Annex A

Draft Elgin Transport Strategy

Environmental Baseline Assessment

June 2017

Contents

Introduction

This annex focuses on information relevant to the assessment of the environmental impacts of implementing the draft Elgin Transport Strategy (ETS) and provides an overview of the environmental baseline against which potential environmental impacts were measured.

The collection, collation and refinement of data is an ongoing process, therefore, following submission of the Strategic Environmental Assessment Environmental Report (SEAE Report), the SEAE Report will be reviewed again in order to incorporate responses from the Consultation Authorities (Scottish Natural Heritage, Scottish Environment Protection Agency and Historic Environment Scotland), the wider public and any other interested parties.

The aim of this assessment is to identify environmental issues associated with each of the following topics as required by the Environmental Assessment (Scotland) Act 2005:

- Biodiversity, flora and fauna
- Landscape
- Cultural Heritage
- Climatic Factors
- Soil
- Air
- Water
- Material Assets
- Population
- Human Health, and
- Inter-relationships

The majority of draft ETS proposals would not have an environmental impact, however, there are some areas where impacts have been identified in terms of flood risk, surface water management and protected species.

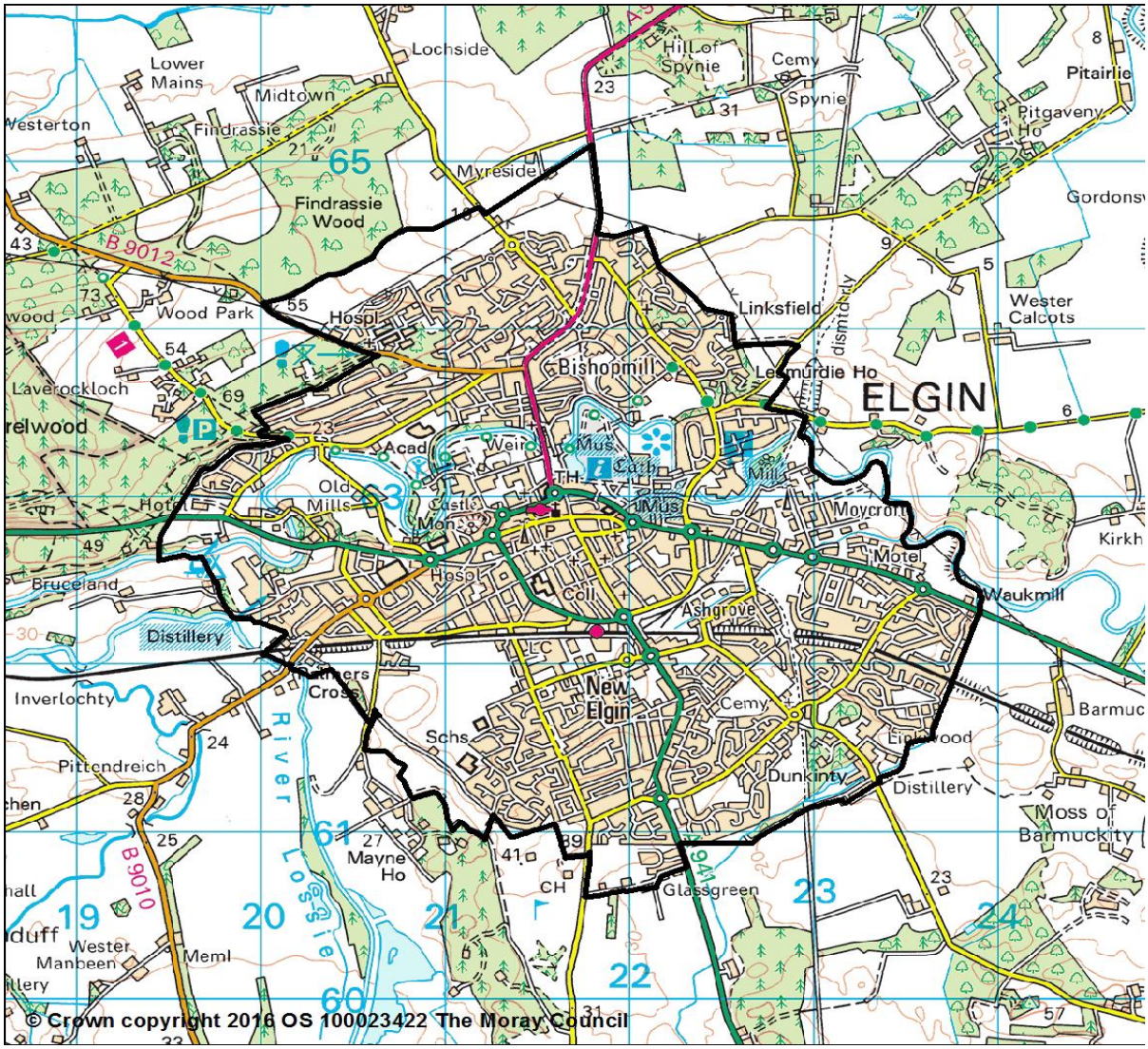
Elgin Area

Elgin is Moray's largest settlement, with a current population of approximately 26,000[1]. It is also Moray's main employment and transport hub, sitting in a strategic position on both the A96 road (Aberdeen to Inverness) and the rail networks. It is a compact town, approximately 4km in diameter, with a transport network that enables travel by foot, bicycle, public transport and car.

The area covered by the draft ETS is shown in Figure 1 below.

[1] Elgin Transport Strategy Main Technical Report.

Figure 1 Elgin Transport Strategy area.



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The draft ETS has considered the environment through its vision, objectives and action plans to address transport issues based on projected growth needs with a 14 year horizon from 2016 through to 2030. This environmental baseline provides a benchmark for the current environmental 'capacity' of Elgin and will inform any monitoring and future updates to the draft ETS.

1.0 Biodiversity, Flora and Fauna.

The importance of biodiversity, flora and fauna is outlined in Scottish Natural Heritage's publication *Biodiversity and Geodiversity Considerations in Strategic Environmental Assessment* which states '*Biodiversity and geodiversity have a crucial influence on the well-being of the people of Scotland and also have a key role in respect to climate change adaptation and mitigation. Understanding the natural processes that shape landscapes and ecosystems has an important role to play in their sustainable management. All new public plans and policies must be developed based on a clear understanding of their effects on biodiversity and geodiversity and other environmental interests*'[2].

1.1 Baseline

Elgin benefits from a wealth of natural heritage and areas of importance to nature conservation. The objectives of, and proposals contained within, the draft ETS have considered biodiversity and flora and fauna.

There are a number of sites within, and surrounding Elgin, designated for their importance to nature conservation and biodiversity. These sites include:

- Special Protection Areas (SPA) – see paragraph 1.2.2.1
- Special Areas of Conservation (SAC) – see paragraph 1.2.2.2
- Ramsar Sites – see paragraph 1.2.3
- SSSI's – see paragraph 1.2.4
- Semi-Natural Ancient Woodland Inventory – see paragraph 1.3
- Ancient Woodland – see paragraph 1.4
- National Nature Reserve - see paragraph 1.5
- Local Nature Reserve - see paragraph 1.6
- Non-statutory Wildlife Sites - see paragraph 1.7
- Tree Preservation Orders (TPOS) see paragraph 1.8

1.2 Appropriate Assessment

In accordance with European Council Directive 92/43/EEC (Habitats Directive), competent authorities must carry out a Natura Assessment / Appropriate Assessment (AA) of plans and projects that, in isolation or in combination with other plans and projects, are likely to have a significant effect on Natura 2000 sites (European Protected Sites).

These regulations require that, where an authority concludes that a development proposal is likely to have a significant effect on a European site, even if the development is out with the European site boundary, an appropriate assessment of the implications for the nature conservation interests of the site must be undertaken.

[2] SNH guidance on Consideration of Biodiversity and Geodiversity in Strategic environmental Assessment.

1.2.1 Requirement for Appropriate Assessment

The draft ETS has the potential to impact the Natura 2000 site (European Protected Sites) listed in Table 1 below.

Table 1 Natura 2000 sites affected by draft ETS

Draft ETS Proposal	Area Affected	Designation
Park and Change Site	Loch Spynie	Special Protection Area

This SPA is within close proximity to the Elgin settlement, however, areas for Park and Change Sites have not been identified and are currently undeveloped. An AA would be undertaken at the project level if selected sites for Park and Change are within close proximity to Loch Spynie.

1.2.2 Special Areas of Conservation and Special Protection Areas

Through the Habitats Directive, the European Union places certain obligations on Member States. Where Natura sites are concerned, these include avoiding deterioration of their qualifying habitats, and significant disturbance to their qualifying species.

In Scotland, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are given legal protection by the Habitats Regulations. The Habitats Regulations ensure that any plan or project that may damage a Natura site is first assessed and can only go ahead if certain strict conditions are met. This procedure is known as Habitats Regulations Appraisal, part of which is called 'appropriate assessment'. SAC and SPAs have a high level of protection because they are designated for habitats and species of European importance.

1.2.2.1 Special Protection Areas

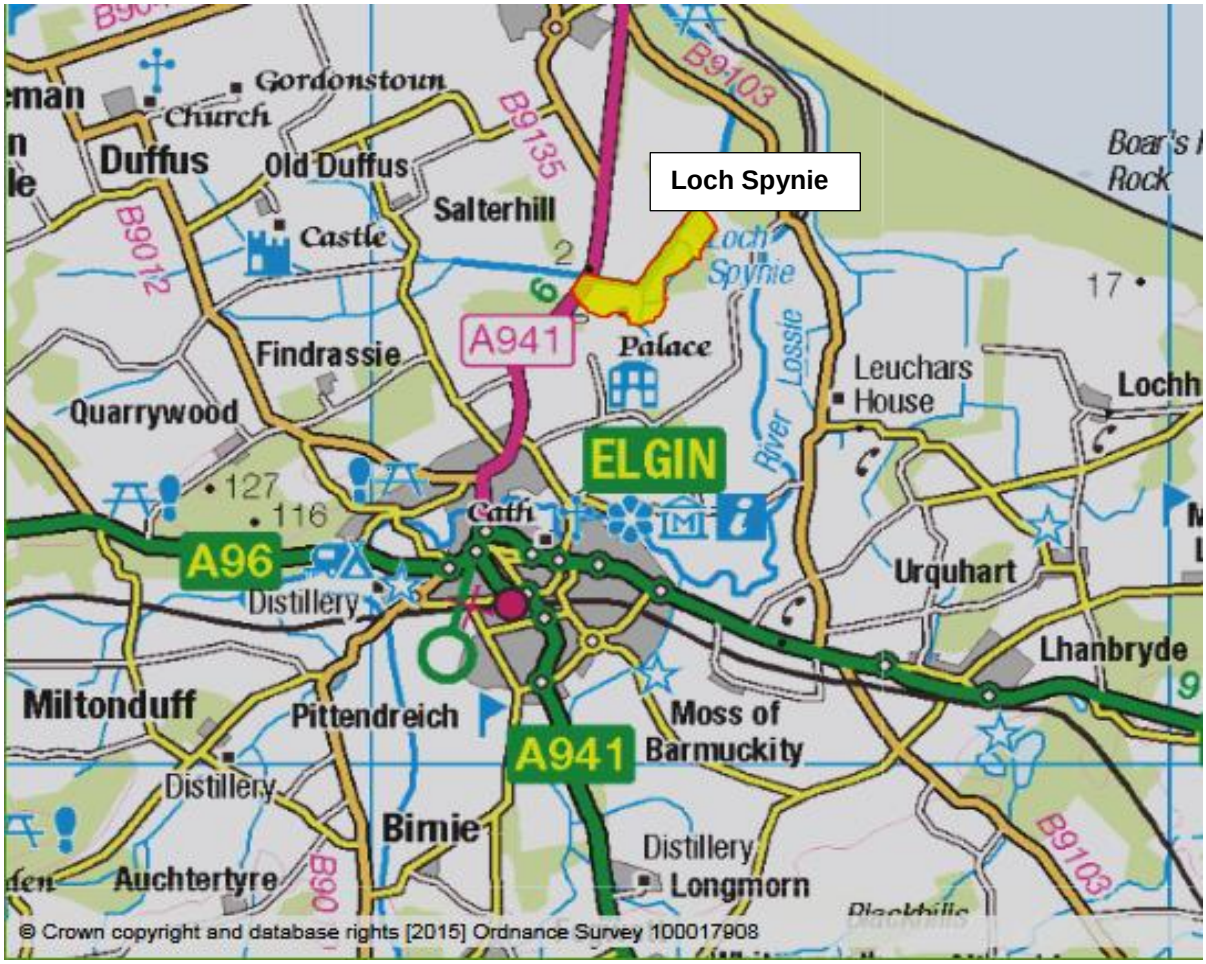
The only SPA within close proximity to Elgin is Loch Spynie, a water dependent area that suffers from diffuse source pollution. The loch is surrounded by fen, swamp and carr woodland. In winter, it supports a roosting population of non-breeding Greylag geese and is also an important spring staging site for Icelandic Greylag geese. The site also supports assemblages of breeding and wintering waterfowl.

This area has the potential to be affected by the draft ETS.

An AA is provided in Annex B of the Draft Elgin Transport Strategy Strategic Environmental Assessment Environmental Report.

The proximity of Loch Spynie in relation to Elgin is shown in Figure 2 below.

Figure 2 Map showing proximity of Loch Spynie in relation to Elgin.



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1.2.2.2 Special Areas of Conservation

There are no Special Areas of Conservation within close proximity to Elgin.

1.2.3 Ramsar Sites

The Convention on Wetlands, referred to as the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Loch Spynie is the only Ramsar site within close proximity to Elgin.

Loch Spynie, situated in an open water transition fen, is one of the few large and naturally eutrophic waterbodies in northern Scotland. It supports a diverse aquatic flora with extensive reedbeds fringing the open water body and various stages of hydroseral succession including mesotrophic fen, willow scrub and swamp Alder woodland. The loch itself contains a nationally uncommon aquatic community and a nationally scarce pondweed species *Potamogeton filiformis*. Loch Spynie regularly supports internationally important numbers of roosting Icelandic Greylag geese.

Negative environmental impacts that affect Loch Spynie are:

- Agricultural operations
- Invasive species
- Diffuse source pollution.

As previously mentioned, Loch Spynie is within close proximity to Elgin. This area has the potential to be affected by draft ETS proposals. An AA is provided in Annex B of the Draft Elgin Transport Strategy Strategic Environmental Assessment Environmental Report.

1.2.4 SSSIs

Sites of Special Scientific Interest (SSSIs) are those areas of land and water that Scottish Natural Heritage (SNH) considers to best represent the natural heritage of Scotland. Many are also designated as Natura sites (SPA and SAC).

SNH designates SSSI under the Nature Conservation (Scotland) Act 2004. SSSIs are protected by law and it is an offence for any person to intentionally or recklessly damage the protected natural features of an SSSI.

Within the Moray Local Authority area, the following SSSI are located within close proximity to Elgin:

- Loch Spynie
- Spynie Quarry
- Quarry Wood

1.2.4.1 Loch Spynie

Loch Spynie, located 3 Km to the north-east of Elgin, is one of very few large eutrophic waterbodies in northern Scotland. It contains extensive and well developed areas of alder and willow carr, reed beds and mesotrophic fen, as well as a fairly large diverse submerged flora.

The wide variety of habitats supports a rich aquatic and terrestrial flora and fauna. The site contains a variety of northern plant species but is particularly noteworthy for the occurrence of several southern species which are rare in northern Scotland.

In winter, Loch Spynie supports internationally important numbers of Icelandic Greylag geese, and is also an important staging site for these geese. The site also supports an exceptional diversity of breeding wildfowl and other species associated with reed beds.

As previously mentioned, Loch Spynie may be affected by draft ETS proposals. An AA is provided at Annex B of the Draft Elgin Transport Strategy Strategic Environmental Assessment Environmental Report.

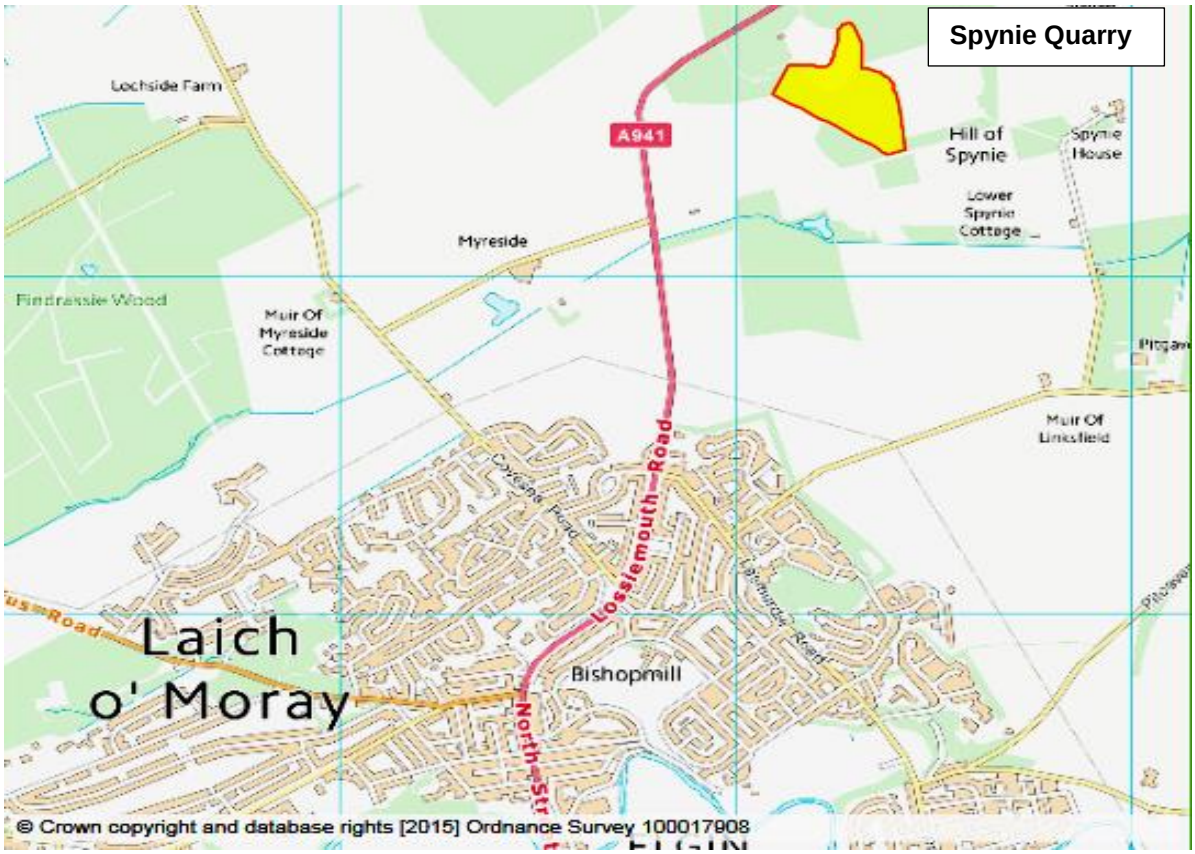
1.2.4.2 Spynie Quarry

Spynie Quarry, located 2 Km to the north-east of Elgin, is important for late Triassic reptiles and considered to be the best site for future finds of the late Triassic Elgin reptiles.

The site has been selected as a SSSI due to the rarity of fossil reptile material and has yielded scientifically important material that helps elucidate the evolution, diversification and extinction of the main reptile groups associated with the Permian and Triassic periods.

It is unlikely that Spynie Quarry will be affected by draft ETS proposals. However, a further assessment may be required at the project level for Park and Change Site proposals.

Figure 3 Map showing proximity of Spynie Quarry in relation to Elgin.



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1.2.4.3 Quarry Wood

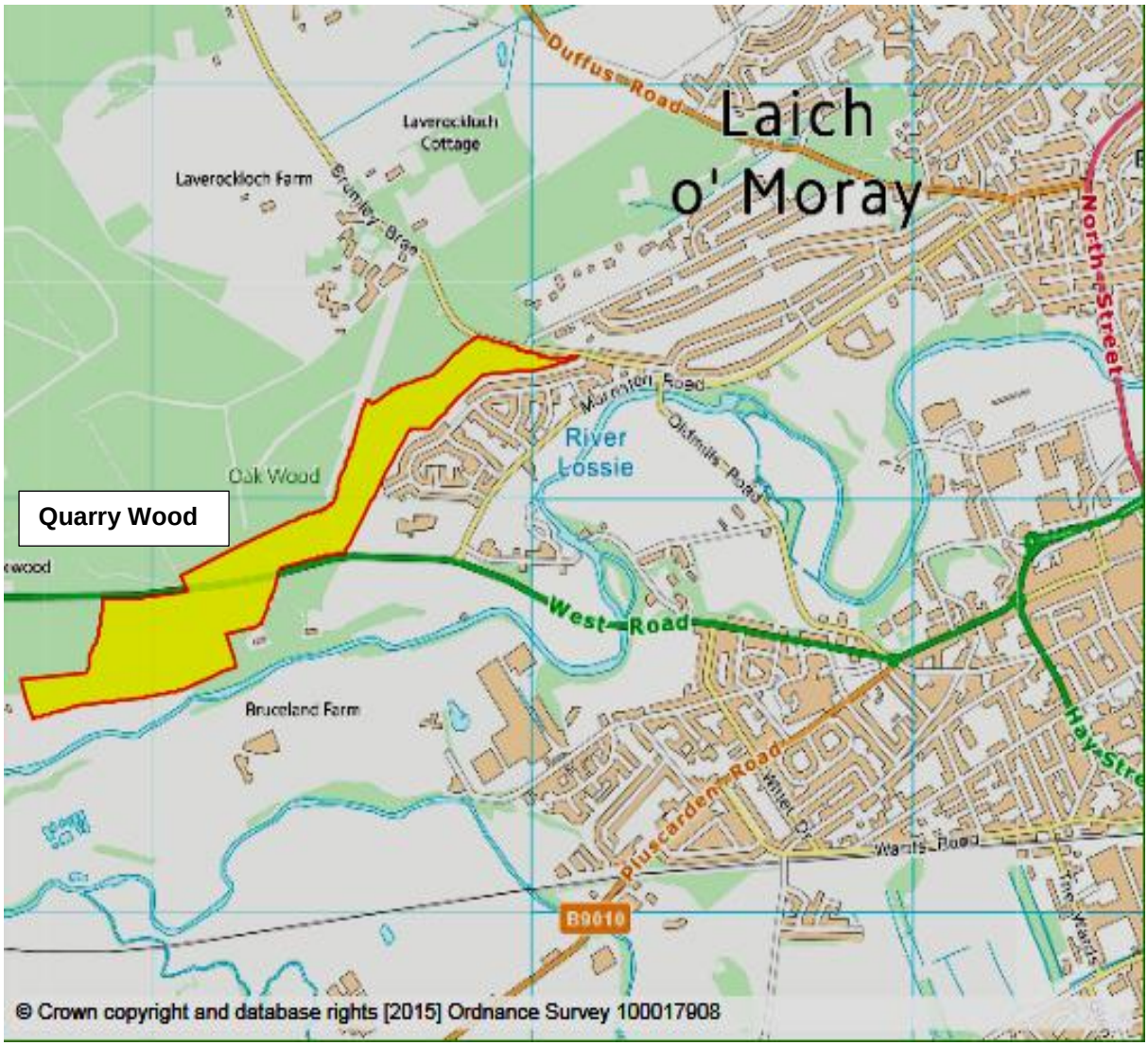
Quarry Wood, located on the western periphery of Elgin, is an ancient wood, with a recorded history extending to at least the eighteenth century. It is one of the best examples of oak woodland in Moray and the lowest altitude example in north-east Scotland.

The woodland is predominantly composed of sessile oak with some birch and scots pine and a locally well-developed shrub layer of holly.

The dominant field layer species are Ling heather and blueberry. Other species include common cow wheat, chickweed, wintergreen and a variety of bryophytes. Elsewhere, the field layer is dominated by bracken and greater wood-rush with sorrel, honeysuckle and bramble. Species of woodruff and bugle occur on pockets of richer soil.

It is unlikely that Quarry Wood will be affected by draft ETS proposals. However, a further assessment may be required at the project level for Park and Change Site proposals.

Figure 4 Map showing proximity of Quarry Wood in relation to Elgin.



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1.3 Semi-Natural Ancient Woodland Inventory

Woods not only encompass the trees themselves but also the ecosystems in which they are situated and the human population which has used and managed it. Scotland's remaining semi-natural woods are some of the most evocative symbols of the past and have seen considerable human influence.

See paragraph 1.4 for designated areas of semi-natural ancient woodland inventory.

1.4 Ancient Woodland

Ancient Woodland is defined as land that is currently wooded and has been continually wooded, at least since 1750. Ancient woodland is directly descended from the original woodland that developed after the retreat of the ice sheets in Britain 10,000 years ago. The wildlife communities, soils and structure of ancient woodlands have had the longest time to develop, and are therefore generally (but not invariably) richer than that of more recent woods in relation to other aspects of the nature and landscapes.

Scottish Natural Heritage has identified the following areas as either Semi-Natural Ancient Woodland Inventory or Ancient Woodland:

- Quarry Wood
- Quarrel Wood
- Spynie – Ancient woodland
- Findrassie Wood
- Trees lining Linkwood Road
- Birkenhill Wood (A941)
- Wood of Level
- Mayne Wood

The location of these woods in relation to Elgin, are shown on Figure 5 below.

Figure 5 Proximity of Semi-Natural and Ancient Woodland in relation to Elgin.

Ancient Woodland and Semi-natural Ancient Woodland Inventory is unlikely to be affected by the draft ETS, however, an Environmental Impact Assessment (EIA) must be undertaken at the project level for the draft ETS proposal to introduce Park and Change Sites once locations have been identified.

1.5 National Nature Reserve

There are no National Nature Reserve sites within close proximity to Elgin.

1.6 Local Nature Reserve

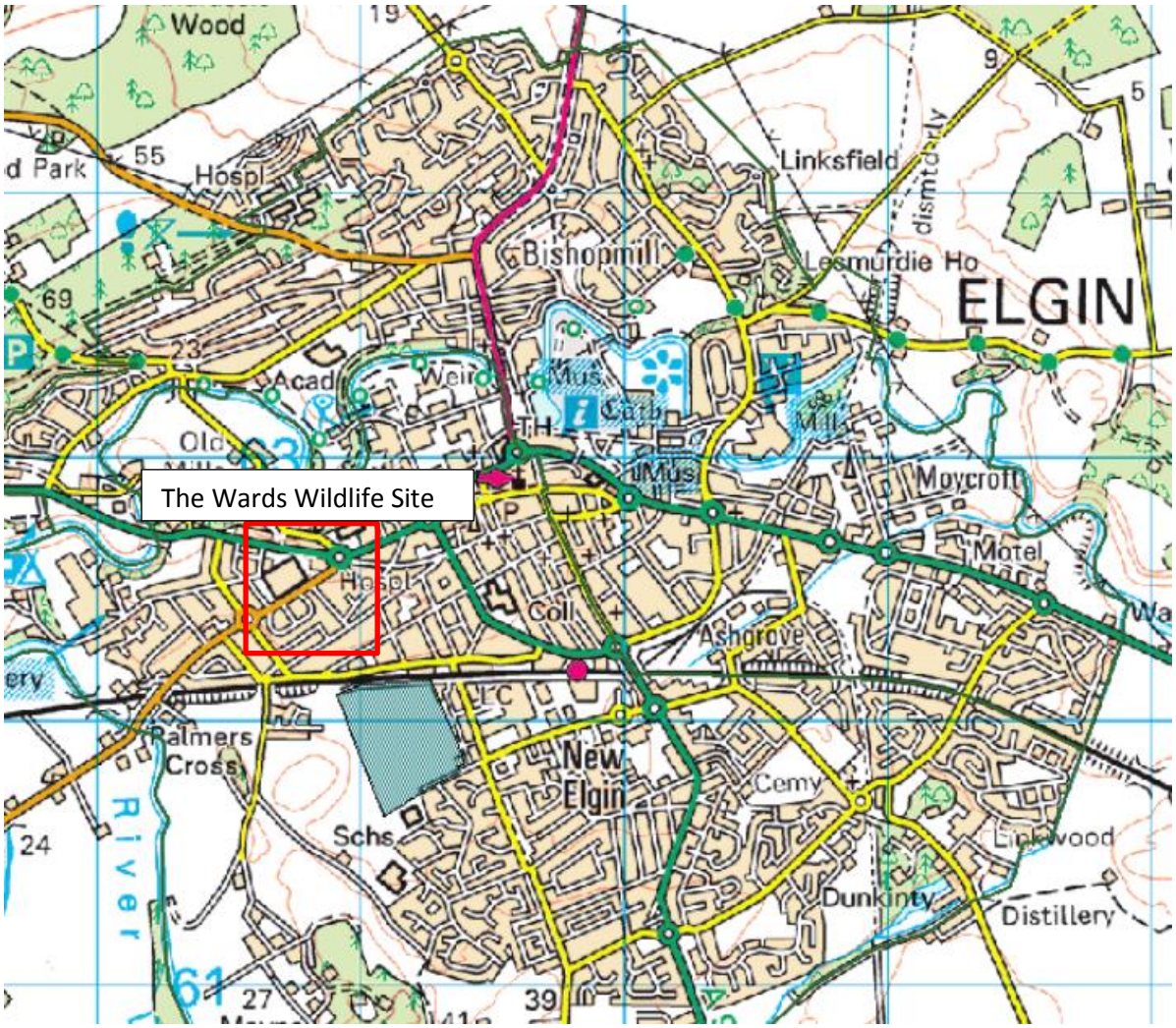
There are no Local Nature Reserve sites within close proximity to Elgin.

1.7 The Wards

The Wards Wildlife Site is designated as a non-statutory wildlife site. It is a flat area of mostly grassland surrounded by neutral grassland with planted broadleaves. The substrate is peaty and the water table is at, or above, the surface. The land, which has been extensively drained in the past, drains into the burn of Tyock in the south. There are drier areas in the south and under the trees in the southwestern and northwestern corners.

The Wards Wildlife Site is unlikely to be affected by the draft ETS, however, a further assessment may be required at the project level for the draft ETS proposal to improve the junction arrangement at Edgar Road / The Wards.

Figure 6 Location of The Wards Wildlife Site.



1.8 Tree Preservation Orders (TPOS)

Trees are protected by the Town and Country Planning (Scotland) Act 1997, through Tree Preservation Orders (TPOs) (Section 160), Conservation Areas (section172) and Planning Conditions (section 159).

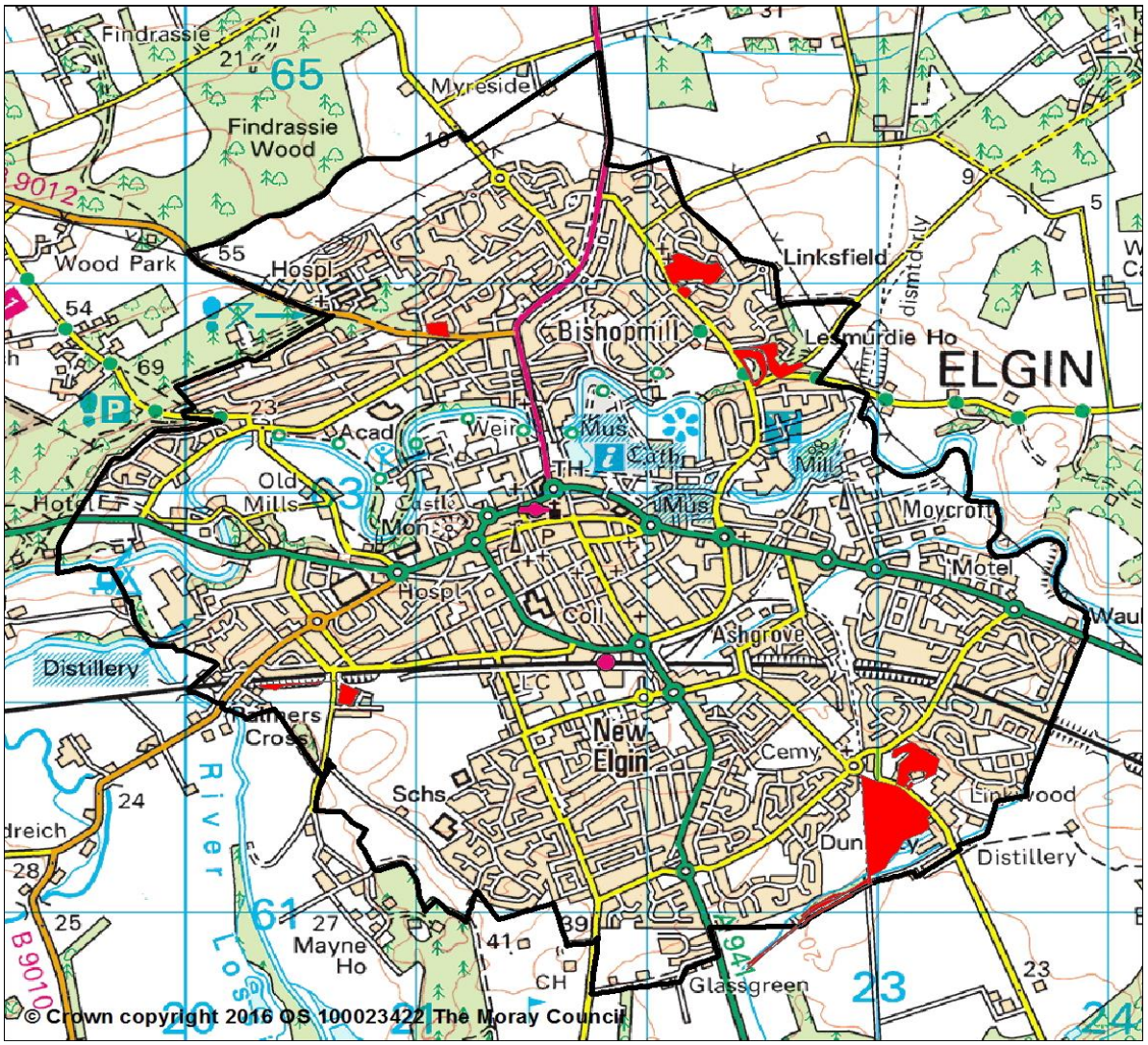
TPOs are generally used when a valued tree, group of trees or woodland is considered to be under threat. The principal effect of a TPO is to prohibit the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction of trees without the Local Authority's consent.

The following sites within the Elgin area have tree preservation orders:

- Linkwood
- Mayne Farm Road
- Ashgrove Road / East Road
- Reiket Park
- Oakbank, Duffus Road
- Dunkinty House
- Lesmurdie Road – A1 and A2
- Dunbarney House, West Road
- Plusgarden Road
- The College, King Street

TPOs are unlikely to be affected by draft ETS proposals. However, a further assessment may be required at the project level for the draft ETS proposals to introduce Park and Change Sites, the Mayne Farm Road – Fleurs Road cycle/pedestrian bridge and for the development specific option relating to Linkwood Road to the south of Reiket Lane.

Figure 7 Location of sites with Tree Preservation Orders.



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1.9 Assessment Method

All draft ETS proposals were screened to identify any with potential for likely significant adverse impacts on Natura 2000 sites. All components of the draft ETS with the potential to have a significant adverse impact on Natura 2000 sites were subject to a preliminary AA. Further details can be found in Annex B of the Draft Elgin Transport Strategy Strategic Environmental Assessment Environmental Report.

1.10 Potential Impacts

Potential impacts of the implementation of the draft ETS on the biodiversity of the Elgin settlement include:

European Protected Species

The Natura 2000 sites, assessed as part of the AA, are also important for supporting populations of European Protected species (EPS). Impacts on EPS are considered within the AA where appropriate e.g. in relation to Loch Spynie SPA.

Special Protection Area – Habitats

- No direct impacts
- Potential indirect impacts in relation to the treatment of surface water

Special Protection Area – Species

- No direct impacts
- Potential indirect impacts in relation to the disturbance of qualifying species of the SPA resulting from construction / maintenance

Sites of Special Scientific Interest

Natura 2000 sites can also be designated nationally as Sites of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act. The qualifying interests of the site as a SSSI must considered and any impacts must be mitigated against.

1.12 Mitigation

The following mitigation measures would be employed to minimise / prevent any adverse environmental impacts that may result from the draft ETS proposals:

- SNH will be consulted on all draft ETS proposals to manage or develop infrastructure that may have a significant effect on Natura 2000 sites or SSSIs
- SNH will be consulted on some of the draft ETS proposals to ensure that there are no impacts on protected species. Surveys for protected species and specific mitigation may be required
- Moray Council would ensure that procedures are in place to identify potential impacts on EPS. Licences will be required if project level baseline surveys indicate the presence of EPS in any locations affected by the draft ETS
- Levels of biodiversity, supported by existing paths, would be maintained and encouraged as far as possible though conservation of existing habitat
- Where draft ETS proposals have the potential to impact on the water environment, any additional requirements in relation to ecological sensitivity, e.g. protection of species and sites, would be taken into account and mitigated against
- Draft ETS proposals that may lead to disturbance of bridges or other built structures would be surveyed to determine the presence of bats

2.0 Landscape

People value landscape for many different reasons, including its role in providing habitats for wildlife and the way in which it provides a cultural record of how people have previously lived in a place. Landscape can have social and community value and it contributes to a sense of identity. For many it is the environment in general, and the landscape in particular, which makes informal recreation appealing. Landscape is a source of wellbeing and enjoyment that, more widely, includes health benefits. Aspects such as tranquillity, wildness, or a more natural character are important and, for many people, invigorating[3].

2.1 Baseline

There are no National Scenic Areas or Areas of Great Landscape Value (AGLVs) within close proximity to Elgin.

2.2 Potential Impacts

Whilst there are no National Scenic Areas or AGLVs within close proximity to Elgin, the following potential impact has been identified:

- Inappropriate signage and use of road materials could detract from the local landscape setting

2.3 Mitigation

- Design and location of transport infrastructure would take account of local and national designations for landscape at the strategic level in order to minimise impacts at the project level. This would include avoiding impacts on Conservation Areas
- Draft ETS proposals that require the addition of new transport infrastructure may require further assessment at project level in order to mitigate against any visual impacts

[3] SNH Landscape Considerations in Strategic Environment Assessments.

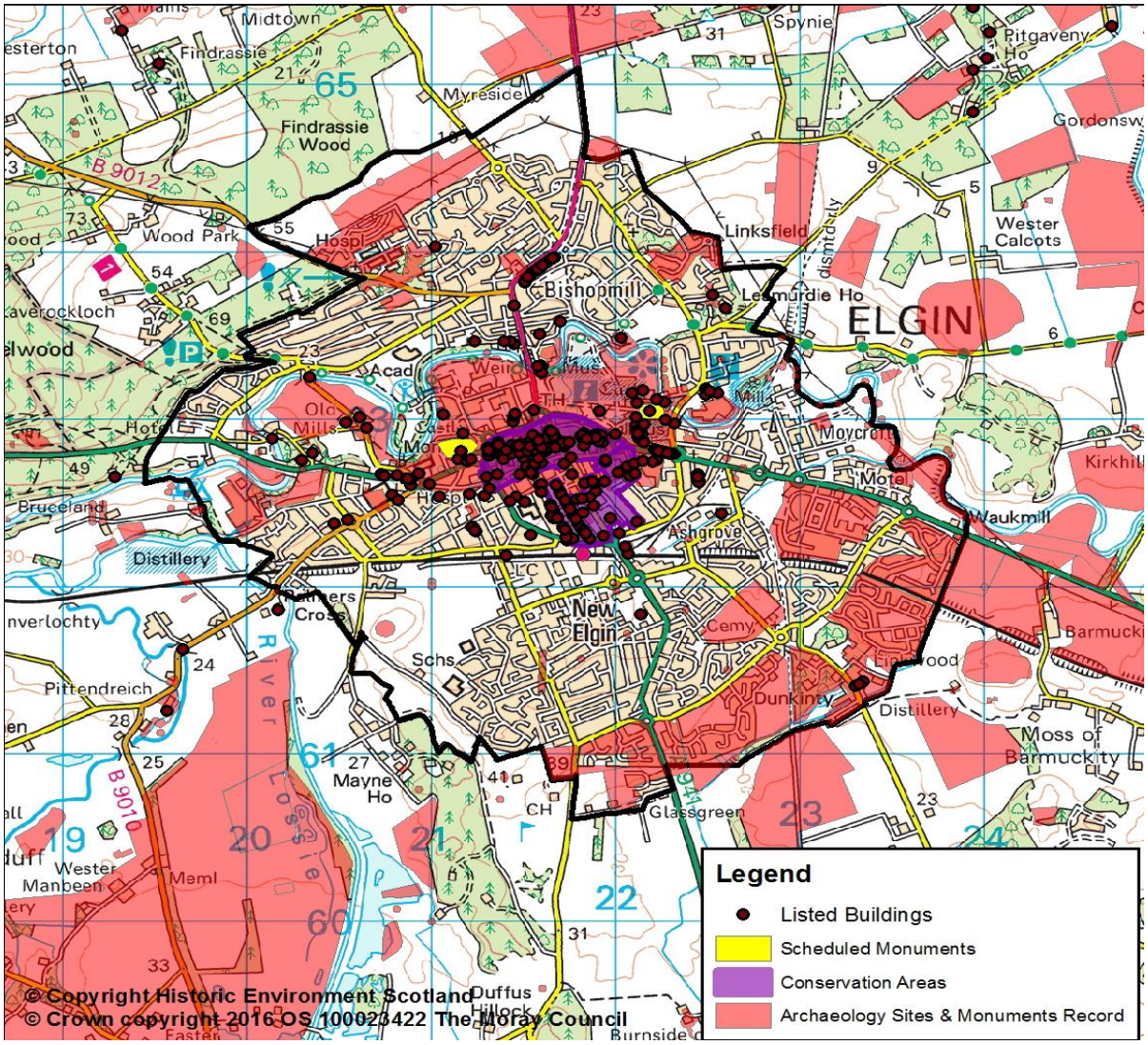
3.0 Cultural Heritage

3.1 Baseline

Elgin has a number of important sites for cultural heritage including:

- Listed Buildings
- Scheduled Monuments - Elgin Castle, Elgin Cathedral, Bishops House and Pans Port
- Archaeological Areas
- Conservation Areas

Figure 8 showing the location of Listed Buildings, Scheduled Monuments, Conservation Areas and Archaeological sites.



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3.2.1 Potential Impacts

Draft ETS proposals resulting from physical interventions e.g. new road link, and increased recreational pressure, could have an adverse impact on cultural heritage interests. Any impacts will be dependent on the proximity of interventions to sites of cultural heritage importance.

- Potential for impacts on known cultural heritage designations
- Landscape impacts on sites of cultural importance should be considered
- Potential for impacts on unknown cultural heritage sites

3.3 Mitigation

- Historic Environment Scotland and the Aberdeenshire Council Archaeology Service (which includes service provision to Moray Council), will be consulted on the draft ETS proposals to ensure that there are no impacts on the cultural heritage of Elgin
- Design and location of transport infrastructure would take account of local and national designations for cultural heritage at the strategic level in order to minimise impacts at the project level. This includes avoiding impacts on listed buildings, protected sites, sites with local historical interest
- Care would be taken to ensure that signage and changes to road layouts do not adversely affect the setting of historical sites and / or landscapes and are appropriate in location, size, scale and colour

4.0 Climatic Factors

Scottish Government Guidance on the Consideration of Climate factors within Strategic Environmental Assessment states: '*The effects of climate change are already being witnessed and are predicted to steadily increase in the future. The consensus of scientific opinion indicates that climate change is being driven by emissions resulting from human activities. Consumption within our society continues to grow, and most aspects of modern life currently give rise to greenhouse gas emissions, such as electricity and heat generation, construction, manufacturing, operating buildings, information and communications technologies, transport and travel and food production. Therefore the need to reduce greenhouse gas emissions and limit dangerous climate change (climate change mitigation) is apparent*'[4].

4.1 Baseline

Due to its proximity to the Moray Firth, Elgin has a temperate climate having mainly cool summers and relatively mild winters.

UK Climate Change Projections[5] (UKCP09) provides the latest indications of likely trends for Scotland's climate throughout the rest of the 21st century.

It is evident that there is the potential for changes to temperatures, precipitation and sea levels. The key climate change trends expected for Scotland are:

- Hotter, drier summers
- Milder, wetter autumns and winters

Other projects also indicate that Scotland can expect to experience:

- An increase in summer heatwaves, extreme temperatures and drought
- Increased frequency and intensity of extreme rainfall
- Reduced frost and snowfall
- Rising sea levels

4.2 Potential Impacts

Transport is the largest contributor of greenhouse gases and, therefore, climate change. Draft ETS proposals could both impact, and be affected by, climatic changes.

The Climate Change (Scotland) Act 2009 sets out the Scottish Government's statutory framework for greenhouse gas emissions reductions in Scotland. The framework sets out an interim 42 per cent reduction target for 2020, with the power for this to be varied based on expert advice, and an 80 per cent reduction target for 2050.

[4] Scottish Government Guidance on the consideration of climatic factors within strategic environmental assessment.
[5] Scotland's Environment.

Dependence on the private car could be reduced by the draft ETS. Any new transport infrastructure should accommodate changing climatic conditions e.g. increased frequency of flooding and higher summer temperatures.

4.3 Mitigation

- The draft ETS would aim to satisfy the requirements of National and Regional Transport Strategies through a reduction in emissions
- Promotion of modal shift and integration of public transport aims to improve accessibility and reduce car use for local journeys

5.0 Soil

SEPA guidance on the Consideration of Soil in Strategic Environmental Assessment states '*Soil is a key part of our environment and soil degradation can have major implications for air and water quality as well as our climate, biodiversity and economy. Sustainable management and protection of soils is key to ensuring that soils can deliver essential functions vital for the sustainability of Scotland's Environment* [6]:

5.1 Baseline

The solid geology of Elgin is comprised of Devonian Red Sandstone with areas of marine metamorphic and igneous rock. The drift geology is a mix of boulder clay and sands and gravels.

There are 3 sites designated for geology around Elgin:

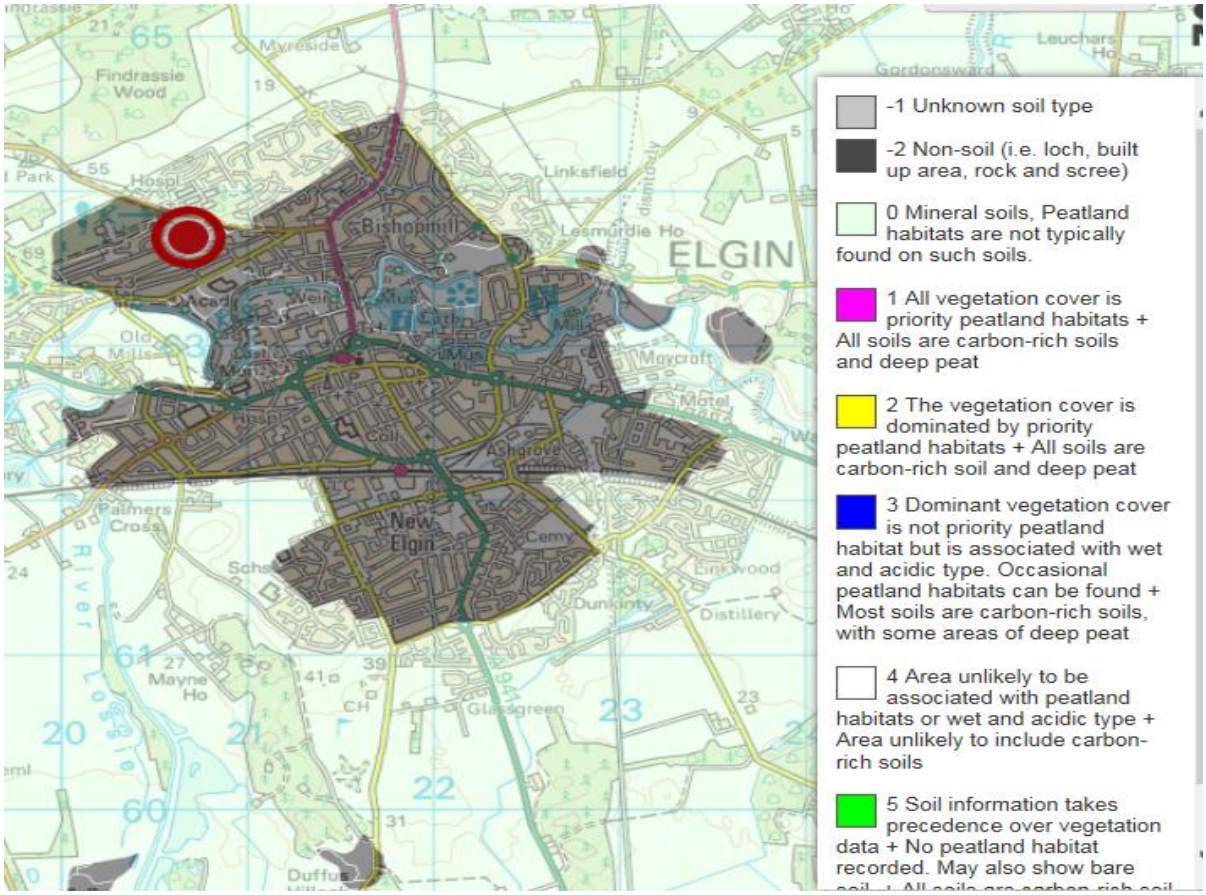
- Cutties Hillock SSSI
- Findrassie SSSI
- Spynie Quarry SSSI

It is unlikely that these sites will be affected by draft ETS proposals, however, a further assessment may be required at the project level for Park and Change Site proposals.

A review of the Scottish Government website Soils Scotland and Scottish Natural Heritage websites show that Elgin is built on non-soil (i.e. built-up area, rock-scree), however, British Geological Survey data does show possible peat deposits within Elgin. Conflict in data is shown in Figures 9 and 10 below.

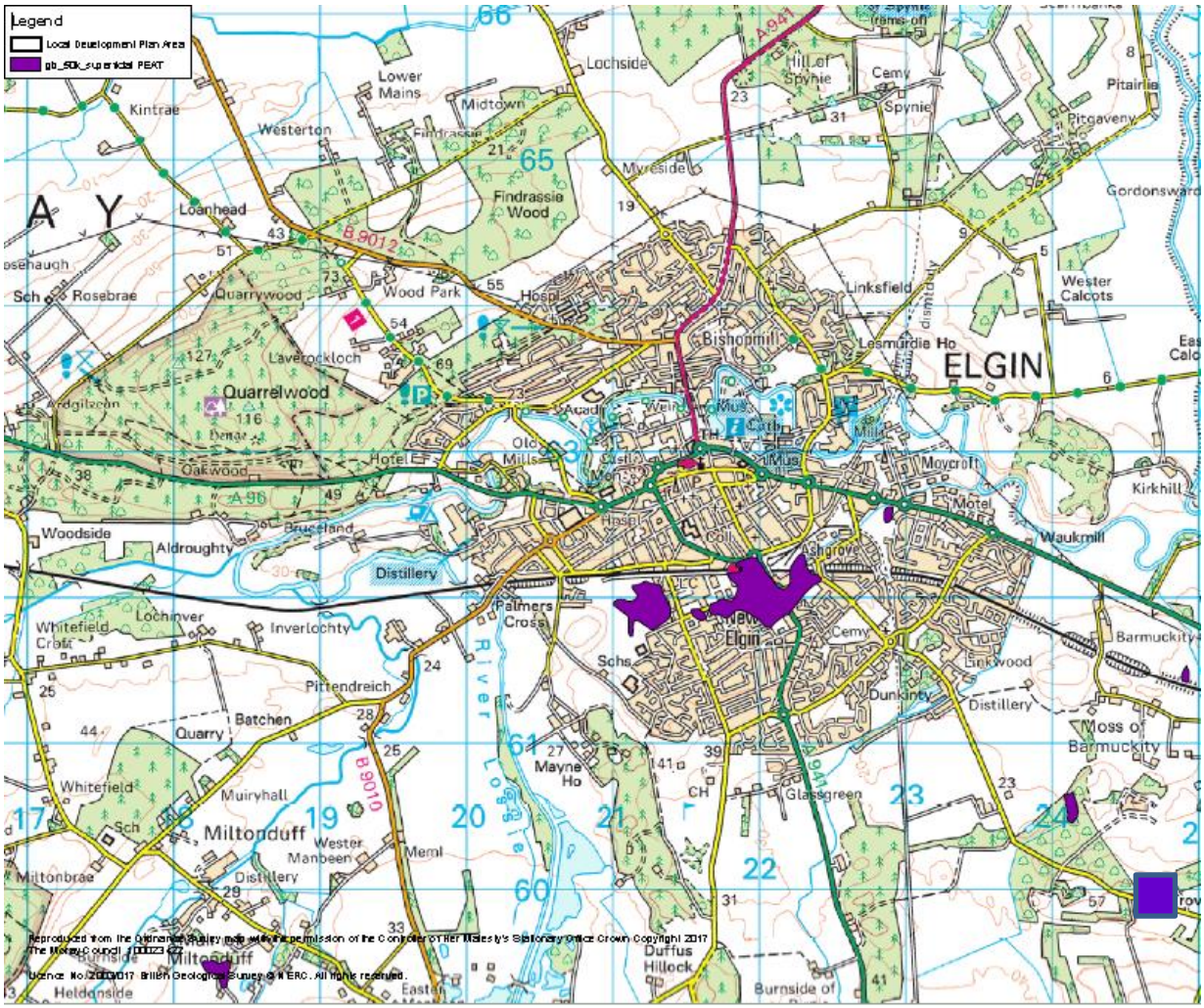
[6] SEPA guidance on Consideration of Soil in Strategic Environmental Assessment.

Figure 9 Soils Scotland Website Map Showing Underlying Soil Type of Elgin



Peat

Figure 10 BGS Website Map Showing Areas of Peat in Elgin



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5.2 Potential Impacts

- Land take for draft ETS proposals may affect areas of carbon-rich soils and / or deep peat areas

5.3 Mitigation

- Safeguarding policies and further guidance documents from statutory bodies would help control development impacts upon soils and carbon rich soils
- Scottish Natural Heritage and Scottish Environment Protection Area will be consulted on some of the draft ETS proposals to ensure that there are no impacts on protected sites, carbon-rich soils and / or areas of deep peat

6.0 Air

SEPA guidance on Consideration of Air in Strategic Environmental Assessment states '*Good air quality is essential for a good quality of life, helping to maintain human health, the climate, habitats and ecosystems. The quality of the air is affected by pollutants released into the atmosphere through human activities including transport, energy generation, industry, waste management and agriculture, and through natural sources*'[7].

6.1 Baseline

Air quality in Moray is of a high standard and there have been no Air Quality Management Areas identified to date.

6.2 Potential Impacts

Currently air quality is not a significant issue within Elgin, however, there is potential for deterioration in air quality resulting from transport issues based on projected growth needs from 2016 through to 2030. The draft ETS is designed to encourage modal shift to sustainable or active travel options and may contribute to small scale attitude change and, therefore, local air quality improvements. Schemes will contribute to emissions reductions and Scottish Government targets.

6.3 Mitigation

- A project level EIA would be undertaken for actions where air quality is identified as being of significant adverse impact
- There would be appropriate controls for dust during construction

[7] SEPA guidance on Consideration of Air in Strategic Environmental Assessment.

7.0 Water

SEPA guidance on Consideration of Water in Strategic Environmental Assessment states '*The quality of the water environment is defined under the Water Framework Directive. Surface water bodies are described in terms of their "ecological status" which takes account of water quality and morphology pressures as well as pressures resulting from abstraction and impoundment. Groundwater bodies are defined in terms of their "status" taking account of water quality and abstraction pressures*'[8].

Much of Scotland's water environment is in a good condition, however, a wide range of problems exist at local levels. SEPA provides information on the water environment in Scotland.

The Scotland River Basin Management Plan 2015 – 2027 states 34% of Scottish water bodies and 17% of protected areas were classified as not in a good condition as a result of impacts on water quality, access for fish migration, physical condition, water flows or levels and, direct impacts from invasive non-native species on aquatic plant and animal communities.

7.1 Baseline

Surface Water

Surface water conditions within Moray have been assessed by sourcing data from SEPA. SEPA databases contain data on water quality through a grading system which is used to classify all surface water bodies within Scotland.

The only river within, or close to, Elgin is the River Lossie.

Standing Water

Loch Spynie is the only body of standing water within close proximity of Elgin.

Water Quality

The SEPA scheme for the classification of water quality of Scotland's surface waters and groundwater is described in the Scotland River Basin Management Plan. Water quality classification looks at both biological and chemical indicators of 'pollution'. Surface water bodies are classified using a system of five quality classes – 'high', 'good', 'moderate', 'poor' and 'bad', with groundwater classified as 'good' or 'poor'.

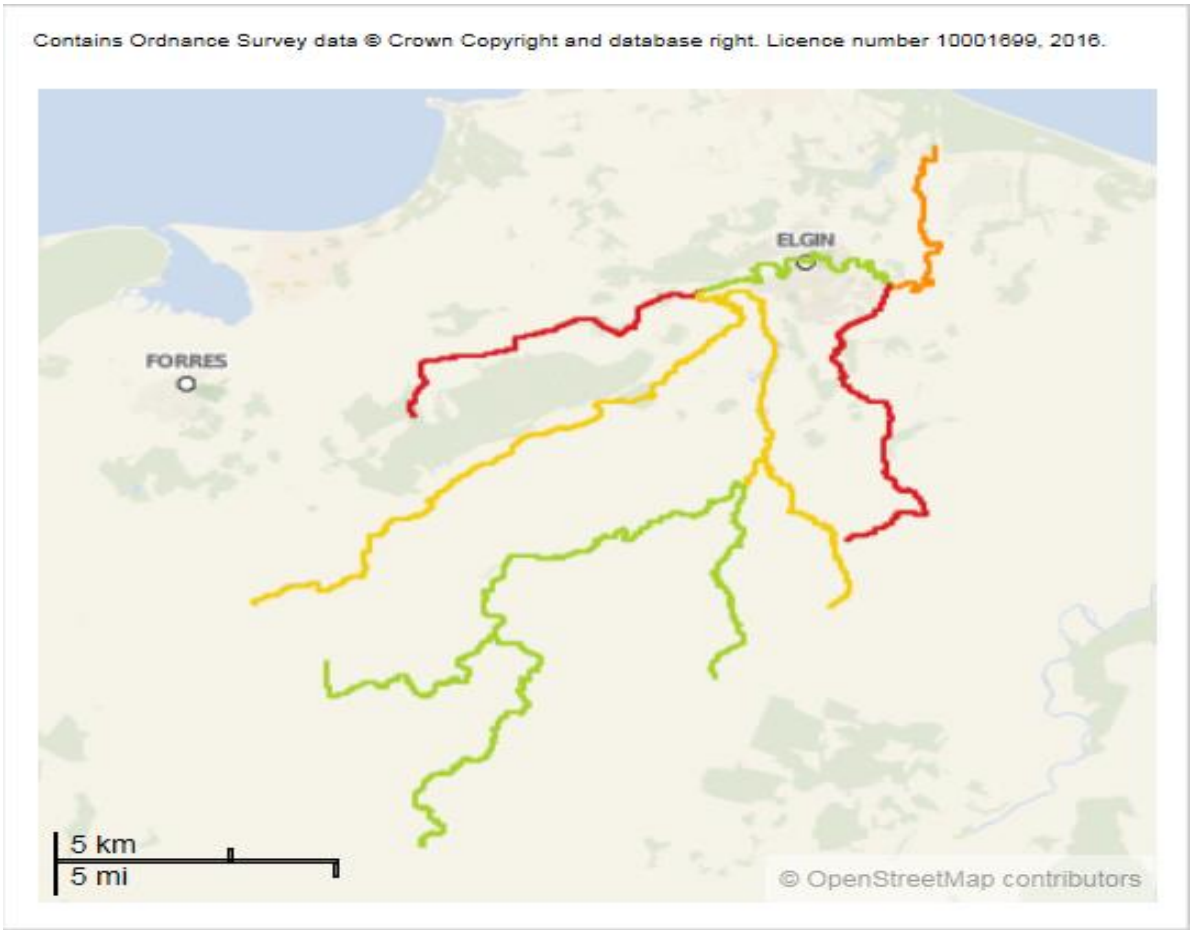
Water bodies with low levels of pollution are classified as 'high' or 'good' water quality, whereas those with high levels of pollution are classified as 'poor' or 'bad'. The classification system is underpinned by a range of biological quality elements, supported by measurements of chemistry, hydrology, morphology and an assessment of invasive non-native species.

Indicators of the ecological condition of rivers include the status of water plants / communities, fish, insects and other invertebrates, levels of nutrients, oxygen, acidity, temperature, toxic pollutants, condition of beds, banks and shores, continuity for fish migration and water flows and levels.

[8] SEPA guidance on Consideration of Water in Strategic Environmental Assessment.

The SEPA River Basin Management Planning Map for Elgin is shown in Figure 11. Table 2 below shows the classification of water bodies in and around Elgin.

Figure 11 SEPA River Basin Management Planning Map for Elgin – Water Body Classification[9]



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	High
	Good
	Moderate
	Poor
	Bad

[9] River basin management planning | Scottish Environment Protection Agency (SEPA).

Table 2 SEPA River Basin Management Planning Map for Elgin – Water Body Classification

Water Body	Classification[10]
River Lossie - Waukmill to Arthurs Bridge	Poor
River Lossie - Mosstowie Canal to Waukmill	Good
Linkwood Burn	Bad
Mosstowie Canal	Bad
Black Burn	Moderate
River Lossie - Leanoch Burn to Mosstowie Canal	Moderate
Leanoch Burn - d/s reservoir	Good
Leanoch Burn - upper catchment	Good
Gedloch Burn	Moderate
River Lossie - upper catchment	Good

Note: 2014 latest available data.

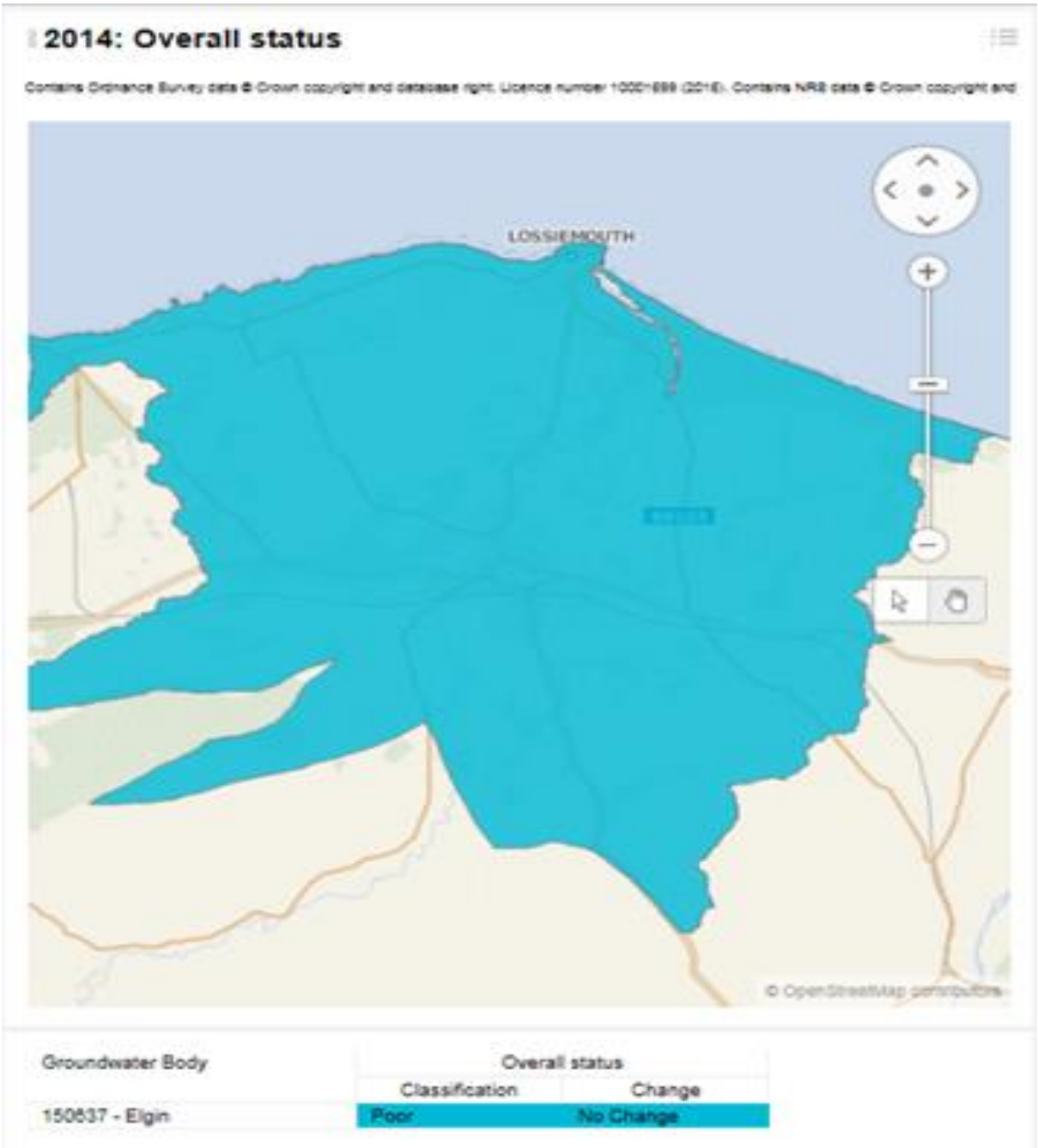
Groundwater quality

Groundwater quality and quantity are assessed by consideration of the ingress of salty or polluted water, effect on the condition of associated surface waters and wetlands, protection of quality of water abstracted for human consumption, other environmental risks and abstraction / replenishment balance.

Groundwater can be in either 'good' or 'poor' condition and, in 2014, the quality of Elgin's groundwater was classified as 'poor' and, in relation to quantity[11], groundwater was classified as 'good'.

[10] http://www.sepa.org.uk/environment/water/classification/classification-results/.
[11] http://apps.sepa.org.uk/wbody/2013/150637.pdf.

Figure 12 SEPA River Basin Management Plan Map for Moray – Overall Groundwater Status



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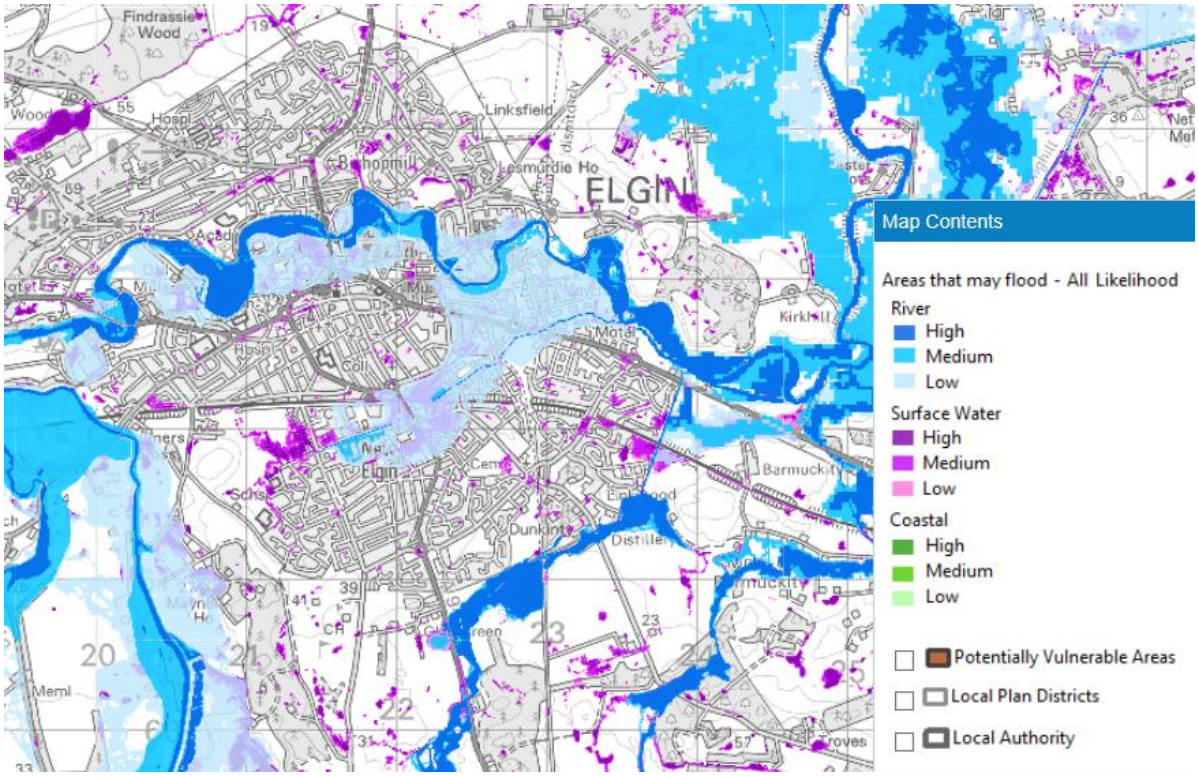
Flooding

Elgin has been severely affected by flooding in the past. The last major flood event that required evacuation of the residents in affected areas was in 2009. A further flood event occurred in 2014, however, the impact on properties was significantly reduced by a major flood alleviation scheme which was under construction at that time. The flood alleviation scheme came into operation in 2015 and provides a 1 in 200 year standard of protection to homes and businesses in Elgin.

Figure 13 below show the flood risk areas within and around Elgin.

Figure 13 SEPA River Basin Management Plan Map for Moray – Overall Groundwater Status



7.2 Potential Impacts

Potential issues associated with implementation of the draft ETS are those that require physical works on the transport network. Any potential issues can be mitigated through application of guidance and best practice.

The issues associated with construction works are:

- Earthworks and construction (track, machinery) may pollute nearby watercourses with sedimentary material or construction materials
- Increased loadings of suspended solids can smother the natural substrate of rivers and burns and adversely affect spawning ground and invertebrate communities

- Earthworks may mobilise pollutants in soil and allow them to contaminate nearby water resources through surface water run-off and percolation to groundwater
- Earthworks / creation of new ponds / drainage systems / culverts / crossings / temporary bunding or material stockpiles may alter runoff, hydrology or morphology of nearby water features resulting in changes to flood risk or habitats
- Accidental physical damage to banks / stream beds / culverts may affect flow characteristics
- Changes in groundwater level may alter hydrological regime
- Disturbance / damage to existing foul drainage systems

The issues associated with normal operation are:

- Increased volume and rate of surface run-off from impermeable surfaces such as new road surfaces can affect flow characteristics or cause soil erosion
- Pollution of groundwater (and watercourses) from accumulated contaminants in run-off from these surfaces e.g. debris from plant litter, fuel, dust, surfactants, pesticides and herbicides, salt
- Changes to the permeability of surface cover may impact on the underlying hydraulic regime and groundwater recharge
- Surface drainage schemes may alter the flow characteristics of nearby watercourses and flooding characteristics

7.3 Mitigation

- In order to satisfy the requirements of the Water Framework Directive and the River Basin Management Plans, any proposals implemented as part of the draft ETS would be managed to ensure that surface water quality will not be adversely affected
- SEPA Pollution Control Guidance and Best Practice measures would be implemented for all draft ETS proposals that may affect surface, standing or groundwater
- Where appropriate, SUDS schemes would be incorporated into any draft ETS proposal to ensure water attenuation and discharge does not impact on attenuation of floodplains
- All draft ETS proposals would be designed to be compliant with Scottish Planning Policy (SPP) 7 Planning and Flooding

8.0 Material Assets

SEPA guidance on Consideration of Material Assets in Strategic Environmental Assessment states *'The main challenges associated with material assets are those generated by our increasing demands for goods and services and the environmental implications for their manufacture or use together with their management and / or disposal when we are finished with them. These challenges include'*[12]:

- The need for greater understanding of the limitations of natural systems to provide regulating services e.g. for dealing with air or water pollution and flooding
- Challenges to the ability of existing infrastructure to support new requirements
- An increasing demand for heating, cooling, energy, and water
- An increase in the requirement to reuse and recycle wastes which require management and disposal mechanisms

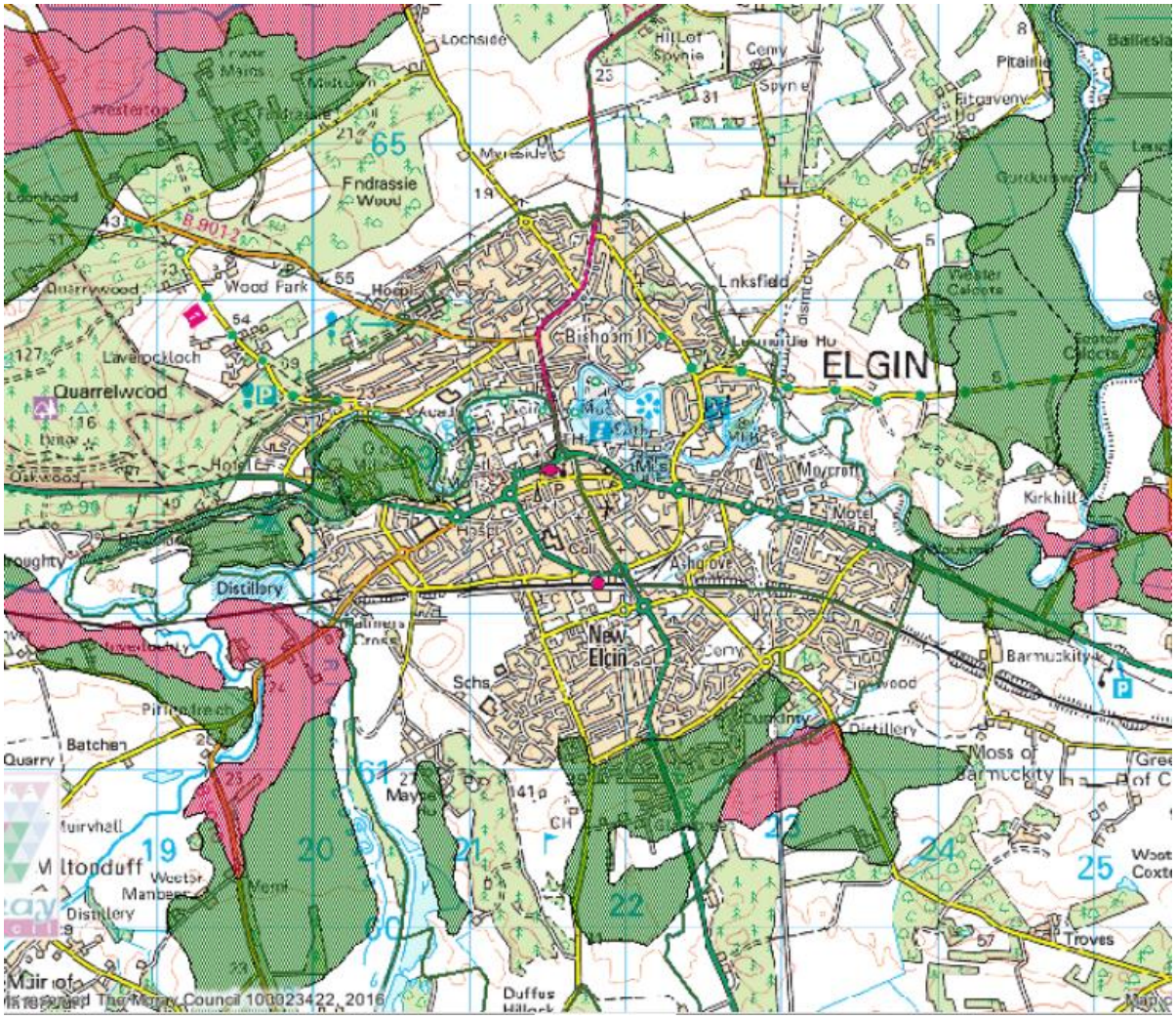
8.1 Baseline

Elgin is surrounded by prime agricultural land, however, draft ETS proposals will not affect these areas.

Figure 14 below shows the areas of prime agricultural land in relation to Elgin.

[12] SEPA guidance on Consideration of Material Assets in Strategic environmental Assessment.

Figure 14 Areas designated as Prime Agricultural Land



8.2 Potential Impacts

- The use of resources in construction, particularly in the construction of road infrastructure, can have major environmental impacts in terms of raw materials
- The draft ETS should have a positive impact on local businesses through improved accessibility for walking and cycling, the reduction of congestion, improvement of transport infrastructure and in support of road and active travel improvements. Any temporary disruptions etc. will be mitigated against appropriately

8.3 Mitigation

The use of resources in construction, particularly in the construction of road infrastructure, have major environmental impacts in terms of raw materials. Mitigation will include the following:

- A project level EIA / AA would be undertaken for any draft ETS proposals where there is potential for significant adverse impacts on sensitive receptors e.g. Loch Spynie
- Adherence to best practice construction methods and working practices to ensure that any impacts on residents / businesses / visitors to Elgin arising from proposals implemented as part of the draft ETS would be minimised
- Commitment to Sustainable Procurement and ensuring contractors undertaking transport works associated with the draft ETS adhere to environmental best practice in line with regulatory and guidance framework

9.0 Population

The population of Moray is concentrated around the towns of Elgin, Forres, Keith, Buckie and Lossiemouth. Data obtained from the 2011 Scotland Census[13] and, accessed through Scottish Census Results OnLine (SCROL), shows that Moray has a higher than national average economically active population at 71.5% compared to the Scottish average of 69%.

Census data also shows that there is a high level of car ownership within Moray. 19.9% of households have no car compared to the Scottish average of 30.5%. Conversely, 80.1% of households within Moray own at least one car compared to the Scottish average of 69.4%.

Table 3 Travel and Car Ownership in Moray in Relation to Scotland

	Moray	Scotland
Resident Population aged 16 – 74 in Employment	44,816	2,400,925
Travel to Work - %		
Car (including passengers, car pools and taxis)	63.7	62.4
Train	2.2	3.7
Bus	3.4	10.0
On foot	12.2	9.9
Other	6.3	3.1
Work from Home	12.1	10.8
Car or Van availability - %		
No car or van	19.9	30.5
1 car or van	46.9	42.2
2 cars or vans	25.5	21.6
3 or more cars or vans	7.7	5.6

[13] http://www.scotlandscensus.gov.uk/ods-web/area.html.

10.0 Human Health

SEPA guidance on Consideration of Human Health in Strategic Environmental Assessment states *'Health is influenced by a range of factors that are 'fixed' (e.g. age, ethnicity and genetics), however, there are other external factors which influence health e.g. wider socio-economic and cultural conditions in addition to the physical and social environments in which people live, learn and work. These factors all affect our health the unequal distribution of health-creating and health-harming environments can lead to health inequalities'*[14].

10.1 Baseline

2011 Scotland Census[15] data shows that the population of Moray benefits from better health than Scotland as a whole. Health data for Moray in relation to Scotland is shown in Table 4 below.

Table 4 Health Data for Moray in Relation to Scotland

	Moray	Scotland
Total Resident Population	93,295	5,295,403
Average Age	41.2	40.3
General Health - %		
Very Good	53.7	52.5
Good	31.3	29.7
Fair	11.1	12.2
Bad	2.9	4.3
Very Bad	0.9	1.3
Interesting Health Facts		
Average age of a person with good or very good health.	37.8	36.2
Average age of a person with a limiting long term illness.	60.8	59.2
Average age of carer.	51.2	50.7
Percentage of economically inactive people who are permanently sick or disabled	11.4	16.6
Percentage of households with one or more carers resident	14.7	16.0

10.1 Potential Impacts

- Improved pedestrian access routes are likely to increase physical activity
- Local population will benefit from increased accessibility within the settlement
- Increased physical activity can result in improved human health, and, in turn, can also lessen

[14] SEPA guidance on Consideration of Human health in Strategic Environmental Assessment.
[15] http://www.scotlandscensus.gov.uk/ods-web/area.html.

the use of vehicles. Transport emissions are associated with increased mortality due to the physical effects of prolonged exposure to pollutants such as carbon monoxide oxides of nitrogen, benzene (carcinogen), particulates (PM10) and sulphur dioxide

10.2 Mitigation

- Draft ETS active travel and transport infrastructure proposals would enhance access for pedestrians, cyclists and other road users during and after construction
- Changes to pedestrian routes, road layouts and crossings would be clearly signed to ensure accessibility is not compromised
- Road re-design would include segregated cycle paths and pedestrian footpaths to aid accessibility

Changes to road layouts and traffic movements of the transport network all have potential implications for health and road safety. These impacts will be mitigated through general measures such as:

- Planning road works in liaison with the local community such that disruption and noise impacts are minimised
- Ensuring safe and well-signed alternative routes and pedestrian crossings etc. are provided
- Diversions due to roadworks would be considerately located to ensure that local routes e.g. through school areas are not adversely affected. Diversions would be clearly signed
- Noise impacts associated with construction of transport infrastructure proposals would be minimised to reduce disruption

10.3 Noise and vibration

10.3.1 Baseline

Noise levels experienced from road traffic in areas of Elgin, which experience higher levels of traffic and congestion, can impact upon human health. Any potential noise / vibration impacts arising from implementation of the draft ETS need to be identified and mitigated against.

10.3.2 Potential Impacts

- Draft ETS proposals could negatively impact upon noise if the proposals taken forward lead to an increase in the number cars / congestion at a particular location in the town centre and / or on existing routes close to existing receptors
- Draft ETS proposals which promote modal shift and therefore aim to reduce congestion during peak periods will benefit those living in built up areas

10.3.3 Mitigation

Without the actions within the draft ETS, road traffic volumes within Elgin would increase at a greater rate and, therefore, would also likely increase noise exposure levels for sensitive receptors e.g. residents living on key routes.

- Project level EIA for actions where noise is identified as being of significant adverse impact
- Appropriate siting of transport infrastructure and use of acoustic barriers where noise is likely to be an issue
- Use of low-noise road surfaces would be considered for new infrastructure and replacement surfacing
- Promotion of lower speed limits in built up areas could reduce noise of passing traffic whilst improving safety

11.0 Inter-relationships

Many environmental problems result from the accumulation of multiple small and often indirect effects, rather than a few large and obvious ones. Examples include loss of tranquillity, changes in the landscape, loss of heathland and wetland, and climate change[16]. An essential part of the SEA process, therefore, is to consider the inter-relationships of a plan, programme or strategy with other SEA topic areas.

Secondary or indirect effects are effects that are not a direct result of the plan, but occur away from the original effect or as a result of a complex pathway. Examples of secondary effects are a development that changes a water table and thus affects the ecology of a nearby wetland and construction of one project that facilitates or attracts other developments.

Cumulative effects arise, for instance, where several developments each have insignificant effects but together have a significant effect or where several individual effects of the plan (e.g. noise, dust and visual) have a combined effect.

Synergistic effects interact to produce a total effect greater than the sum of the individual effects. Synergistic effects often happen as habitats, resources or human communities get close to capacity. For instance a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.

The above three effects are captured under the single term ‘cumulative effects’.

[16] A Practical Guide to the Strategic Environmental Assessment Directive (Accessed 27 Jan 2017)

11.1 Potential Impacts

Cumulative Effects

Many draft ETS proposals involve junction improvement (i.e. replacement of roundabouts with traffic signals) or Active Travel and Streetscape Changes (i.e. improving pedestrian / cycling provision and crossings), therefore, no cumulative effects associated with these draft ETS proposals have been identified at this time.

Draft ETS proposals that may introduce cumulative effects are:

- Introduction of Park and Change sites
- New road link between Ashgrove Road / Linkwood Road and Maisondieu Road

Park and Change:

- The development of greenfield land may result in localised changes to the water table
- The development of greenfield land may result in an overall loss of biodiversity for the Elgin area
- The development of greenfield land may result in a negative effect on soil quality due to soil sealing

New Road link:

- The area identified for the road link is close to a peat area
- The Burn of Tyock may be affected by water run-off which has the potential to alter the water table in the local area
- The new route for traffic would need to take account of the potential for offsite impacts arising from this change, as well as detailed assessment of the level of significance of noise in the immediate vicinity of the proposed route

11.2 Mitigation

A number of policies within the Moray Local Development Plan 2015 act as safeguarding / mitigation to the environmental effects associated with the draft ETS proposals. While the Policy and Supplementary Guidance do not protect against all environmental effects, the additional policies within the Local Development Plan will fulfil the role of safeguarding and mitigating against the environmental effects.

Finally, potential cumulative effects will be fully reviewed for adopted draft ETS proposals where the draft ETS Strategic Environmental Assessments (see Appendix 3) have identified a requirement for an AA / EIA at the project level.