ENVIRONMENTAL REPORT

OF THE

DRAFT BRAY ENVIRONS
LOCAL AREA PLAN 2009-2015

STRATEGIC ENVIRONMENTAL ASSESSMENT



For: **Wicklow County Council**

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List of Abbreviations

CSO	Central Statistics Office
DEHLG	Department of the Environment, Heritage and Local Government
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
GSI	Geological Survey of Ireland
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NSS	National Spatial Strategy
RBD	River Basin District
RMP	Record of Monuments and Places
RPS	Record of Protected Structures
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEO	Strategic Environmental Objective
SI No.	Statutory Instrument Number
SPA	Special Protection Area
WFD	Water Framework Directive

Glossary

Biodiversity and Flora and Fauna

Biodiversity is the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems' (United Nations Convention on Biological Diversity 1992).

Flora is all of the plants found in a given area.

Fauna is all of the animals found in a given area.

Biotic Index Values (Q Values)

The Biotic Index Values, or Q values, are assigned to rivers in accordance with biological monitoring of surface waters - low Q ratings, as low as Q1, are indicative of low biodiversity and polluted waters, and high Q ratings, as high as Q5, are indicative of high biodiversity and unpolluted waters. Good status as defined by the Water Framework Directive equates to approximately Q4 in the national scheme of biological classification of rivers as set out by the Environmental Protection Agency.

Environmental Problems

Annex I of Directive 2001/42/EC of the European Parliament and of the Council of Ministers, of 27 June 2001, on the assessment of the effects of certain plans and programmes on the environment (the Strategic Environmental Assessment Directive) requires that information is provided on 'any existing environmental problems which are relevant to the plan or programme', thus, helping to ensure that the proposed strategic action does not make existing environmental problems worse.

Environmental problems arise where there is a conflict between current environmental conditions and ideal targets. If environmental problems are identified at the offset they can help focus attention on important issues and geographical areas where environmental effects of the plan or programme may be likely.

Environmental Vectors

Environmental vectors are 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.

Mitigate

To make or become less severe or harsh

Mitigation Measures

Mitigation measures are measures envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing a human action, be it a plan, programme or project. Mitigation involves ameliorating significant negative effects. Where there are significant negative effects, consideration should be given in the first instance to preventing such effects or, where this is not possible, to lessening or offsetting those effects. Mitigation measures can be roughly divided into those that: *avoid* effects; *reduce* the magnitude or extent, probability and/or severity of effects; *repair* effects after they have occurred; and, *compensate* for effects, balancing out negative impacts with other positive ones.

Protected Structure

Protected Structure is the term used in the Planning Act of 2000 to define a structure included by a planning authority in its Record of Protected Structures. Such a structure shall not be altered or demolished in whole or part without obtaining planning permission or confirmation from the planning authority that the part of the structure to be altered is not protected.

Recorded Monument

A monument included in the list and marked on the map which comprises the Record of Monuments and Places that is set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified. Any works at or in relation to a recorded monument requires two months notice to the Department of the Environment, Heritage and Local Government under section 12 of the National Monuments (Amendment) Act, 1994.

Scoping

Scoping is the process of determining what issues are to be addressed, and setting out a methodology in which to address them in a structured manner appropriate to the plan or programme. Scoping is carried out in consultation with the appropriate bodies.

Strategic Actions

Strategic actions include: *Policies*, which may be considered as inspiration and guidance for action and which set the framework for plans and programmes; *Plans*, sets of co-ordinated and timed objectives for the implementation of the policy; and, *Programmes*, sets of projects in a particular area.

Strategic Environmental Assessment (SEA)

Strategic Environmental Assessment (SEA) is the formal, systematic evaluation of the likely significant environmental effects of implementing a plan or programme before a decision is made to adopt it.

Strategic Environmental Objective (SEO)

Strategic Environmental Objectives (SEOs) are methodological measures which are developed from international, national and regional policies which generally govern environmental protection objectives and against which the environmental effects of the Draft LAP can be tested. The SEOs are used as standards against which the objectives of the Draft LAP can be evaluated in order to help identify areas in which significant adverse impacts are likely to occur, if not mitigated.

Section 1 SEA Introduction and Background

1.1 Introduction and Terms of Reference

This is the Environmental Report of the Strategic Environmental Assessment (SEA) of the Draft Bray Environs Local Area Plan 2009-2015. The purpose of the report is to provide a clear understanding of the likely environmental consequences of decisions regarding the future accommodation of development in Bray Environs.

The SEA is carried out in order to comply with the provisions of the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004) and in order to improve planning and environmental management of future development in Bray Environs. This report should be read in conjunction with the Draft Plan.

1.2 SEA Definition

Environmental assessment is a procedure that ensures that the environmental implications of decisions are taken into account before the decisions are made. *Environmental Impact Assessment*, or EIA, is generally used for describing the process of environmental assessment which is limited to individual projects such as waste incinerators, housing developments or roads while *Strategic Environmental Assessment*, or SEA, is the term which has been given to the environmental assessment of plans, and other strategic actions, which help determine what kind of individual projects take place.

SEA is a systematic process of predicting and evaluating the likely environmental effects of implementing a proposed plan, or other strategic action, in order to insure that these effects are appropriately addressed at the earliest appropriate stage of decision-making on a par with economic and social considerations.

The kind of development occurs in Bray Environs and where it occurs will be significantly determined by the implementation of a Local Area Plan. By anticipating the effects and avoiding areas in which growth cannot be sustainably accommodated and by directing development towards more compatible and robust receiving environments adverse effects of development are likely to be mitigated, planning applications are more likely to be granted permission and the scope of EIAs which may be required as part of certain planning applications are likely to be reduced.

1.3 Legislative Context

Directive 2001/42/EC of the European Parliament and of the Council of Ministers, of 27 June 2001, on the assessment of the effects of certain plans and programmes on the environment, referred to hereafter as the SEA Directive, introduced the requirement that SEA be carried out on plans and programmes which are prepared for a number of sectors, including land use planning. The SEA Directive was transposed into Irish Law through the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (Statutory Instrument Number (SI No.) 435 of 2004) and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004). Both sets of Regulations became operational on 21 July 2004.

1.4 Implications for Wicklow County Council and the Elected Members

The above legislation requires certain plans and programmes which are prepared by Wicklow County Council - including the Bray Environs Local Area Plan - to undergo SEA. The findings of the SEA are expressed in an Environmental Report which is submitted to the Elected Members alongside the Plan. The Elected Members must take account of the Environmental Report before the adoption of the Plan. When the Plan is adopted a statement must be made public, summarising, inter alia: how environmental considerations have been integrated into the Plan; and, the reasons for choosing the Plan as adopted over other alternatives detailed in the Environmental Report.

Section 2 SEA Methodology

2.1 Introduction

This section details how the SEA for the Bray Environs Local Area Plan has been undertaken alongside the preparation of the Plan. The SEA process started in July 2008 and this report has been produced in November 2008.

Figure 2.1 lays out the main stages in the Plan preparation/SEA process. The process is currently at the fifth stage in the process 'Draft Plan and Environmental Report (ER) are on public display' as highlighted in green in this Figure.

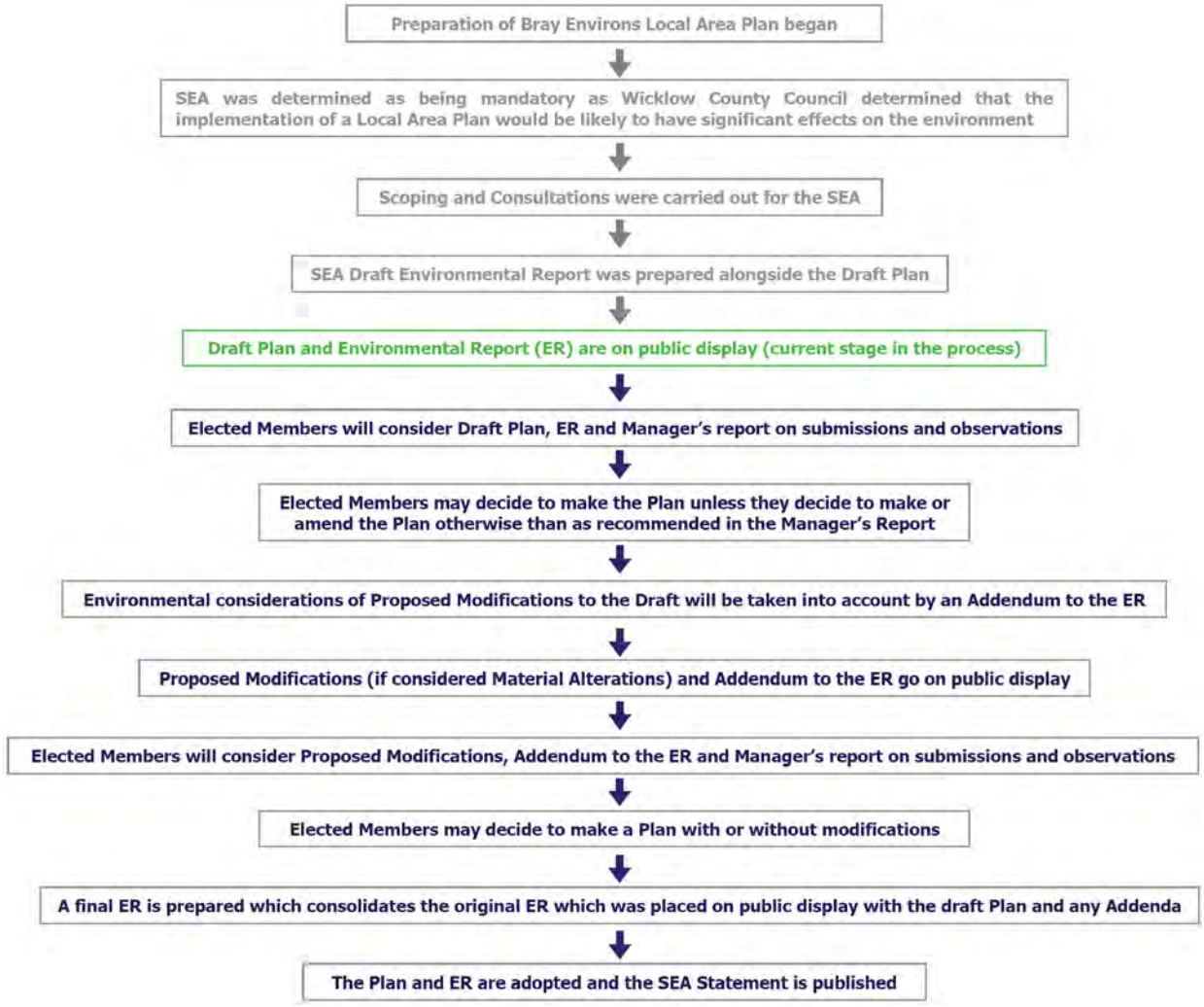

Figure 2.1 LAP and SEA Stages

2.2 Scoping

2.2.1 Introduction

In consultation with the relevant authorities, the scope of environmental issues to be dealt with by the SEA together with the level of detail to which they are to be addressed was broadly decided on after preliminary data collection. Scoping of the SEA was continuous with certain issues being selected for further examination after certain data was obtained. Scoping helped the SEA to become focused upon the important issues, such as those relating to existing and potential environmental issues and environmental problems[1], thereby avoiding resources being wasted on unnecessary data collection.

Scoping facilitated the selection of issues relevant to the environmental components which are specified under the SEA Directive - biodiversity, fauna, flora, population, human health, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, and landscape.

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). Impacts upon human beings arising as a result of social and economic conditions are not considered by SEA.

Consultations were held with: the Environmental Protection Agency (EPA); the Department of the Environment, Heritage and Local Government (DEHLG); and, the Department of Agriculture, Fisheries and Food.

The Bray Environs plan area covers two parcels of land - one at Fassaroe to the west of Bray and the N11/M11 and one at Kilruddery - to the south of Bray and to the west of Bray Head.

2.2.2 Most Important Strategic Environmental Issues

The most important strategic environmental issues relating to the Fassaroe area were identified as follows:

- The existence of areas where known landfilling activity was carried out at the northern boundary of the area;
- An area of sloping land in north of Fassaroe which is visually prominent;
- Five entries to the Record of Monument and Places (RMP) are located within the Fassaroe area including Fassaroe Castle which was built in 1536. This suggests there may be other archaeological sites which could possibly be uncovered in the development process, especially as this is a greenfield site. Structures, including their curtilage, which have been protected for architectural reasons are also located within the Fassaroe area; and,
- Development in Bray Environs would lead to an increase in traffic and associated emissions. Noise radiating from the N11/M11 is also an issue.

The most important strategic environmental issues relating to the Kilruddery area are identified as follows:

- Certain lands in Kilruddery area which are located within an Area of Outstanding Natural Beauty and are adjacent to an area under consideration for a Special Amenity Area Order are visually prominent making them sensitive to development; and,
- The cultural heritage and historic importance of Kilruddery Estate could be cumulatively diminished by the continual selling of land facilitated by rezoning.

[1] Annex I of the SEA Directive requires that information is provided on 'any existing environmental problems which are relevant to the plan or programme', thus, helping to ensure that the proposed strategic action does not make existing environmental problems worse.

Environmental problems arise where there is a conflict between current environmental conditions and ideal targets. If environmental problems are identified at the offset they can help focus attention on important issues and geographical areas where environmental effects of the plan or programme may be likely.

Common to both Fassaroe and Kilruddery is the need to: provide energy, transport, waste water collection and waste water treatment infrastructure in a timely and sufficient manner. The provision of timely and sufficient waste water treatment infrastructure will contribute to the protection of water quality.

Environmental considerations were communicated to the plan making team at Wicklow County Council on an ongoing basis from the outset in order to allow for their integration into the Plan thus minimising the potential for significant negative environmental effects arising from implementation of the Plan.

2.3 Environmental Baseline Data and Other Strategic Actions

The SEA process is informed by the environmental baseline (i.e. the current state of the environment - flora and fauna, soil, water, cultural heritage etc.) to facilitate: the identification and evaluation of the likely significant environmental effects of implementing the Plan and the alternatives; and, the subsequent monitoring of the effects of the Plan as adopted. Data was collected to describe the environmental baseline and its likely evolution without implementation of the Plan.

The SEA Directive requires that information is provided on 'any existing environmental problems which are relevant to the Plan or programme'. Information is therefore provided on existing environmental problems which are relevant to the Plan, thus helping to ensure that the Plan does not exacerbate any existing environmental problems in Bray Environs.

The SEA Directive requires that information on the baseline environment be focused upon the relevant aspects of the environmental characteristics of areas likely to be significantly affected and the likely evolution of the current environment in the absence of the strategic action i.e. the Plan. Any information that does not focus upon this is surplus to requirements; therefore the SEA focuses on the significant issues, disregarding the less significant ones. In addition, the SEA Directive aims to avoid duplication of the assessment whereby a strategic action forms part of a hierarchy. Furthermore, if certain matters are more appropriately assessed at different levels of the hierarchy in which the Plan is positioned, or, if certain matters have already been assessed by a different level of the hierarchy then additional assessment is not needed.

In order to describe the baseline (the current state of the environment) in the Bray Environs Plan area, data was collated from currently available, relevant environmental sources.

2.4 Alternatives

The SEA Directive requires that reasonable alternatives (taking into account the objectives and the geographical scope of the plan or programme) are identified described and evaluated for their likely significant effects on the environment.

Taking into account the objectives and the geographical scope of the Plan, alternatives were formulated through consultation with the plan-making team for Wicklow County Council and a number of departments at the Council.

2.5 The SEA Environmental Report

In this Environmental Report, which is being placed on public display alongside the Draft Plan, the likely environmental effects of the Draft Plan and the alternatives are predicted and their significance evaluated with regard to the environmental baseline. The Environmental Report provides the decision-makers, the Elected Members of Wicklow County Council, who decide whether or not to adopt the Draft Plan, as well as the public, with a clear understanding of the likely environmental consequences of decisions regarding the future accommodation of growth in Bray Environs. Mitigation measures to prevent or reduce significant adverse effects posed by the Plan, or to maximise any benefits arising, are proposed. The alternatives are also presented in this report, as are measures concerning monitoring.

The Environmental Report will be required to be altered should a Plan which includes elements which have not been evaluated by the SEA and which may be likely to have significant environmental effects be adopted.

2.6 The SEA Statement

When the Draft Plan is adopted a document must be made public, referred to as the SEA Statement. This is required to include information on: how environmental considerations have been integrated into the Plan - highlighting the main changes to the Plan which resulted from the SEA process; how the Environmental Report and consultations have been taken into account - summarising the key issues raised in consultations and in the Environmental Report indicating what action, if any, was taken in response; and the reasons for choosing the Plan in the light of the other alternatives, identifying the other alternatives considered, commenting on their potential effects and explaining why the Plan was selected.

The SEA Statement must include information on how environmental considerations have been integrated throughout the process. It must also describe how the preferred alternative was chosen to introduce accountability, credibility and transparency into the strategic decision-making process.

2.7 Legislative Conformance

This report complies with the provisions of the SEA Regulations and is written in accordance with Schedule 2B of the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004). Table 2.1 (overleaf) is a reproduction of the checklist of information to be contained in the Environmental Report (DEHLG, 2004)[2] and includes the relevant sections of this report which deal with these requirements.

[2] DEHLG (2004) *Implementation of SEA Directive (2001/42/EC): Guidelines for Regional Authorities and Planning Authorities* Dublin: Government of Ireland.

Information Required to be included in the Environmental Report	Corresponding Section of this Report
(A) Outline of the contents and main objectives of the Plan, and of its relationship with other relevant plans and programmes	Sections 4 and 5
(B) Description of relevant aspects of the current state of the environment and the evolution of that environment without implementation of the Plan	Section 3 and Appendix I
(C) Description of the environmental characteristics of areas likely to be significantly affected	Sections 3, 4, 7 and 8
(D) Identification of any existing environmental problems which are relevant to the Plan, particularly those relating to European protected sites	Section 3
(E) List environmental protection objectives, established at international, EU or national level, which are relevant to the Plan and describe how those objectives and any environmental considerations have been taken into account when preparing the Plan	Sections 4, 6, 7 and 9
(F) Describe the likely significant effects on the environment	Section 7 and 8
(G) Describe any measures envisaged to prevent, reduce and as fully as possible offset any significant adverse environmental effects of implementing the Plan	Section 9
(H) Give an outline of the reasons for selecting the alternatives considered, and a description of how the assessment was undertaken (including any difficulties)	Sections 2, 6 and 7
(I) A description of proposed monitoring measures	Section 10
(J) A non-technical summary of the above information	Appendix II
(K) Interrelationships between each Environmental topic	Addressed as it arises within each Section

Table 2.1 Checklist of Information included in this Environmental Report

2.8 Difficulties Encountered

2.8.1 Centralised Data Source

The lack of a centralised data source that could make all environmental baseline data for the Plan area both readily available and in a consistent format posed a significant difficulty to the SEA process. This difficulty is one which is encountered at local authorities across the country and was overcome by investing time in the collection of data from various sources and through the use of Geographical Information Systems.

2.8.2 Landfills

A number of areas exist within the Fassaroe part of the Plan area where known landfilling activity was carried out in the past. Although mapping indicating the location of these areas was prepared as part of the SEA process, there is uncertainty as to precisely where the landfill sites lie relative to zoning boundaries.

Risks relating to development within or in close proximity to these areas will be required to be mitigated before any development of these lands takes place (see Section 9.3.6).

Section 3 The Baseline Environment at Bray Environs

3.1 Introduction

The environmental baseline of Bray 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 Local Area Plan (LAP) 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 Local Area Plan.

The Plan area consists of two parcels of land, one at Fassaroe to the west of Bray Town and the N11 and one at Kilruddery to the south of Bray Town.

The boundary of the Fassaroe site is guided by the Cookstown River to the south, a stream to the north and the N11 to the east of the Plan area. There are a number of land uses at the Fassaroe site including residential, the Greenstar recycling facility and the sand and gravel pit, Residential use is generally low in density. The remainder of the Plan Area generally consists of agricultural lands.

Lands at Kilruddery are dominated by the presence of Kilruddery House and Gardens. Land uses at this site include mainly agricultural use and woodlands. The lands are situated in a visually sensitive area at the foot of the Little Sugar Loaf, south of a housing estate and an industrial park along the R768.

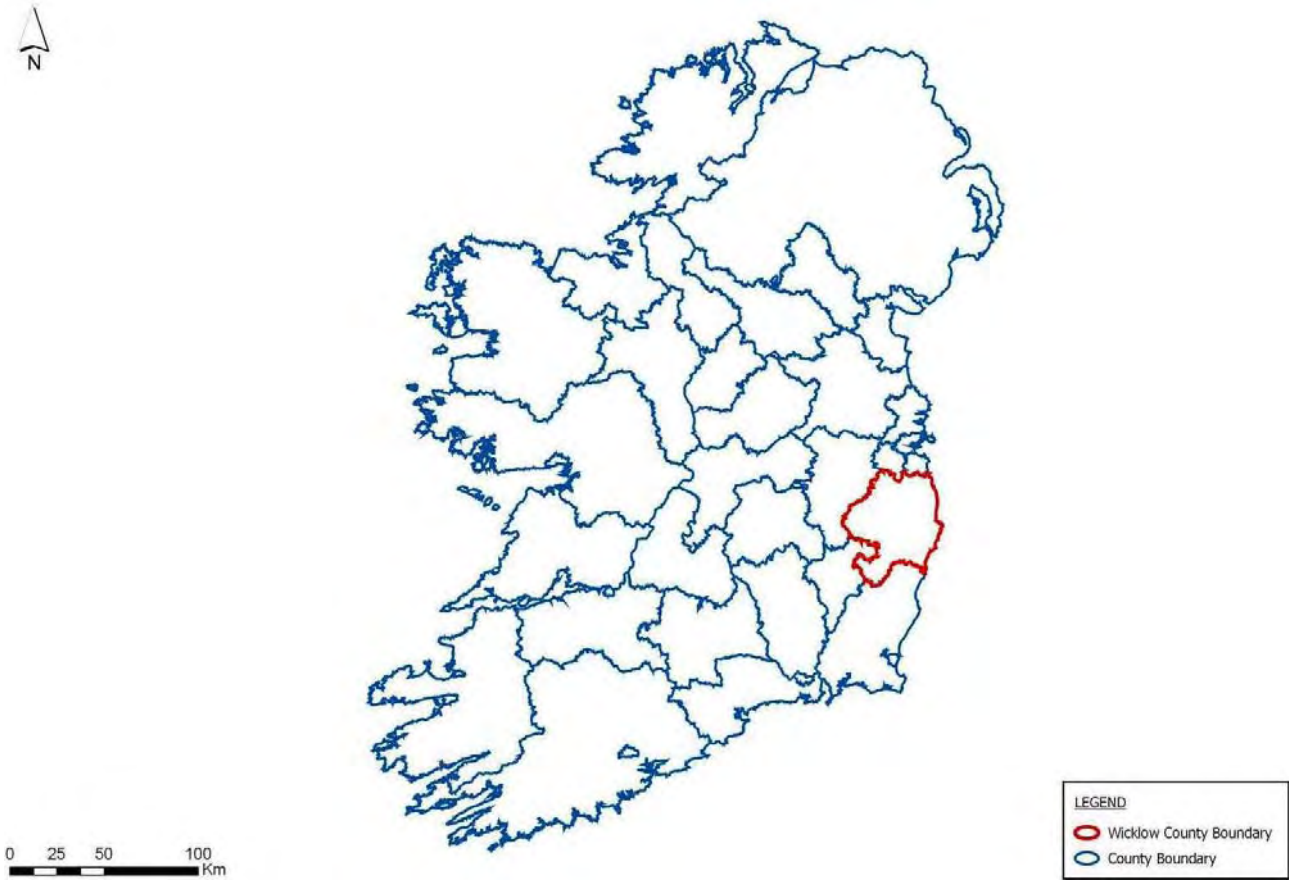

Figure 3.1 Context of County Wicklow in relation to the island of Ireland

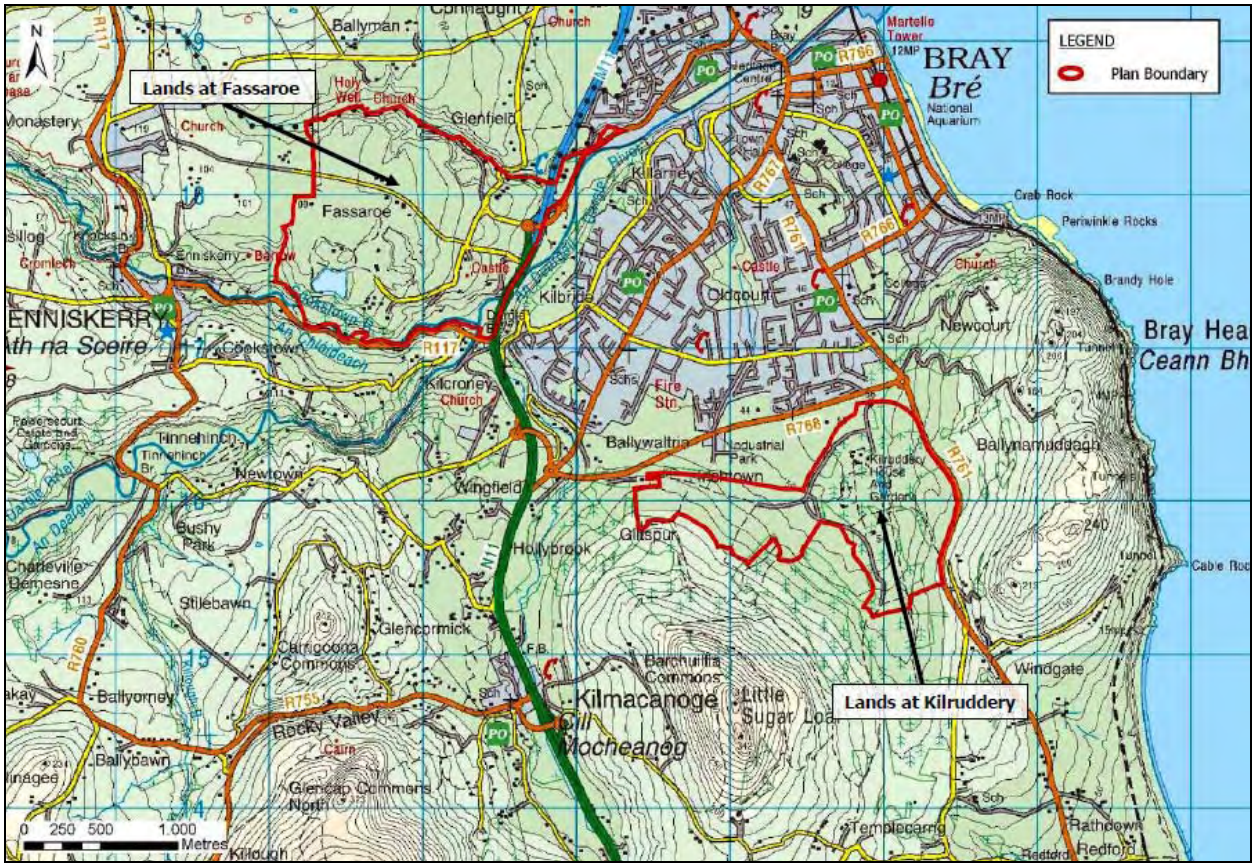

Figure 3.2 Context of the Plan area in relation to Bray and surrounding region

Figure 3.3 Photograph of the Plan area in relation to Bray and surrounding region

3.2 Biodiversity and Flora and Fauna

3.2.1 Overview of the Habitats

3.2.1.1 Introduction

Green space, which makes up the vast majority of both sites, consists of habitats and corridors for movement for a wide range of wildlife including various bird species, invertebrates such as bees and butterflies and mammals such as hedgehogs, mice, rats and foxes.

The River Dargle and the Cookstown River run adjacent to the Fassaroe site interacting with both the natural and built heritage to give a unique and distinct character as well as providing habitats for flora and fauna.

Broad leaved, coniferous and mixed forests as well as pastures at the Kilruddery site provide habitats for a number of species.

3.2.1.2 CORINE Land Cover Mapping[3]

The CORINE land cover mapping[4] for the Bray Environs area for the year 2000 (see Figure 3.5) which classifies land cover indicates that *agricultural land* is the main type of land cover. This comprises semi-natural lands such as *pastures, non-irrigated arable lands and agricultural lands with natural vegetation, mixed forest and complex cultivation patterns.* There is a large area on the Fassaroe site which is classified as *dump* – this reflects its past use as a waste disposal site in the past.

A large portion of the Kilruddery site is made up of *non-irrigated arable land* with the remainder comprising *pasture, mixed forest and broad-leafed forest*.

Land cover categories which indicate lands that are likely to be valuable to biodiversity are illustrated on Figure 3.7. These lands comprise, inter alia, an area of mixed woodland at the southern boundary of the Fassaroe site, an area of broad leafed forest to the east of the Kilruddery site and an area of mixed woodlands to the south of that.

It is noted that some of these land covers have come about as a result of human interaction with the landscape, forest at Kilruddery Demesne was planted in the 18th century.

Land cover differences between the CORINE 1990 data (see Figure 3.4) and the data for the year 2000 (see Figure 3.5) are illustrated on Figure 3.6 and show no changes of land cover within the Fassaroe and Kilruddery. A large area of land to the north of the Kilruddery site has changed from *non-irrigated arable land* to *discontinuous urban fabric.*

3.2.2 Ecological Networks

Article 10 of the Habitats Directive recognises 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.

Within and surrounding the Plan area, the ecological networks are made up of components including the Cookstown River, the River Dargle and their tributaries and banks, the various woodlands and hedgerows within and

[3] CORINE Land Cover (CLC) is a map of the European environmental landscape based on interpretation of satellite images. Land cover is the observed physical cover, as seen from the ground or through remote sensing, including for example natural or planted vegetation, water and human constructions which cover the earth's surface. Because of the scale of the CORINE data and the method by which it was collected there are likely to be a number of inaccuracies at the local level. It is noted, however, that the land cover shown on the maps is generally accurate. The European Environment Agency, in conjunction with the European Space Agency, the European Commission and member countries is currently updating the CORINE land cover database.

[4] European Environment Agency Coordination of Information on the Environment (2004) *Ireland's Corine Land Cover 2000 (CLC2000)* Copenhagen: EEA

surrounding the Plan area and lands used for agriculture. The Dargle River is a designated Salmonid River (see Section 3.5.4.2).

These components provide habitats for flora and fauna and facilitate linkages for the flora and fauna both between and within designated ecological sites, the non-designated surrounding countryside of Bray Environs.

3.2.3 Designations

3.2.3.1 Introduction

There is one ecologically designated site within the Bray Environs Plan boundary. Ballyman Glen candidate Special Area of Conservation and proposed National Heritage Area (Site Code: 000713) lies along the northern Fassaroe site boundary and continues westwards outside the Plan area. Bray Environs has a number of designated sites in its vicinity. The Great Sugar Loaf pNHA (Site Code: 001769) and Kilmacanogue Marsh pNHA (Site Code: 000724) lie to the south of the Plan area. Bray Head pNHA and SAC (Site Code: 000714) is situated to the east. The Dargle River Valley pNHA (Site Code: 001745) lies south of the Fassaroe site. Powerscourt Woodland pNHA (Site Code: 001768) and Knocksink Wood pNHA and SAC (Site Code: 000725) are located to the west and southwest of the Fassaroe Plan area.

Some of these sites are mapped on Figure 3.8. The context of the Plan area in relation to the designated sites within this region of County Wicklow is shown on Figure 3.9.

It is noted that the majority of the ecological sensitivities discussed below – and associated potential for environmental impacts – occur at or beyond the fringes of the Plan area. They are included, however, to ensure that areas which could be impacted as a result of implementing the plan are identified and assessed.

3.2.3.2 Special Protection Areas

Special Protection Areas (SPAs) have been selected for protection under the 1979 European Council Directive on the Conservation of Wild Birds (79/409/EEC) by the DEHLG due to their conservation value for birds of importance in the European Union.

3.2.3.3 Special Areas of Conservation

Special Areas of Conservation (SACs) have been selected for protection under the European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) by the Department of the Environment, Heritage and Local Government (DEHLG) due to their conservation value for habitats and species of importance in the European Union.

3.2.3.4 Natural Heritage Areas

Natural Heritage Areas (NHAs) are designated due to their national conservation value for ecological and/or geological/geomorphological heritage. They cover nationally important semi-natural and natural habitats, landforms or geomorphological features, wildlife plant and animal species or a diversity of these natural attributes. NHAs are designated under the Wildlife (Amendment) Act 2000. The sites are *proposed* sites because they are currently under consideration by the Commission of the European Union.

3.2.3.5 Designated Sites[5]

The following designated ecological sites are found within or adjacent to the Plan area:

- **Ballyman Glen cSAC and pNHA**

Ballyman Glen is situated approximately 3 km north of Enniskerry, just inside the northern Fassaroe boundary. It is orientated in an east-west direction with a stream running through the centre. The glen is bounded mostly by steeply sloping pasture with Gorse and areas of wood and scrub.

Areas of marsh are found in the wetter areas by the stream, particularly at the western end of the site. There is an area of broad-leaved woodland on the steeper southern slopes of the glen.

This site is a candidate SAC selected for habitats listed on Annex I of the EU Habitats Directive namely alkaline fen and petrifying springs.

Fens are rare in Wicklow/Dublin and this is one of only two sites in Wicklow for the Narrow-leaved Marsh-orchid.

On designation, this SAC will become part of Natura 2000 - a network of protected areas

[5] Text in this section is taken from the National Parks and Wildlife Service's Site Synopses. Full Site Synopses for these designations can be found in Appendix II

throughout the EU established under the Habitats Directive.

Ballyman Glen SAC and pNHA is mapped on Figure 3.8 and Figure 3.9.

- **Bray Head SAC and pNHA**

This coastal site is situated in the north-east of Co. Wicklow between the towns of Bray and Greystones. Heath, a habitat listed on Annex I of the EU Habitats Directive, is the principal habitat over much of the Head. Bray Head is of high conservation importance as it has good examples of two habitats (sea cliffs and dry heath) listed on Annex I of the EU Habitats Directive. It also supports a number of rare plant species and has ornithological importance.

On designation, this SAC will become part of Natura 2000.

Bray Head pNHA and SAC is mapped on Figure 3.8 and Figure 3.9.

- **Knocksink Woods SAC and pNHA**

Knocksink Wood is situated in the valley of the Glencullen River north-west of Enniskerry. The fast-flowing Glencullen River winds its way over granite boulders along the valley floor. The importance of this site lies in the diversity of woodland habitats which occur. The presence of rare or threatened plants and invertebrates adds to the interest. Much of this site has been designated a Statutory Nature Reserve and there is presently an educational centre within the site.

This SAC will become part of Natura 2000 when designated.

Enniskerry Woods pNHA and SAC is partially mapped on Figure 3.8 and can be seen in full on Figure 3.9.

- **Great Sugar Loaf pNHA**

The Great Sugar Loaf is situated about 5 kilometres southwest of Bray. It is a steep mountain, 501 meters above sea level, and has been modified greatly by glacial erosion. The site is of both ecological and geological interest, and is also a prominent feature in the landscape of north County Wicklow. Because of its ease of access and close proximity to large urban areas, the Great Sugar Loaf is a valuable educational and recreational asset.

The Great Sugar Loaf pNHA is mapped on Figure 3.8 and Figure 3.9.

- **Kilmacanogue Marsh pNHA**

This site is located at the base of the Great Sugarloaf, south of Kilmacanogue just off the main Dublin to Wexford road. A small stream links the site to the Great Sugarloaf pNHA. This site is important in having a diversity of species-rich wetland habitats within a relatively small area, and particularly for the presence of some rare invertebrates.

Kilmacanogue Marsh pNHA is mapped on Figure 3.8 and Figure 3.9.

- **Powerscourt Woodland pNHA**

Powerscourt Woodland is located about 2 km south-west of Enniskerry. It is largely contained within the two large demesnes of Powerscourt and Charleville, and includes a 4 km stretch of the Dargle River. The topography of the area is rolling hillside sloping down to the river. The site includes some parkland with large specimen trees. The well documented record of land management practices held by the demesnes adds to the scientific interest. The area is also of great educational value, being frequently used for teaching.

Powerscourt Woodland pNHA is partially mapped on Figure 3.8 and can be seen in full on Figure 3.9.

- **Dargle River Valley pNHA**

This site is located about 2 km south of Fassaroe. It is a section of the River Dargle with steep wooded banks. The importance of this site is that it is a fine example of a wooded valley. It is likely that this valley has been wooded for a long period and such habitats are becoming rare in north County Wicklow. The removal of the conifers would increase the interest of the site. The site is also of considerable geological importance.

The Dargle River Valley pNHA is mapped on Figure 3.8 and Figure 3.9.

3.2.3.6 Trees Considered for Preservation

There are two trees considered for preservation within the Plan area. These are located at Kilruddery Demesne and at the southern Fassaroe site boundary along the Cookstown River. Outside of the Plan area, there are two other areas with trees considered for preservation. These locations are to the west of the Fassaroe site at Enniskerry and to the west of the N11 near Kilmacanogue. These locations are mapped on Figure 3.10.

Tree Preservation Orders (TPOs) enable local authorities to preserve any single tree or group of trees and brings them under planning control. TPOs are only made if it appears that a tree or group of trees need to be protected in the interests of amenity in the environment. The Planning and Development Act 2000 has further outlined the legal framework and procedures provided in the 1963 Act to make a TPO.

3.2.3.7 Special Amenity Area Orders

A Special Amenity Area Order for Bray Head was drawn up in 2007. Areas Considered for Special Amenity Area Order (SAAO) include the Dargle Glen, The Little Sugar Loaf, The Great Sugar Loaf. This is discussed further in Section 0.

3.2.3.8 Areas of Outstanding Natural Beauty

According to the Wicklow County Development Plan, the areas of Fassaroe, Giltspur and Kilruddery Demesne East are areas of outstanding natural beauty. Kilruddery Demesne East is classified as a corridor area. This is discussed further in Section 3.9.2.2.

3.2.3.9 Register of Protected Areas

In response to the requirements of the Water Framework Directive a number of water bodies or parts of water bodies which must have extra controls on their quality by virtue of how their waters are used by people and by wildlife have been listed on Registers of Protected Areas (see Section 3.5).

The Dargle River has been listed on the RPA for Habitat Rivers. This is discussed further in Section 3.5.3.4.

The waters listed on the RPA are mapped on Figure 3.23.

3.2.4 Existing Problems

Land cover differences between the CORINE 1990 data and the data for the year 2000 indicate a cumulative loss of agricultural areas which have natural vegetation and their associated habitats - including their flora and fauna. The change of land cover north of the Kilruddery site to discontinuous urban fabric indicates what could be the beginning of a cumulative encroachment onto the Little Sugar Loaf.

At the Kilruddery site, an old oak forest mixed with non-native species lies to the south of the housing estate. Habitats may be threatened by the invasion of non-native species. These are species that have been introduced, generally by human intervention, outside their natural range and whose establishment and spread can threaten native ecosystems.

With regard to terrestrial flora and fauna, all greenfield development in the area will cause 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.

3.2.5 Evolution of Biodiversity and Flora and Fauna in the absence of a Local Area Plan

In the absence of a Local Area Plan for Bray Environs development would have no guidance as to where to be directed and planning applications would be assessed on an individual basis with flora and fauna, habitats and ecological connectivity protected under a number of strategic actions relating to biodiversity and flora and fauna protection. The evolution of biodiversity and flora and fauna would be dependent on the rate and extent of any such developments which would take place and these developments would be considered with regard to the Wicklow County Development Plan 2004-2010. An LAP will contribute towards the occurrence of development in an appropriate and sustainable manner.

An LAP provides an opportunity to integrate the ecological protection measures required by the Habitats Directive with the planning or development management of vulnerable areas,

which might not be presented in the absence of a LAP.

Any future development along the edges of designated ecological sites would be likely to result in a reduction in habitats and would therefore be likely to reduce ecological connectivity on the edges of these sites.

Development along or adjacent to the banks of rivers could result in a reduction in ecological connectivity within and between these and other habitats.

Pollution of water bodies as a result of any future development along river catchments would be likely to adversely impact aquatic biodiversity and flora and fauna including salmonid species and other species protected under Annex II of the Habitats Directive. The status of the River Dargle which is listed on the Register of Protected Areas for *Habitats Rivers* and is a salmonid river could be compromised if pollution of the Cookstown River, a tributary of the Dargle, was to occur.

Beneficial effects upon biodiversity and flora and fauna which would be likely to arise out of the policies and objectives included in the LAP which are not included in the current Wicklow County Development Plan would not be likely without the implementation of the Plan.

In the absence of an LAP, any greenfield development would adversely impact upon biodiversity and flora and fauna by replacing natural or semi natural habitats with artificial surfaces. The significance of such impacts would be dependent on whether such developments would result in the loss of habitats or species of importance as well as the cumulative loss and fragmentation of habitats and species as a result of all greenfield developments.

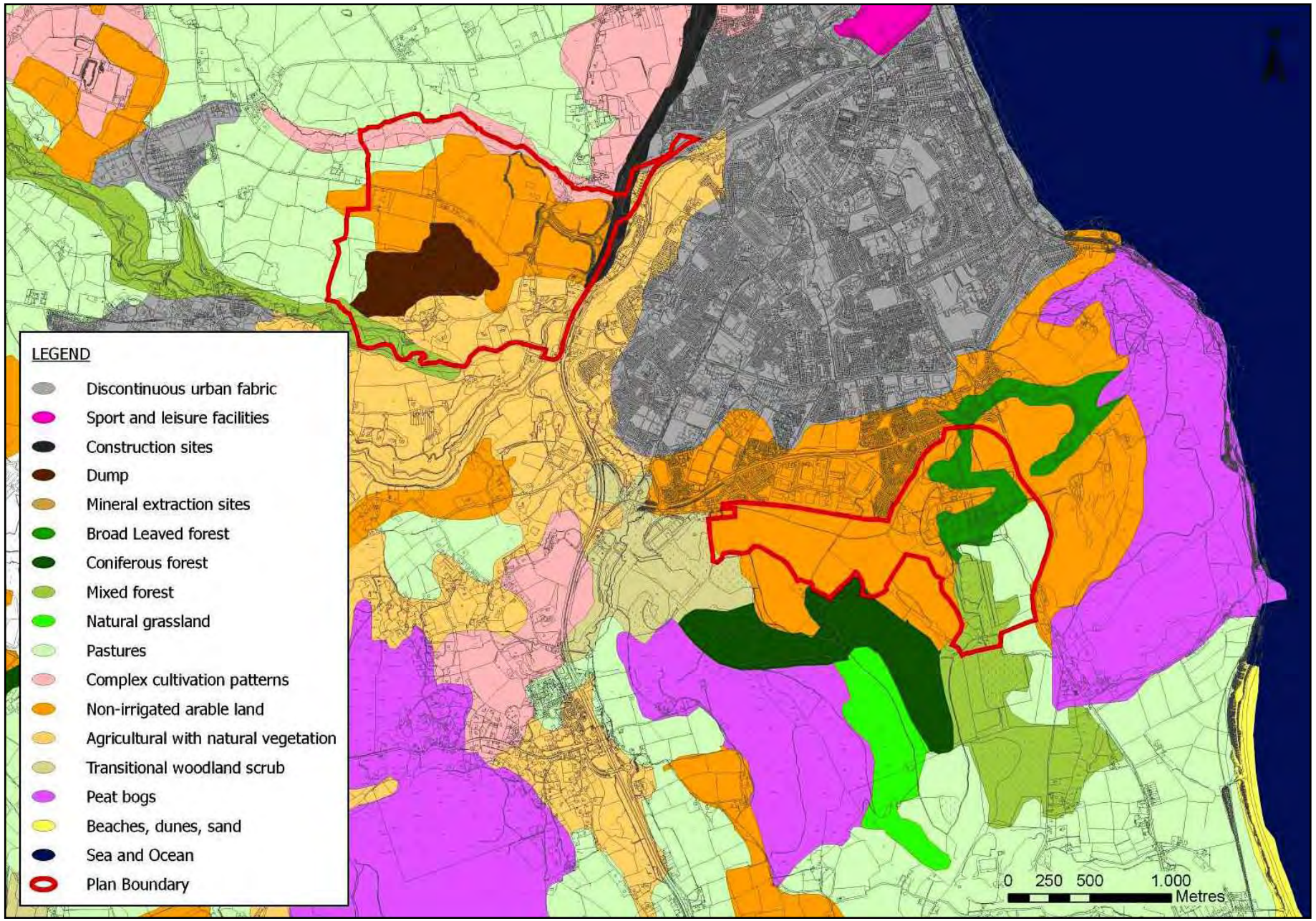

Figure 3.4 CORINE Land Cover 1990

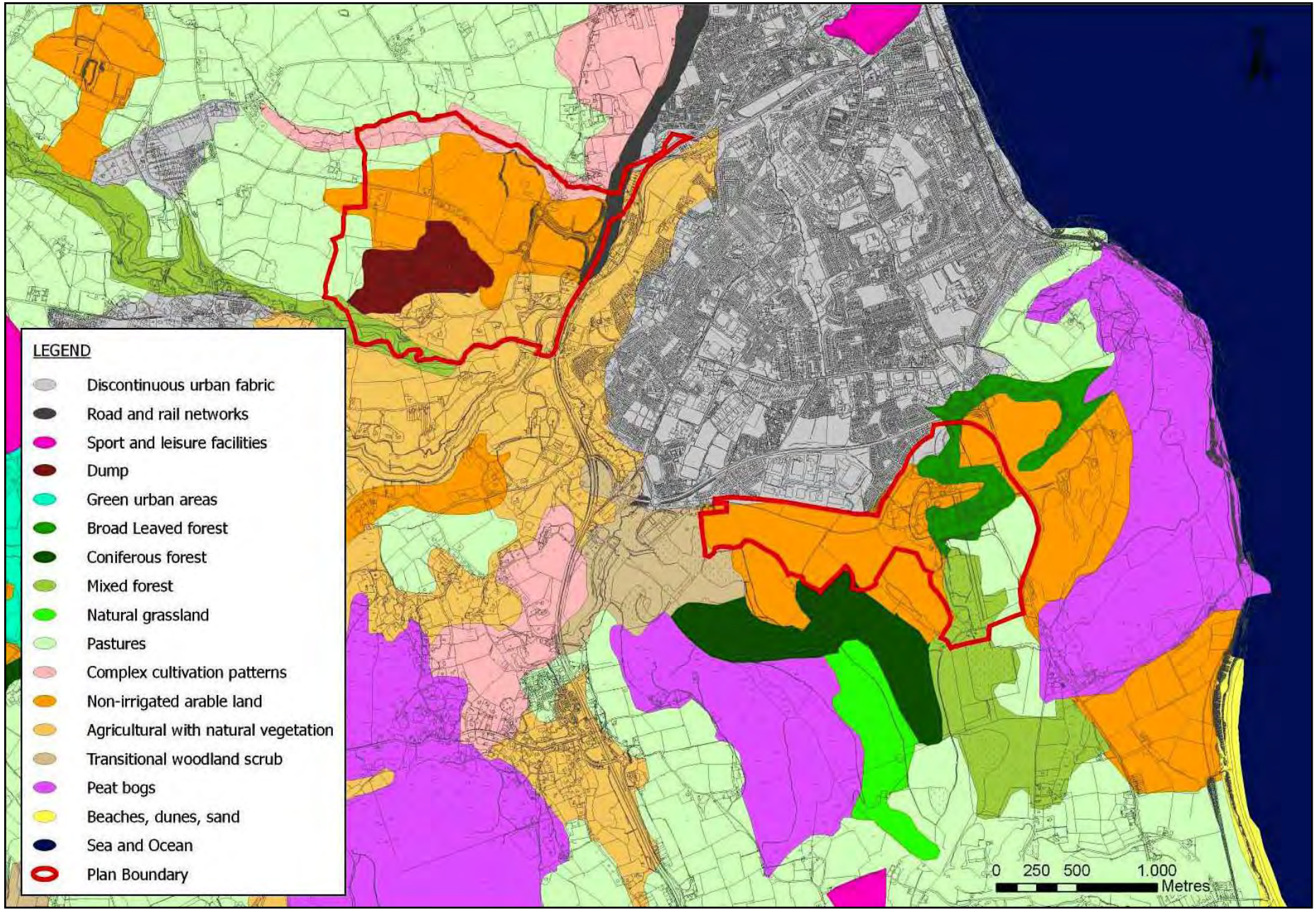

Figure 3.5 CORINE Land Cover 2000

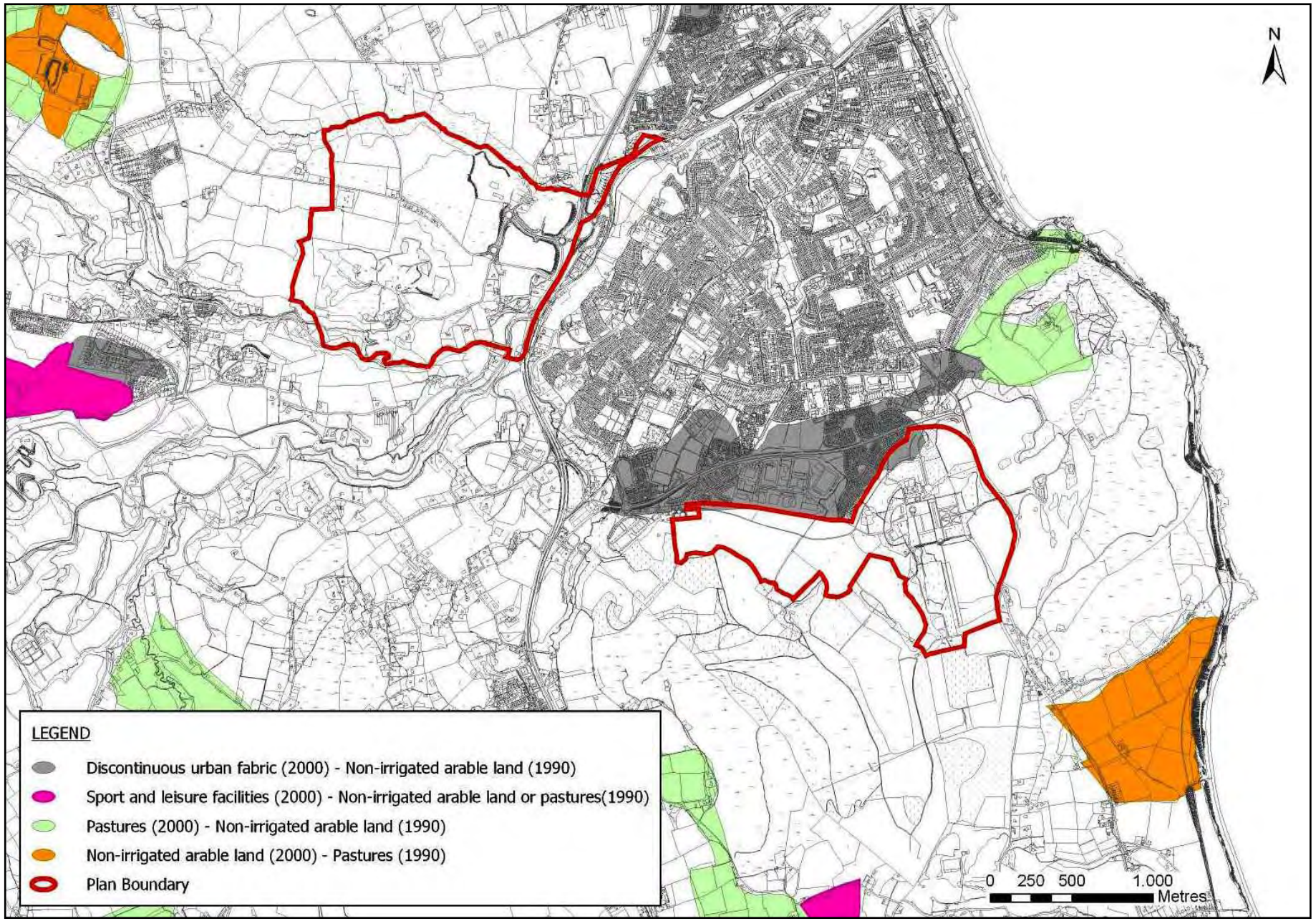

Figure 3.6 CORINE Land Cover Changes 1990-2000

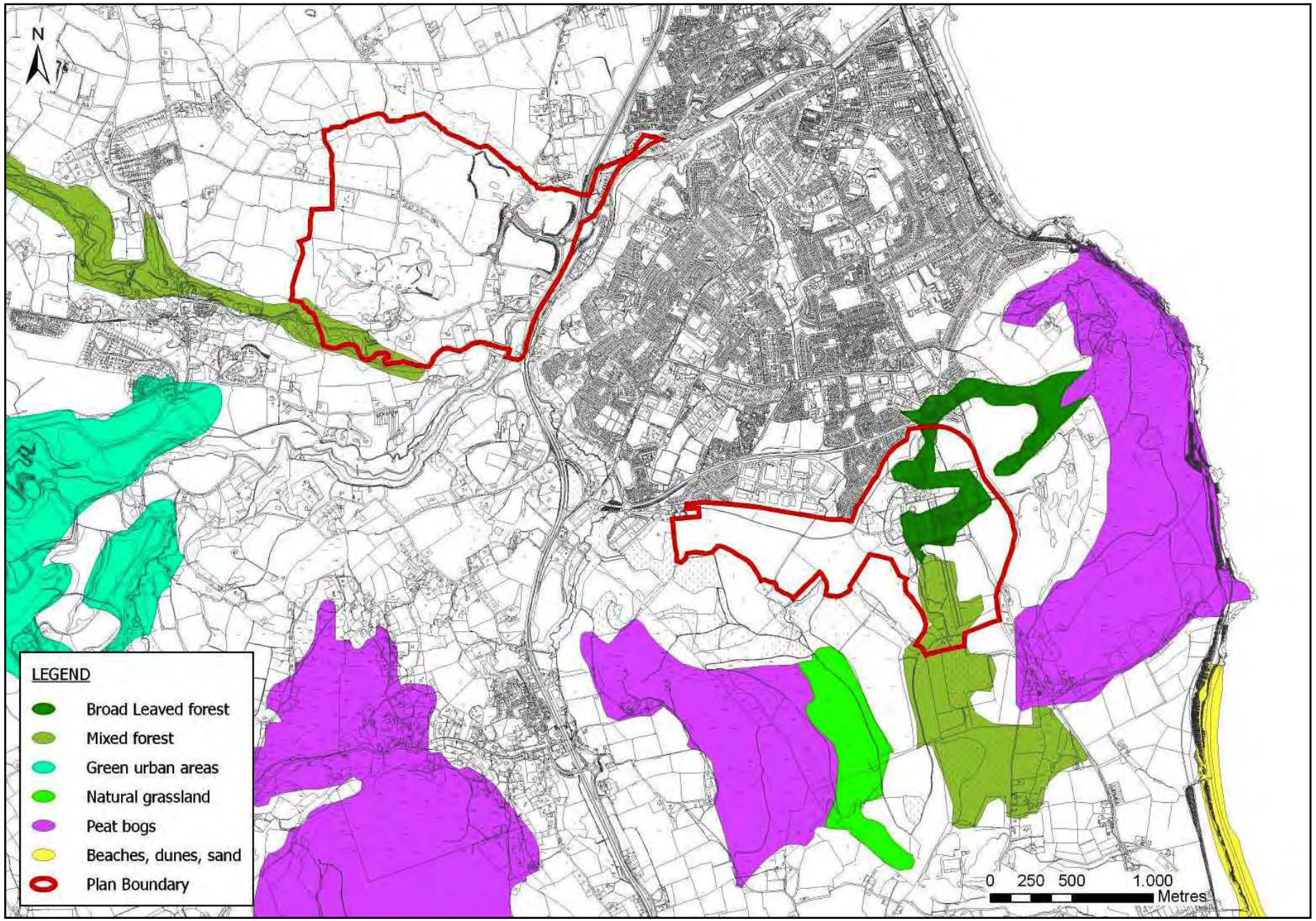

Figure 3.7 CORINE Land Cover Categories which indicate lands which are likely to be most valuable to biodiversity

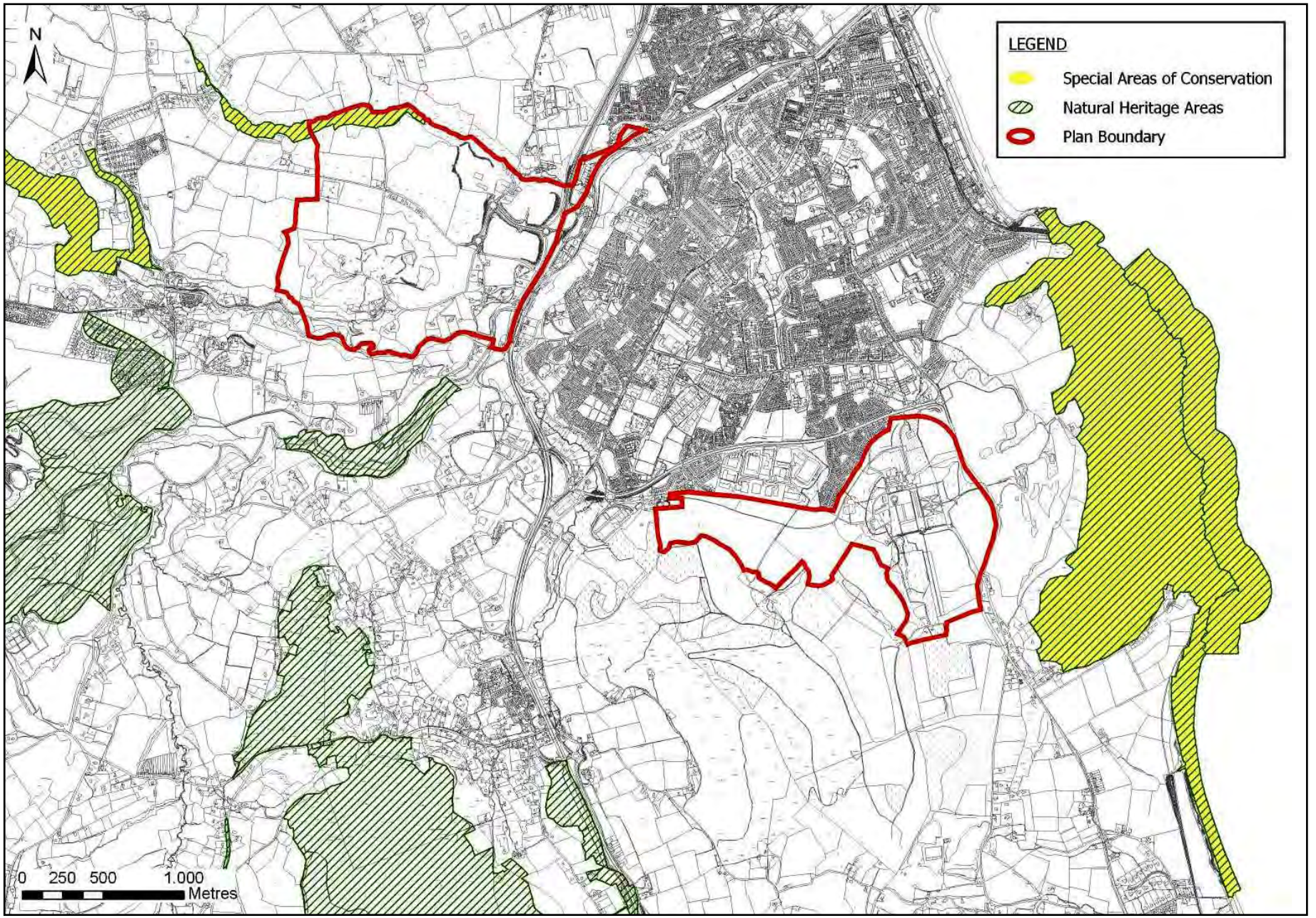

Figure 3.8 Designated Sites within and surrounding the Plan area

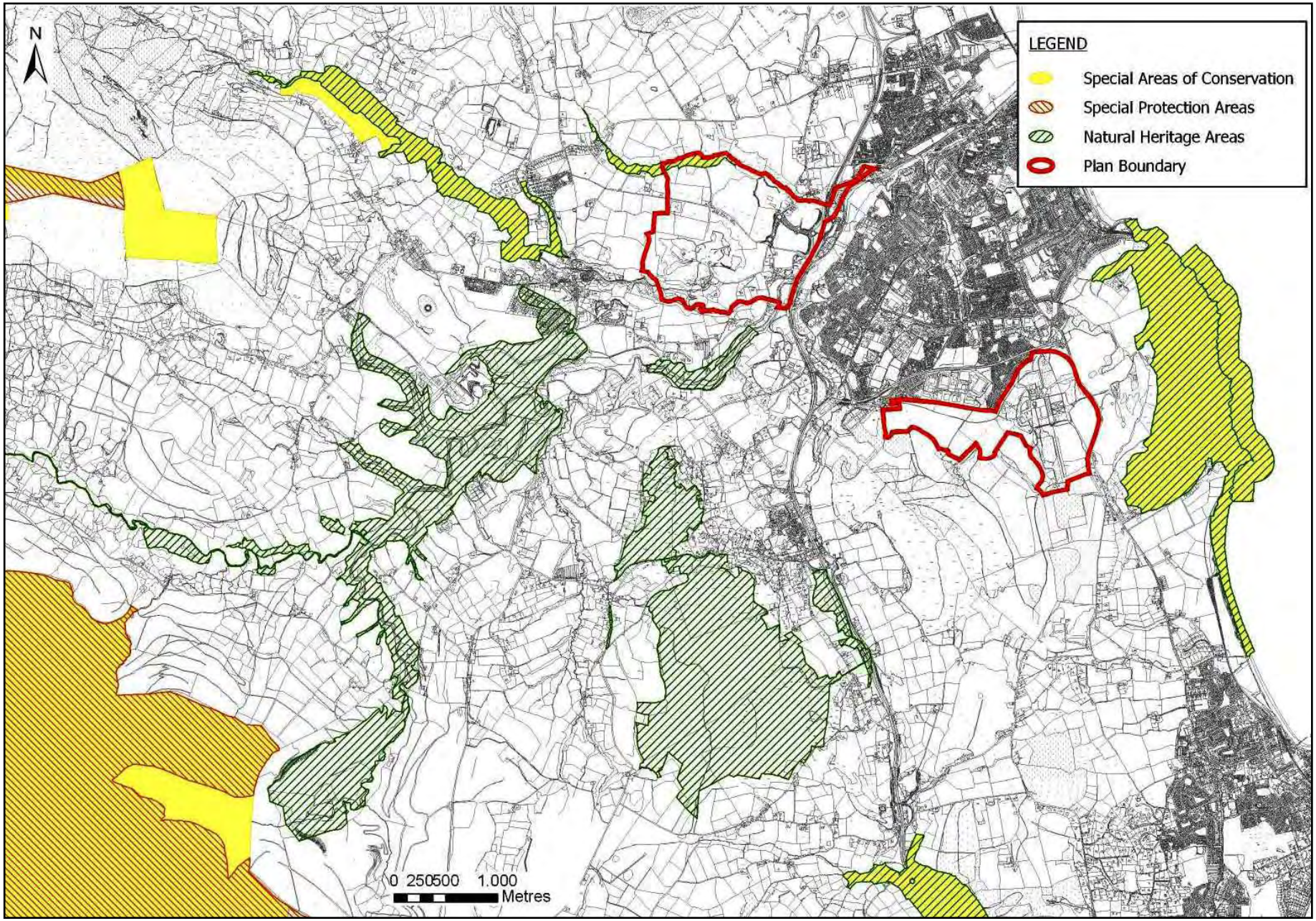

Figure 3.9 Context of Bray Environs Plan Area in relation to the Ecologically Designated Sites within the region

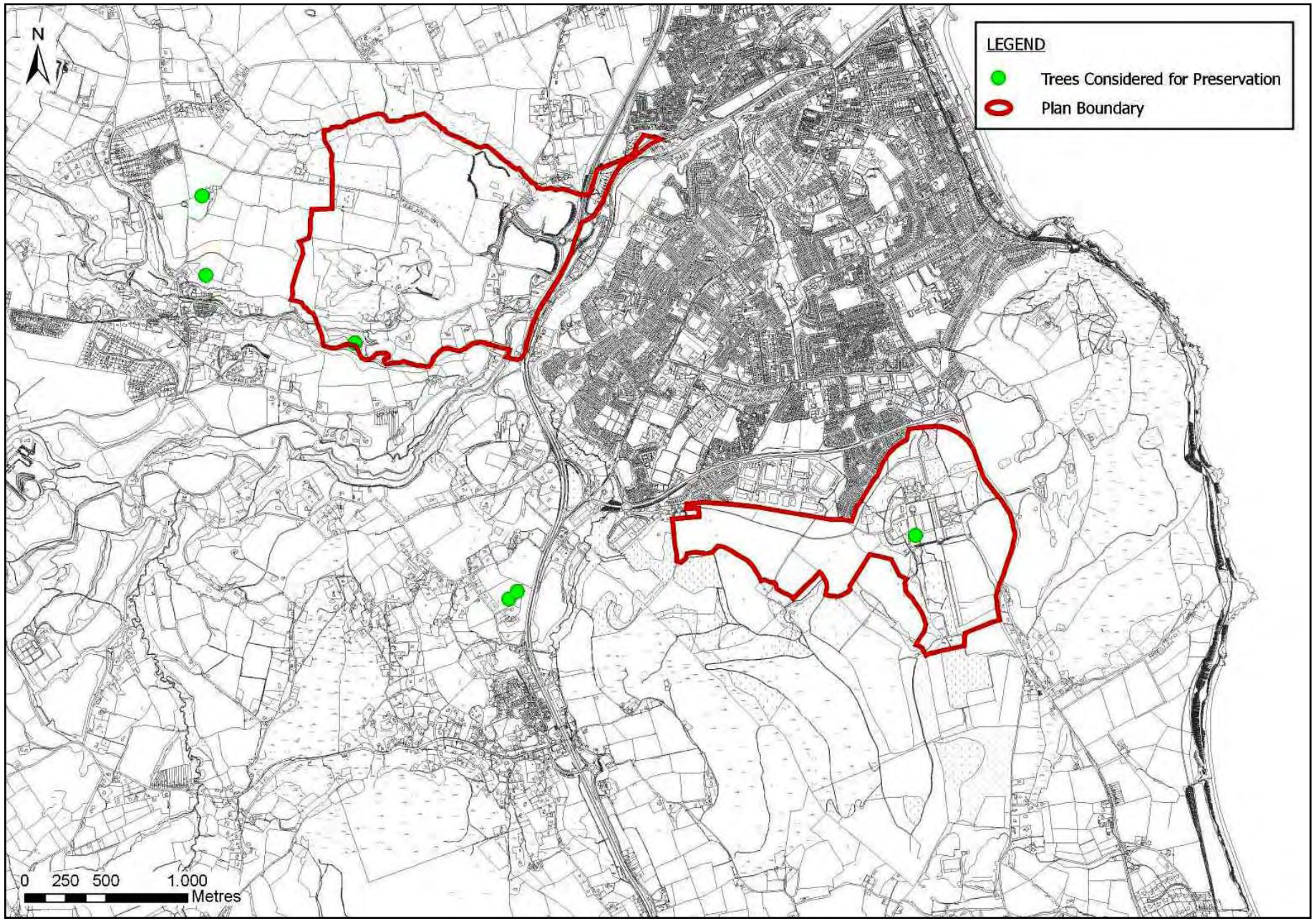

Figure 3.10 Trees Considered for Preservation

3.3 Population and Human Health

3.3.1 Population

Bray is the third largest town in Ireland with a population of almost 32,000 persons. The Plan area falls under the DED of Kilmacanogue. This DED covers an area of 2,564 hectares to the south and west of Bray town. The 2006 Census figures show that the population of the Kilmacanogue DED stood at 3,724[6]. This figure is up from 3,582 in 2002, a 4% increase.

Housing densities in the Plan area are comparatively low. Spatial spread of the population in the Plan area is generally one-off housing, linear in parts.

3.3.2 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 arising from incompatible adjacent land uses for example. 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.

The Air Framework Directive deals with each EU member state in terms of "Zones" and "Agglomerations". For Ireland, four zones are defined in the Air Quality Regulations (2002). Bray falls under Zone C whose current air quality status is “Good”. This is discussed further in Section 3.6.

[6] CSO (various) *Census 2002 Volume 1 - Population Classified by Area*; *Census 2006 Volume 1 - Population Classified by Area* Cork: CSO

3.3.3 Existing Problems

Certain environmental vectors within the Plan area - such as air, water or soil - have the potential to transport and deposit contaminants or pollutants, which have the potential to cause harm and adversely impact upon the health of the area’s population. Issues relevant to this potential in Bray Environs include landfills and noise. If the landfills are to continue to behave as they have been doing until now, it is uncertain what effect, if any, they would have on human health. The landfills are monitored on a regular basis. This would help to identify any problems which could impact upon human health. Noise emanating from the N11 could be seen as a potential problem. These issues are expanded upon in Sections 3.4.4 and 3.6.3.

3.3.4 Evolution of Population and Human Health in the absence of a Local Area Plan

Due to the constraints regarding land availability within the administrative boundaries of Bray Town Council, land within the Bray Environs area is required to accommodate the anticipated population increases from higher level land use strategic actions (see Section 5.2). 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 Bray 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 an LAP 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 LAP such direction 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. Urban sprawl and joining of settlements would be likely to occur in the absence of a Local Area Plan.

In the absence of a LAP 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.

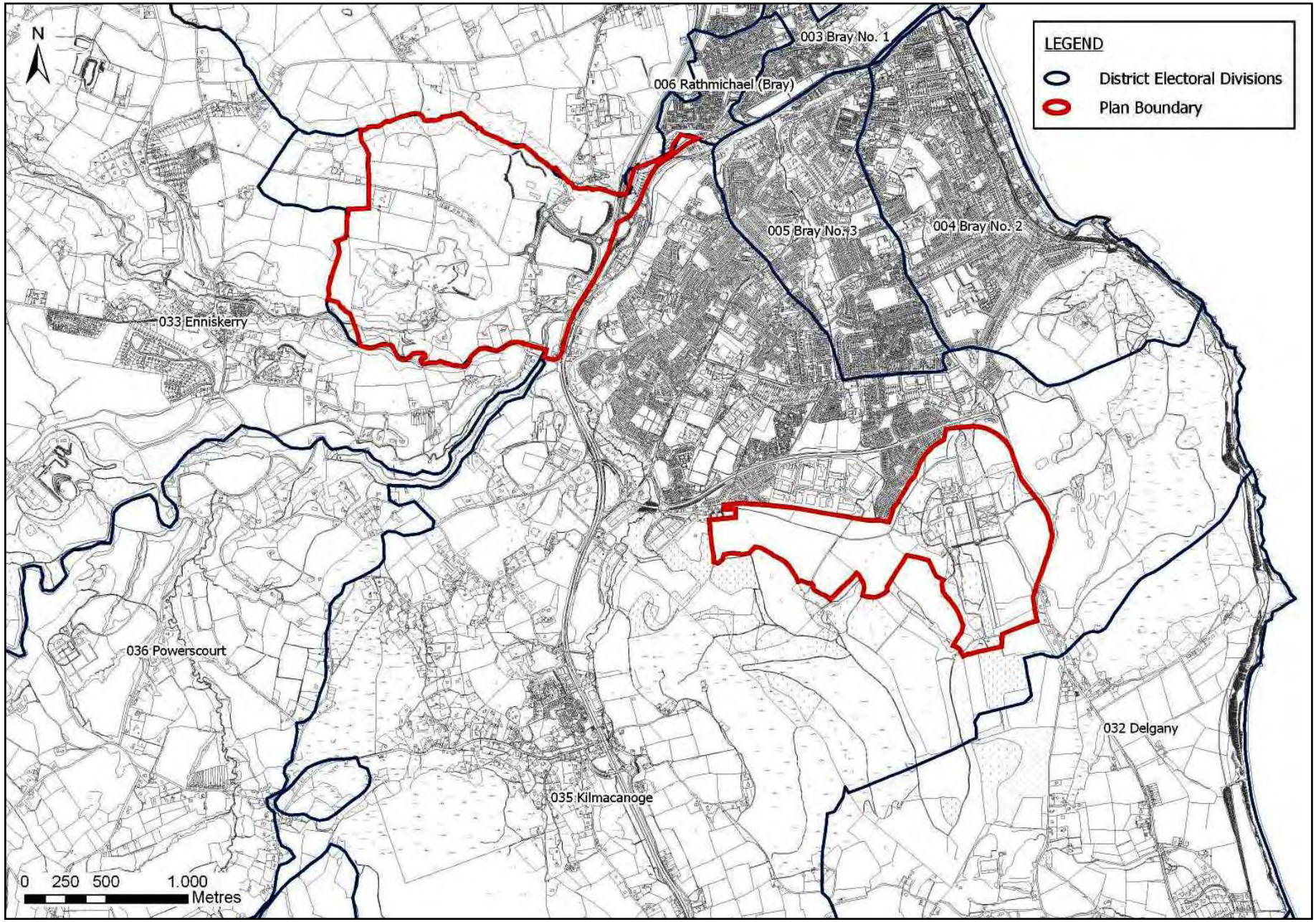

Figure 3.11 District Electoral Divisions

3.4 Soil

3.4.1 Introduction

Soil is the top layer of the earth's crust. It is formed by mineral particles, organic matter, water, air and living organisms. Soil can be considered as a non-renewable natural resource because it develops over very long timescales. It is an extremely complex, variable and living medium and 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.

Soils in any area are the result of the interaction of various factors, such as parent material, climate, vegetation and human action.

To date, there is no legislation which is specific to the protection of soil resources. However, there is currently an EU Thematic Strategy on the protection of soil which includes a proposal for a Soil Framework Directive which proposes common principles for protecting soils across the EU.

3.4.2 Soil Types

Figure 3.13 shows the distribution of soils across the Plan area. The biodiversity, flora and fauna detailed under Section 3.2 are facilitated by these soils as is an extent of agricultural land use. The majority of the area is covered by Grey Brown Podzols. Areas of Brown Soils and Lithosols and Rocky Outcrops lie to the south of the Plan area.

3.4.3 Geology and Sites of Geological Interest

The soils and habitats of Bray Environs have been influenced by the county's underlying geology (see Figure 3.12).

The Wicklow County Development Plan designates the following as Areas of Geological and Geomorphological Interest:

- Fassaroe Delta
- Bray Head
- Little Sugar Loaf
- Dargle River Valley

These designations and the extent of their areas are currently under review through the Geological Heritage Program of the Geological Survey Ireland. Areas of geological interest may be designated in the future as Geological Natural Heritage Areas.

The geology of the Bray Environs area consists of the Bray Head Formation, the Devils Glen Formation and the Glencullen River Formation. The Bray Head Formation consists mainly of green, purple, red and grey slates and interbedded greywacke sandstones and sandstones. Thickly bedded white to pink quartzites form prominent coastal and inland features such as the two Sugar Loaf Mountains. The Devils Glen Formation consists of greywackes and slates which are thickly bedded. Its quartzites are very rare. The Maulin Formation comprises grey slates and thin quartzite. The Glencullen River Formation is of early Ordovician age.

3.4.4 Existing Problems relating to Soil

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 infrastructure 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.

In addition to water quality and fishery impacts, these can impact on infrastructure and can have health and safety implication.

Figure 3.15 provided to CAAS by Wicklow County Council indicates a number of areas

where known landfilling activity was carried out in the past. These areas lie in close proximity to one another at the northern boundary of the Fassaroe study area.

Activity at these landfills began in the 1970's. They are unlined and capped and were used to dispose of municipal waste. The sites are kept under observation, and gas testing is carried out on a regular basis they are walked to check for settlement or breaks in the capping.

There is uncertainty as to where the landfill sites lie relative to zoning boundaries. The area lies east of a proposed residential zone where there are some existing dwellings.

Decomposition of materials in the landfill sites may pollute and contaminate soils.

The removal and disposal of landfilled material from the areas mentioned above could, if unmitigated, cause problems for water quality, ecology and human health.

A list of issues associated with unauthorised waste disposal sites is contained in the EPA's Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites[7]

3.4.5 Evolution of Soil in the absence of the Local Area Plan

In the absence of a Local Area Plan for Bray and its Environs, the evolution of soil would be dependent on developments which take place.

[7] Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites, EPA, 2007. http://www.epa.ie/downloads/advice/waste/waste/epa_cop_waste_disposal_sites.pdf

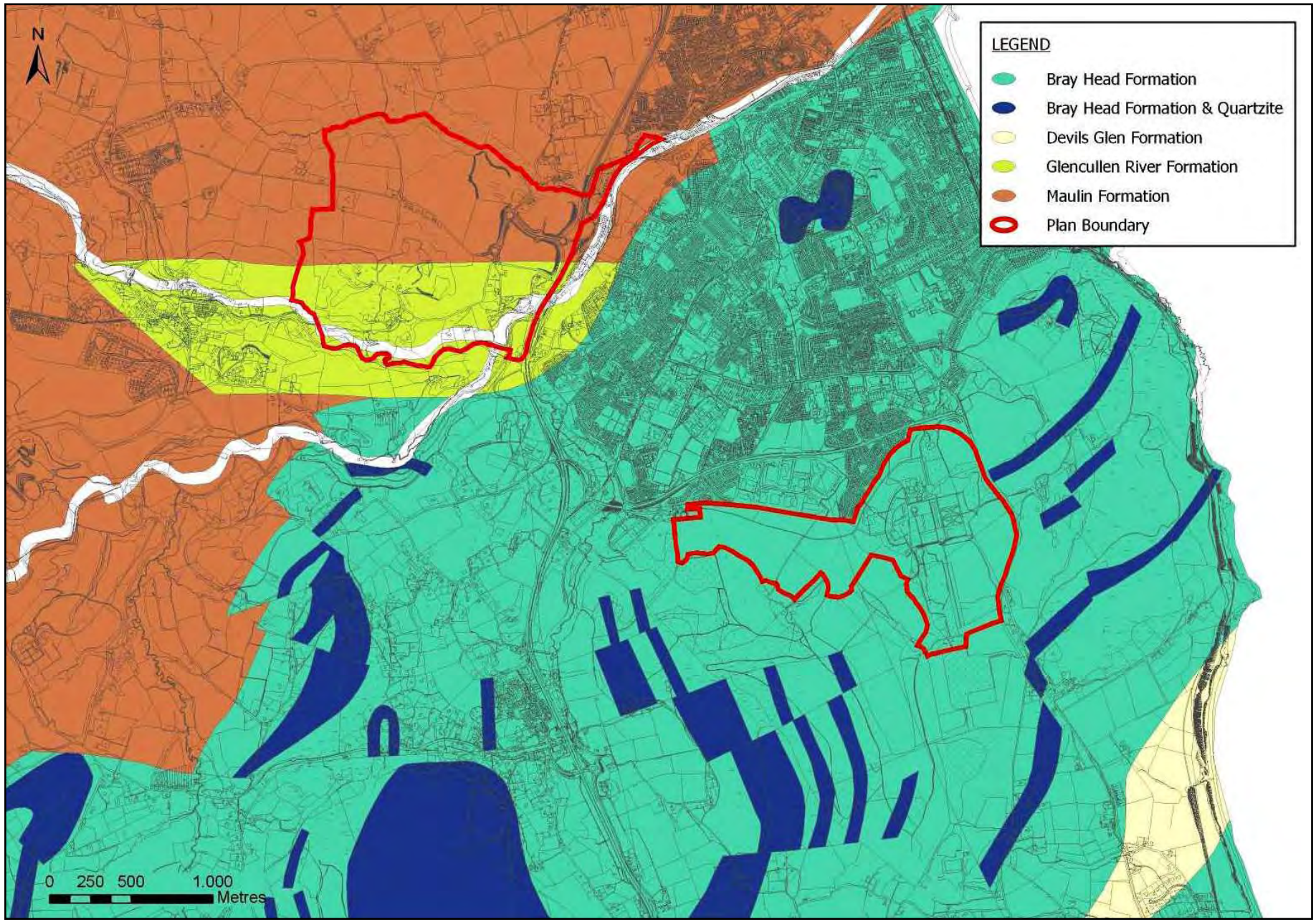

Figure 3.12 Geology in the Bray and Environs Plan Area

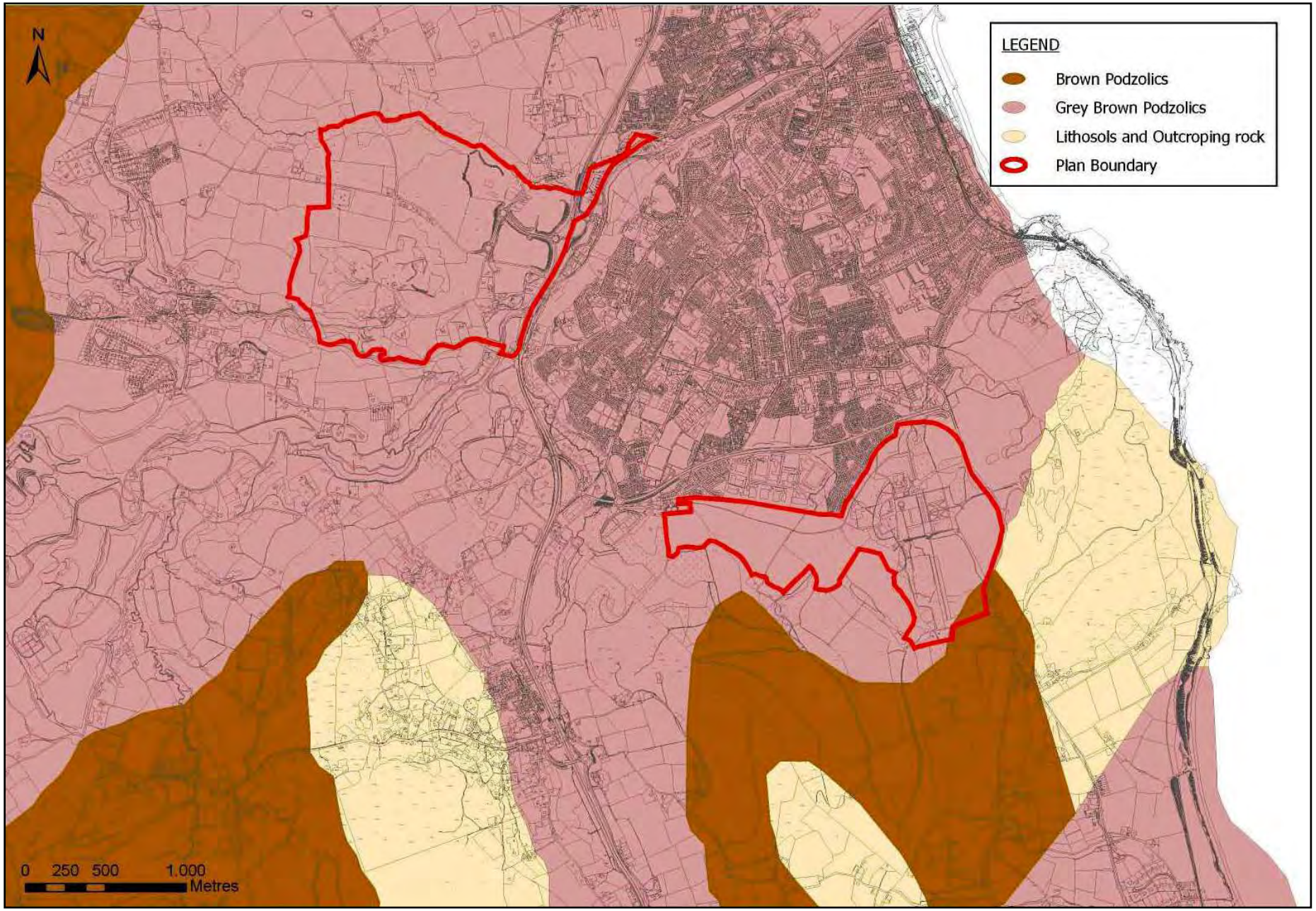

Figure 3.13 Soil Types in the Bray and Environs Plan Area

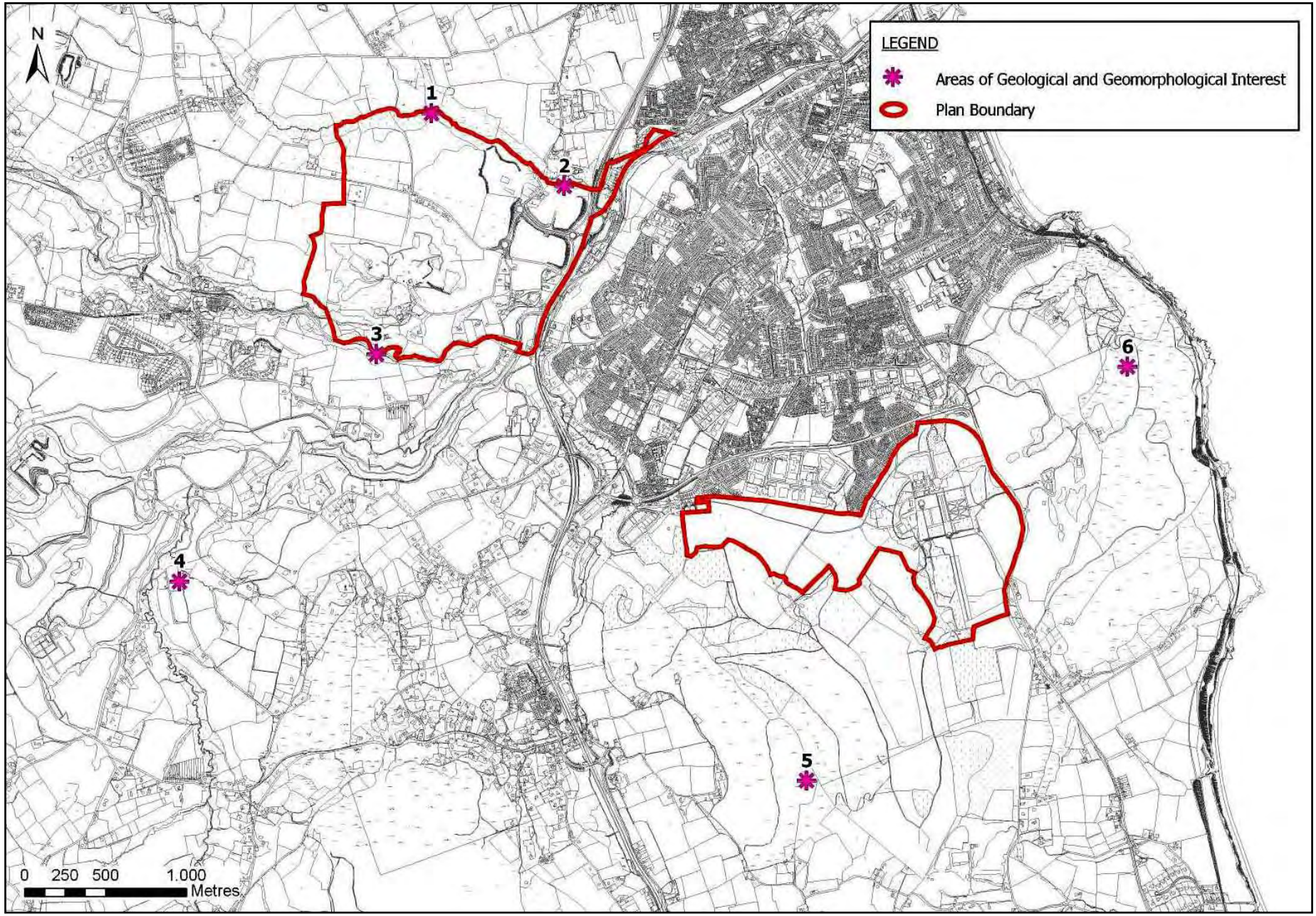

Figure 3.14 Areas of Geological and Geomorphological Interest

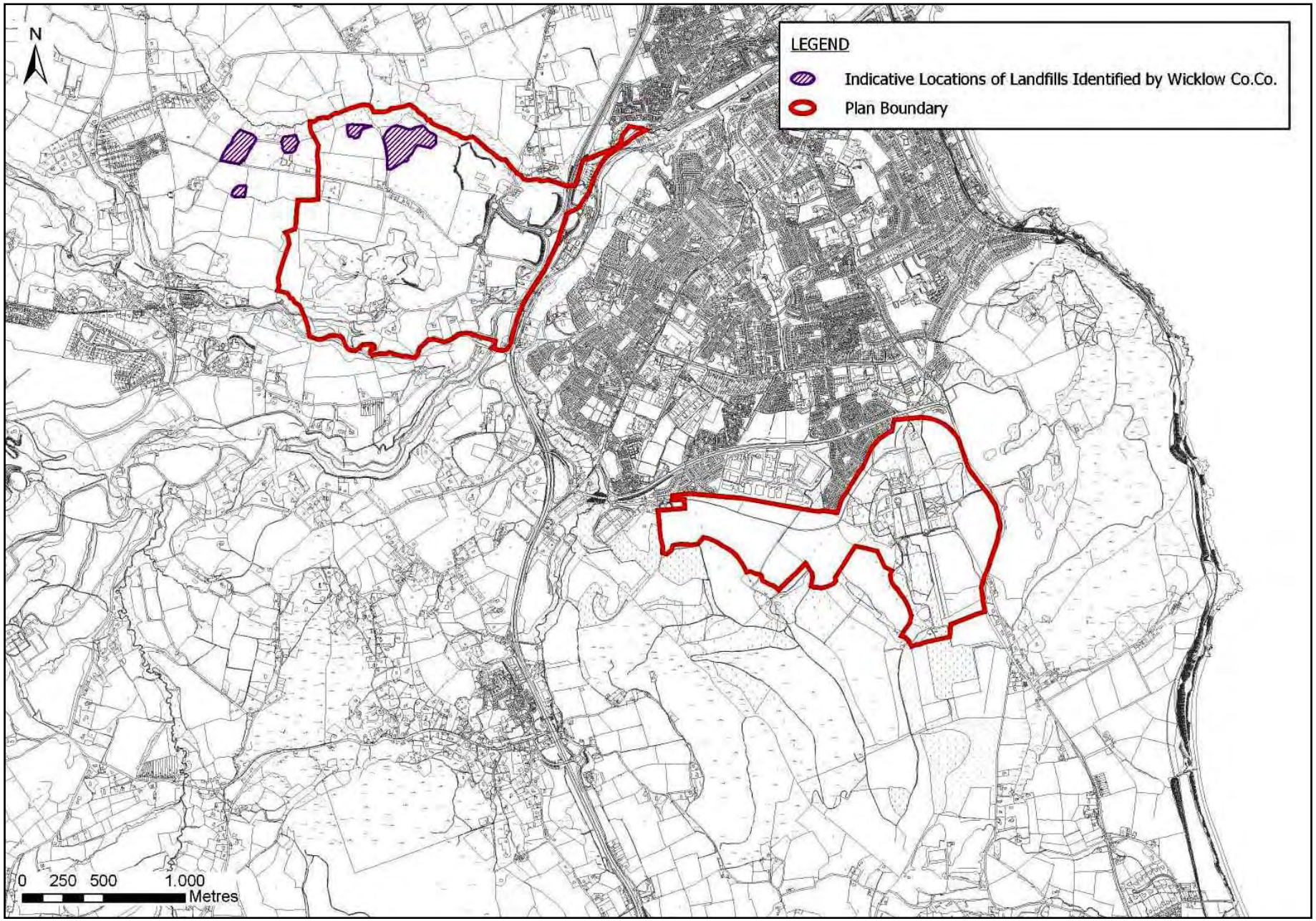

Figure 3.15 Indicative locations of landfills as identified by Wicklow County Council

3.5 Water

3.5.1 Introduction

Water within and surrounding Bray Environs has many functions: it provides drinking water to the area's population; it sustains the biodiversity and flora and fauna described under Section 3.2; and it is an integral part of the landscape.

3.5.2 Potential Pressures on Water Quality

Human activities, if not properly managed, can cause deterioration in water quality. Pressures exerted by human activities include the following:

- sewage and other effluents discharged to waters from point sources, e.g. pipes from treatment plants;
- discharges arising from diffuse or dispersed activities on land;
- abstractions from waters; and
- structural alterations to water bodies.

A *point source* pressure has a recognisable and specific location at which pollution may originate. Examples of significant point source pressures include direct discharges from waste water treatment plants, licensed discharges from industrial activities, landfills, contaminated lands (e.g. disused gas works) and mines.

A *diffuse source* pressure unlike a point source is not restricted to an individual point or location. The source of a diffuse pressure can be quite extensive. Significant examples of diffuse pressures include runoff from forestry and agricultural lands.

Excessive *abstractions* from surface waters and groundwater for drinking and industrial purposes can create pressures on the ability of a water body to maintain both chemical and ecological status.

Structural alterations such as river straightening; construction of embankments, weirs, dams, port facilities and dredging can create conditions such that a water body is no longer able to support the natural ecology which would have existed prior to such modifications. These pressures are also referred to as morphological pressures.

3.5.3 The Water Framework Directive

3.5.3.1 Introduction and Requirements

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD 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. All public bodies, including Bray Town Council and Wicklow County Council, are also required to: coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted; and improve polluted water bodies to good status by 2015.

3.5.3.2 River Basin Districts and Water Bodies

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. The management of water resources will be on these river basin districts. The Plan area is located in 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*.

3.5.3.3 WFD Risk Assessments

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 referred to under Section 3.5.2. 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, 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) Probably Not at Significant Risk* - the water body is expected to meet good status in 2015; and,
- *(2b) 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.

3.5.3.4 WFD Registers of Protected Areas

In addition to the these assessments, the WFD requires that Registers of Protected Areas (RPAs) are compiled for a number 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.

The WFD requires that these RPAs contain: areas from which waters are taken for public or private water supply schemes; designated shellfish production areas; bathing waters; areas which are affected by high levels of substances most commonly found in fertilizers, animal and human wastes - these areas are considered nutrient sensitive; areas designated for the protection of habitats or species e.g. salmonid areas; Special Areas of Conservation (SACs); and, Special Protection Areas (SPAs).

In Ireland, waters intended for human consumption are protected under the Drinking Water Regulations (S.I. 439/2000). The Cookstown River has been listed on the RPA for Drinking Water. Groundwater underlying the Plan area is listed on the RPA for Drinking Water (Ground Water).

The Dargle River has been listed on the RPA for Habitat Rivers. Wildlife habitats (as identified by the National Parks and Wildlife Service) that are dependent on water are included in the Register.

The waters listed on the RPA are mapped on Figure 3.23.

3.5.3.5 River Basin Management Plan

Local Authorities located in the ERBD, including Bray Town Council and Wicklow County Council, are preparing a management plan which will be implemented in order to help protect and improve all waters in the ERBD. This Management Plan will provide specific policies for individual river basins in order to implement the requirements of the WFD. The River Basin Management plan will be drafted in this year for the Eastern RBD area for public consultation and finalised in June 2009.

3.5.4 Rivers

3.5.4.1 Introduction

The two largest surface water bodies which flow through the Plan area are the River Dargle, which flows through the south-eastern corner of the Fassaroe site, and the Cookstown River, which forms the southern boundary of the Fassaroe site. The confluence of these rivers is just inside the south eastern boundary of the Fassaroe site. There is a small stream which forms the northern boundary of the Fassaroe site.

Of these rivers the River Dargle is the largest. The Dargle rises in the Wicklow Mountains and flows in a north-easterly direction for twelve miles before entering the sea at Bray. The Cookstown River rises as the Glencullen River in Prince Williams Seat to the east of Bray Town and flows through Enniskerry, where it becomes known as the Cookstown River. It

merges with the Dargle at the south eastern corner of the Fassaroe site.

3.5.4.2 Salmonid Rivers

The main channel of the River Dargle is designated and protected as Salmonid Waters under the European Communities (Quality of Salmonid Waters) Regulations 1988 (SI No. 293 of 1988). Designated Salmonid Waters are capable of supporting salmon (Salmo salar), trout (Salmo trutta), char (Salvelinus) and whitefish (Coregonus). The Cookstown River is a tributary of the Dargle which could indicate that salmonid species may be present.

3.5.4.3 Risk Assessment

Figure 3.17 shows the current risk assessment for the River Dargle and the Cookstown River. In terms of achieving the WFD's objectives by 2015, both rivers are currently classified as being *(1a) at significant risk* of failing to achieve the WFD's objectives by 2015. Diffuse source pressures can be attributed to this classification.

3.5.5 Transitional, Bathing and Coastal Waters

3.5.5.1 Introduction

As defined by the WFD, transitional waters are bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.

Coastal water is surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.

Coastal waters are important for tourism, for use as bathing locations and for supporting marine wildlife.

3.5.5.2 Water Quality

In Ireland, monitoring of water quality at designated bathing areas is undertaken by Local Authorities in accordance with Bathing Water Regulations (S.I. 155 of 1992). The EPA reports the compliance results of these 131 sites annually. There are three compliance categories: non compliant sites fail to meet the necessary quality criteria, sites compliant with mandatory values meet the minimum quality criteria and sites compliant with guide values meet all the recommended quality criteria. Quality of bathing water in Bray is classified as being compliant with EU Mandatory Values (Acceptable Quality). This is mapped on Figure 3.18. This is a decrease in quality for previous years where bathing water in Bray complied with Guide Values (good quality) for the years 2005 and 2006.

3.5.5.3 WFD Risk Assessment of Waters

The WFD risk assessment of transitional waters for the Bray area shows that waters at Bray Harbour are classified as being *(1a) at significant risk of not achieving good status.*

Figure 3.19 shows the WFD risk assessment for the coastal waters located off Bray. The coastal waters of the South-Western Irish Sea - Killiney Bay are classified as being *(1a) at significant risk of not achieving good status*.

Point source pollution such as water treatment plants and other pressures could possibly be the reason behind the classification of the South-western Irish Sea - Killiney Bay. Morphological pressures such as coastal defences and intensive land uses are the reasons for the classification of Bray Harbour.

3.5.6 Groundwater

3.5.6.1 Introduction

Groundwater is stored in the void spaces in underground layers of rock, or aquifers. These aquifers are permeable, allowing both the infiltration of water from the soils above them and the yielding of water to surface and coastal waters. Groundwater is the part of the subsurface water that is in the saturated zone - the zone below the water table, the uppermost level of saturation in an aquifer at which the pressure is atmospheric, in which all pores and fissures are full of water.

3.5.6.2 WFD Risk Assessment of Groundwaters

Figure 3.20 maps the current risk assessment for groundwater in the Bray Environs area. Groundwater at the Kilruddery site and in the western part of the Fassaroe site is classified as being *(1b) probably at significant risk of not achieving good status*. Reasons for this include landfills and mobile chemicals. The

groundwater bodies underlying the remainder of Bray Environs are currently classified as being *(2a) expected to achieve good status* by 2015.

Urban groundwater pollution sources and pathways are complex, and sources of pollution are difficult to control. Because of the complexities involved, urban groundwater pollution is considered to be a significant water management issue on a national scale as: Irish towns are growing rapidly; and, the financial costs of returning affected groundwater bodies to WFD status objectives will likely be significant, requiring extensive monitoring and management measures.

3.5.6.3 Groundwater Vulnerability

The Geological Survey of Ireland (GSI) rates aquifers according to their vulnerability to pollution. Aquifer vulnerability refers to the ease with which pollutants of various kinds can enter underground water.

Figure 3.21 maps this rating for the Plan area. It indicates that the Fassaroe area is generally rated as *High* with the south and east of that area rated as *Extreme.* There is a small area along the eastern Fassaroe site rated as *Extreme (rock near surface or Karst).* The vulnerability varies from *Moderate* to *High* to *Extreme* moving from east to west through the Kilruddery site.

3.5.6.4 Groundwater Productivity

The GSI rates aquifers based on the hydrogeological characteristics and on the value of the groundwater resource. Ireland's entire land surface is divided into nine aquifer categories. The Plan area is divided into two different classifications as seen on Figure 3.22. The northern two thirds of the Fassaroe site are underlain by a locally important aquifer which is moderately productive only in local zones-it is capable of yielding enough water to boreholes or springs to supply villages, small towns or factories. The majority of the Plan area is underlain by a poor aquifer which is generally unproductive except for in local zones.

3.5.7 Existing Problems

The above descriptions identify a number of sensitivities with regard to the status of water bodies within the Bray Environs Plan area. By virtue of how they are used by people and by wildlife, the Cookstown River, the River Dargle and the groundwater underlying the Plan area are all listed on the Registers of Protected Areas under the Water Framework Directive.

The River Dargle and the Cookstown River are both at significant risk of failing to achieve the WFD's objectives of good status by 2015.

Ground waters underlying the Plan area are at risk or possibly at risk of failing to meet the objective.

The coastal waters of the South-Western Irish Sea - Killiney Bay are at significant risk of not achieving good status.

Transitional waters at Bray Harbour are also at significant risk of not achieving good status.

Leachate from the illegal landfills mentioned in Section 3.4.4 could pose a threat to water bodies, especially as they are unlined.

3.5.8 Evolution of Water in the absence of a Local Area Plan

Based on the current risk assessments, rivers, coastal waters and the most of the underlying groundwater within and surrounding the Plan area are likely to fail to meet their commitments under the WFD.

If new development was not accompanied by appropriate waste water infrastructure /capacity then it is likely that:

- Rivers and coastal waters would fail to meet WFD commitments;
- Groundwaters would possibly not meet WFD commitments; and,
- Significant adverse impacts upon the biodiversity and flora and fauna of Bray Environs area would be likely to arise.

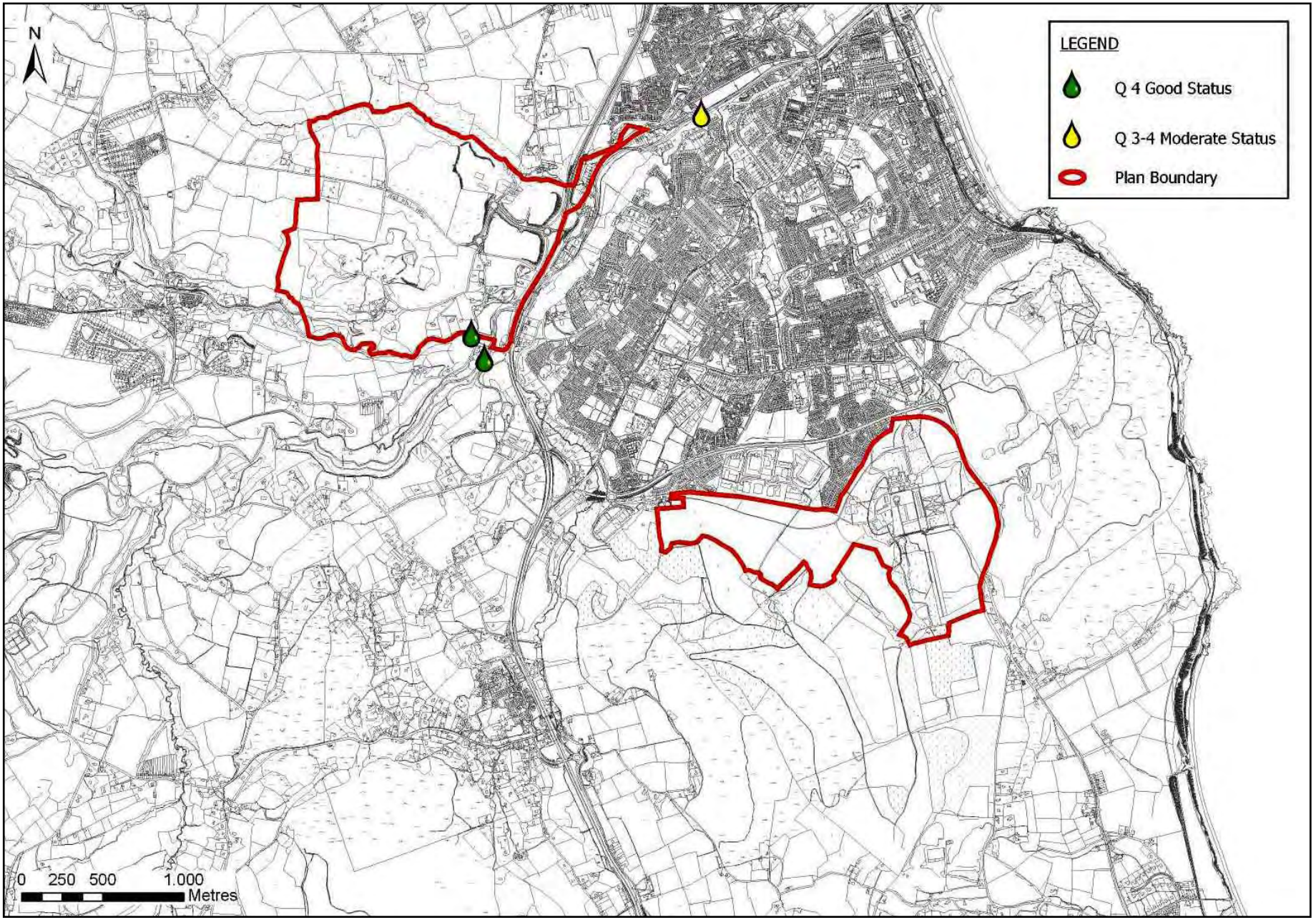

Figure 3.16 Q Values (Biotic Index Rating) for Points on River Bodies

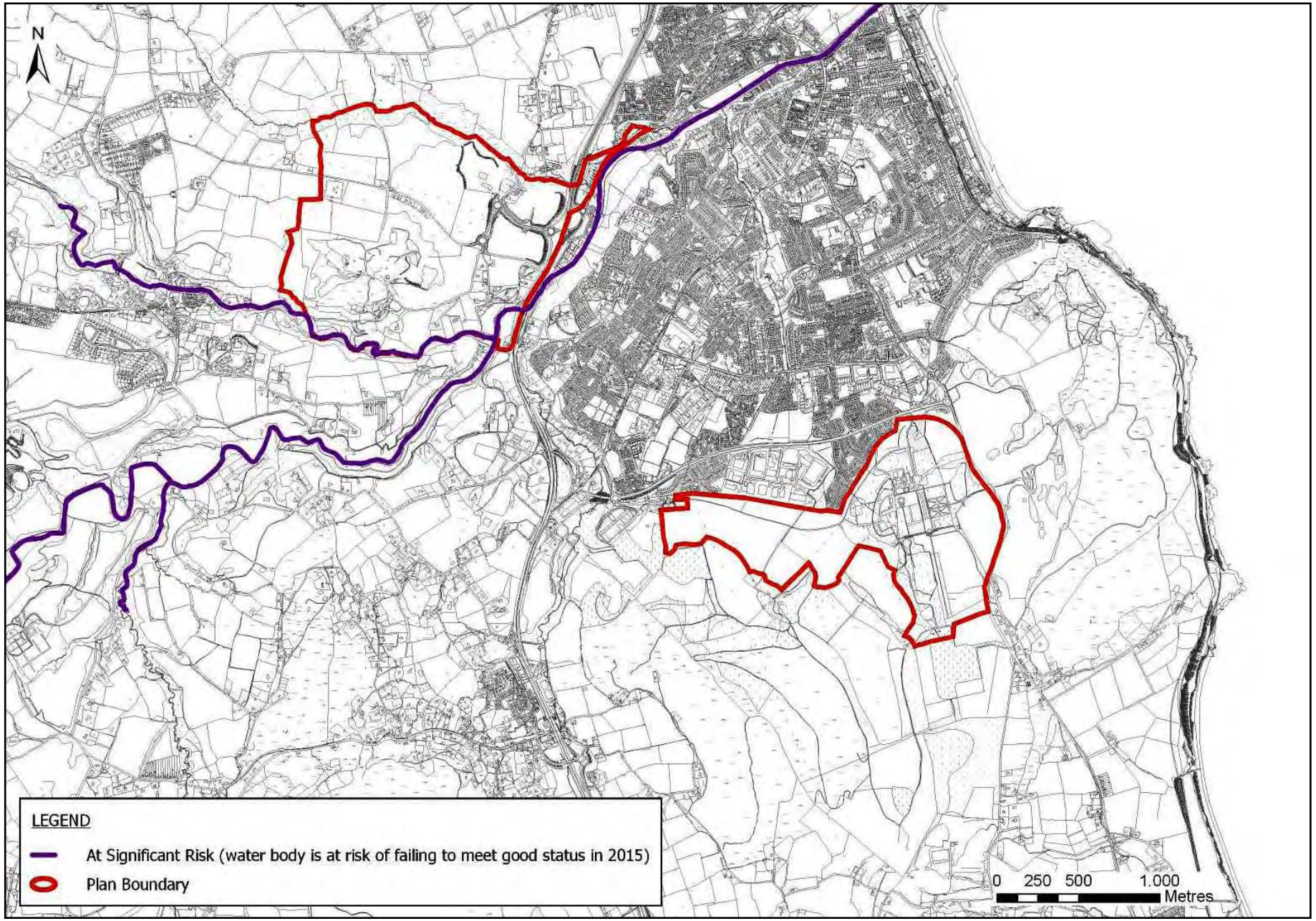

Figure 3.17 Risk Assessment of Rivers

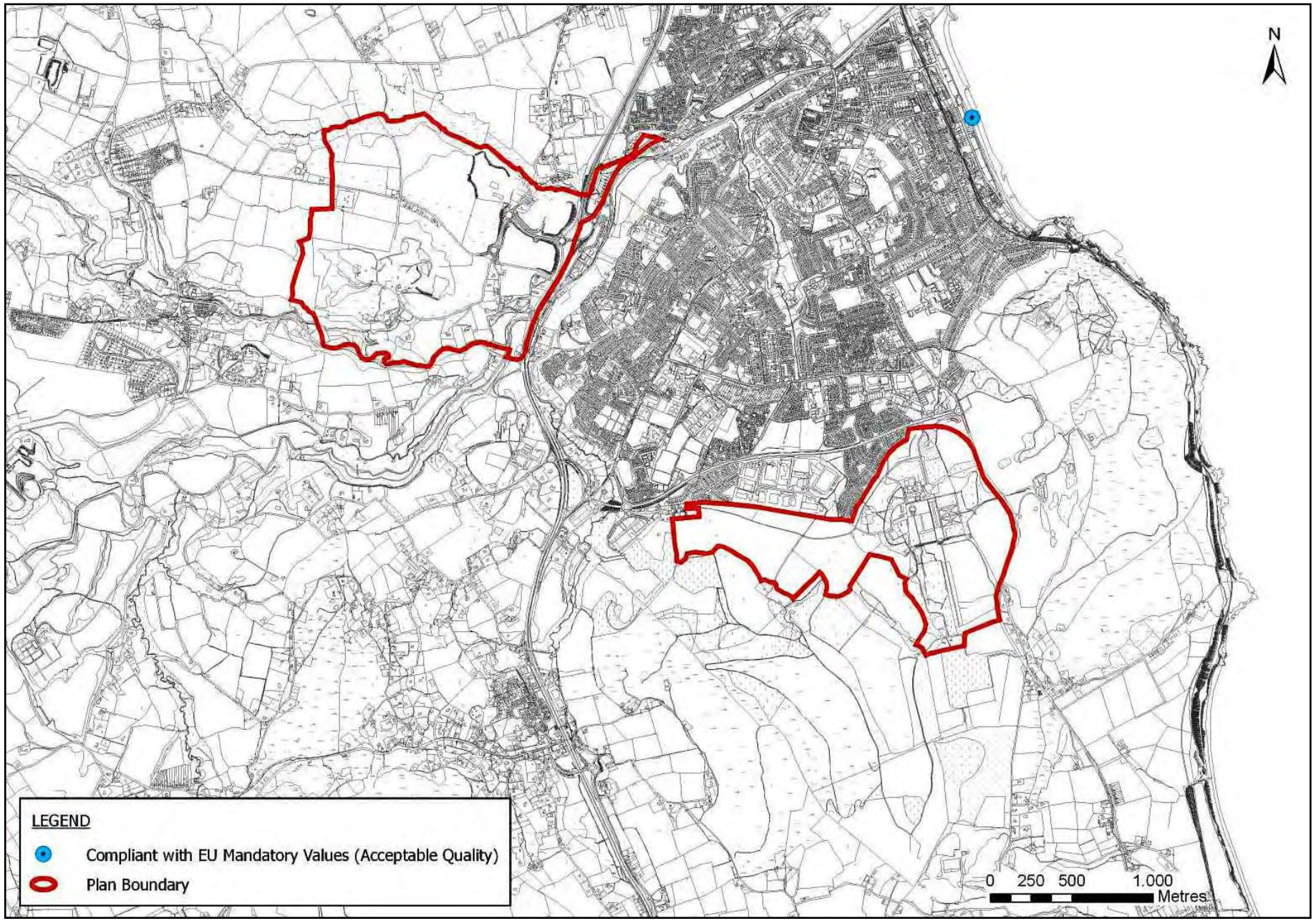

Figure 3.18 Quality of Bathing Waters

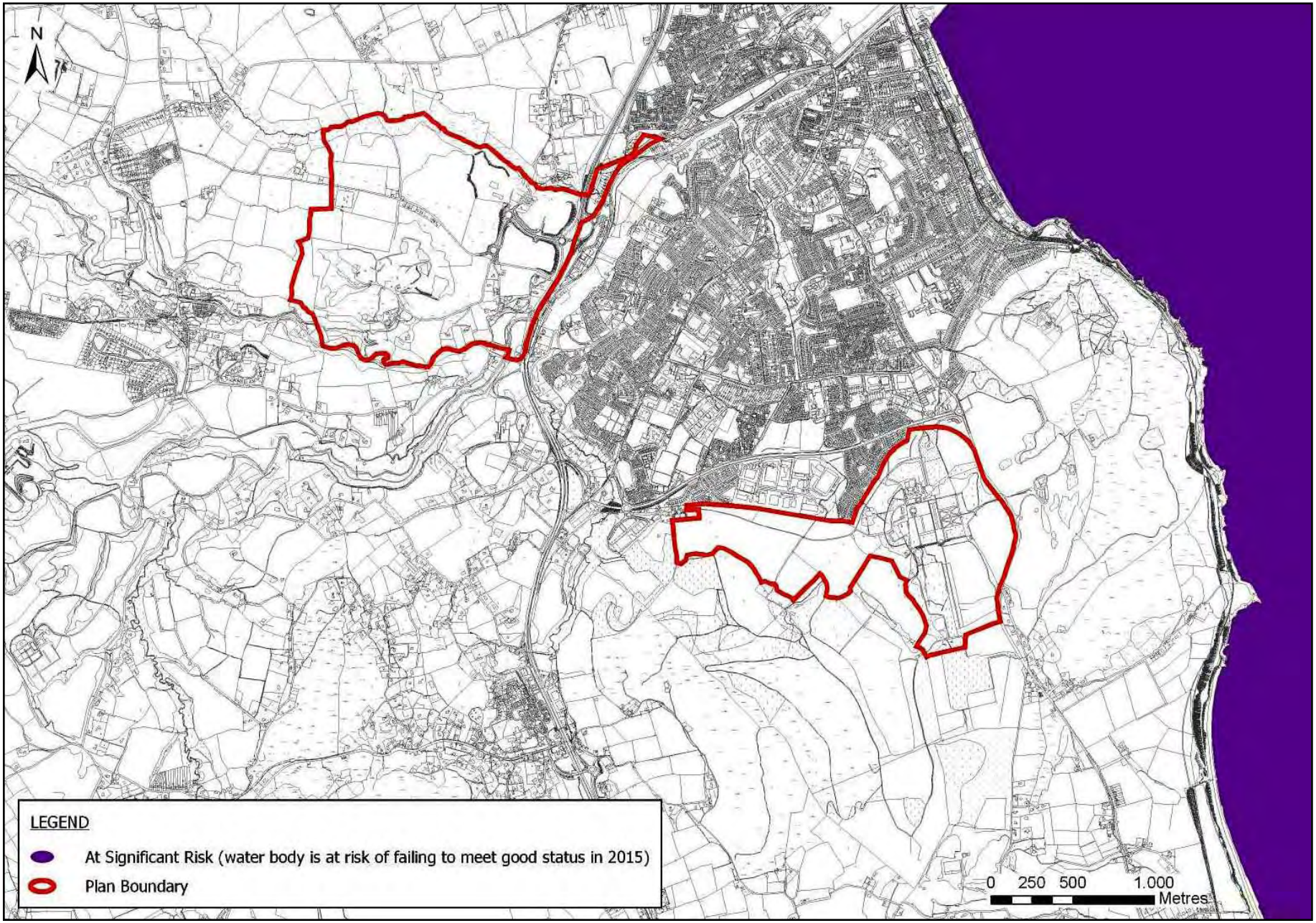

Figure 3.19 Risk Assessment of Coastal Waters

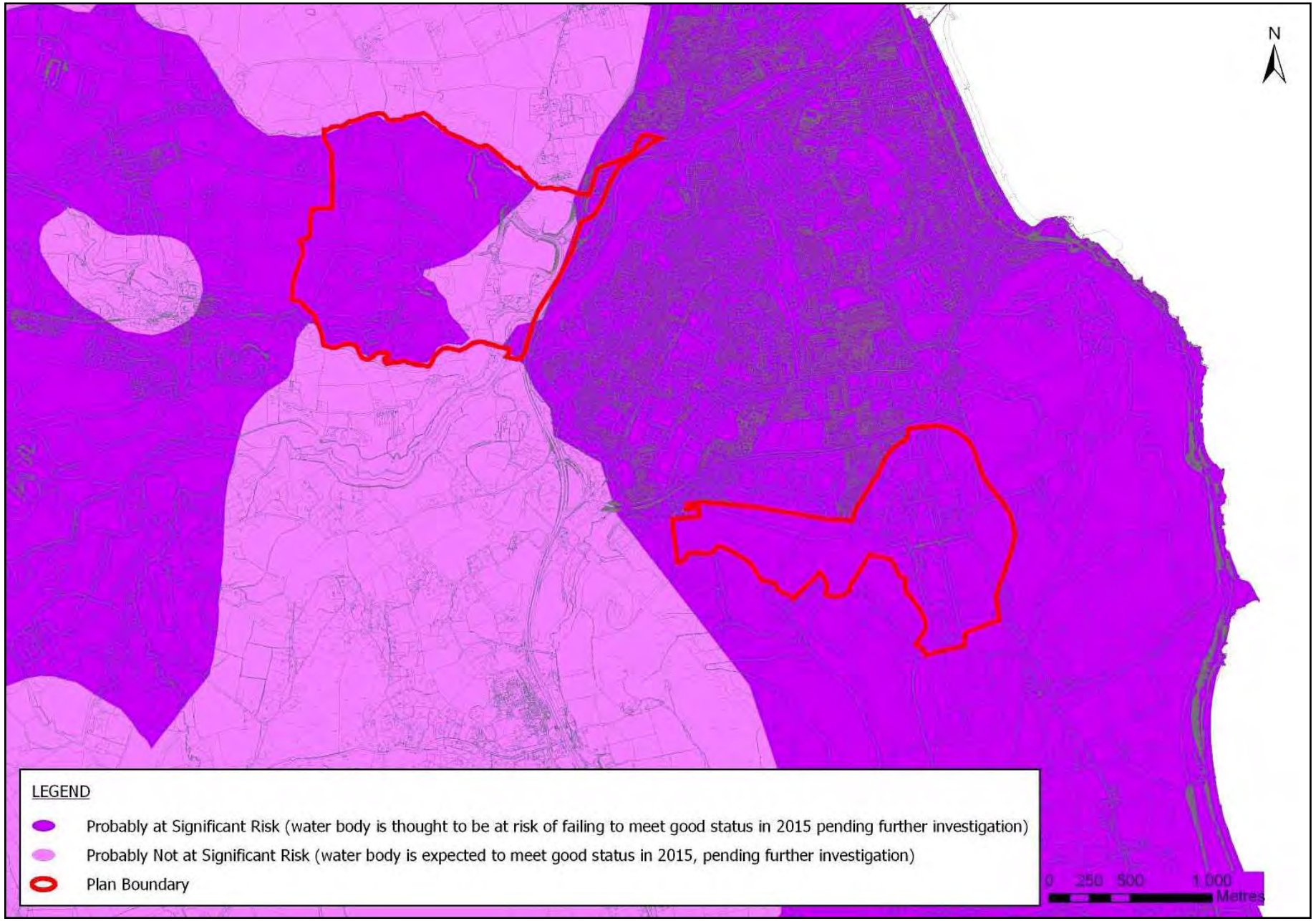

Figure 3.20 Risk Assessment of Groundwater

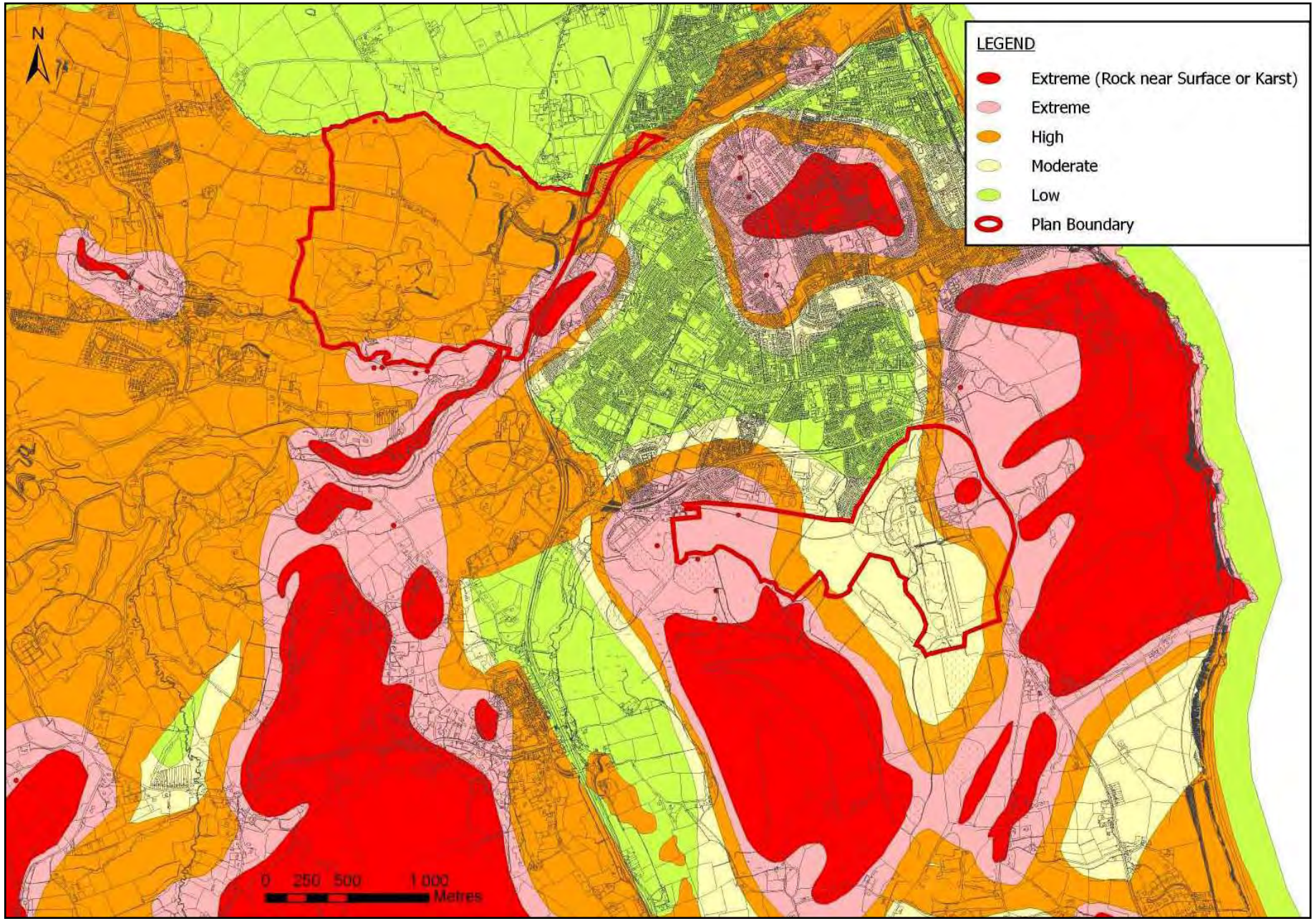

Figure 3.21 GSI Groundwater Vulnerability

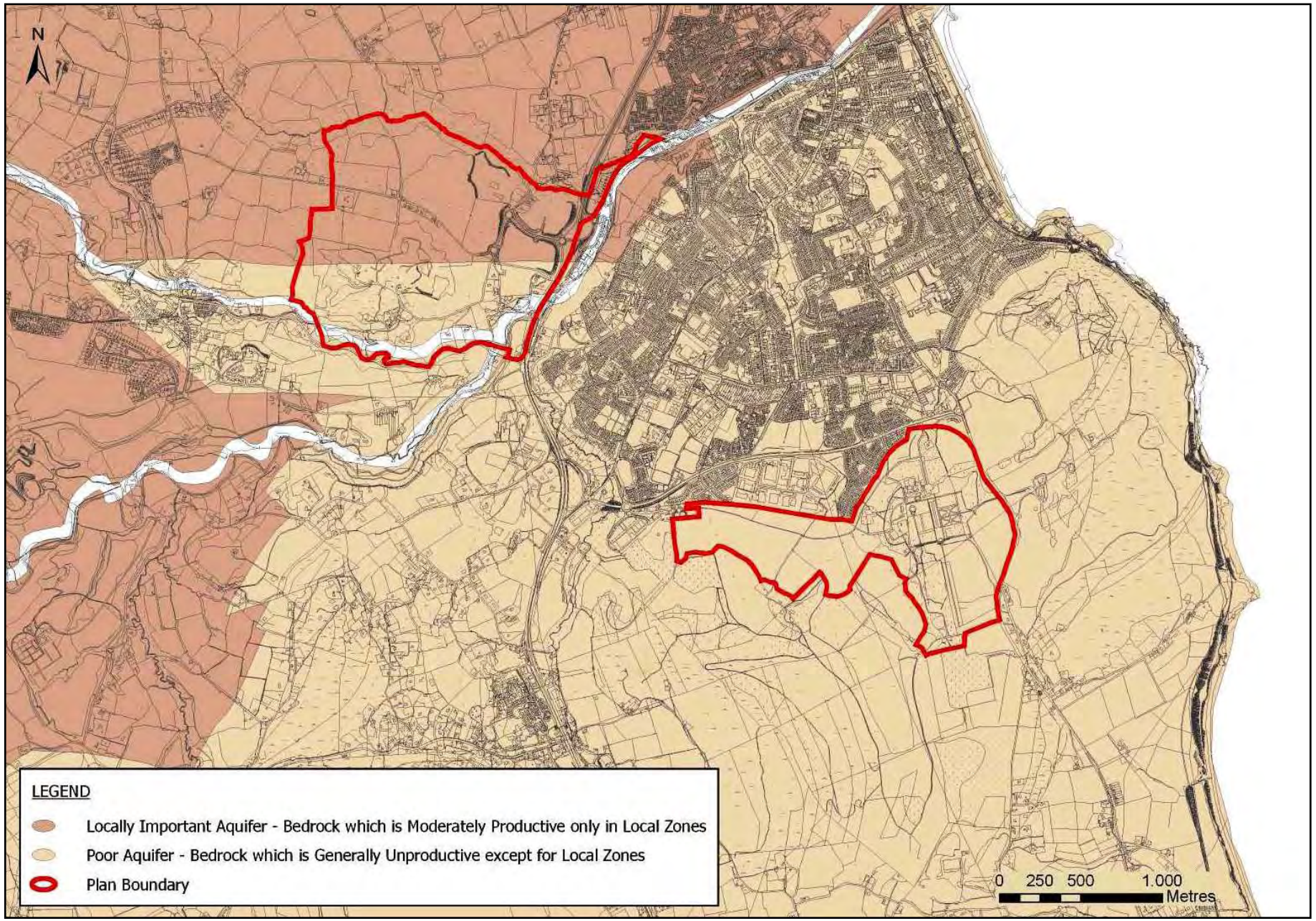

Figure 3.22 GSI Groundwater Productivity

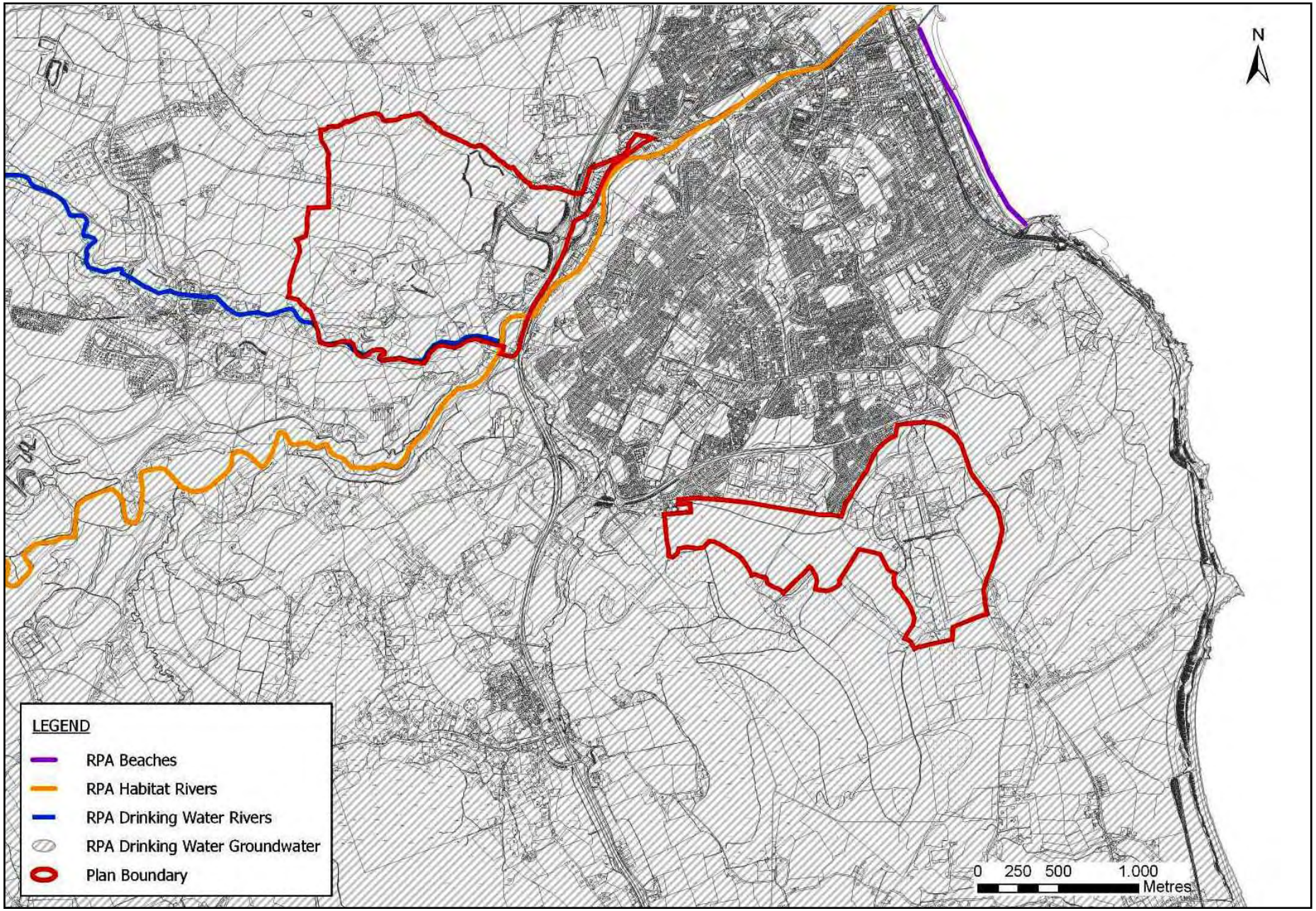

Figure 3.23 WFD Register of Protected Areas

3.6 Air and Climatic Factors

3.6.1 Ambient Air Quality

3.6.1.1 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, Bray, 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.

Bray falls into zone C. Current air quality in Zone C is “good”. The index is calculated based on the latest available measurements of PM10, sulphur dioxide, nitrogen dioxide and ozone in Zone C.

3.6.1.2 Air Quality Monitoring

Air quality in Bray was monitored between 20th October 2005 and 11th May 2006 at the Health Service Executive, Killarney Road, Bray. Parameters measured included PM10, Carbon Monoxide, Sulphur Dioxide, Oxides of Nitrogen, Benzene and Lead

3.6.1.3 Particulate matter (PM_{10} and $PM_{2.5}$)

Particulate matter (PM_{10} and $PM_{2.5}$), or dust, arise from vehicle exhaust emissions, soil and road surfaces, construction works and industrial emissions. Small particles can penetrate the lungs and cause damage. These are known as PM_{10} (diameter less than 10µm) and $PM_{2.5}$ (diameter less than 2.5µm). There are high levels of PM_{10} in many cities and towns.

3.6.2 Potential Point Sources of Emissions

3.6.2.1 IPPC Licensed Facilities

The EPA has been licensing certain large-scale industrial and agriculture activities since 1994. Originally the licensing system was known as Integrated Pollution Control (IPC) licensing, governed by the Environmental Protection Agency Act, 1992. The Act was amended in 2003 by the Protection of the Environment Act, 2003 which gave effect to the Integrated Pollution Prevention Control (IPPC) Directive. Detailed procedures concerning the IPPC licensing process are set out in the EPA Acts 1992 to 2007 and the associated licensing regulations.

IPPC licences aim to prevent or reduce emissions to air, water and land, reduce waste and use energy/resources efficiently. An IPPC license is a single integrated license which covers all emissions from the facility and its environmental management. All related operations that the license holder carries in connection with the activity are controlled by this license. Before a license is granted, the EPA

must be satisfied that emissions from the activity do not cause a significant adverse environmental impact.

There are two IPPC licensed facilities in Bray, A.O. Smith Electric Motors (Ireland) Limited and Alert Packaging Limited. These lie outside the Plan boundary.

Greenstar Ltd. operates an integrated waste management facility in the Fassaroe area. Greenstar Ltd. are licensed to carry out several different operations including bulking of municipal solid waste prior to transfer off site for disposal, composting, wood shredding, processing/storage of dry recyclables, recovery of construction and demolition waste, acceptance of waste at a civic waste facility to include acceptance of hazardous waste such as bonded asbestos waste, WEEE and chlorofluorocarbons.

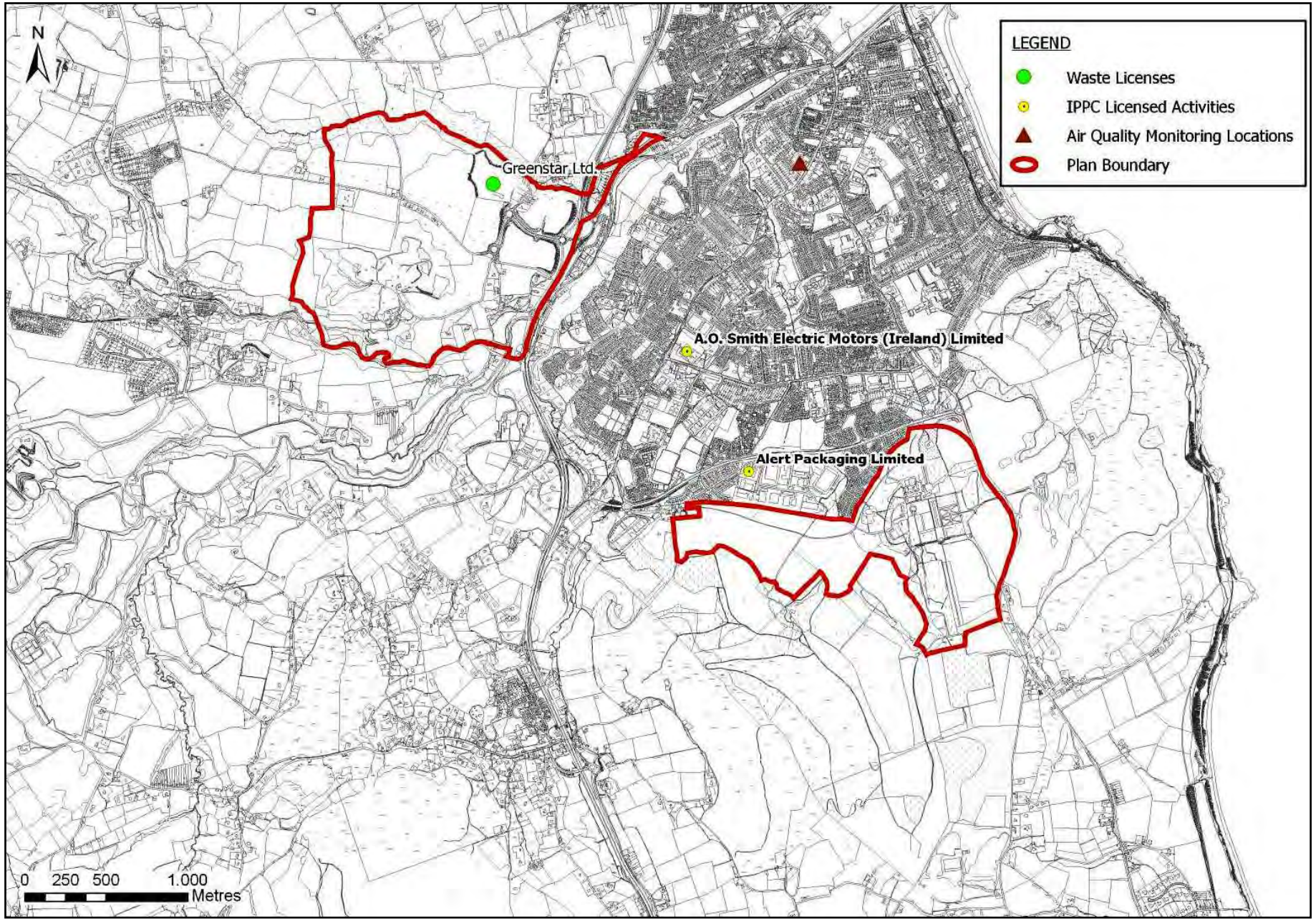

Figure 3.24 Waste Licences, IPPC Licences and Air Quality Monitoring Locations

3.6.3 Noise

The over-riding noise source which is relevant to the Fassaroe part of the Plan area is from movements of traffic along the M11 Motorway and N11 National Primary Route. This source could potentially cause a nuisance for residents, particularly in Fassaroe.

3.6.4 Climatic Factors

3.6.4.1 Greenhouse Gases

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.

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[8].

3.6.4.2 Climate Change

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity.

The release of greenhouse gases into the atmosphere as a result of human activities adds to natural climate variability by increasing the naturally occurring greenhouse effect. This greenhouse effect occurs in the atmosphere and is caused by greenhouse gases which exist naturally in the atmosphere. The greenhouse gases retain the radiation which is released from the earth as a result of heating by the sun. This retention maintains a global temperature which is suitable for ecosystems and life.

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.

3.6.4.3 Potential Effects of Changed Climate and Rising Sea Levels

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. The following potential effects are cited from this report.

- **Flooding and Erosion**

At the 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 inundation and increased risk of flooding (both at the coast and inland along major river networks during storm surge events). Flooding risk would also be enhanced if a storm surge is coupled with intense or long duration precipitation events.

Coastal floodplains are especially at risk on occasions when a high tide and storm surge couple 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.

Sea level rise presents itself as a serious problem where there is infrastructure at risk of inundation.

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. The increase in winter precipitation will be likely to produce a significant increase in the more intense discharge episodes, raising the risk of future flooding.

The report identifies that although it is not possible to comment on changes in flood magnitude and frequency, the increase in winter runoff indicated for many parts of the west, especially under the scenario for the period 2061–2090, is likely to have significant implications. River flooding tends to be more

[8] EPA (2008) *Provisional figures for Ireland's 2006 Greenhouse Gas Emissions for the period 1990-2006* Wexford: EPA

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.

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. Estuarine systems, including that of the River Dargle, are important nursery and breeding areas for many commercial fish species.

Sea level rise in Bray Environs could result in changes to the ecologically designated sites located there as well as a changing of the landscape.

3.6.5 Existing Problems

Traffic, particularly along the N11 route is likely to have elevated levels of air pollution and noise due to traffic congestion. This provides a harsh sensory environment which may impact upon human health.

Localised air pollution incidences with regard to PM_{10} and $PM_{2.5}$ and noise pollution are both likely to occur when construction takes place.

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.

Changes in sea level and/or changes in the occurrence of severe rainfall events as a result of climate change would be likely to increase the occurrence and magnitude of flooding events and inundation - this could result in damage and loss to houses and infrastructure.

As sea levels rise, so too will water levels of rivers. This could result in changes to the ecologically designated sites located there as well as a changing of the landscape.

3.6.6 Evolution of Air and Climatic Factors in the absence of a Local Area Plan

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.

The Draft LAP provides an opportunity to minimise this by providing public transport and pedestrian routes within and between residential areas. This would to reduce trip generation and promote the use of alternative modes of transport other than the car and would therefore be likely to generate less transport related greenhouse gas emissions. In the absence of an LAP this opportunity to prevent the generation of future transport related greenhouse gas emissions would be missed. In the absence of an LAP, the proposed extension to the Luas line may not be economically viable - without the LAP, development would be more dispersed and there would be no coherent strategy for the creation of employment opportunities.

3.7 Material Assets

3.7.1 Waste Water

3.7.1.1 Relevant Legislation

The Urban Waste Water Treatment Directive (91/271/EEC) (amended by Directive 98/15/EEC) aims to protect the environment from the adverse effects of the wastewater discharges by ensuring that wastewater is appropriately treated before it is discharged to the environment. Such treatment is essential in order to meet the requirements of the Water Framework Directive (see Section 3.5).

3.7.1.2 Waste Water Treatment

Waste water from the Bray area is currently subject to screening at the facility near Bray Harbour. It is then pumped into the Irish Sea through a long sea outfall. A Design, Build and Operate contract to upgrade the Shanganagh Waste Water Treatment Plant (WWTP) to provide full secondary treatment for wastewater from Shanganagh and Bray has been signed. The project will include laying a pipeline from Shanganagh wastewater treatment works to Bray. It is hoped that works will be complete by 2011/2012.

The existing WWTP at Bray will be kept a new stormwater tank will be built and the plant will be used as a fallback system.

The upgrading of the Shanganagh Wastewater Treatment Works plant will improve coastal water quality and will meet the requirements of the EU Urban Wastewater Treatment Directive as mentioned above. It will also contribute to fulfilling Wicklow County Council's obligations under the Water Framework Directive.

3.7.1.3 Connection to Existing Network

The current sewer network in the Bray area does not extend to the Plan area. There is a pumping station to the west of the Fassaroe site near Enniskerry and another one at Kilmacanoge. Two possible access points to the sewage network have been identified, one at the north-eastern corner of the Fassaroe site and the other, which is not fixed in location, near Ballywaitrin, west of the Kilruddery site. This is mapped on Figure 3.25.

3.7.1.4 Capacity and Demand

Current waste water treatment capacity at the Bray Waste Water Treatment Plant is 35,000PE (population equivalent). Current demand exceeds this at 42,000PE. Capacity at the upgraded plant in Shanganagh will be 61,500 PE which is more than sufficient for the population provided for by the Plan.

3.7.2 Drinking Water

3.7.2.1 Water Supply

Water in the Plan area is provided by Dublin City Council. The Dublin Region Watermains runs through the Fassaroe site form the north, see Figure 3.26. Requests to increase the amount of water supplied to the Bray area have been made and granted in the past. It is envisaged that this will be the case regarding water supply for the Plan area. It is likely that a new high level water tower will be constructed to serve the Kilruddery area and provide additional supply to the Bray Town area. Continuing at a moderate level of growth, it is thought that maximum output will be reached by 2010, which is in excess of requirements, and continue until 2016. Problems relating to drinking water supply could arise in 2018.

Current water consumption for the Bray area stands at .4m³/day or 2.56m³/day based on occupancy levels.

3.7.2.2 Drinking Water Quality

Drinking water must be clean and wholesome. That means it must meet the relevant water quality standards and must not contain any other substance or micro-organism in concentrations or numbers that constitute a potential danger to human health.

Compliance with the drinking water requirements is determined by comparing the results of analyses submitted by water suppliers to the standard for 48 parameters specified in the European Communities (Drinking Water) Regulations (No. 2), 2007. To ensure that these standards are met each water supply must be monitored on a regular basis.

Under Section 58 of the Environmental Protection Agency Act 1992 the EPA is required to collect and verify monitoring results for all water supplies in Ireland covered by the European Communities (Drinking Water) Regulations, 2000. The EPA publishes their results in annual reports.

The overall rate of compliance in Wicklow County Council, 95.0%, was below the national average during 2006. This was mainly due to below average microbiological compliance in the private water supplies.

3.7.3 Waste Management

Greenstar currently operate an integrated waste management facility in the Fassaroe area. Waste is separated and sent off the appropriate recycling facilities.

The license allows several different operations to be carried out at the depot, which include:

- bulking of municipal solid waste prior to transfer off-site for disposal;
- in-vessel composting of biodegradable waste;
- wood shredding;
- processing/storage of dry recyclables;
- recovery of construction and demolition waste; and,
- acceptance of waste at a civic waste facility which includes acceptance of hazardous waste such as bonded

asbestos waste, WEEE and chlorofluorocarbons.

It is the intention of Greenstar to have all operations indoors.

Roadstone currently have applied for planning permission for the sorting of construction and demolition waste on site.

Ballynagran landfill accepts 150 tonnes of waste from the Bray area each year. If the current rate of waste being sent there continues there is 15-20 years capacity left. There is capacity of 3-5 years remaining at the landfill facility at Rampere if the existing rate of waste is sent there at 50 tonnes per year.

3.7.4 Vehicular Circulation

The North Bray and Environs Land Use and Transportation Study which was carried out in 2006 encompassed Woodbrook, Rathmichael, Old Connaught, Fassaroe and North Bray. It recommended a scheme of road improvements focused on improving access into the areas west of the M11, and into Bray Town Centre via the Dublin Road; and the development of a cycle network connecting Fassaroe, Old Connaught, Woodbrook and Rathmichael with Bray Town Centre, Cherrywood and DART.

The N11 National Primary Road links the Plan area to Dublin via the M11 Motorway. This route facilitates the movement of commuters into the Greater Dublin Area. It is noted that a previous application for development of the Fassaroe area failed on the basis that current N11 access arrangements are inadequate.

A Rapid Transit Strategy is developed incorporating a LUAS extension from Cherrywood to Fassaroe, and a Bus Rapid Transit link from Fassaroe and Old Connaught to Bray Town Centre, including a Park and Ride at Fassaroe. Progress is being made on the proposal for the extension of the Luas. A Draft EIS Scoping Report has been carried out for the B2 line[9].

3.7.5 Existing Problems

There is inadequate wastewater treatment capacity for existing development and no capacity for further development with the existing plant overloaded. This represents a significant existing environmental problem which is likely to be adversely impacting upon Wicklow County Council's ability to meet its commitments under the Water Framework Directive (see Section 3.5.3). The upgrading of the waste water treatment plant at Shanganagh will help to solve this problem and enable future population growth.

In order to accommodate recent and future growth, the new waste water 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.

3.7.6 Evolution of Material Assets in the absence of a Local Area Plan

In the absence of an LAP, it is likely that dispersed development would occur. This would make it more difficult to provide the necessary infrastructure such as waste water treatment plants and networks, water supply infrastructure, transport infrastructure and powerlines etc.

Failure to provide sufficient infrastructure for development would be likely to result in significant adverse impacts. For example, failure to upgrade and provide new waste water infrastructure would be likely to adversely impact upon water quality and indirectly significantly adversely impact upon biodiversity and flora and fauna, drinking water supplies and human health.

Capacity of the waste water treatment plant to which waste water arising from dispersed new populations and existing populations would be in adequately treated until the plant at Shanganagh was in operation.

[9] RPA Luas Line B2, Cherrywood to Bray Area, Environmental Draft Scoping Report, April 2008.

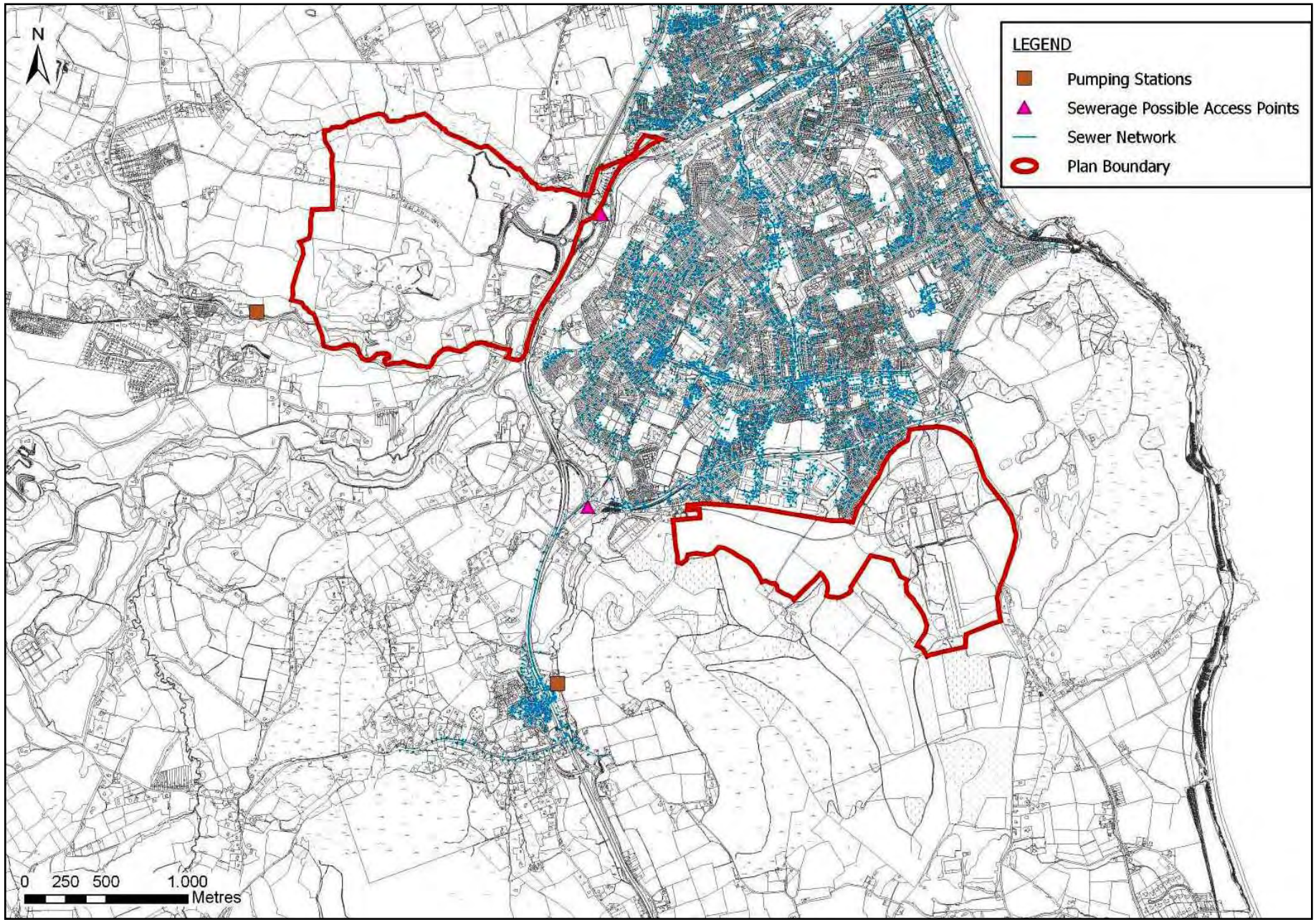

Figure 3.25 WWTP

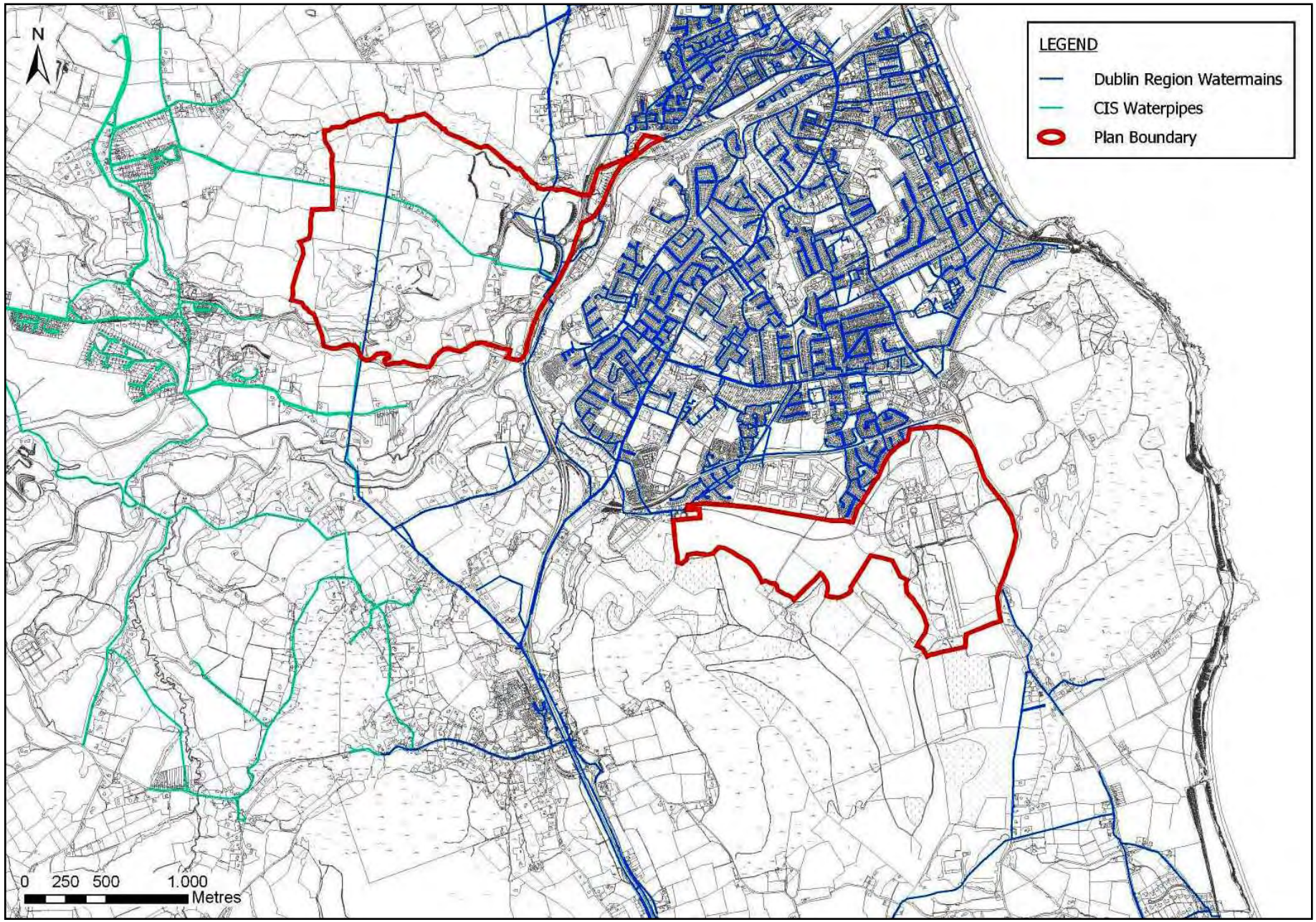

Figure 3.26 Water supply within and surrounding the Plan area

3.8 Cultural Heritage

3.8.1 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 heritage of Bray Environs is a unique resource which is fundamental to the cultural identity of the area and the quality of life of its citizens - it is central to how we see ourselves and to our identity as individuals and communities. Historic buildings can define localities and communities within the area and can become a focus of community identity and pride. An historic church or park, for example, can help define a neighbourhood and create a sense of local cohesion.

3.8.2 Archaeological Heritage

3.8.2.1 Introduction

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.

Archaeology in its various forms ranging from fragmentary buried remains to the fabric and contents of modern domestic and industrial buildings is a vital component of the culture, conservation and development of Bray Environs.

3.8.2.2 Record of Monuments and Places

The term ‘monument’ includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. All monuments in existence before 1700 A.D. are automatically considered to be historic monuments within the meaning of the Acts. Monuments of architectural and historical interest also come within the scope of the Acts. 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’.

A recorded monument is a monument included in the list and marked on the map which comprises the Record of Monuments and Places (RMP) set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified.

St. Valery’s Cross is in the Fassaroe area and is listed on the RMP. There is also a *font* at this location which is also listed on the RMP. Fassaroe Castle, built in 1536, is located to the south of the Fassaroe site about 25 meters to the south east of the road leading into Roadstone. This suggests there may be other archaeological sites which could possibly be uncovered in the development process, especially as the Fassaroe area is predominantly

comprised of greenfield sites. There is also a *burial site* within the Fassaroe area at the Roadstone site. There is a *"redundant record"*[10] listed to the south of Fassaroe Castle.

Within Kilruddery Demesne, there are two *designated landscape features*, a *possible burial ground* as well as Kilruddery House itself. To the west of the House there are two *Fulacht Fia*s listed on the RMP.

Figure 3.27 maps the location of entries to the Record of Monuments and Places within and surrounding the Plan area.

3.8.3 Architectural heritage

3.8.3.1 Introduction

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.

There are two entries to the NIAH within the Plan area, namely Kilruddery House, Registration Number: 16400816 and its Gate Lodge Registration Number: 16400817. Kilruddery House is a detached multiple-bay part single part two part three and part four-storey Mansion, originally dating from the 17th century, but remodelled and extended in 1820 in Elizabethan style to designs by Sir Richard Morrison. Though part demolished in the 1950s, this building is still one of the finest examples of the Elizabethan Rural style in the country, much popularised by the Morrisons in the early 19th century. It is also listed on the Record of Protected Structures. The gate lodge, a detached three-bay single-storey former gate lodge, built c.1850, is set adjacent to the demesne main entrance. Despite the reordering and the loss of some original detail this mid 19th-century gate lodge adds to the group value of the demesne.

3.8.3.2 Record of Protected Structures

The Record of Protected Structures (RPS) included in the current Local Area Plan is legislated for under Section 51 of the Planning and Development Act 2000. Figure 3.28 maps these structures.

Protected Structures 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.

In relation to a protected structure or proposed protected structure, the following are encompassed:

(i) the interior of the structure
(ii) the land lying within the curtilage[11] of the structure;
(iii) any other structures lying within that curtilage and their interiors; and
(iv) all fixtures and features which form part of the interior or exterior of any structure or structures referred to in subparagraph (i) or (iii).

There are four structures within the Plan area which are listed on the Record of Protected Structures. In the Fassaroe area, there are two country houses. Structure Number: 03-32 is a three-bay, two-storey villa with painted rendering, raised quoins, hipped roof with eaves, pedimented, ionic porch. A house of circa 1820, attributed to Sir Richard Morrison. Structure number 03-34 in the Dargle Valley is an early, gothic-revival house of circa 1810, with a crenellated tower at the south end and a

[10] Records classed as "Redundant record" are those that fulfil one or more of the following criteria: (1) a record identifying a location where, according to literature or personal communication, a monument existed, but which, on inspection, was found not to be an archaeological monument (e.g. a natural feature); (2) a record classified using a term which is now obsolete (e.g. ecclesiastical remains); (3) a record created in the database for which there is no supporting evidence recorded on file or in the database; (4) an archaeological object (i.e. an artefact), e.g. a quernstone; (5) a record entered as a Shipwreck.

[11] Curtilage is normally taken to be the parcel of ground immediately associated with the Protected Structure, or in use for the purposes of the structure. Protection extends to the buildings and land lying within the curtilage. While the curtilage sometimes coincides with the present property boundary, it can originally have included lands, features or even buildings now in separate ownership, e.g. the lodge of a former country house, or the garden features located in land subsequently sold off. Such lands are described as being attendant grounds, and the protection extends to them just as if they were still within the curtilage of the Protected Structure.

large, pointed, mullioned window, also attributed to Sir Richard Morrison.

RPS number 08-33 Kilruddery House and RPS number 08-34 Kilruddery House entrance Gates lay within the Plan area at Kilruddery. Kilruddery House is an important early-19th Century house by William Vitruvius Morrison now partially truncated. The exterior is tudor-gothic revival and the interior a lush neo-classicism. The garden layout dates from the seventeenth Century. The entrance gates and piers were designed by William Morrison.

3.8.4 Existing Environmental Problems

The integrity of the historic gardens and setting of Kilruddery Demesne may be compromised by encroaching development.

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 have 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.

The cumulative accommodation of large scale development in Bray Environs has the potential to cumulatively impact upon cultural heritage of the Plan area.

3.8.5 Evolution of Cultural Heritage in the absence of a Local Area Plan

In the absence of Local Area Plan, the evolution of cultural heritage would be dependent on developments which take place. Such development would have no guidance as to where to be directed and planning applications would be assessed on an individual basis with cultural heritage protected under a number of strategic actions relating to archaeological and architectural protection.

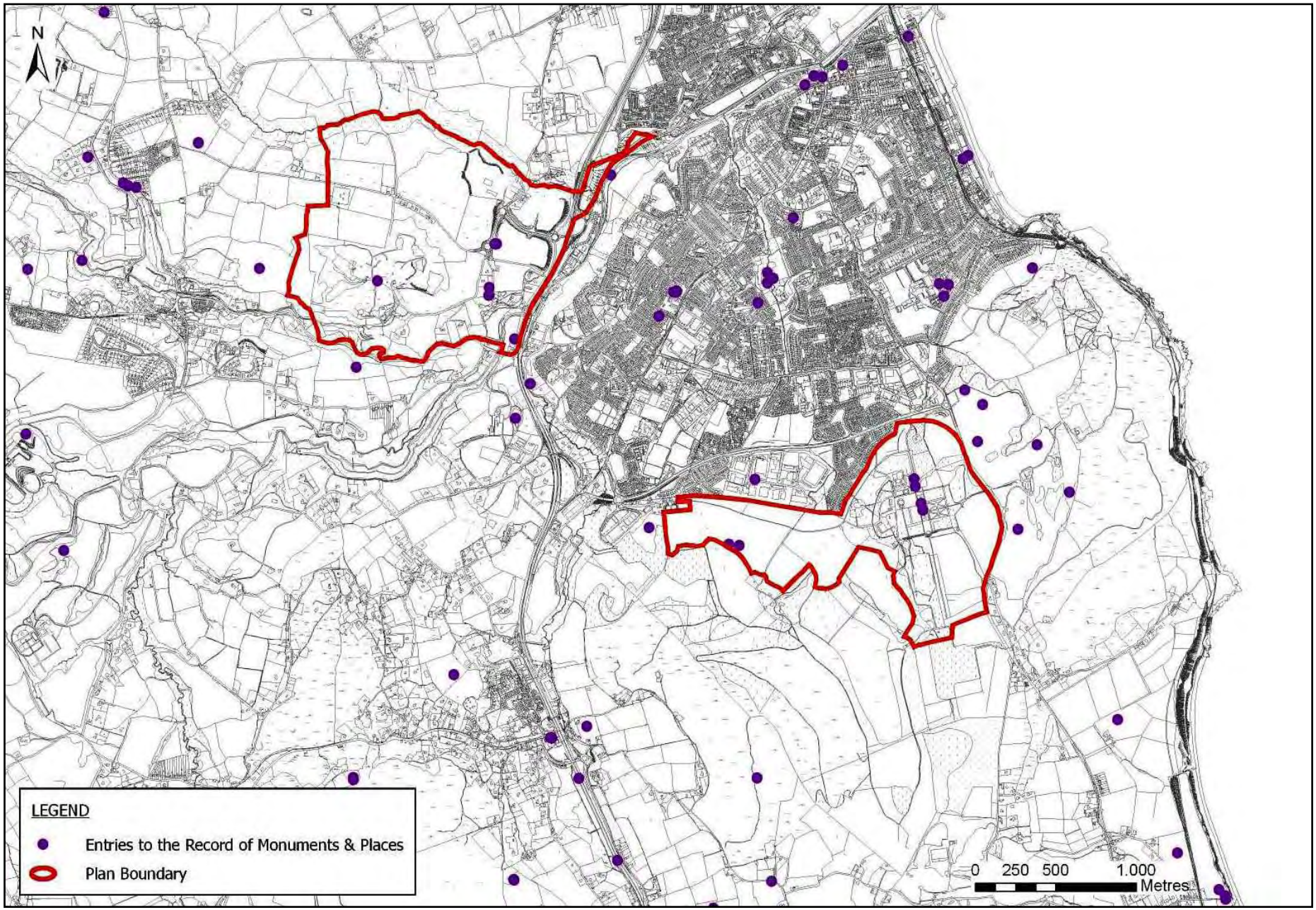

Figure 3.27 Archaeological Heritage: Sites and Monuments Records

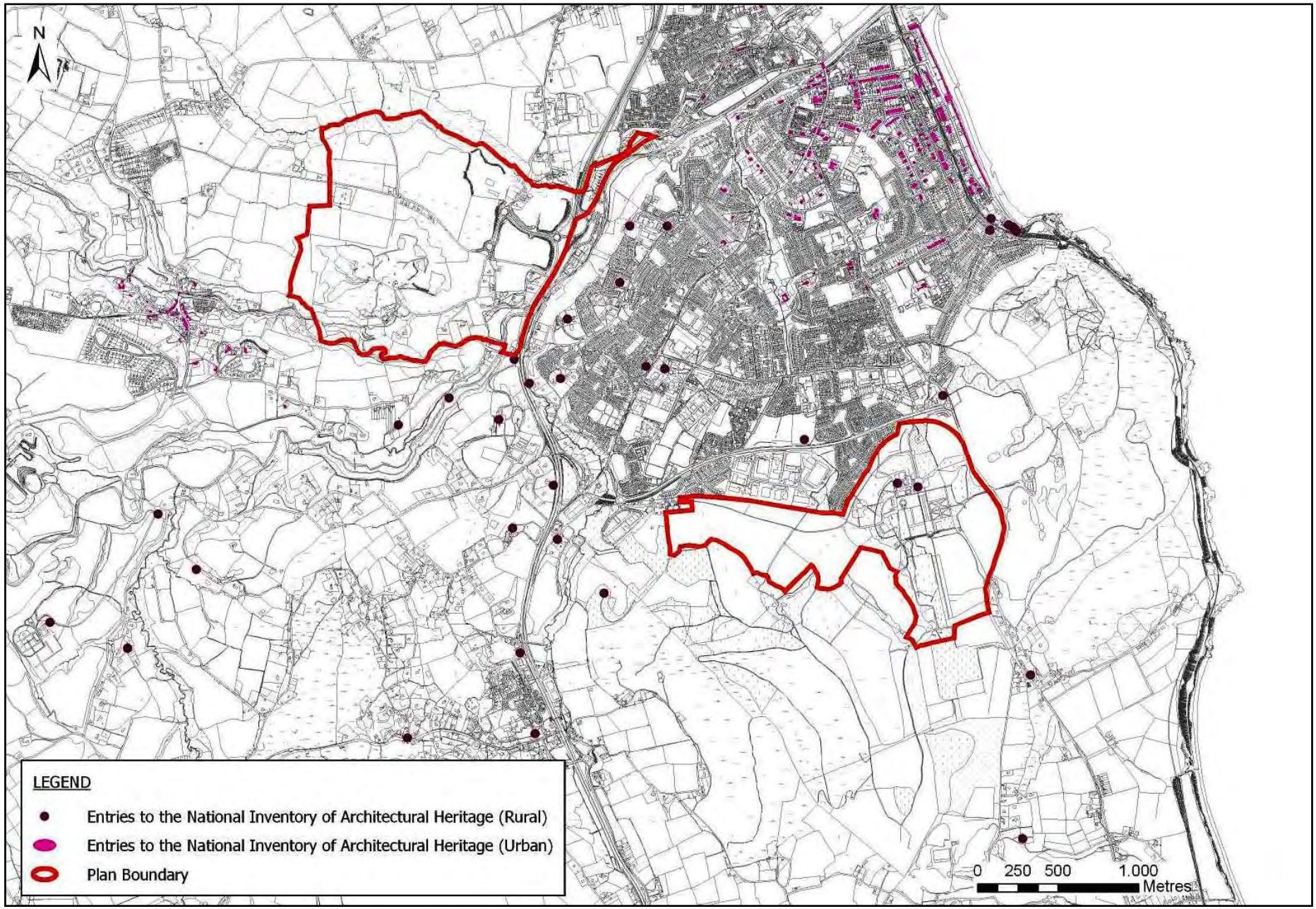

Figure 3.28 Architectural Heritage: National Inventory of Architectural Heritage

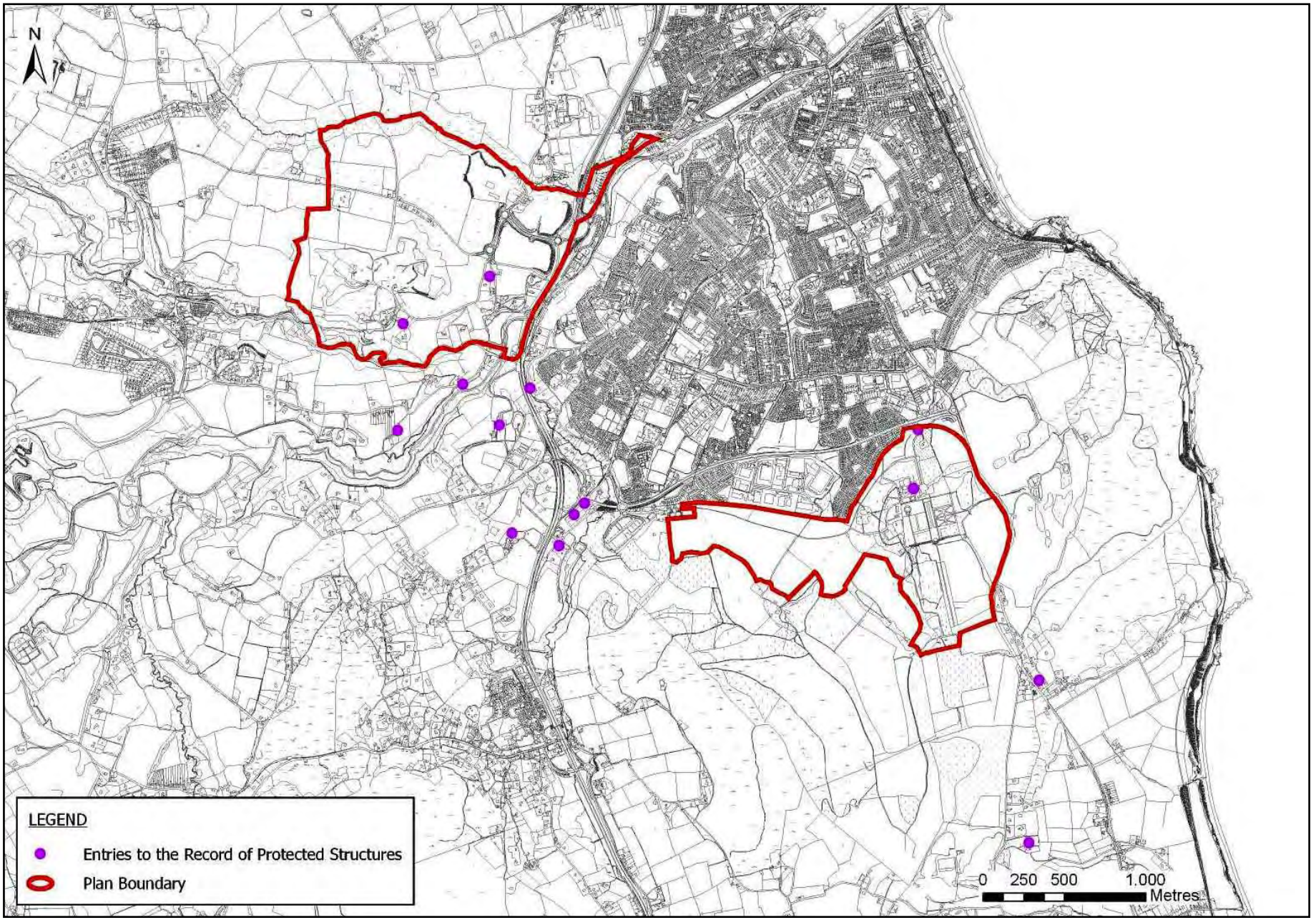

Figure 3.29 Record of Protected Structures

3.9 Landscape

3.9.1 Introduction

Landscapes are areas which are perceived by people and are made up of a number of layers: landform, which results from geological and geomorphological history; land cover, which includes vegetation, water, human settlements, and; human values which are a result of historical, cultural, religious and other understandings and interactions with landform and land cover. The Wicklow County Development Plan cited the landscape particularly in the North East of the county as being vulnerable to development pressure, which threatens its intrinsic character.

3.9.2 Landscape Characterisation [12]

3.9.2.1 Introduction

Wicklow County Council's Landscape Characterisation (2004) 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.

These landscape areas are shown on Figure 3.30 and are named below.

3.9.2.2 Areas of Outstanding Natural Beauty

The Areas of Outstanding Natural Beauty (AONB) zone encompasses those areas which are most vulnerable and sensitive, and which are considered to be of greatest scenic value. These areas tend to be under severe development pressure. The areas of Fassaroe, Giltspur and Kilruddery Demesne East are Areas of Outstanding Natural Beauty.

3.9.2.3 Areas of Special Amenity

This landscape zone encompasses those areas which, whilst not as vulnerable nor as sensitive as those areas in the AONB zone, are still subject to pressure for development which could result in a serious deterioration in the landscape quality. The sensitivity of these areas is made more pronounced by the fact that they act as an effective "gateway" to the more remote and wild upland areas and because the more ameliorative nature of the landform ensures that there is greater development pressure.

3.9.2.4 Rural Areas

The rural area landscape zone is located along the western and southern extremities of the County. Whilst the landform, to some extent, corresponds to that found in Carlow and Kildare, it differs considerably in that, relative to their elevation, this land can be described as gently rolling and undulating and could really only be described as lowlying when compared to the rest of the terrain in County Wicklow. The area is very rural and is characterised by only a few small towns and villages.

3.9.2.5 Corridors Areas

This landscape zone covers main access corridors in the County. The boundaries generally follow what is considered to be the areas upon which the greatest influence is exerted by these access routes. These routes, for the most part, run through the more low lying and accessible tracts of land and connect the major towns. These corridors are under intense pressure from residential and other sporadic development. The majority of the Kilruddery area lies within a corridor zone with the remainder of the Kilruddery area falling into an Area of Outstanding Natural Beauty.

3.9.3 Special Amenity Area Orders

A Special Amenity Area Order (SAAO) is designed to protect areas that are of particularly high amenity value, which are sensitive to intense development pressure and which cannot be adequately protected by existing planning controls. An SAAO for Bray Head was drawn up in 2007. Areas Considered for an SAAO include the Dargle Glen, The Little Sugar Loaf, The Great Sugar Loaf.

[12] Text in this section is taken from Wicklow County Council (2004) *Wicklow County Development Plan 2004 – 2010 County Landscape Characterisation* Wicklow: Wicklow County Council

3.9.4 Views and Prospects of Special Amenity and Value

There are a number of views and prospects identified in the Wicklow County Development Plan. Protected views and prospects within and surrounding the Plan area are mapped on Figure 3.31 and are listed below:

Views of Special Amenity Value or Special Interest:

1. R117 at The Scalp, Enniskerry: View of Sugarloaf Mountains and Enniskerry
2. C6/L5507-0 Ballyman Road, Enniskerry Road/L5507-0: View of The Scalp and the Scalp Valley from the Ballyman Road.
3. N11 Kilmacanagoe: View of Little Sugarloaf
4. R761 Windgates Coast Road: View of Little Sugar Loaf.
5. Cliff Road Windgates: View of Coast, Greystones and foreground of Bray Head.
6. R761Windgates Coast Road: View of Bray Head.
7. R761 North of Greystones: View northwards to Bray Head and southwards of sea and built up area of Greystones.

Prospects of Special Amenity or Special Interest:

1. C33 and C19 at Rocky Valley Drive: Prospect of Bray, Powerscourt and Enniskerry.
2. R755 Rocky Valley, Kilmacanogue: Prospects of both sides of Rocky Valley Kilmacanague.
3. C29 Little Sugarloaf, Kilmacanogue: Prospect of Little Sugarloaf and the Coast.
4. Southern Cross Road: Prospect of Bray Head from Southern Cross Road.
5. R761 North of Greystones: Prospect of Bray Head from R761 towards Bray Golf Course.
6. Bray-Greystones Cliff Walk: Prospect of sea, cliffs and across southern slopes to Bray Head to R761 from Cliff Walk.

3.9.5 Existing Environmental Problems

A problem with regard to the environmental component of landscape is the cumulative visual impact which occurs as a result of developments such as one off houses. Such developments, which individually often do not have significant adverse impacts, have the potential to cumulatively and adversely significantly impact upon sensitive landscapes. This is especially problematic in the visually prominent, elevated parts of the Plan area including the foot of the Little Sugar Loaf at Kilruddery, where lands are threatened by encroaching development and lands at the centre of the Fassaroe area.

The landfills to the north of the Fassaroe site have been capped which lessens their visual impact on the landscape.

The area including Fassaroe is classified under the Wicklow County Development Plan 2004-2010 County Landscape Characterisation as being within an *Area of Outstanding Natural Beauty*. This classification indicates that the lands are of a high sensitivity and value on a County level however it is noted that the validity of the designation in the Fassaroe area has largely been eroded in the past by the existing sand and gravel pit as well as more recent development close to the N11.

3.9.6 Evolution of Landscape in the absence of a Local Area Plan

In the absence of a Local Area Plan, development would be likely to occur on a one-off, dispersed basis. As outlined above, this would have cumulative impacts on the landscape.

Encroachment at the foot of the Little Sugar Loaf would continue uncontrolled.

The absence of a Local Area Plan may see the expansion of a semi-urban footprint of Bray Town and perhaps the coalescence of Bray, Enniskerry, Kilmacanogue and Greystones.

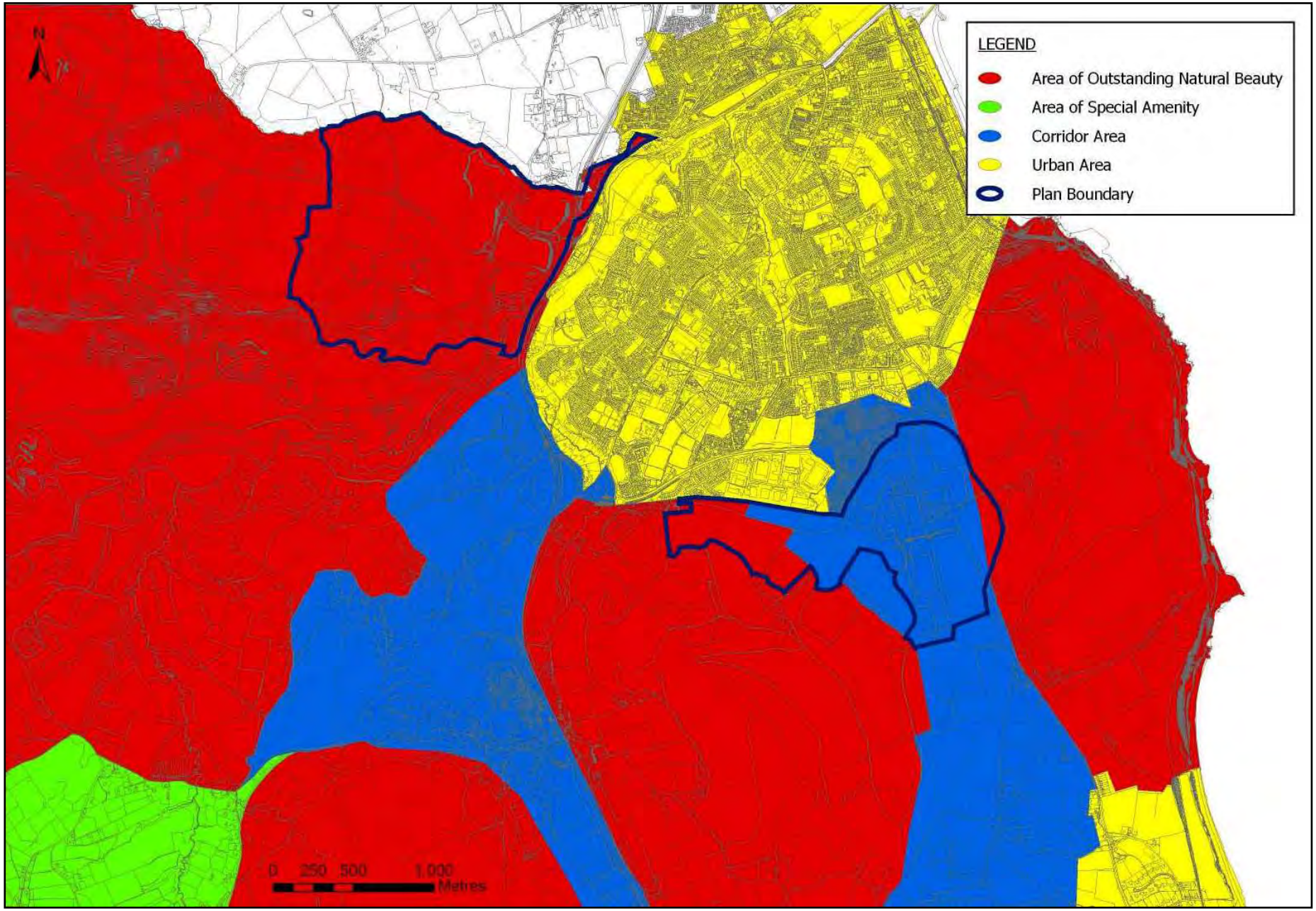

Figure 3.30 Landscape Characterisation

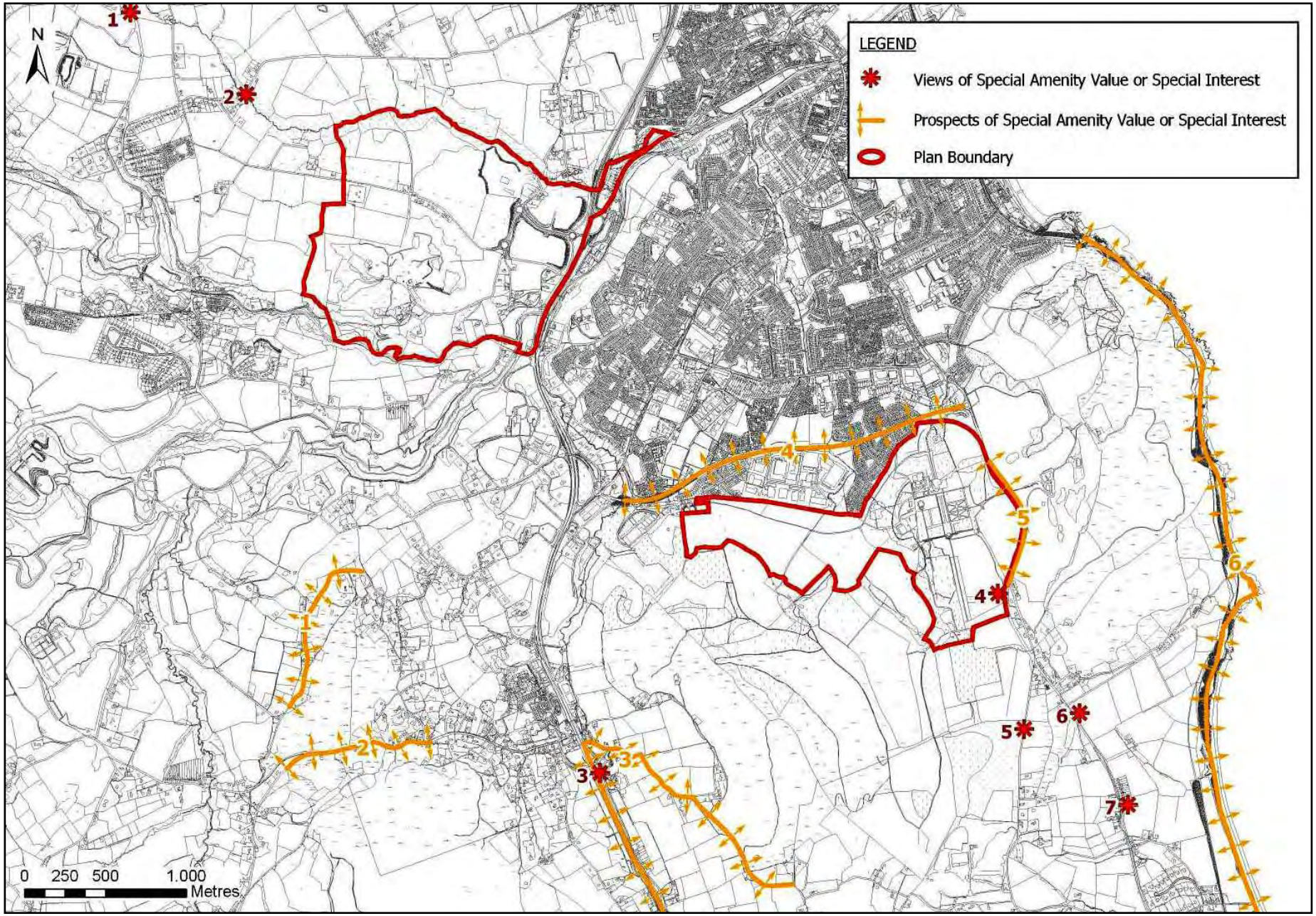

Figure 3.31 Views and Prospects of Special Amenity Value or Interest

Section 4 Strategic Environmental Objectives

4.1 Introduction

Strategic Environmental Objectives (SEOs) are methodological measures against which the environmental effects of the Local Area Plan (LAP) can be tested. If complied with in full, SEOs would result in an environmentally neutral impact from implementation of the Plan. The SEOs are set out under a range of topics and are used as standards against which the provisions of the LAP can be evaluated in order to help identify areas in which significant adverse impacts are likely to occur, if unmitigated.

SEOs are distinct from the objectives of the LAP - although they will often overlap - and are developed from international, national and regional policies which generally govern environmental protection objectives. Such policies include those of various European Directives which have been transposed into Irish law, relevant other Irish environmental legislation and the policies of the Wicklow County Development Plan 2005 to 2011 all of which are intended to be implemented at the local level in the Bray Environs area and integrated into any LAP for the area.

The SEA Directive requires that the evaluation of plans be focused upon the relevant aspects of the environmental characteristics of areas likely to be significantly affected. In compliance with this requirement, SEOs have been developed for the relevant environmental components of this SEA. Focus has been developed throughout the SEA, from the scoping stage to the compilation of the existing environmental baseline. Most attention has been given to environmental components which are likely to be impacted as a result of implementation of a LAP.

A number of SEOs are linked to indicators which can facilitate monitoring the implementation of the Draft LAP when adopted, as well as to targets which the LAP can help work towards.

The primary source used in formulating the SEOs was Table 4B of the SEA Guidelines (DEHLG, 2004)[13]. This list has been amended to give affect to objectives that are considered relevant to this LAP. The use of SEOs, although not a statutory requirement, does fulfil obligations set out in Schedule 2B of the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004).

4.2 Biodiversity, Flora and Fauna

4.2.1 International, European and National Strategic Actions

4.2.1.1 UN Convention on Biological Diversity 1992

The United Nations Convention on Biological Diversity 1992 requires the promotion of the conservation and sustainable use of biodiversity.

4.2.1.2 National Biodiversity Plan 2002

The preparation and implementation of Ireland's National Biodiversity Plan 2002[14] complies with an obligation under the UN Convention on Biological Diversity. The overall goal of the Plan is to secure the conservation, including where possible the enhancement and sustainable use of biological diversity in Ireland and to contribute to conservation and sustainable use of biodiversity globally. Objectives following on from this goal are to:

- Conserve habitat diversity, including all sites of special biodiversity importance;
- Conserve species diversity;
- Conserve genetic diversity, both wild and domesticated; and
- Contribute to the conservation and sustainable use of biodiversity and to

[13] DEHLG (2004) *Implementation of SEA Directive (2001/42/EC): Guidelines for Regional Authorities and Planning Authorities* Dublin: Government of Ireland.

[14] Department of Arts, Heritage, Gaeltacht and the Islands (2002) *National Biodiversity Plan* Dublin: Government of Ireland

advancing other obligations of the CBD in the EU, regionally and internationally.

4.2.1.3 Habitats Directive 1992

The European Council Directive on the Conservation of natural habitats and of wild fauna and flora (92/43/EEC), referred to as the Habitats Directive, aims to ensure the conservation of certain natural habitats and species which are at favourable conservation status. Article 10 of the Habitats Directive recognises 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 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.

Special Areas of Conservation (SACs) are designated and protected under the under the Habitats Directive 1992 (92/43/EEC) due to their conservation value for habitats and species of importance in the European Union. In Ireland, the habitats and species occurring in SACs are protected from effects of development occurring outside their boundaries under Section 18 "Prohibition of works on lands outside a European site" of the European Communities (Natural Habitats) Regulations 1997. The Regulations require that where a development is proposed to be carried out, on any land that is not within a protected site and is liable to have an adverse impacts on the protected site in question, including direct, cumulative and indirect impacts, an appropriate assessment, which conforms to an environmental impact assessment, of the likely effects of the proposed development on the site is undertaken. Depending on the conclusions of this assessment such development may be refused planning permission.

The Habitats Directive seeks to establish Natura 2000, a network of protected areas throughout the EU. It is the responsibility of each member state to designate SACs to protect habitats and species, which, together with the SPAs designated under the 1979 Birds Directive, form Natura 2000.

4.2.1.4 Widlife Act 1976 and Wildlife (Amendment) Act 2000

Natural Heritage Areas (NHAs) are designated and protected due to their national conservation value for ecological and/or geological/ geomorphological heritage under the Wildlife (Amendment) Act 2000. They cover nationally important semi-natural and natural habitats, landforms or geomorphological features, wildlife plant and animal species or a diversity of these natural attributes. Proposed NHAs were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated.

4.2.1.5 European Freshwater Directive 1978

Salmonid Waters are designated and protected under the European Communities (Quality of Salmonid Waters) Regulations 1998 (SI No. 293 of 1988) which implements the European Council Directive on the quality of fresh waters needing protection or improvement in order to support fish life (78/659/EEC), referred to as the European Freshwater Directive as amended and codified. Salmonid Water designation imposes an obligation to maintain specific water quality standards and control pollution.

4.2.2 SEOs, Indicators and Targets

The following SEOs, Indicators and Targets for Biodiversity and Flora and Fauna have been developed with regard to the environmental baseline of the Plan area and the objectives of the above strategic actions.

SEO B1:	To avoid loss of relevant habitats, geological features, species or their sustaining resources in designated ecological sites
Indicator B1:	Percentage of relevant habitats and designated ecological sites lost as a result of implementation of the LAP
Target B1:	No losses of relevant habitats, species or their sustaining resources in designated ecological sites as a result of implementation of the LAP

SEO B2:	To avoid significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites
Indicator B2:	Number of significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites as a result of implementation of the LAP
Target B2:	No significant adverse impacts, including direct, cumulative and indirect impacts, to relevant habitats, geological features, species or their sustaining resources in designated ecological sites by development within or adjacent to these sites as a result of implementation of the LAP

SEO B3:	To sustain, enhance or - where relevant - prevent the loss of ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity
Indicator B3:	Percentage loss of connectivity between areas of local biodiversity as a result of implementation of the LAP - as evidenced from a resurvey of CORINE mapping
Target B3:	No ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity to be lost without remediation as a result of implementation of the LAP

Note: the impact of implementing the LAP on aquatic biodiversity and flora and fauna is also influenced by impacts upon the quality of water bodies which relate to SEO W1.

4.3 Population and Human Health

4.3.1 Population

The impacts of implementing the LAP on both the spatial distribution of population and the nature of development (with regard to greenfield and brownfield development) within the Plan area relates to SEO S1 which aims to maximise sustainable brownfield development in line with high level forward planning policy.

4.3.2 Human Health

The impact of implementing the LAP upon human health will be determined by the condition of environmental vectors into which the new population provided for by the plan will come into contact with.

The condition of these vectors will be determined by past, existing and new land uses (such as old landfills) and by the extent to which new development is accompanied by appropriate infrastructure (such as waste water treatment infrastructure).

Emission limits for discharges to air, soil and water are set with regards to internationally recognised exposure limit values. These are generally set to be many times the safe exposure limit - in order to provide protection.

4.3.3 SEOs, Indicators and Targets

SEO HH1:	To protect human health from hazards or nuisances arising from exposure to incompatible landuses
Indicator HH1:	Occurrence (any) of a spatially concentrated deterioration in human health
Target HH1:	No spatial concentrations of health problems arising from environmental factors

4.4 Soil

4.4.1 Proposal for a Soil Framework Directive

To date, there is no legislation which is specific to the protection of soil resources. However, there is currently an EU Thematic Strategy on the protection of soil which includes a proposal for a Soil Framework Directive which proposes common principles for protecting soils across the EU.

Article 5 of the proposed Directive states that, for the purposes of preserving the various functions of soil; sealing, the development of artificial surfaces on top of soil resources, should be limited. The proposed Directive suggests that this may be achieved through rehabilitating brownfield sites, thus reducing the depletion of greenfield sites. The proposed Directive also states soil should be used in a sustainable manner which preserves its capacity to deliver ecological, economic and social services, while maintaining its functions so that future generations can meet their needs.

4.4.2 SEOs, Indicators and Targets

The following SEO, Indicator and Target for Soil has been developed with regard to the environmental baseline of the Plan area, the proposed Soil Directive and certain land use strategic actions detailed under Section 5.2 *Interactions with Relevant Planning Policy*.

SEO S1:	Maximise the sustainable re-use of brownfield lands, and maximise the use of the existing built environment rather than developing greenfield lands
Indicator S1:	Area of brownfield land developed over the plan period
Target S1:	Reduced availability of brownfield land (subject to availability on the open market, the demand for such land and the ability for such lands to be sustainably re-used within the provisions of the LAP) at the end of the LAP lifespan

Note: the impact of implementing the LAP on soil quality is influenced by impacts, upon in particular, ground water bodies which relate to SEO W2.

4.5 Water

4.5.1 The Water Framework Directive 2000

4.5.1.1 Introduction

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). The WFD 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.

4.5.1.2 Good Status for Surface Waters

Good status as defined by the WFD equates to approximately Q4 in the national scheme of biological classification of rivers and mesotrophic in the trophic classification of lakes, as set out by the EPA.

4.5.1.3 Good Status for Transitional Waters

Good status as defined by the Water Framework Directive can be attained by transitional waters through the achievement of *unpolluted* status in the Assessment of Trophic Status of Estuaries and Bays in Ireland (ATSEBI) System which is used by the EPA in order to classify the quality status of transitional waters.

4.5.1.4 Quality Standards and Threshold Values for Ground Water

Detailed provisions to achieve the aims of the WFD for ground water have been presented in a Groundwater Daughter Directive (Directive 2006/118/EC on the protection of groundwater against pollution and deterioration).

This Directive sets up environmental objectives of good groundwater quantitative and chemical status, as well as ensuring a continuity to the 1980 Groundwater Directive (Directive 80/68/EEC on the protection of groundwater

against pollution caused by dangerous substances) which is due to be repealed under the WFD by the end of 2013.

Article 3 of the 2006 Directive required that the assessment of the chemical status of groundwater use both quality standards identified in Annex I of the Directive and threshold values to be set by individual member states.

Groundwater quality standards are environmental quality standards expressed as the concentration of a particular pollutant, group of pollutants or indicator of pollution in groundwater, which should not be exceeded in order to protect human health and the environment. Annex I of the Directive sets standards for two pollutants: Nitrates - 50mg/l - and; Active substances in pesticides[15], including their relevant metabolites, degradation and reaction products - 0,1 µg/l and 0,5 µg/l (total[16]).

Irish groundwater threshold values[17] are currently in the process of being set by the EPA.

4.5.2 SEOs, Indicators and Targets

The following SEOs, Indicators and Targets for Water have been developed with regard to the environmental baseline of the Plan area and the objectives of the above strategic actions.

SEO W1:	To maintain and improve, where possible, the quality of rivers and transitional waters
Indicator W1i:	Biotic Quality Rating (Q Value)
Target W1ia:	To maintain a biotic quality rating of Q4, in line with the requirement to achieve good water status under the Water Framework Directive, by 2015
Target W1ib:	To improve biotic quality ratings, where possible, to Q5
Indicator W1ii:	Trophic Status (ATSEBI)
Target W1ii:	To maintain or to improve trophic status, where relevant, to unpolluted in line with the requirement to achieve good water status under the Water Framework Directive, by 2015

SEO W2:	To prevent pollution and contamination of ground water
Indicator W2:	Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC
Target W2:	Compliance with Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC

SEO W3:	To prevent development on lands which pose - or are likely to pose in the future - a significant flood risk
Indicator W3:	Number of developments granted permission on lands which pose - or are likely to pose in the future - a significant flood risk
Target W3:	Minimise developments granted permission on lands which pose - or are likely to pose in the future - a significant flood risk

[15] 'Pesticides' means plant protection products and biocidal products as defined in Article 2 of Directive 91/414/EEC and in Article 2 of Directive 98/8/EC, respectively.

[16] 'Total' means the sum of all individual pesticides detected and quantified in the monitoring procedure, including their relevant metabolites, degradation and reaction products.

[17] Threshold values are to be established by Member States for all pollutants and indicators of pollution which characterise groundwater bodies classified as being at risk of failing to achieve good groundwater chemical status under the WFD. Threshold values are required to be established in a way that, should the monitoring results at a representative monitoring point exceed the thresholds, this will indicate a risk that one or more of the conditions for good groundwater chemical status - with regard to the ability of groundwater to support human uses and with regard to waters used for the abstraction of drinking water - are not being met.

4.6 Air and Climatic Factors

4.6.1 Air Quality

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.

4.6.2 SEOs, Indicators and Targets

The following SEO, Indicators and Targets for Air and Climatic Factors have been developed with regard to the environmental baseline of the Plan area and the objectives of the above strategic action.

SEO C1:	To minimise increases in travel related greenhouse emissions to air
Indicator C1i[18]:	Percentage of population within the plan area travelling to work or school by public transport or non-mechanical means
Target C1i:	An increase in the percentage of the population travelling to work or school by public transport or non-mechanical means
Indicator C1ii[19]:	Average distance travelled to work or school by the population of the LAP area
Target C1ii:	A decrease in the average distance travelled to work or school by the population of the LAP area

4.7 Material Assets

4.7.1 Waste Water

The treatment of wastewater is governed by the Urban Waste Water Treatment Directive (91/271/EEC) (amended by Directive 98/15/EEC) transposed into Irish law by the Urban Waste Water Treatment Regulations 2001 (SI 254 of 2001). The Directive aims to protect the environment from the adverse effects of the wastewater discharges by ensuring that wastewater is appropriately treated before it is discharged to the environment. The Regulations stipulate that sewage treatment facilities are in place in all towns by 2005.

Appropriate treatment is essential in order to meet the requirements of the Water Framework Directive (see Section 4.5.1).

4.7.2 Traffic

4.7.2.1 Introduction

The occurrence of increased numbers of journeys within, to and from development provided for under the LAP could cause traffic congestion at certain locations. These locations or *hotspots* would be likely to occur along the main road routes - especially at intersections - and would have elevated levels of air pollution and noise levels thereby providing for a harsh sensory environment which may impact upon human health.

It is noted that in addition to being addressed as part of this assessment, traffic issues will also be addressed at the level of individual projects by the development management process and, for certain projects, by EIA.

4.7.3 SEOs, Indicators and Targets

The following SEOs, Indicators and Targets for Material Assets have been developed with regard to the objectives of the above strategic actions.

[18] As measured by the Central Statistics Office
[19] As measured by the Central Statistics Office

SEO M1:	To serve new development with appropriate waste water treatment
Indicator M1:	Number of new developments granted permission which cannot be adequately served by a public waste water treatment plant over the lifetime of the LAP
Target M1:	No new developments granted permission which cannot be adequately served by a public waste water treatment plant over the lifetime of the LAP

SEO M2:	To reduce the overall proportion of car dependency within County Wicklow by way of, inter alia, encouraging modal change from car to more sustainable forms of public transport and encouraging development which will not be dependent on private transport

The use of the SEO M2 provides a qualitative directional measure which is used to evaluate the effects of implementing the LAP.

4.8 Cultural Heritage

4.8.1 Archaeological Heritage

4.8.1.1 Valletta Convention 1992

The European Convention on Protection of the Archaeological Heritage known as the Valletta Convention of 1992. This was ratified by Ireland in 1997 and requires that appropriate consideration be given to archaeological issues at all stages of the planning and development process.

4.8.1.2 National Heritage Plan for Ireland 2002

The core objective of the National Heritage Plan for Ireland 2002[20] is to protect Ireland's heritage. In this regard the 'polluter pays' principle and the precautionary principle are operable.

[20] Department of Arts, Heritage, Gaeltacht and the Islands (2002) *National Heritage Plan for Ireland* Dublin: Government of Ireland

4.8.1.3 National Monuments Acts

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

Recorded monuments are protected by inclusion on the list and marked on the map which comprises the Record of Monuments and Places set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified.

Any works at or in relation to a recorded monument requires two months notice to the Department of the Environment, Heritage and Local Government under section 12 of the National Monuments (Amendment) Act, 1994.

Direct impacts on national monuments in State or Local Authority care or subject to a preservation order require the consent of the Minister for the Environment, Heritage and Local Government under Section 14 of the National Monuments Act 1930 as amended by Section 5 of the National Monuments (Amendment) Act 2004.

4.8.2 Architectural Heritage

4.8.2.1 Planning and Development Act 2000

The Record of Protected Structures (RPS) included in the current County Development Plan is legislated for under Section 51 of the Planning and Development Act 2000 and includes structures which form part of the architectural heritage and which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

4.8.2.2 Architectural Heritage and Historic Monuments Act 1999

The National Inventory of Architectural Heritage (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.

4.8.3 SEOs, Indicators and Targets

The following SEOs, Indicators and Targets for Cultural Heritage have been developed with regard to the environmental baseline of the Plan area and the above strategic actions.

SEO CH1:	To protect archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant
Indicator CH1:	Number of unauthorised developments occurring which result in full or partial loss to archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant
Target CH1:	No unauthorised developments occurring which result in full or partial loss to archaeological heritage - including entries to the Record of Monuments and Places and unknown archaeology - and the context of the above within the surrounding landscape where relevant
SEO CH2:	To preserve and protect the special interest and character of architectural heritage with regard to entries to the Record of Protected Structures and their context within the surrounding landscape where relevant
Indicator CH2i:	Number of unauthorised developments occurring which result in physical loss or loss entries to the Record of Protected Structures and/or their context within the surrounding landscape where relevant
Indicator CH2ii:	Number of additions to the Record of Protected Structures and the number of additional ACAs and comparison with the NIAH
Target CH2i:	No unauthorised developments occurring which result in physical loss or loss entries to the Record of Protected Structures and/or their context within the surrounding landscape where relevant
Target CH2ii:	Make Additions to the Record of Protected Structures and make additional ACAs, where appropriate

4.9 Landscape

4.9.1 European Landscape Convention 2000

Ireland signed and ratified the European Landscape Convention (2000) in 2002 with the Convention entering into force in Ireland in 2004. The aims of the Convention include: to conserve and maintain the significant or characteristic features of a landscape, justified by its heritage value derived from its natural configuration and/or from human activity; to harmonise changes in the landscape which are brought about by social, economic and environmental processes, and to enhance landscapes.

4.9.2 SEOs, Indicators and Targets

The following SEO, Indicator and Target for Landscape has been developed with regard to the environmental baseline of the Plan area and the above strategic action.

SEO L1:	To avoid significant adverse impacts on the landscape, especially with regard to landscapes which are most valuable and most sensitive to change and views and prospects of special amenity
Indicator L1:	Number of complaints received from statutory consultees regarding avoidable impacts resulting from development which is granted permission under the Plan
Target L1:	No developments permitted which result in avoidable impacts on Bray Environs' most sensitive landscapes