as would the potential that sensitive landscapes and sensitive landscape components - such as the prospect of special amenity value to the north of the plan area - would be impacted upon.

3.12.Overlay Mapping of Environmental Sensitivities

3.12.1 Introduction:

In order to identify where most sensitivities in the study area occur, a number of the environmental sensitivities described above were weighted and mapped overlapping each other.

Environmental sensitivities on the figures, which follow, are indicated by colours and range from extreme sensitivity (dark red) to high sensitivity (light red) to elevated sensitivity (orange/red) to moderate sensitivity (orange) and low sensitivity (Yellow). Where the mapping shows a concentration of environmental sensitivities there is an increased likelihood that development will conflict with these sensitivities and cause environmental deterioration. This is particularly the case where the cumulative development of small-scale projects, such as small housing developments, gradually causes a slow deterioration of a resource, such as water quality.

3.12.2 Methodology

A Risk weighting system applied through Geographical Information System (GIS) software was used in order to calculate the sensitivity of all parts of the study area. The following table sets out the values placed on the landscape categories within and surrounding the plan area.

Table 3.4 Landscape Categoristiaon Weightings:

Landscape Category	Sensitivity	Risk Weighting
Urban Area	Low	1
Coastal Area	High	10
Corridor Area	Medium	5

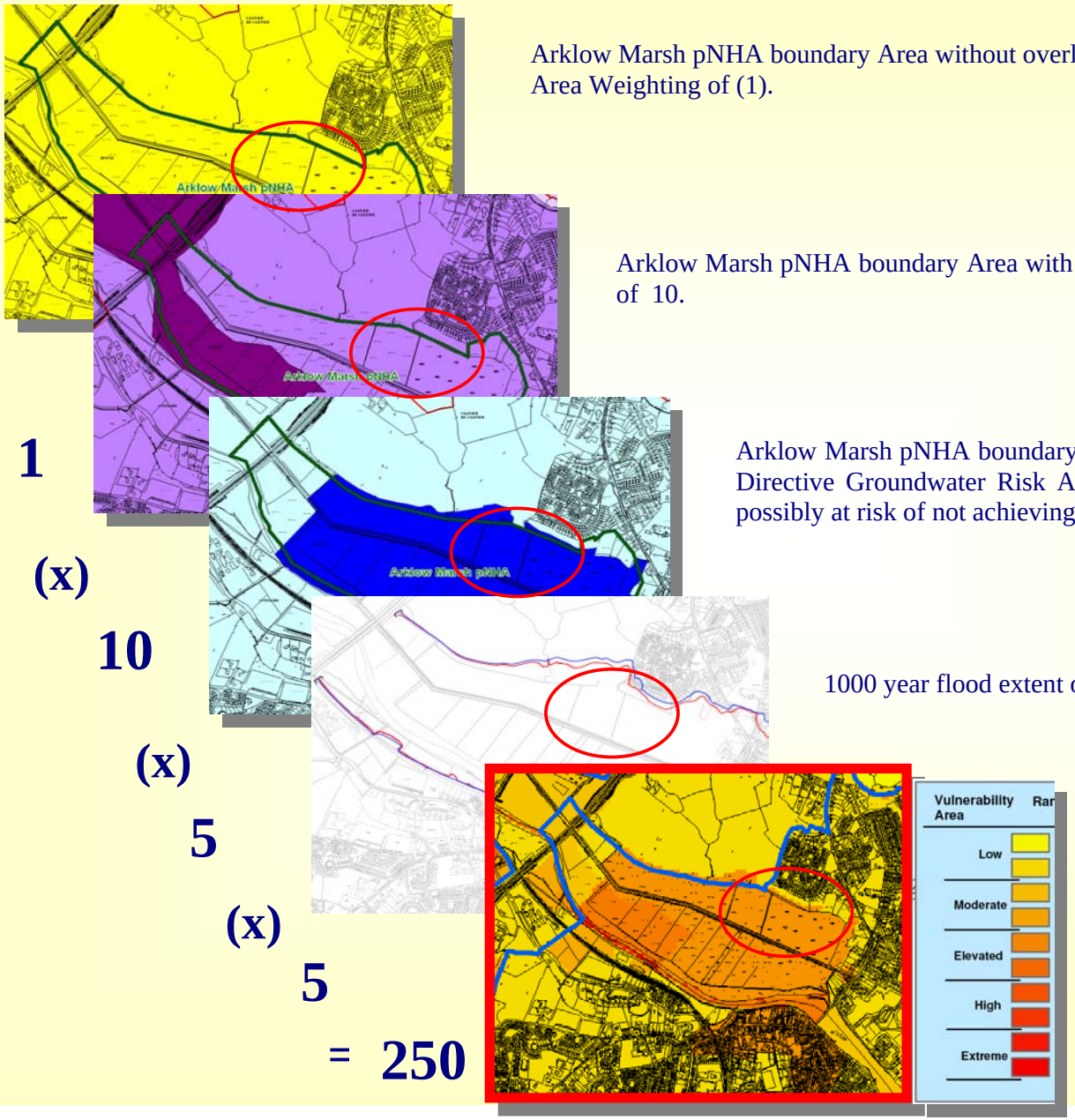
The table below provides details of further risk weightings applied to relevant environmental components located within the plan area such as ecological designations, surface waters at significant risk, Groundwater, entries to the Record of Protected Structures, Zones of Archaeological Conservation and the findings of the Urban Habitat Mapping Study. While there are elements of unavoidable subjectivity inherent to the selection and weighting of environmental sensitivities the SEA and plan making team worked closely in order to minimise such subjectivity. The more sensitive the environmental component was deemed to be the higher the risk weighting that was applied e.g. pNHA's are given a risk weighting of 10 as these habitats would be highly sensitive to development and therefore at a higher risk.

Table 3.5 Environmental Components Weighting Table:

Key Environmental Components	Description	Arklow's Context	Risk Weighting
Ecological Designations	NHA designations	Marsh/Arklow Rock/ Avoca River Valley	10
Surface Waters	Rivers and Estuaries	Templerainy – Significant Risk Ballyduff – Significant Risk Avoca River – Significant Risk	10
Groundwater	Drinking Supplies	Low Vulnerability – Northern Section of the plan area High Vulnerability – Town Centre and Surrounding Area Extreme Vulnerability – South of Environs	1A at risk of not achieving good status = 10 1B possibly at risk of not achieving good status = 5
Cultural Heritage	NIAH RPS RMP Zone of Archaeological Potential		10
Other Environmental Components			
Urban Habitat Mapping Study (Town Centre)	High Value and Locally Important Habitats	Located within the Arklow Town boundary of the plan area.	5
Flood extents	Extent of 1000yr fluvial flood/1000 year tidal flood with climate change	Lands Adjoining and in the immediate vicinity of the Avoca River and Estuary	5

Each environmental component was then over laid on top of the plan boundary map with scores for each area being multiplied by each other in order to determine overall sensitivity. A working example of how this was carried is provided below in figure 3.18. This example demonstrates how differing environmental components that fell within the Arklow Marsh area were over laid in order to derive a figure for this land areas overall sensitivity.

Figure 3.18 – working example of overlay mapping for lands located within the Arklow Marsh Area



Arklow Marsh pNHA boundary Area without overlay landscape category map – Urban Area Weighting of (1).

Arklow Marsh pNHA boundary Area with overlay of pNHA weighting score of 10.

1

(x)

10

Arklow Marsh pNHA boundary Area with overlay of Water Framework Directive Groundwater Risk Assessment Weighting of (5) (5 – 1B at possibly at risk of not achieving good status (WFD)).

(x)

5

1000 year flood extent of the Avoca River and Avoca Estuary (5)

(x)

5

= 250

Total Sensitivity of lands highlighted within Arklow Marsh

250 = High Sensitivity

Given the extent of the values derived from multiplying the environmental components, where they overlap each other, the range of values were normalised/re-classified. The reason for this was due to the fact that, where a vulnerable groundwater source (weighting 10), a vulnerable surface water source (weighting 10) and a recorded Monument (weighting 10) where all falling within the same area this could produce a sensitivity rating of 1000. Based on this, the sensitivity range was reclassified using GIS (re-classification tool as set out below) to provide for a more simplified sensitivity range of 0 to 19+ as set out below.

Figure 3.19 – GIS reclassification Tool used in order to normalise the sensitivity findings of overlay mapping.

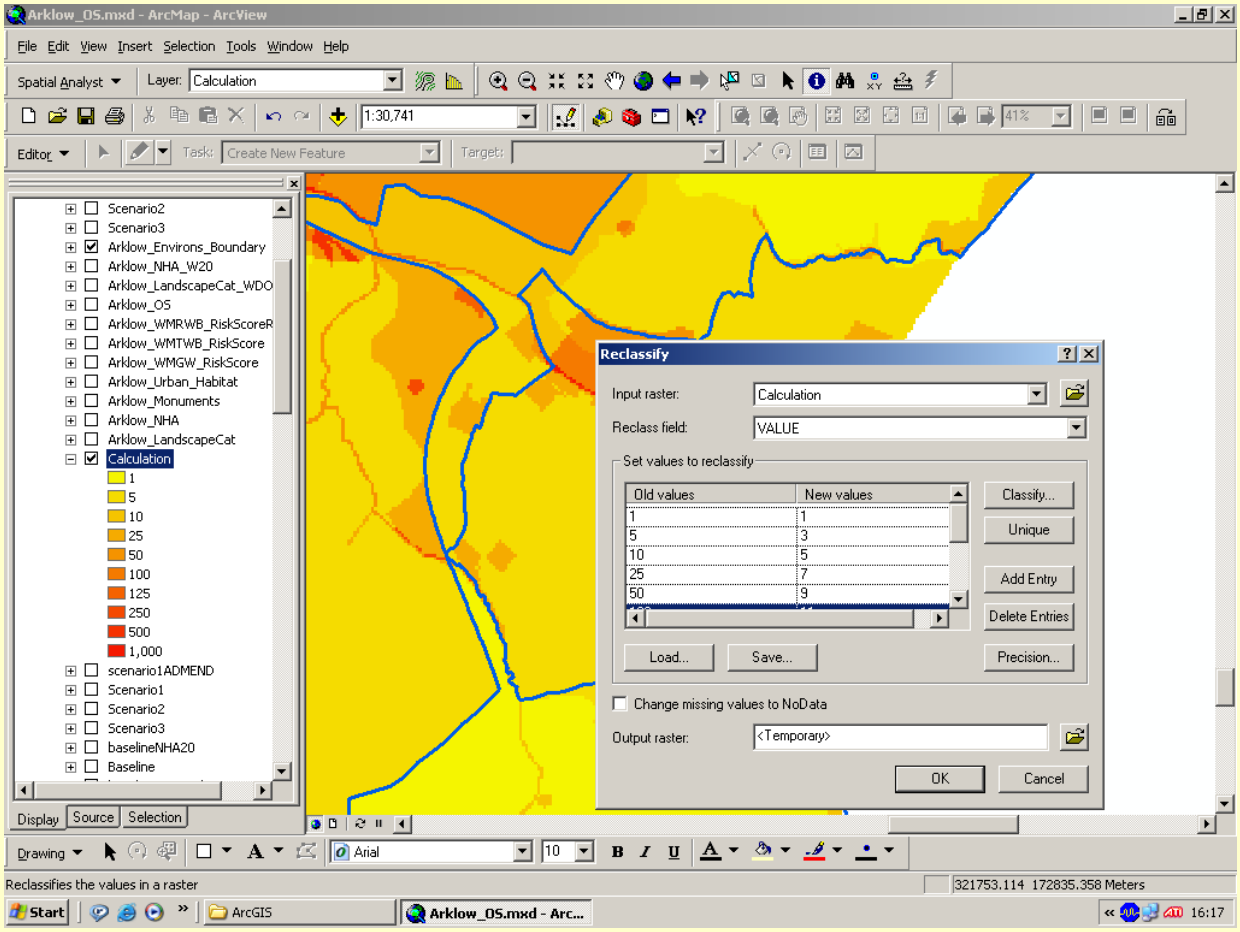


Table 3.6 – Re-Classified Sensitivity Range

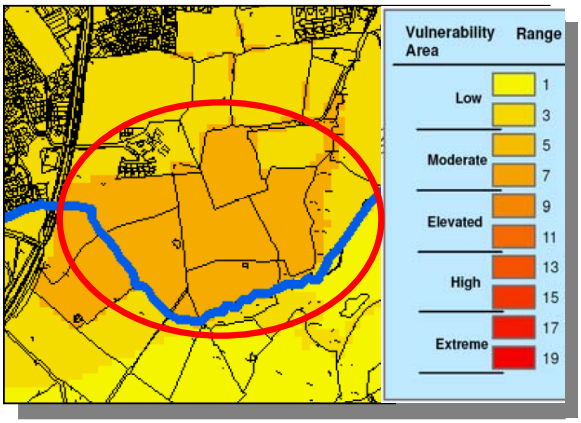
Sensitivity Range prior to Re-classification	Re-classified sensitivity Range	Sensitivity
1 – 10	0-3	Low
10 – 50	4-7	Moderate
50 – 100	8-11	Elevated
100 – 500	12-15	High
500 - 1000	16-19+	Extreme

3.12.3 Mapping

Figure 3.20 below 'Overlay of Weighted Environmental Sensitivities' (all selected factors given equal weight) is an overlay of environmental sensitivities with all selected environmental factors given equal weight. This map was chosen to be used as the sensitivity map for the plan area as it provides the most balanced approach in assessing sensitivity.

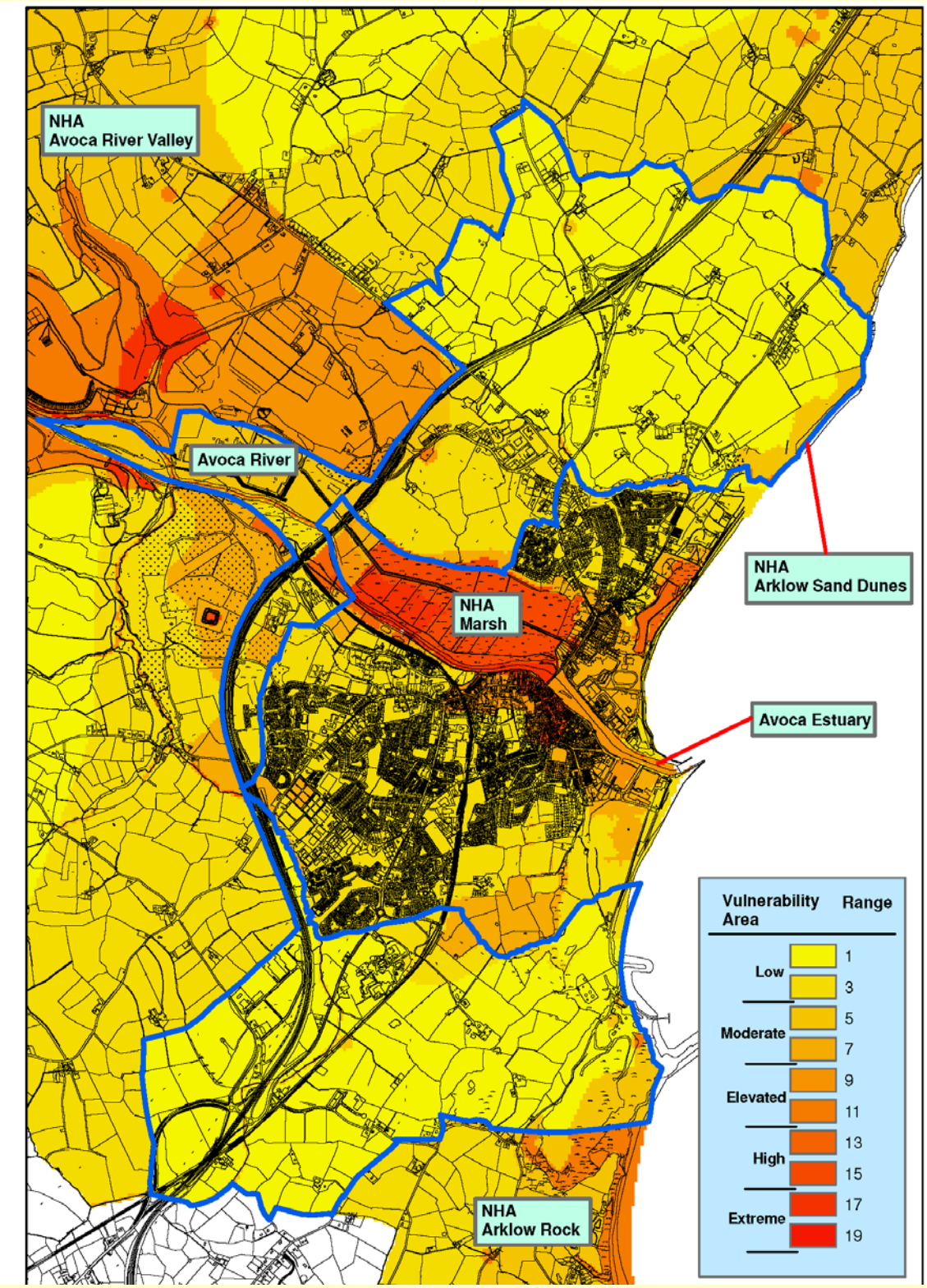
As can be seen from this map the distribution of the most sensitive areas relate to the locations where a number of the environmental components fall within the same area as set out above in figure 3.18. The sensitivity rating derived for this area (part of the Arklow Marsh lands), indicates that this area has a high level of sensitivity and would therefore fall within the 12-15 range in the re-classified table above.

Another example to the south of the Avoca River within the town centre area, it can be seen from figure 3.20 below that this area falls within the high sensitivity range for the following reasons: Zone of Archaeological Potential rating of 10 and the Water Framework Directive Groundwater Risk Assessment Weighting of 5 (IB possibly at risk of not achieving good status) and Flood Zone = 5 fall within the same area providing for a total sensitivity of 250.



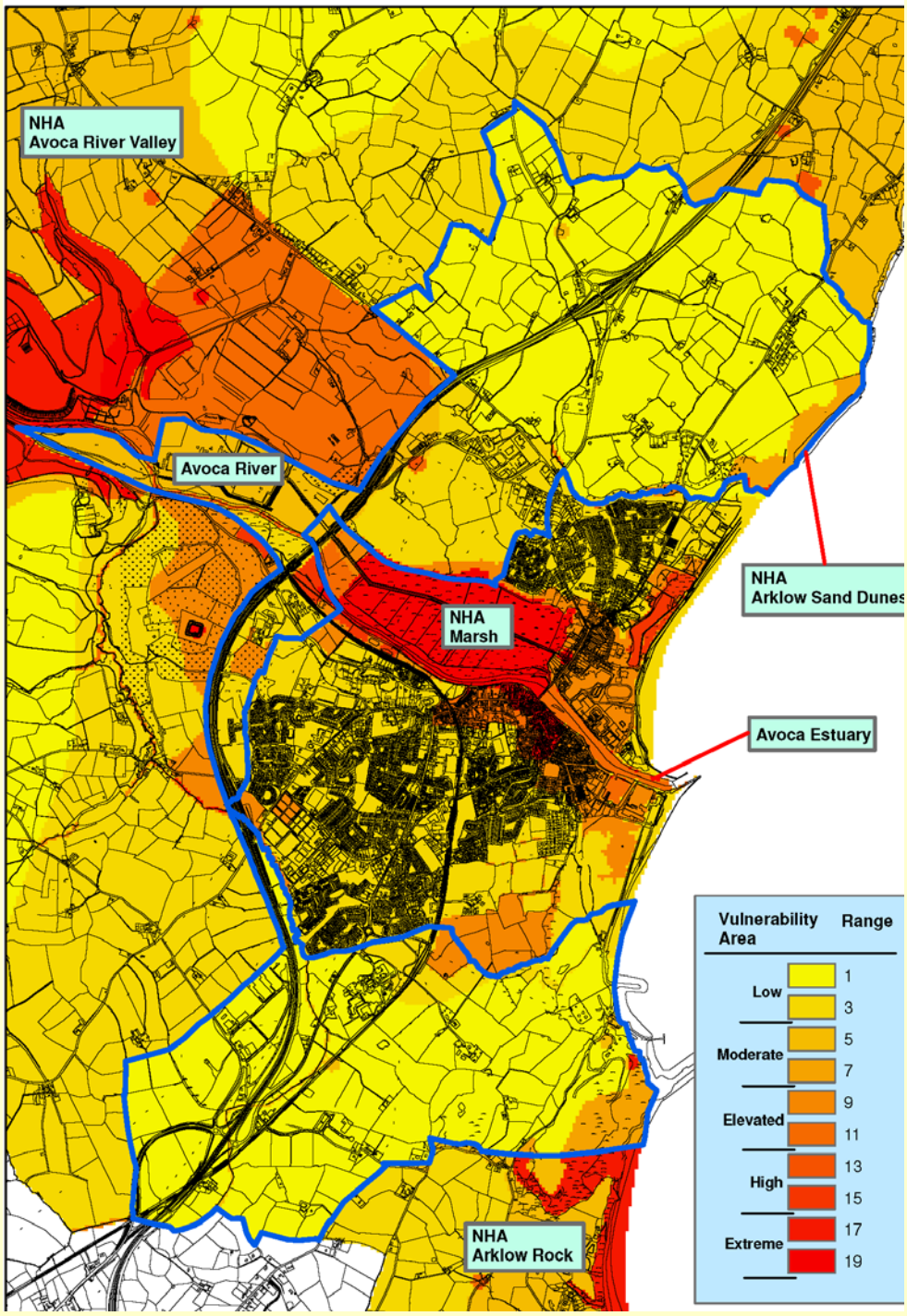
A third example as indicated in this diagram demonstrates that the lands located to the extreme south east of the Arklow Town Council Boundary have derived a sensitivity/risk weighing of 25 as the environmental components of a Local Important Urban Habitat risk weighting (5) and the Water Framework Directive Groundwater Risk Assessment risk weighting of 5 (IB possibly at risk of not achieving good status) fall within in this area. Multiplied by each other they produce a risk weighting of 25 which when re-classified falls within the moderate sensitivity range 5-7.

Figure 3.20 - Overlay of Weighted Environmental Sensitivities (all selected factors given equal weight)



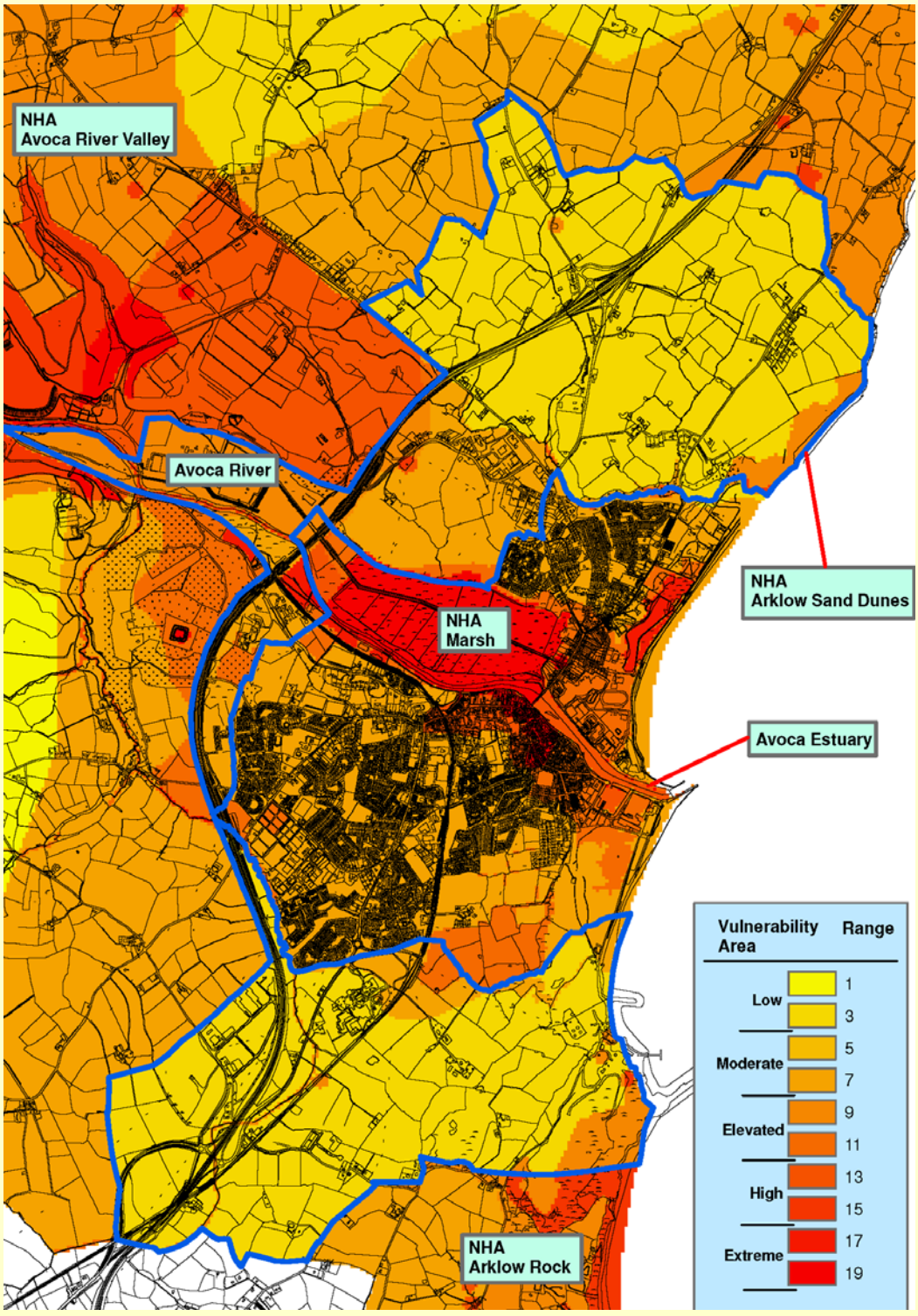
The weighting system used for Figure 3.21 Overlay of Weighted Environmental Sensitivities (Ecological Designations given greater weight) places more importance on ecological sensitivities (consequently these factors are given double the rating of other factors). Here the 3 pNHA's of Arklow Marsh, Arklow Rock and Arklow Sand Dunes are more sensitive because of this increased risk weighting of 20.

Figure 3.21 - Overlay of Weighted Environmental Sensitivities (Ecological Designations given greater weighting)



Similarly, Figure 3.13 Overlay of Weighted Environmental Sensitivities (Landscape Sensitivities given greater weight) places more importance on landscape sensitivities.

Figure 3.22 - Overlay of Weighted Environmental Sensitivities (Landscape Categories given greater weighting)



Limitations

It is noted that there are elements of subjectivity to the weighting systems used. However, efforts are made to be as objective as possible - for Figure 3.20 each sensitive factor is given an equal weighting while for Figures 3.21 and 3.22 an attempt has been made to take account of placing differing importance on the environmental components of biodiversity, flora and fauna (pNHAs given a weighting of 20) and landscape.