



A9 Dualling Kincaig to Dalraddy

Environmental Statement

Volume I

ATKINS





Environmental Statement

Volume 1

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Glossary

Term	Definition
1 in 200 year event	A flood that has a 0.5% (1 in 200) or greater chance of happening each year.
Above Ordnance Datum (AOD)	The mean sea level at Newlyn (UK) used as a base measurement on Ordnance Survey Maps for contours.
Acoustics	The study of sound, especially its generation, transmission and reception.
Assessment	An umbrella term for description, analysis and evaluation.
At-grade junction	A type of junction where there is no height (grade) difference or separation between the traffic carriageways of a junction, e.g. a roundabout or a T-junction is an at-grade junction.
Air Quality Management Area (AQMA)	An area where the AQS (Air Quality Strategy) objectives are not likely to be achieved in all relevant locations. They are designated by the local authorities following a review and assessment process.
Ancient Woodland Inventory (AWI)	Aims to list all probable ancient semi-natural woodlands on a county basis together with those woodlands in other ancient categories of lesser woodland nature conservation interest.
Arable fields	Fields able to be ploughed and used for the cultivation of crops.
Archaeological Watching Brief	An archaeological watching brief is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive. This definition and Standard do not cover chance observations, which should lead to an appropriate archaeological project being designed and implemented, nor do they apply to monitoring for preservation of remains in situ.
Attenuation	Increase in duration of flow hydrograph with a consequent reduction in peak flow.
Basic Noise Level (BNL)	The baseline noise level at a reference distance of 10m away from the nearside carriageway edge, calculation of which takes account of time period, vehicle flow, speed, % heavy vehicles, gradient and road surface.
Beaker burials	Beaker burials began to appear around 4700 years ago. These are crouched inhumations accompanied by a particular pottery form known as a beaker and covered by a small round earthen mound.
Best Practicable Means (BPM)	In the UK, suggested pragmatic approach for the control of polluting effluents and emissions, without unduly penalising industry. Based on the concept that the costs of pollution are at least partially offset by the economic and social benefits of a viable industry. Often referred to as Best Practicable Environmental Option.
Biodiversity	Biological diversity, or richness of living organisms present in representative communities and populations.
Biodiversity Action Plan (BAP) – UK and local	The UK BAP is the UK government's response to the Convention on Biological Diversity, signed in 1992. There are three types of action plan: species, habitat and local (LBAP). Each LBAP identifies local priorities and usually conforms to local authority boundaries.
Bryophytes	Member of the division of the plant kingdom of non-flowering plants. Includes mosses, liverworts and hornworts.

Term	Definition
Bunding	Earth mounding that provides screening (e.g. for noise or landscape purposes).
Chainage	Topographical reference for distance which is measured and marked between two points on the land.
Compulsory Purchase Order (CPO)	A legal document giving the government (Scottish Ministers) power to compulsorily purchase the areas of land necessary for construction of a road (or other scheme).
Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)	Transpose the EC Habitats Directive into national law. The Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species (listed in Annexes I and II of the Habitats Directive respectively) to the EC. They also provide for the control of potentially damaging operations, whereby consent from the country agency may only be granted once it has been shown through appropriate assessment that the proposed operation will not adversely affect the integrity of the site.
Contaminated land	The Environment Protection Act 1990 defines contaminated land as 'any land which appears to the local authority as to be in such condition, by reason of substances, on or under the land, that significant harm is being caused or there is a significant possibility of such harm being caused; ... or pollution of controlled water is being, or likely to be caused'.
Continuous analyser / continuous monitoring	Real time monitoring equipment that measure concentrations of pollutants over specified time periods.
Contractor	The successful tenderer in the construction process.
Controlled Activities Regulation (CAR)	The Water Environment (Controlled Activities) (Scotland) Regulations 2011. Regulatory controls introduced by the Water Environment and Water Services (Scotland) (WEWS) Act 2003.
Cropmark	Probable archaeological site (e.g. enclosure) that appears on aerial photographs.
Culvert	A culvert is a structure carrying a watercourse beneath land, carriageway or a railway.
Cup and ring marked stones	A stone, either in situ or part of a monument, bearing one or more small, roughly hemispherical depressions surrounded by a concentric arrangement of annular or pennanular grooves.
Curcus	A long narrow rectangular earthwork enclosure of Neolithic date usually defined by a bank and ditch and presumed to be of ceremonial function. Known examples range in length from less than 100m to c.10km.
Decibel (dB)	Unit on the logarithmic scale used to express sound levels; a weighted decibel unit. The (A) denotes that levels are 'A' weighted. Several different weightings have been proposed but the 'A' weighting has been found to give one of the best correlations with the perceived noisiness of vehicles.
Desk study	Assessment of a site usually preceding ground investigations typically incorporating a review of available site information, consultation with relevant bodies and a site visit.

Term	Definition
Discounted shadow price of carbon	Damage costs of climate change caused by each additional tonne of greenhouse gas emitted, expressed as carbon dioxide equivalent (CO ₂ e) for ease of comparison.
Doleritic	Igneous rock formed in shallow intrusions, such as dykes, a form of basalt, containing relatively little silica.
Do-minimum scenario	Assumes that the existing A9 in the study area persists in its current layout in future years in the absence of the implementation of a construction or improvement project, but also assuming that maintenance is ongoing with traffic levels on the road increasing.
Downthrow	The sudden drop or depression of the strata of rocks on one side of a fault.
D2AP	Dual, all-purpose, two-lane carriageway.
Dualling	The widening of an existing road in order to provide two carriageways in both directions.
Effect	The result of a change or changes on specific environmental resources or receptors.
Environmental Quality Standard (EQS)	A value, generally defined by regulation, which specifies the maximum permissible concentration of a potentially hazardous chemical in an environmental sample, generally of air or water.
Ephemeral findspots	An isolated archaeological find-spot such as flint, pottery or stone scatters.
EQUIVALENT CONTINUOUS A-WEIGHTED SOUND PRESSURE LEVEL (dB LAeq)	Value of the A-weighted sound pressure level of a continuous, steady sound that within a specified time interval, T, has the same mean square sound pressure as the sound under consideration whose level varies with time.
European Protected Species (EPS)	Species of plants and animals (other than birds) protected by law throughout the European Union. They are listed in Annexes II and IV of the European Habitats Directive.
Extant remains	Remains surviving above ground.
Facade Noise Level	A facade noise level is the noise level 1m in front of the most exposed window or door in a building facade. The effect of reflection, is to produce a slightly higher (+2.5 dB) sound level than it would be if the building was not there.
Fault	A fracture in the earth's crust resulting in the relative displacement of the rocks on either side of it.
Fauna	All members of the animal kingdom; vertebrates (e.g. birds, mammals and fish) and invertebrates (e.g. insects).
Favourable Conservation Status	A natural habitat defined as 'favourable' under Article 1 of the EC Habitats Directive. Status is dependent on a number of factors, including: natural range; structure and functions; presence of favourable species (in turn dependent on population dynamics, natural range and size of habitat).
Fill	Material deposited by man in ground depression or excavated area.
Filter drain	A linear drain consisting of a trench filled with a permeable material, often with a perforated pipe in the base of the trench to assist drainage.

Term	Definition
Fish ladders	A series of ascending pools providing a passage for salmon to swim upstream past a dam.
Flora	All members of the plant kingdom: higher plants, ferns and fern allies, mosses and liverworts, algae and phytoplankton. This grouping is often also said to include the fungi and lichens.
Free field	A region in which no significant reflections of sound occur
Frequency	The rate of repetition of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the Hertz (Hz), which is identical to cycles per second. A thousand hertz is often denoted kHz, eg 2 kHz = 2000 Hz. Human hearing ranges approximately from 20 Hz to 20 kHz. For design purposes, the octave bands between 63 Hz to 8 kHz are generally used. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it.
Geological Conservation Review sites (GCRs)	The aim of the Geological Conservation Review Series is to provide a public record of the features of interest and importance at localities already notified or being considered for notification as 'Sites of Special Scientific Interest' (SSSIs). The sites selected – GCR sites – form the basis of statutory geological and geomorphological site conservation in Britain.
Glacial moraine	Glacial moraines are formed by the deposition of material from a glacier and are exposed after the glacier has retreated.
(Historic) Gardens and Designed Landscapes	Scotland has a wealth of beautiful landscapes and gardens, many of which can be visited. Historic Scotland maintains an inventory which provides details of their locations along with full descriptions of each site. These gardens and landscapes are valuable assets at national, regional and local level.
Geomorphology	The branch of geology concerned with the structure, origin and development of topographical features of the earth's crust.
Ghost island	An area of the carriageway suitably marked (e.g. cross-hatching) to separate lanes of traffic travelling in the same direction on both merge and diverge layouts. They are useful as a means of reducing accidents by separating on-coming traffic, reducing traffic speed and providing safe right turning areas.
Glacial till	Glacial till is that part of glacial drift which was deposited directly by the glacier. It may vary from clays to mixtures of clay, sand, gravel and boulders.
Glaciofluvial deposits	Tracts of alluvial sand and gravel deposited by meltwater downstream of glacier snouts, also known as stratified till or glacial sand and gravel.
Grade-separated junction	A type of junction where the connecting carriageways of a junction are separated by a height (grade) allowing vehicles to join and leave the main road using slip roads.
Ground Investigation	Exploratory investigation to determine the structure and characteristics of the ground influenced by a development. The collected information is used to establish or predict ground and groundwater behaviour during, and subsequent to, construction.
Groundwater	Water below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Groundwater Source Protection Zones	Areas defined which certain types of development are restricted / prevented in order to ensure that groundwater sources remain free.

Term	Definition
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities, as used, for example in a Phase 1 Habitat Survey.
Habitats Directive	EC Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.
Heavy Duty Vehicle (HDV)	Any vehicle with a gross weight greater than 3.5t, including heavy goods vehicles (HGVs) and coaches.
Heavy Goods Vehicle (HGV)	Vehicles with 3 axles (articulated) or 4 or more axles (rigid and articulated).
Hibernacula	Places where bats or other animals hibernate, or sleep, during the winter to conserve energy.
Hut circle	A round house indicated by the presence of a low, roughly circular bank of turf, earth or stone, which formed the base of the walls; characteristic of the later prehistoric period.
Hybrid	The offspring of two plants or animals of different species or varieties.
Hydrocarbons	Chemical compounds that contain only carbon and hydrogen. Frequently the term is also used to include other organic compounds that are not strictly hydrocarbons because they contain other elements.
Impact	Any changes attributable to the proposed Scheme that have the potential to have environmental effects (i.e. the causes of the effects).
Improved grassland / pasture	Grassland that has been subject to a level of fertilisation and, or weed control (but not reseeded) to the extent that most of the original species have disappeared, leaving a low number of dominant vigorous species, with a resultant low species richness (reseeded leys are classed as arable).
Inhumation	An interment of un-burnt, articulated human remains.
Invertebrates	Animals without backbones, such as spiders, butterflies, snails.
Isthmus	A narrow strip of land, bordered on both sides by water, connecting two larger bodies of land.
LA	A-weighted sound pressure level (in decibels, dB). The measured sound level incorporating a logarithmic base and weighting system to approximate the manner in which humans perceive sound. An increase of 10dB is approximately equivalent to a perceived doubling of loudness.
LA10,T LA10,18hr	A-weighted sound pressure level (in decibels, dB) that is exceeded for 10% of the given time period. 'T'. For road traffic, it is typically expressed as the arithmetic average of hourly LA10 values over an 18 hour day (06:00 – 24:00).
LAeq,T	Equivalent continuous A-weighted sound pressure level (in decibels, dB), over a given time interval. Where a time interval is not given it is typically considered as a continuous level.
Landform	Combination of slope and elevation producing the shape and form of the land surface.
Landscape	Human perception of the land, conditioned by knowledge and identity with a place.

Term	Definition
Left in / left out	Junctions which remove cross-carriageway turning movements and are theoretically safer than junctions which allow all movements as they remove conflicting traffic streams. This is particularly useful on fast-moving roads, where high traffic speeds make judging suitable gaps in approaching traffic more problematic.
Ley grassland	A field covered with grass or herbage and suitable for grazing by livestock.
Limit values	The concentration of a pollutant; below which there are not expected to be any health effects to sensitive individuals.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified Categories A, B & C(S).
Macrophytes	A rooted aquatic plant.
Made ground / fill	Material deposited by man, i.e. not natural.
Magnitude	Size, extent, scale and duration of an impact.
Major trip attractor	A major trip attractor is a key destination for NMU trips such as a village centre, school or tourist attraction.
MAXIMUM SOUND LEVEL, dB LAmax,T	The highest value of the A-weighted sound pressure level that occurs during a given event or time period. The time-weighting should be specified.
Mitigation	Term used to indicate avoidance, remediation or alleviation of adverse impacts.
National Road Traffic Forecasts (NRTF)	Forecasting by the UK Department of the Environment, Transport and the Regions of the growth in the volume of motor traffic (excluding motorcycles) in Great Britain (e.g. 1997 report predicts growth to 2031).
Network Evaluation from Survey and Assignment (NESA)	A computer program developed and maintained by Transport Scotland that is used to assess proposed road schemes, measuring their impact on traffic and the economy in the surrounding area.
NOx	A general term for the oxides of nitrogen including nitric oxide (NO), nitrogen dioxide (NO ₂), and nitrous oxide (N ₂ O).
Non-prime agricultural land	Agricultural land of Land Capability for Agriculture (LCA) classes 32 to 7.
Non-motorised user (NMU)	Pedestrians, equestrians and cyclists.
Notable species	Scarce invertebrate or floral species – occurring in 16 – 100km squares in Britain.
Open space	Any land laid out as public parks or used for the purpose of public recreation, or land which is a disused burial ground.
Ordnance Datum (OD)	Mean sea level calculated used as the official basis for height calculation on British maps.
PM10	Particulate matter – particles in this size range have an effective aerodynamic diameter of less than 10 micrometers (µm).
Particulate matter	Particulate matter in vehicle exhaust gases consists of carbon nuclei onto which a wide range of compounds are absorbed.

Term	Definition
Passerines	Of or relating to birds of the order Passeriformes, which includes perching birds and songbirds.
Pasture fields	Fields covered with grass, suitable for grazing cattle or sheep.
Peak Particle Velocity (PPV)	For an element which is experiencing vibratory motion, this is the maximum value of particle velocity obtained during a given measurement period in any direction.
PERCENTILE LEVEL (STATISTICAL SOUND LEVEL INDICES, dB LAN, dB LA90)	LAN is the dBA level exceeded N% of the time measured on a sound level meter with Fast(F) time weighting, e.g. LA90 the dBA level exceeded for 90% of the time, is commonly used to estimate background noise level. LA10, the level exceeded for 10% of the time, is commonly used in the assessment of road traffic noise.
Phase 1 Habitat Survey	Methodology developed by the NCC in the 1970s for rapid survey of semi-natural vegetation over large areas of countryside. Uses a hierarchical classification based primarily on vegetation, but also augmented by reference to topography and soil characteristics. The method recognises specific habitat types, each represented by a standard colour code, and supplemented by descriptive target notes which record anything of particular interest in a given habitat.
Pillbox	An often squat building with thick, loop-holed walls and a flat roof, designed to accommodate a variety of weapons, usually strategically positioned to cover a vulnerable point in a defensive system.
Pit alignment	A single line, or pair of roughly parallel lines, of pits set at intervals along a common axis or series of axes; the pits are not thought to have held posts.
Point source pollution	A single identifiable localised source of pollution.
Pool and riffle sequence	In a flowing stream a riffle-pool sequence develops as an area of alternating areas of relatively shallow and deeper water. Riffles describe shallow water where the flow is rippling over gravel deposits whereas pools are deeper and calmer areas.
Precautionary approach / principle	The Precautionary Principle is one of the key elements for policy decisions concerning environmental protection and management. It is applied in the circumstances where there are reasonable grounds for concern that an activity is, or could, cause harm but where there is uncertainty about the probability of the risk and the degree of harm. The principle has been widely endorsed internationally.
Prime agricultural land	Good quality agricultural land in classes 1 to 32.
Q95	The flow rate for a watercourse that is met or exceeded for 95% of the time.
Red list species	Birds of conservation concern following the nationally agreed colour coded system developed by The Royal Society for the Protection of Birds (RSPB).
Resonant frequency	Natural frequency of vibration of an object determined by its physical characteristics.
Retention pond	A pond where run-off is detained for several days to allow settlement and biological treatment of some pollutants.

Term	Definition
Rig and furrow	A type of cultivation practiced in upland areas of the British Isles which differs slightly from the more common ridge and furrow in that it appears to have been created through excavation by spade rather than plough.
Riparian	Relating to or situated on the banks of a river.
Run-off	Water that flows over the ground surface to the drainage system. This occurs if the ground is impermeable or if permeable ground is saturated.
Runs, riffles and berms	Run – moderate gradient with substrate of small gravel and/or cobble; above average water velocities; average depth; low to moderate turbulence; and generally associated with downstream extent of riffles. Riffle – relatively high gradient with substrate of large gravel and/or cobble; above average water velocities; below average depth; surface turbulence; shallow, turbulent stream segments with higher gradients than pools or glides. Berm – a raised shelf or barrier.
Salmon parr	A young salmon during its first two years of life, when it lives in fresh water.
Salmon redds	The space at the bottom of a stream that a spawning salmon makes for its eggs.
Salmonid	Water containing fish of the family Salmonidae, e.g. salmon, trout.
Schedule I Protected Species	Species protected under Schedule 1 of the Wildlife and Countryside Act 1981.
Scheduled Monument	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the Ancient Monuments and Archaeological Areas Act 1979.
Scour	Removal of sediment from the stream by flowing water.
Shingle	Composed of pebbles.
Sites of Special Scientific Interest (SSSI)	Areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species across Britain. The site network is protected under the provisions of Sections 28 and 19 of the Wildlife and Countryside Act 1981 as well as the Amendment Act 1985 and the Environmental Protection Act 1990. Sites notified for their biological interest are known as Biological SSSIs, and those notified for geological or physiographic interest are Geological SSSIs. Many SSSIs are notified for both biological and geological interest.
Sound Level	Sound level in decibels is the weighted sound pressure level obtained by use of a sound-level meter. The reference is 20 micro Pa unless otherwise stated.
Souterrain	An underground chamber, store room or passage.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive 74/409/EEC) to protect important bird habitats. Implemented under the Wildlife and Countryside Act 1981. Under the Habitats Directive, all SPAs will be proposed Special Areas of Conservation.
Street canyon	Street canyons are created when there are high buildings either side of a road corridor affecting the dispersion of air.

Term	Definition
Sustainable Urban Drainage System (SUDS)	A sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than some conventional techniques.
Sward	A stretch of turf or grass.
Tholeitic	A form of basalt including most ocean-floor basalt, most ocean island basalts and continental floor basalts, those low in sodium & silica.
Till	Unsorted glacial sediment.
Trash line	Vegetation and debris deposited on the upper banks during river spate (high water).
Understorey	A layer of vegetation beneath the main canopy of a forest.
Undesignated cultural heritage assets	An asset is taken as being any cultural heritage site, feature, area or landscape.
Unimproved grassland	Grassland that has not been subject to fertilisation and, or weed control and which is usually species rich.
Vascular plants	Plants with vascular tissue, e.g. flowering plants, conifers, cycads, ferns, horsetails, and clubmosses.
Walkover survey	A cursory survey carried out by walking through a site.
Watercourse	Any natural or artificial channel that conveys surface water Wetland A pond that has a high proportion of emergent vegetation in relation to open water.
Water Environment and Water Services (Scotland) (WEWS) Act 2003	This Act granted power to Scottish Ministers to introduce regulatory controls (refer to Controlled Activities Regulations (CAR) above) to protect and improve Scotland's water environment, including wetlands, rivers, lochs, transitional waters (estuaries), coastal waters and groundwater.
Water Framework Directive (WFD)	Wide-ranging European environmental legislation (2000/60/EC). Addresses inland surface waters, estuarine and coastal waters and groundwater. The fundamental objective of the WFD is to maintain "high status" of waters where it exists, preventing any deterioration in the existing status of waters and achieving at least "good status" in relation to all waters by 2015.
Weighting dB(A)	The sound pressure level determined when using the frequency-weighting network A. The A-weighting network modifies the electrical response of a sound level meter so that the sensitivity of the meter varies with frequency in approximately the same way that the sensitivity of the human hearing system varies with frequency. The human ear has a non-linear frequency response; it is less sensitive at low and high frequencies and most sensitive in the range 1 to 4 kHz. The A-weighting is applied to measured or calculated sound pressure levels so that these levels correspond more closely to the response of the human ear. A-weighted sound levels are often denoted as dB(A).
WS2+1	Wide single carriageway with three lanes, the middle of which switches direction every so often to provide an overtaking lane to each side in turn. Based on the principle that alternate WS2+1 layouts are provided to ensure balanced overtaking opportunities in each direction.
µg/m3	Microgram (1 millionth of a gram) per cubic metre – measure of concentration of pollutants in air.

Abbreviations

Abbreviation	Definition
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
AGLV	Area of Great Landscape Value
AOD	Above Ordnance Datum
AQA	Air Quality Archive
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ASNO	Ancient woods of Semi Natural Origin
AST	Appraisal Summary Table
ATC	Automatic Traffic Counter
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan
BGS	British Geological Survey
BHS	British Horse Society
BNL	Basic Noise Level
BPM	Best Practicable Means
CAR	Controlled Activities Regulation
CEL:LfN	Cost Effective Landscapes: Learning from Nature
CIRIA	Construction Industry Research and Information Association
CMS	Construction Method Statement
CO	Carbon monoxide
CO ₂	Carbon dioxide
COMEAP	Committee on the Medical Effects of Air Pollutants
CPO	Compulsory Purchase Order
Cr	Chromium
CROW	Catalogue of Rights of Way
CRTN	Calculation of Road Traffic Noise
CTC(S)	Cycle Touring Club (of Scotland)
Cu	Copper
D2AP	Dual, two-lane, all-purpose carriageway
dB	Decibels
DM	Do-Minimum
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
EC	European Commission
EIT	Environmental Impact Table
EPS	European Protected Species

Abbreviation	Definition
EQS	Environmental Quality Standard
EU	European Union
FC	Forestry Commission
FCS	Favourable Conservation Status
GCRs	Geological Conservation Review sites
GLVIA	Guidelines for Landscape and Visual Impact Assessment
HDV	Heavy Duty Vehicle
HER	Historic Environment Record
Hg	Mercury
HGDL	Historic Garden and Designed Landscape
HGV	Heavy Goods Vehicle
IFA	Institute for Field Archaeologists
km	Kilometres
kph	Kilometres per hour
LBAP	Local Biodiversity Action Plan
LTS	Local Transport Strategy
LVASG	Supplementary Guidance for Landscape and Visual Assessment
m	Metres
MAGIC	Multi Agency Geographical Information for the Countryside
mbgl	Metres below ground level
NAQIA	National Air Quality Information Archive
NBN (Gateway)	National Biodiversity Network (Gateway)
NCN	National Cycle Network
NESA	Network Evaluation from Survey and Assignment
NGR	National Grid Reference
Ni	Nickel
NMRS	National Monuments Record of Scotland
NMU	Non-Motorised User
NOx	Oxides of nitrogen e.g. NO ₂ – nitrogen dioxide
NPF2	National Planning Framework2
NPPG	National Planning Policy Guidance
NRTF	National Road Traffic Forecasts
NSCA	National Society for Clean Air
OD	Ordnance Datum
OS	Ordnance Survey
Pb	Lead
PMW	Precautionary Method of Working

Abbreviation	Definition
PPG	Pollution Prevention Guidance (produced by SEPA)
RA	Rambling Association
RCAHMS	Royal Commission on the Ancient and Historical Monuments of Scotland
RE	River Ecosystem
RSPB	Royal Society for the Protection of Birds
RTA	Road Traffic Accident
RTS	Regional Transport Strategy
SAC	Special Area of Conservation
SCOTWAYS	Scottish Rights of Way Association
Se	Selenium
SEPA	Scottish Environment Protection Agency
SINC	Sites of Importance for Nature Conservation
SMR	Sites and Monuments Record
SNH	Scottish Natural Heritage
SNWI	Semi-Natural Woodland Inventory
SPA	Special Protection Area
SPP	Scottish Planning Policy
SSI	Scottish Statutory Instrument
SSSI	Site of Special Scientific Interest
STAG	Scottish Transport Appraisal Guidance
SUDS	Sustainable Urban Drainage System
SWT	Scottish Wildlife Trust
TACTRAN	Tayside and Central Scotland Transport Partnership
TRRL	Transport and Roads Research Laboratory
TPO	Tree Preservation Order
UK APIS	United Kingdom Air Pollution Information System
UNECE	United Nations Economic Commission for Europe
USA	Updating and Screening Assessment
V	Vanadium
WHO	World Health Organisation
Zn	Zinc

1. Introduction

- 1.1. Scheme Background and Context
- 1.2. Previous A9 Dualling studies
- 1.3. Current A9 Dualling Development Work
- 1.4. The A9 Dualling: Kincaig to Dalraddy Scheme
- 1.5. Environmental Impact Assessment
- 1.6. Purpose of the Environmental Statement
- 1.7. Scope and Content of the Environmental Statement
- 1.8. Draft Orders
- 1.9. The Assessment Team
- 1.10. Report Structure
- 1.11. Review and Comments

1. Introduction

1.1 Scheme Background and Context

- 1.1.1. The A9 Dualling: Kincaig to Dalraddy Scheme (hereafter referred to as the 'proposed Scheme') presented in this Environmental Statement (ES) forms part of a wider programme to dual the A9 trunk road between Perth and Inverness.
- 1.1.2. The Cabinet Secretary for Infrastructure and Capital Investment launched the Scottish Government's Infrastructure Investment plan (IIP)¹ in December 2011 which provides an overview of the Scottish Government's plans for infrastructure investment in the forthcoming decades. Included in this is the commitment to deliver a dual carriageway A9 trunk road between Perth and Inverness by 2025.
- 1.1.3. The IIP commitment builds on work undertaken in the Strategic Transport Projects Review² (STPR) in 2008 which identified dualling of the A9 as a priority Trunk Road intervention.
- 1.1.4. The A9 Trunk Road provides a strategic link between Perth and Inverness. The A9 is 177 kilometres long between Perth and Inverness, of which, 129 kilometres requires dualling. Isolated lengths of dual carriageway and Wide Single 2+1 (WS2+1) layouts are provided north of Perth.
- 1.1.5. The A9 between Perth and Inverness requires dualling between the following sections:
- Luncarty to Pass of Birnam;
 - Pass of Birnam to Ballinluig;
 - Pitlochry to Killiecrankie;
 - Killiecrankie to Glen Garry;
 - Glen Garry to Crubenmore;
 - Crubenmore to Kincaig;
 - Kincaig to Dalraddy;
 - Dalraddy to Slochd; and
 - Tomatin to Moy.
- 1.1.6. The combination of agricultural, Heavy Goods Vehicles (HGV) and tourist vehicles on the single carriageway sections leads to congestion and driver frustration, particularly during the summer months and holiday periods. For example, the journey time between Perth and Inverness can vary by up to half an hour as a result of slow moving vehicles. Traffic levels are much higher in the summer months demonstrating the importance of the route to tourism.
- 1.1.7. Driver frustration due to a lack of safe overtaking opportunities has led to a higher than average rate of serious and fatal accidents. When accidents occur they cause severe delays to traffic largely due to the lack of alternative diversion routes.

1
2

<http://www.scotland.gov.uk/Publications/2011/12/05141922/0>
<http://www.transportscotland.gov.uk/strategy/strategic-transport-projects-review>

1.2. Previous A9 Dualling studies

A9 Route Action Plan and Route Strategy, 1995-97, 1996

- 1.2.1. Studies into the potential for improving the A9 date back to 1995-97 when Scott Wilson developed a Route Action Plan culminating in a Route Strategy³ for the corridor which considered schemes to improve safety and relieve driver stress. One dualling scheme was brought forward at that stage at Crubenmore and the remainder of the programme of work that emerged included junction improvements and overtaking schemes such as Bankfoot, Ballinluig and a scheme between Kincaig and Dalraddy.

A9 Route Improvement Strategy, 2004

- 1.2.2. Following pressure for dualling of the A9, Transport Scotland commissioned a Route Improvement Strategy Study (RISS) in 2004 to identify a strategy for the Perth to Blair Atholl section of the A9, considering both dual and WS2+1 route improvements. The study was commissioned to identify the medium to long term strategy for the route. The brief for the study was:
- To review previous work undertaken, in particular, the A9 Perth to Inverness Route Strategy, 1996;
 - To establish a set of objectives against which a route improvement strategy could be appraised; and
 - To produce a firm strategy for medium to long term improvement of the A9 between Perth and Blair Atholl.

- 1.2.3. The study was completed in 2005 and indicated that the town of Pitlochry provided a clearly defined split in the character of the route, primarily due to the reduction in traffic volumes north of the town. Part of the emerging strategy was to undertake a programme of upgrading of the A9 between Perth and Pitlochry to dual carriageway standards.

- 1.2.4. The findings of the RISS were subject to appraisal as part of the STPR.

Strategic Transport Projects Review (STPR), 2009

- 1.2.5. The STPR, which reported in 2009, examined the strategic transport corridor from Inverness to Perth. The following objectives were established with respect to the network performance and Government policy for this corridor:
- To reduce journey time and increase opportunities to travel between Inverness and Perth (and hence onwards to the central belt);
 - To improve the operational effectiveness of the A9 as it approaches Perth and Inverness;
 - To address issues of driver frustration relating to inconsistent road standard, with attention to reducing accident severity; and
 - To promote journey time reductions, particularly by public transport, between the central belt and Inverness primarily to allow business to achieve an effective working day when travelling between these centres.
- 1.2.6. Based on these objectives the STPR recommended upgrading of the A9 from Dunblane to Inverness. The first phase of this A9 upgrading would consist of provision of A9 Dual Carriageway from Perth to Blair Atholl. The STPR states that this intervention is expected to provide a sustainable economic growth.

3

Scott Wilson Kirkpatrick Consulting Engineers, 1997, A9 (T) Perth To Inverness Development Of A Route Strategy, Phase 3 Final Report

- 1.2.7. The studies have found that the key characteristics / issues associated with the route are:
- A higher than average rate of serious or fatal accidents;
 - A lower than average general accident rate;
 - Traffic flows that vary between circa 20,000 Annual Average Daily Traffic (AADT) at Perth and Inverness to circa 6,000 AADT at Aviemore;
 - Approximately 20% of accidents are winter weather related;
 - Marked seasonal fluctuations in traffic flows;
 - A changing cross section from S2 through localised WS2+1 sections to D2AP;
 - Numerous at grade junctions;
 - Driver frustration due to lack of guaranteed overtaking opportunities;
 - Proximity and access to residential and agricultural properties; and
 - A surrounding environment of high sensitivity.

- 1.2.8. The A9 passes through areas, which are outstanding in wildlife and landscape terms, some of which are of national or international importance. Conservation of the heritage is extremely important, not only for its inherent value but also because it is a major asset to the tourist industry. In particular, the A9 passes through the Cairngorms National Park, which is Britain's largest National Park.

1.3 Current A9 Dualling Development work

- 1.3.1. Following the IIP announcement in December 2011, two corridor wide commissions were implemented to help develop a consistent approach to dualling design and assessment. These are outlined below. The emerging findings of these studies have helped to inform the design approach being undertaken for the proposed Scheme.

A9 Dualling Strategic Environmental Assessment (SEA) - June 2013

- 1.3.2. In accordance with the requirements of the Environmental Assessment (Scotland) Act 2005, Transport Scotland has undertaken a Strategic Environmental Assessment (SEA) for the A9 between Perth and Inverness. Awarded to Halcrow in September 2012 and working with the key statutory bodies and a range of environmental stakeholders, this commission identified the key environmental and landscape issues along the A9 route and assessed the potential impacts associated with the wider A9 dualling programme. This commission also developed design principles for dealing with the key issues such as rock cutting, Natura sites, landscape characterisation and flood risk assessment.

A9 Dualling Preliminary Engineering Services (PES) - ongoing

- 1.3.3. Awarded to Jacobs in September 2012, this commission is working in parallel with the SEA to undertake engineering constraints mapping, route options work and other design strategies such as junction and access strategy, layby and rest area strategy and NMU strategies. Other workstreams are being undertaken to give a strong basis for future design work. These include Geotechnical Desk Study, Topographical Survey work, business case development, land referencing and stakeholder engagement.
- 1.3.4. The A9 Dualling programme also inherited 3 live schemes which were in various stages of development prior to the IIP announcement in 2011. These are detailed below.

A9 Luncarty to Pass of Birnam

1.3.5. Atkins undertook a Stage 2 Assessment of options for dualling the first section of S2 north of Perth in 2007/8. This work was to support the STPR process. Jacobs were commissioned in September 2012 to take the scheme forward with a view to achieving the Ministerial commitment of construction start in 2017.

A9 Birnam to Tay Crossing

1.3.6. URS are currently commissioned under the 2003/1 Multiple Framework Agreement to undertake Stage 2 assessment only for this scheme which is the second S2 section north of Perth and close to its proximity to the community of Dunkeld and Birnam. A range of options are currently being developed to try and establish the community's preferred approach. This contract will be subsumed into the main consultancy services once commissioned.

A9 Kincaig to Dalraddy

1.3.7. Awarded to Atkins Limited under the 2003/1 Multiple Framework Agreement, this is a development of previous WS2+1 options work to provide a dual carriageway scheme north of Kingussie. The previous WS2+1 scheme was successfully defended through Public Local Inquiry (PLI) and land acquired in 2010. Further land is now required to enable all accommodation and access matters to be addressed. There is a Ministerial commitment to start construction of this scheme in 2015/16 and the construction is anticipated to take 18 months. The assessment has therefore been based on an Opening Year of 2017 (Year 1).

1.3.8. The latter is the subject of this ES and is considered in more detail in the following section and subsequent ES chapters.

1.4. The A9 Dualling: Kincaig to Dalraddy Scheme

1.4.1. Transport Scotland has developed outline specimen design proposals to widen the A9 carriageway to dual carriageway standard over a 7.45 kilometre section of the route between Kincaig to Dalraddy, located approximately 11 kilometres south west of Aviemore near the village of Kincaig within the district of Badenoch and Strathspey between Ordnance Survey Grid references NH811037 and NH856095.

Figure 1. Proposed Scheme Location



1.5. Environmental Impact Assessment

- 1.5.1. Chapter 1 of the Highways Agency's (HA) Design Manual for Roads and Bridges (DMRB) Volume 11 Section 2, Part 1 (HA 201/08) considers the principles of and provides guidance for undertaking Environmental Impact Assessments (EIA) of road scheme projects. DMRB guidance is based upon the requirements of the European Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, as amended by EC Directive 91/11/EC⁴ and the Public Participation Directive 2003/35/EC; these are known collectively as the Environmental Impact Assessment Directive.
- 1.5.2. This has been transposed, in respect of strategic road projects into Scottish Law by Sections 20A and 55A of the Roads (Scotland) Act 1984 as amended by Part III of the Environmental Impact Assessment (Scotland) Regulations 1999 and the Environmental Impact Assessment (Scotland) Amendment Regulations 2011.
- 1.5.3. In determining whether the proposed Scheme is deemed a 'Relevant Project' for the purposes of the EIA Regulations, the focus is based on the question 'Is the project being considered likely to have a significant effect on the environment?'
- 1.5.4. The proposed Scheme is less than 10 kilometres in length and therefore not classified as an Annex I development, for which an Environmental Impact Assessment (EIA) is mandatory. However, the proposed Scheme is considered to be a 'relevant project' in Annex II as the footprint exceeds 1ha, and is located within a 'sensitive area', the Cairngorms National Park. The schemes' constraints are set out within Figure 2.2 in Volume 2 of this ES, which aided the record of determination. An EIA of the proposed Scheme has therefore been undertaken.

1.6. Purpose of the Environmental Statement

1.6.1. An ES is a document that has to contain information required by the relevant EIA Regulations.

1.6.2. The methods used in the preparation of this ES follow those set out in official guidance published within DMRB Volume 11 'Environmental Assessment'. The basic requirements of an ES are outlined in DMRB Volume 11 Section 2, Part 2 (HA 202/08) and set out as a mandatory requirement in DMRB Volume 11 Section 2 Part 6 (HD 48/08) paragraphs 3.2 to 3.4, as follows:

"An ES is the document that should contain information meeting the requirements of the EIA Directive as translated into UK law by the EIA Regulations.

The ES will identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11 of the Directive and the EIA Regulations, the significant environmental effects of the project on the factors mentioned in Article 3 of the EIA Directive. It will contain the information referred to in the EIA Regulations and Annex IV of the EIA Directive to the extent that the Secretary of State or equivalent considers that it is relevant to the specific characteristics of the project and of the environmental features likely to be affected by it; and that (having regard in particular to current knowledge and methods of assessment) the information may reasonably be gathered. As a minimum, an ES should contain the following:

- i. a description of the project (in accordance with the relevant EIA Regulations);*
- ii. a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse environmental effects;*
- iii. the data required to identify and assess the main effects which the project is likely to have on the environment;*
- iv. an outline of the main alternatives studied and an indication of the main reasons for the choice of project, taking into account the environmental effects; and*
- v. a non-technical summary of the information mentioned in paragraphs (i) to (iv) above.*

An ES should comprise two parts, of different levels of detail:

- i. The Statement - a comprehensive and concise document drawing together all the relevant information about the project; and*
- ii. A Non-Technical Summary (NTS) – a brief report summarising the principal sections of the Statement in non-technical language, in accordance with the specific requirements of the Overseeing Organisation. The NTS should be readily understandable by members of the public(...)The NTS should be bound into the Statement, but also be available as a free-standing document."*

1.7. Scope and Content of the Environmental Statement

- 1.7.1. The objectives of EIA are to identify the likely consequences for the biological, physical and geomorphological environment and for human beings arising from development and to consider these issues within the proposed Scheme's planning design process.
- 1.7.2. The EIA process has been undertaken as an integral part of the proposed Scheme's design and appraisal and follows a series of feasibility and comparative studies as recorded in greater detail in Chapter 2 of this ES. In this way, the EIA has been used as a means of informing the decision making process throughout the design, to mitigate where possible the potentially significant impacts of the proposed Scheme where practicable through introducing measures to avoid, reduce or remedy any predicted adverse environmental impacts.
- 1.7.3. This ES has been prepared to document the findings of the EIA, recording the predicted environmental impacts and offering integrated measures to mitigate any effects where possible. The purpose of this document is to ensure that the Scottish Ministers, statutory and non-statutory bodies with interest in the environment, and the public are fully informed of the proposals and that they are provided with the opportunity to comment on the environmental effects of the proposed Scheme.
- 1.7.4. Accordingly, the ES includes the following information:
- A description of the proposed Scheme, including information about its physical characteristics and its land use requirements during both construction and operation.;
 - A description of the nature and quantity of expected residues and emissions resulting from the operation of the proposed Scheme;
 - An outline of the main alternatives and the main reasons for the choices made, taking into account environmental effects;
 - A description of the aspects of the environment likely to be significantly affected by the proposed Scheme;
 - A description of the likely significant effects of the proposed Scheme on the environment, including direct and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the development arising from the existence of the proposed Scheme, the use of natural resources and its emissions, and a description of the forecasting methods used to assess the effects on the environment;
 - A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment;
 - A Non-Technical Summary (NTS) of the above information; and
 - An indication of any difficulties encountered in compiling the required information.

1.8. Draft Orders

- 1.8.1. This ES is published with the Draft Statutory Orders for the proposed Scheme. The Draft Statutory Orders consist of Road Orders and Compulsory Purchase Orders, and comprise plans with an accompanying schedule indicating the route plan and land requirements of the proposed Scheme.
- 1.8.2. These Draft Orders are:
- The A9 Trunk Road (Kincaig to Dalraddy)(Side Road) Order 20[]
 - The A9 Trunk Road (Kincaig to Dalraddy)(Compulsory Purchase) Order 20[]

1.9. The Assessment Team

- 1.9.1. The EIA was undertaken, managed and compiled into this ES on behalf of Transport Scotland by Atkins Limited in consultation with other organisations as necessary. In addition to experts specialising in the management of EIA, the team included specialist environmental scientists, traffic and transportation engineers, highway engineers, structural engineers, water quality experts, hydrologists, geologists, ecologists, landscape architects, archaeologists, air quality experts, acoustic specialists and town planners.

1.10. Report Structure

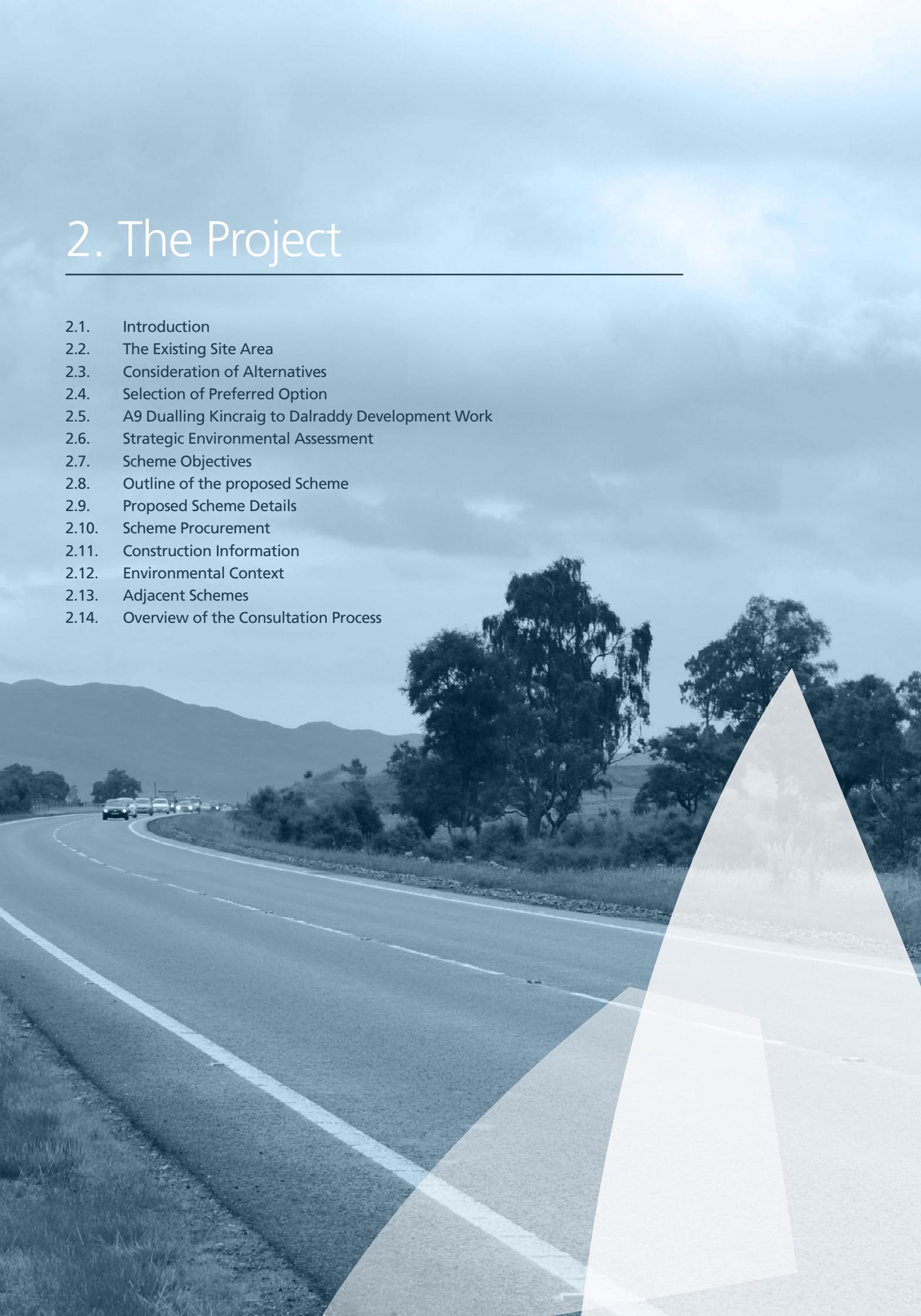
- 1.10.1. The complete Stage 3 Scheme Assessment Report for this project is divided up into two parts:
- Part 1 presents the ES and NTS; and
 - Part 2 presents all other aspects of the Assessment and is titled “Stage 3 Scheme Assessment Report, Part 2: Engineering Report”.
- 1.10.2. This ES is presented in three volumes, as follows:
- Volume One – main text report;
 - Volume Two – the ES Figures that support the main text; and
 - Volume Three – supporting appendices, which provide additional information in the form of technical data or detailed survey reports.
- 1.10.3. Volume One is divided into three parts. Each part is subdivided into sections and subsection as follows:
- Part One** – The Proposed Scheme, comprises two Chapters. Following Chapter 1, which incorporates this introduction, Chapter 2 describes the need for the proposed Scheme in terms of existing route and the associated traffic conditions and environment. It also presents the history of the proposed Scheme, including the consultation undertaken throughout the EIA process with key statutory and non-statutory consultees. The objectives of the proposed Scheme and proposed Scheme details and associated construction methods and the proposed Scheme programme are also outlined in Chapter 2.
- Part Two** – Environmental Impact Assessment, contains thirteen Chapters. Chapter 3 provides information on the general approach and methods of the assessment process. Chapters 4 to 16 present the results of the EIA for each environmental issue including materials and waste. Each Chapter is subdivided into a series of subsections on assessment methods, baseline conditions, consultation undertaken, assessment of predicted temporary and permanent impacts for Opening Year (Year 1), mitigation measures, assessment of predicted temporary and permanent impacts for the Design Year (Year 15), and assessment of cumulative impacts.
- Part Three** – Summary Tables, comprises Chapter 17, which presents a summary of the key findings of the EIA in the format of an Environmental Impacts Table for Opening Year 1 and Design Year 15; Chapter 18, which presents the Schedule of Environmental Commitments and a reference list.
- A Non Technical Summary, providing an outline of the proposals and highlighting the key impacts and mitigation measures in non-technical language is inserted into the inside front cover of this document and is available as a separate document.

1.11. Review and Comments

- 1.11.1. Copies of this ES, together with copies of the Draft Statutory Orders are made available for inspection during normal office hours at the following address:
- Transport Scotland
58 Port Dundas Road
Glasgow
G4 0HF**
- 1.11.2. Copies of the ES may be purchased (at a charge of £150.00 for a hard copy) and are also available in CD format (at a charge of £10.00) on application in writing to:
- Transport Scotland
58 Port Dundas Road
Glasgow
G4 0HF**
- 1.11.3. The NTS is available free of charge from the same address.
- 1.11.4. The ES, NTS and Draft Statutory Orders may also be viewed online at the following Transport Scotland web address <http://www.transportscotland.gov.uk/>
- 1.11.5. Following the publication of the Draft Statutory Orders and the ES, there will be a period of six weeks, during which representations may be made in writing to the Director of Trunk Roads: Infrastructure and Professional Services at Transport Scotland at the address above. The closing date for any such representations will be as specified in the Public Notice.

2. The Project

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2. The Project

2.1. Introduction

- 2.1.1. This Chapter provides a description of the existing route along with details of the proposed Scheme development history, including how detailed consideration has been given to the SEA described previously, which has been undertaken for the wider scheme. The Chapter goes on to provide an outline of the proposed Scheme including procurement details, construction information and environmental considerations as well as details about adjacent schemes and an overview of how inclusive consultation has informed the process.

2.2. The Existing Site Area

Locality and Topography

- 2.2.1. The proposed Scheme is located along 7.45 kilometres of the existing single carriageway A9 (Perth to Inverness) Trunk Road between Kincaig and Dalraddy, approximately 11 kilometres south west of Aviemore near the village of Kincaig between Ordnance Survey National Grid Reference NH81 1037 and NH856095.
- 2.2.2. The proposed Scheme is within the Cairngorms National Park, in the valley of the River Spey, where the topography consists of undulating hills with shallow dipping slopes. Along most of the route, land falls from east to west.
- 2.2.3. Near Loch Insh, the A9 runs parallel to the B9152 and the Perth to Inverness Railway Line, moving further away as the A9 continues north. East of the route is the small village of Kincaig, originally called Boat of Insh. Before the bridge was built in Kincaig, the Spey was crossed by ferry, at the north end of Loch Insh. Further north, the proposed Scheme passes the small community of Alvie to the east of the existing A9.
- 2.2.4. The community of Kincaig has close links to local industry (fishing, game, light industry and tourism). Along the route the existing A9 passes through two major estates, both of which are engaged in a variety of commercial interests ranging from mineral extraction and forestry, to hunting and fishing.
- 2.2.5. Kincaig and Alvie share community resources. The primary school is in Alvie and the community hall and library is in Kincaig. The villages also engage in the local tourism industry through various Bed and Breakfast, Guest Houses and Hotel businesses.

Existing Road Conditions

- 2.2.6. The section of the existing A9 between Kincaig and Dalraddy is partially in cutting on either side of the carriageway.
- 2.2.7. The existing A9 is a single carriageway road which is approximately 7.3 metres wide with 0.6 to 0.7 metres wide hardstrips. Grass verges which are generally around 3-4 metres wide are present on both sides of the road. The road alignment is generally straight with standard geometry and good visibility.
- 2.2.8. The 7.45 kilometre section of A9 trunk road from the Loch Insh tie-in and Dalraddy access shows an undulating profile along the scheme extents. The maximum gradient is near the middle of the scheme (1.8% at approximate Chainage 3800 metres) and the highest point is 245 metres AoD at approximately Chainage 2580 metres. The minimum level of 221 metres AoD is reached at approximate Chainage 6700 metres. The areas adjacent to the A9 mainly consist of farmland currently used for pasture with vegetation cover typically consisting of grass. There are occasional small areas of evergreen plantations adjacent to the A9. Some of the existing embankment and cutting slopes are covered with grass and a thick covering of small and medium sized conifers.

Side Roads and Private Accesses

- 2.2.9. There are several access tracks which are accessible from the A9. Five tracks link directly to the A9 from Dunachton Estates and seven tracks link directly to the A9 from Alvie Estates. These access points were constructed when the A9 was upgraded in the late 1970's and early 1980's. The intention was to provide for occasional access and gates were provided to prohibit unsolicited use of the tracks from the A9. Currently most of the gates are either left open or have been removed. Local residents and the estates are known to make use of these access tracks to gain access to the trunk road or the villages of Kincaig and Alvie.
- 2.2.10. There are four accommodation underpasses within the proposed Scheme extents. The southern underpasses (referred to as Dunachton Burn Underpass) and Baldow Smiddy Underpass) serve Dunachton Estate. The northern underpasses (referred to as Lower Milehead Underpass and Allt an Fhearna Underpass) serve Alvie and Dalraddy Estates. There are no direct public accesses to Kincaig, however a total of eight private accesses belonging to the above estates link the trunk road to the B9152.

Watercourses

- 2.2.11. The proposed Scheme intercepts three main watercourses: Dunachton Burn; Leault Burn; and Allt an Fhearna. Dunachton Burn outfalls into Loch Insh, Leault Burn outfalls directly into the River Spey and Allt an Fhearna outfalls directly to Loch Alvie. The River Spey is classified as a Special Area of Conservation (SAC) for its internationally important populations of Atlantic salmon, freshwater pearl mussel, otter and sea lamprey⁵. However, there are no special protection measures, such as, oil/petrol interceptors or retention ponds incorporated into the existing drainage network. There is no evidence of pollution prevention measures installed at the existing discharge points.

Surface Water

- 2.2.12. Surface water can be contaminated with silt, heavy metals, chemicals and oil which can be damaging to watercourses and groundwater. In many cases, it will require treatment by controlling the pollution at its source or just before the discharge point. In areas where there is a high risk of oil pollution, there may be risk of pollution. The section of A9 does not currently incorporate a Sustainable Urban Drainage System (SuDS) to accommodate the treatment of roadside surface waters as existing drainage outfalls discharge directly with little or no attenuation or treatment to land or to the small watercourses that ultimately flow into the River Spey. It is likely that groundwater is present at shallow depth below the original ground level within any drift deposits and within fractured rock. Perched water may be present within sand lenses in the glacial till and in the overlying fluvioglacial materials. The groundwater table is expected to be parallel to the natural slope of the site falling towards the river, however, the groundwater regime at the site will require confirmation as part of the proposed ground investigation.

Lay-bys

- 2.2.13. There are eight lay-by areas, four on the northbound carriageway and four on the southbound carriageway.

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<http://www.hie.co.uk/mbse/riverspey.htm> and <http://www.jncc.gov.uk/>.

Structures

- 2.2.14. Within the proposed Scheme extents there are two underpasses, two combined culvert and underpass and one significant culvert. Two of the underpasses (Baldow Smiddy underpass and Lower Milehead underpass) consist of limited headroom "Armco" corrugated steel structures while Dunachton Burn and Allt an Fhearna combined culvert and underpasses are single span concrete structures. The combined culvert and underpass at Dunachton Burn incorporates a fish ladder. The culvert at Leault Burn is also an "Armco" corrugated steel structure which incorporates a small ledge for passage of livestock. Minor small diameter piped culvert structures at Baldow Smiddy, Lower Milehead and Dalraddy cross under the existing carriageway.

Safety Fencing

- 2.2.15. Safety fencing is present in the verges generally to protect vehicles from roadside hazards, predominantly large signs and culvert structures.

2.3. Consideration of Alternatives

Scheme Development History

- 2.3.1. Between 1995 and 1997, the A9 Route Action Plan study (RAP)⁶ was undertaken by Scott Wilson Kirkpatrick Ltd to assess the A9 trunk road between Perth and Inverness. The main objectives of this study were to examine conditions on the route and to suggest improvements to the level of service to road users, provide further safe overtaking opportunities and to help reduce the number of road traffic accidents on this section of the A9. This culminated in the A9 Route Strategy, which recommended a series of improvement schemes including a scheme for carriageway widening between Kincaig and Dalraddy.
- 2.3.2. In November 2003, the Scottish Executive commissioned Atkins Ltd to review previous work undertaken in the Route Strategy for the A9 and identify the optimum means of improving carriageway standards and overtaking opportunities between Kincaig and Dalraddy.
- 2.3.3. This commission commenced with a STAG Part 1 Appraisal which reviewed the following 3 options in the vicinity of Kincaig:
- Option 1 – 4.0 kilometres of Carriageway Widening (WS2+1) – Guaranteed Overtaking for approximately 2.0 kilometres in each direction through introduction of dedicated overtaking lanes;
 - Option 2 – 4.0 kilometres of Carriageway Widening (WS2) – Improved opportunistic overtaking through widening of the carriageway to 5.0 metres wide lanes in each direction; and
 - Option 3 – 4.0 kilometres of Dual Carriageway Widening (D2AP) to provide guaranteed overtaking for approximately 4 kilometres in each direction.
- 2.3.4. The STAG appraisal recommended that Options 1 and 3 above were developed further through DMRB Stage 2 Scheme Assessment Reporting.

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Route Action Plans Final Report, Scott Wilson, 2007

- 2.3.5. The DMRB Stage 2 assessment completed in April 2006, considered 6 options as follows:
- Option 1 (Widening to Overtaking Lane). Improving the existing road by the introduction of two overtaking lanes one northbound one southbound;
 - Options 2, 3, 4 and 5 (Widening to WS2+1). Improving the existing road by the introduction of WS2+1 standards of differing lengths and various layouts; and
 - Option 6 (Widening to Dual Carriageway). The construction of a new southbound carriageway and the retention of the existing single carriageway for use of the northbound carriageway. Existing pavement and associated features would be reconstructed as part of this scheme.
- 2.3.6. The above options were also informed by development of various junction sub-options.
- 2.3.7. Following the completion of the Stage 2 Assessment, and on the basis of providing localised, discrete overtaking opportunities along the route, the preferred route was confirmed at a Transport Scotland Investors Decision Makers (IDM) meeting on 5th April 2006 where the investors were presented with all the options studied at Stage 2. The meeting identified Option 3 as the preferred option on the basis of design, value for money, integration into the existing trunk road network and its ability to reduce the platoon effect of slow moving vehicles. Therefore Option 3 was taken forward to the Stage 3 Assessment as the preferred route subject to a decision not to add more direct accesses to the A9 trunk Road
- 2.3.8. This option was subsequently developed in line with DMRB Stage 3 reporting and Draft Statutory Orders and an Environmental Statement were published in 2007.
- 2.3.9. In early 2009 a Public Local Inquiry took place following a number of objections to the Draft Statutory Orders and Environmental Statement. The Scottish Ministers confirmed that the scheme should proceed. Orders for the scheme were subsequently made in 2009 and land was vested in the same year. In the light of the Scottish Government's commitment to dual the A9 trunk road between Perth and Inverness, the WS2+1 scheme did not proceed to construction.
- 2.3.10. In December 2011, the Scottish Government published its Infrastructure and Investment Plan (IIP)⁷ which detailed spending up to 2030. The IIP explains the Government's intention to invest in new roads to target additional infrastructure where this addresses key challenges. The proposed dualling of the route between Perth and Inverness by 2025 is identified as a key project within the investment pipeline, with a phased programme of schemes from 2017 onwards.
- 2.3.11. The "A9 Dualling: Kinraig to Dalraddy" scheme will form the first of the proposed A9 Dualling schemes to be examined and assessed in advance of the wider route principles being established.

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<http://www.scotland.gov.uk/Publications/2011/12/05141922/0>

2.4. Selection of Preferred Option

- 2.4.1. As part of the DMRB Stage 2 Assessment, a Dual Carriageway Option was considered alongside a number of Wide Single (WS) and WS2+1 options.
- 2.4.2. In 2006 a WS2+1 option was selected as the preferred option in the context of a scheme that provided discrete, short sections of improved overtaking for the route at the time of assessment.
- 2.4.3. In the light of the Scottish Government's commitment to dual the A9 trunk road between Perth and Inverness the DMRB Stage 2 Dual Carriageway Option has been refined and developed at Stage 3 to form the proposed Scheme considered by this ES, with the following changes noted:
- 2.4.4. Route strategy is to provide a Category 7A route as defined by DMRB, Volume 6, Part 1 (TD9/93).
- 2.4.5. As a result of consultation with estate landowners, to ensure that all accommodation and access matters were addressed for those affected, the proposed Scheme was lengthened from approximately 4.0 kilometres to 7.45 kilometres to enable appropriate access provision. It seeks to address all accommodation and access matters for affected landowners within the extents of the proposed Scheme.
- 2.4.6. A Grade separated Junction at Baldow Smiddy was discounted following consultation with The Highland Council (THC).
- 2.4.7. Extension of the southern section of the proposed Scheme has been undertaken with reference to the carriageway widening options developed at DMRB Stage 2 and as a result of localised constraints associated with provision of access to Dunachton Estate.
- 2.4.8. Extended widening of the northern section of the proposed Scheme has been undertaken to enable junction access provision to Alvie and Dalraddy Estates to be provided within the extents of this proposed Scheme.
- 2.4.9. Under current standards, the proposed Scheme is too close to the existing WS2+1 overtaking lane at Loch Insh. Once the proposed Scheme is implemented, the existing WS2+1 section will therefore require to be reduced back to S2 single carriageway as an interim intervention until such time as A9 dualling is provided immediately south of the proposed Scheme.
- 2.4.10. A left in left out junction from the northbound carriageway is to be provided at Leault Farm access as a result of consultation with the landowner to ensure appropriate access to Dunachton estate is achieved. Connection to new underpasses will minimise impacts on various businesses operating from the estate.
- 2.4.11. A left in left out junction from the northbound carriageway is to be provided for Easter Delfour Quarry and other estate businesses as a result of consultation with the landowner to ensure appropriate access to Alvie and Dalraddy estates is achieved. Connection to new underpasses will minimise impacts on various businesses operating from the estate.
- 2.4.12. During development of the proposed Scheme, in July 2013 the Cairngorms National Park Authority identified the need to provide and enhance non-motorised user facilities as part of the wider A9 dualling. While National Cycle Network Route 7 is not affected by the proposed Scheme, the need to connect communities as part of trunk road improvements, namely Kingussie, Kincaig and Aviemore was identified in the context of the wider A9 dualling programme. In line with the Cycling Action Plan for Scotland 2013, which specifically references the A9 dualling commitment, a non-motorised user route has been included in the scheme parallel to the northbound carriageway of the proposed Scheme. This will connect to the existing access to the Highland Wildlife park, the access at Baldow Smiddy (for Kincaig) and to access tracks in the vicinity of Allt An Fhearna. In the context of the wider A9 dualling commitment this will be the first section of this route to connect the communities identified above, with further sections requiring to be considered when adjacent schemes are developed.

2.5. A9 Dualling Kincaig to Dalraddy Development Work

- 2.5.1. As noted for the 1.8 kilometres of the southern extension, widening has been undertaken to the west of the existing A9 due to a number of constraints to the east: the proximity of the B9152 side road which runs parallel and railway line beyond; and properties immediately to the east of the existing A9. Widening to the west through this section is also able to take advantage of existing wide verges to minimise the overall footprint and land-take through this area.
- 2.5.2. With respect to the extended northern section, widening to the east of the A9 Trunk Road between Leault Farm and the northern proposed Scheme extents is a direct development of the Dual Carriageway scheme included in the DMRB Stage 2 Route Options Study undertaken in 2006. In particular, as a result of a number of constraints as outlined in paragraph 2.2 above, it is acknowledged that widening to the east does stray into the margins of the Loch Alvie SSSI, however it was decided that there was no value in having another crossover to the west side of the A9 beyond the Stage 2 extents from a disruption due to construction perspective.
- 2.5.3. The route of the Leault Burn to the west of the A9 runs parallel to the existing A9 for approximately 180 metres and prohibits carriageway widening to the west without significant re-routing of this watercourse which, is to be avoided. From Baldow Smiddy, extending north for approximately 550 metres, there is an adjacent and parallel watercourse immediately to the west of the existing A9. Furthermore known existing ground conditions prohibit widening to the west, for instance there is an area of swamp immediately adjacent to Lower Milehead Underpass which would give rise to difficult ground conditions if widening to the west. Additionally in the vicinity of Jock of the Loch (located within Alvie and Dalraddy estates) there is an area of Dry Modified Bog which would give rise to difficult ground conditions if widening in this direction were to occur.

2.6. Strategic Environmental Assessment

- 2.6.1. As detailed in Chapter 1, as a result of the Scottish Governments commitment to dual the A9 trunk road between Perth and Inverness, in 2012, Transport Scotland commissioned Halcrow to undertake a Strategic Environmental Assessment (SEA) for the A9 Trunk Road between the two cities.
- 2.6.2. The purpose of the SEA is to identify route wide environmental constraints and opportunities and carry out a high level strategic assessment to provide recommendations and guidance for specific studies and later design and assessment stages. The findings from the SEA were published in June 2013 within the SEA Environmental Report and the proposed Scheme has been developed in line with the findings of this report and as agreed with key stakeholders to achieve route consistency.
- 2.6.3. This proposed Scheme has been developed and refined through consultation with Transport Scotland, Halcrow, Jacobs and statutory consultees, to ensure that the EIA for this proposed Scheme has taken cognisance of the findings of the route-wide SEA and associated workstreams. These considerations are referred to in the relevant specialist chapters as appropriate.

2.7. Scheme Objectives

National Objectives

2.7.1. This section discusses the environmental and planning aspects which have been reflected in both the overall development policy and objectives and in the proposed Scheme specific objectives as set out below.

2.7.2. At the national level, the Scottish Government's STPR outlines the national strategic objectives.

2.7.3. At Perth to Inverness corridor level, the following STPR Perth to Inverness objectives apply:

- To reduce journey time and increase opportunities to travel between Inverness and Perth;
- To improve the operational effectiveness of the A9 as it approaches Perth and Inverness;
- To address issues of driver frustration relating to inconsistent road standard with attention to reducing accident severity; and
- To promote journey time reductions, particularly by public transport, between the central belt and Inverness, primarily to allow business to achieve an effective working day when travelling between these centres.

A9 Dualling Programme Objectives

2.7.4. At A9, Perth to Inverness level, the following A9 dualling programme objectives apply:

- To improve the operational performance of the A9 by;
 - Reducing journey times;
 - Improving journey time reliability;
 - To improve safety for motorised and non-motorised users by:
 - Reducing accident severity
 - Reducing driver stress
 - Facilitate active travel in the corridor; and,
 - To improve integration with public transport facilities.

A9 Dualling Kintraig to Dalraddy – The proposed Scheme

2.7.5. Objectives at project level have been set to align with the strategic objectives above, but also to take into account the local level constraints and needs.

Stage 2 Objectives:

2.7.6. Objectives developed prior to STPR publication at Stage 2 DMRB assessment identified that the outcome of the scheme development must satisfy the following STAG objectives:

- **Protect the Environment**
To minimise the environmental impact of the trunk road wherever practicable.

- **Enhance Safety**

Improve and increase the number of overtaking opportunities to eradicate the conflicts between long distance users and local/agricultural traffic.

Improve the operational performance and level of service and road safety on the A9 by reducing the effects of driver stress and journey times.

- **Assist Economic Growth**

- Maintain the asset value of the A9 and achieve good value for money for both tax payers and transport users.

- **Improve Accessibility**

- To provide safe and appropriate access across and along the trunk road for motorised and non-motorised users.

- **Integrate Transport**

Work with local planning strategies as part of an integrated and sustainable transport strategy for Scotland.

Stage 3 Objectives

2.7.7.

In order to provide measureable objectives for the proposed Scheme, those from previous Stages have been refined to align with STPR, as set out below.:

- i. To improve the operational performance of the A9 by:
 - Reducing journey times; and
 - Improving journey time reliability.
- ii. To improve safety for motorised and non-motorised users by:
 - Reducing accident severity;
 - Reducing driver stress;
 - Rationalising direct access on to the trunk road; and
 - Enhance safe access across the trunk road for local motorised and non-motorised users through segregation from trunk road traffic.
- iii. Facilitate active travel in the corridor; and,
- iv. Locally mitigate the environmental impact of the scheme in keeping with the wider route strategy and landscape character of the Cairngorms National Park.

2.8.

Outline of the proposed Scheme

2.8.1.

The proposed Scheme layout is shown on Figure 2.1 in Volume 2 of the ES. The proposed Scheme consists of 7.45 kilometres of online widening to the existing single carriageway (S2) to provide guaranteed overtaking opportunities by means of constructing a parallel carriageway such that a full dual all purpose carriageway (D2AP) is provided. Over the length of the new dual carriageway there will be an increase in speed limit, to national speed limit for a rural dual carriageway.

2.9. Proposed Scheme Details

Mainline

- 2.9.1. The proposed Scheme will provide two 7.3 metre carriageways with 1 metre hard strips, 2.5 metre verges and a 2.5 metre central reserve with local widening to achieve sight distance where required. In addition a 2.0 metre wide Non-Motorised User facility is provided adjacent to the northbound carriageway, with an associated 1.5 metre verge between this facility and the proposed Scheme earthworks. Figure 2.3 in Volume 2 of the ES shows the typical cross section dimensions of the proposed Scheme.
- 2.9.2. The proposed Scheme can be divided into three discrete sections: the southernmost section being widening to the west of the existing A9 to form the new northbound carriageway; a short section where changeover takes place; and for the northern most part of the proposed Scheme widening to the east of the existing A9 to form the new southbound carriageway. Refer to Figure 2.1 (Proposed Scheme Layout) in Volume 2 of the ES.
- 2.9.3. The mainline Chainage runs from south west to north east and commences on the existing A9 approximately 20 metres north of the existing underpass structure that provides access beneath the A9 trunk road to the Highland Wildlife Park from the adjacent B9152 side road.
- 2.9.4. Travelling northbound from the southern tie-in, carriageway widening tapers are introduced to create the additional width required to achieve the minimum cross sectional requirements of a D2AP road layout. Subsequently, a central reserve median is introduced to ensure separation of both carriageways for vehicles travelling in opposite directions. Widening is entirely parallel and to the west of the existing carriageway for up to Chainage 1800 metres. The widening therefore provides the new northbound carriageway in this location with the footprint of the existing carriageway being used for the new southbound carriageway provided by the proposed Scheme.
- 2.9.5. From Chainage 1800 to 2300 metres, the proposed Scheme then crosses over the existing carriageway.
- 2.9.6. From Chainage 2300 to 7450 metres, the proposed Scheme is provided by widening entirely to the east of the existing carriageway. The widening therefore provides the new southbound carriageway through this section with the footprint of the existing carriageway being used for the new northbound carriageway provided by the proposed Scheme.

Accesses

- 2.9.7. An existing access to Leault Farm located to the west of the A9 trunk road will be upgraded to a DMRB compliant left in left out junction from the northbound carriageway at Chainage 2340 metres to ensure appropriate access to Dunachton Estate.
- 2.9.8. A new access to Easter Delfour located to the west of the A9 trunk road will be provided in accordance with DMRB standards for a left in left out access from the northbound carriageway at Chainage 6115 metres to ensure appropriate access to Alvie and Dalraddy estates.
- 2.9.9. All other direct accesses to the A9 will be stopped up under the Draft Statutory Orders with alternative access provided via the upgraded underpasses as outlined below.

Lay-bys

2.9.10. There are eight existing substandard lay-bys which will be removed as part of the proposed Scheme. The location of new lay-bys has been determined by the proposed mainline geometry and proximity to junctions and with attention to the emerging PES layby and rest area strategy. In recognition of the loss of some existing parking provision the new lay-bys will be to the maximum DMRB size of 100 metre length parking bays. The following DMRB compliant lay-bys will be provided as replacement at the following locations:

- Southbound – Chainage (approximately 200 metres north of the Leault access); and
- Southbound – Chainage (approximately 700 metres north of Lower Milehead).

Proposed Embankments

2.9.11. The proposed Scheme is predominantly in cutting. However, at underpass locations where the existing carriageway emerges on embankment, these embankments will be extended to accommodate the dual carriageway widening.

Structures

2.9.12. The following key existing structures will be replaced with upgraded structures at the following locations:

- Dunachton Underpass/Watercourse (Chainage 1660 metres);
- Leault Burn Watercourse (Chainage 3090 metres);
- Baldow Smiddy Underpass/Watercourse (Chainage 3540 metres);
- Lower Milehead Underpass (Chainage 4460 metres); and
- Allt an Fhearna Underpass/Watercourse (Chainage 7050 metres).

2.10. Scheme Procurement

2.10.1. The method of procurement for construction of the proposed Scheme has not yet been determined. However, it is anticipated that construction is likely to be procured by means of a Design and Build Contract.

2.10.2. As well as being responsible for the design and construction of the proposed Scheme, the chosen Contractor would also usually be responsible for a 5 year maintenance period, during which any defects are corrected under the contract.

2.10.3. A specimen (outline) design has been prepared, which the Contractor will optimise as the detailed design is developed. Such optimisation shall be within the constraints imposed by the parameters of this ES, including the Schedule of Commitments, Draft Statutory Orders and any specific limits set within the contract documents.

2.10.4. Effective site supervision will ensure that the design, including environmental mitigation measures, will meet the proposed Scheme objectives and comply with contract requirements.

2.11. Construction Information

Construction Programme

- 2.11.1. The construction of the proposed Scheme, subject to satisfactory progression of the statutory process is currently programmed to commence in early 2016, with the construction period expected to be approximately 18 months in duration.

Construction Methods

- 2.11.2. Construction of the proposed Scheme will involve the following components of work:

- Advance works;
- Temporary works, such as drainage control;
- Temporary compounds and storage areas;
- Site Clearance including demolition of structures;
- Temporary traffic management;
- Permanent drainage including SuDS;
- Construction of earthworks;
- Construction of road pavement;
- Construction of underpass and culvert structures;
- Environmental mitigation; and
- Post construction maintenance and management.

Advance Works

- 2.11.3. To reduce complexity and facilitate the programming of the main construction works, there may be an opportunity to undertake advance works to divert existing services. Statutory Undertakers (i.e. Public Utilities) will be consulted regarding any such works.

- 2.11.4. British Telecom, Scottish and Southern Energy and Scottish Water have apparatus within the existing road boundary and will be affected by the proposed Scheme. Diversion work may be carried out using the Undertakers' own access rights (wayleaves) or where this is not appropriate, land will be acquired by temporary servitude to ensure these works can be completed.

Temporary Works

- 2.11.5. To control run-off and prevent pollution of watercourses, temporary drainage is likely to be required prior to the construction of the permanent drainage system, particularly during earthworks operations. Any restrictions on the location and design of drainage control will be specified within the construction contract and the Contractor will be required to liaise with the Scottish Environment Protection Agency (SEPA) to obtain the necessary licences where applicable. The Engineer for the works will monitor the compliance with the contract requirements on site.

- 2.11.6. There may be a requirement for the construction of sections of temporary carriageway in order to maintain traffic flows during construction for example at the locations of the underpasses/culverts whilst the structures are being extended.

Temporary Compounds and Storage Areas

- 2.11.7. The Contractors' site offices, compounds and storage areas will be established at appropriate locations in the vicinity of the construction activities and adjacent to the main works site. The exact location(s) for these has not been determined nor assessed as part of this ES as these will be considered by the Contractor at a later stage, within the restrictions imposed by the Contract and this ES.
- 2.11.8. Contract restrictions will ensure that the compounds are sited appropriately; away from watercourses and sensitive locations identified in this ES to ensure that no permanent environmental impacts occur.
- 2.11.9. Where areas for compounds are identified and agreed, topsoil will be stripped and the area covered with placed and compacted granular material to establish an area of hard-standing to accommodate the offices, car parks and welfare facilities. Main compounds will generally require connections to mains water, foul water, and electricity and telecommunications networks.
- 2.11.10. The Contract will require that all compound areas are re-instated to the satisfaction of the affected landowner and within any restrictions imposed by this ES.

Site Clearance

- 2.11.11. Prior to any work starting on site existing environmental features to be retained will be identified on site and protected e.g. existing vegetation, stone walls etc. Any ecological mitigation work required to be implemented in advance of site works e.g. translocation of wood ant nests will be carried out under ecological supervision prior to site clearance. Tree protection fencing will be erected prior to the start of works and maintained in place for the duration of the construction period.
- 2.11.12. Prior to construction commencing in any particular area, clearance of the site will include:
- Demolition of structures as necessary;
 - Felling of trees and removal of other vegetations as specified; and
 - Removal of road furniture such as signs.
- 2.11.13. Plant for such operations may include dozers, tracked and rubber wheeled excavators and dump trucks or road wagons for removal of cleared materials.
- 2.11.14. It is intended that materials will be re-used where possible, but where this cannot be achieved materials will be removed from site to licensed landfill. The Contractor shall be responsible for the disposal of material and for obtain any licenses as appropriate.

Temporary Traffic Management

- 2.11.15. The proposed Scheme has been developed to provide widening and new carriageway parallel to existing where possible in order to minimise the impacts of temporary traffic management on the A9 trunk road and surrounding area.
- 2.11.16. During construction there will be a requirement for temporary traffic management in order to provide safe working areas for construction plant and operatives while maintaining traffic flows on the A9 trunk road. To minimise accidents and safeguard health, reduced speed limits will be implemented during construction for the protection of the workforce and travelling public. Temporary barriers will also be implemented where appropriate to further safeguard workers and the travelling public during construction.

2.11.17. The contract will contain specific restrictions regarding traffic management and routing of vehicles to and from the site. The Contractor shall be responsible for preparing his own programme for the construction works which will require approval by the Engineer on site. This programme will be required to take account of any restrictions contained in the contract.

2.11.18. The contract will include penalties and or incentives to ensure that one lane of traffic is maintained in each direction as far as is reasonably practical.

Control of Site Drainage during Construction

2.11.19. Control of site drainage during construction has been covered within Chapter 6: Disruption due to Construction and Chapter 13 Road Drainage and the Water Environment.

2.11.20. The Contractor will be required to consult and comply with the requirements of SEPA when planning and implementing construction. It is anticipated that the Contractor will adopt recognised and established construction practices including storage and attenuation, to avoid impacts on watercourses during construction. The contract will require that this is detailed in the Contractor's Construction Environmental Management Plan (CEMP).

Permanent Drainage

2.11.21. The nature of existing watercourses, flooding and drainage outfall locations is described within Chapter 13 of this ES and accompanying Flood Risk Assessment (FRA) (Appendix 17 in Volume 3 of this ES).

2.11.22. The overall drainage strategy for the proposed Scheme has been developed in accordance with the requirements of the DMRB, SuDS and through consultation with SEPA.

2.11.23. The primary function of the road drainage is to ensure that the carriageway and associated infrastructure drains effectively. The key objective being to ensure that surface run-off is controlled and treated as near to source as possible to protect downstream habitats without polluting the local environment.

2.11.24. Construction of the permanent drainage will require excavation of trenches and installation of filter drains as well as earthworks associated with SuDS features including swales and attenuation ponds.

Construction of Earthworks

2.11.25. The construction of earthworks will involve the creation of embankments and cuttings along the route using a variety of heavy plant and machinery. All acceptable excavated material is likely to be re-used. However, at this stage an overall surplus of excavated material has been identified. This is discussed in greater detail in Chapter 15 with respect to Materials and Waste.

Construction of Road Pavements

2.11.26. Construction of the road pavement will involve importing sub-base (crushed stone material forming the lower layer of the pavement) or bituminous materials to the site from quarries or bitumen plants. Where possible, the contract will include for the requirement to recycle existing road pavement materials into the new road pavement layers. This is discussed in greater detail in Chapter 15 with respect to Materials and Waste.

2.11.27. Pavement finishes include features such as road markings, signs, safety barriers, and other ancillary works. New signing will generally be limited to warning signs, regulatory signs and information signs associated with accesses, lay-bys and the end of the dual carriageway where it reduces back to single carriageway (S2) cross section. The proposed Scheme does not include any large Advance Directional Signs (ADS) or route confirmatory signs.

2.11.28. The existing A9 in this location is unlit and it is not proposed that the carriageway, underpasses or signs are lit for the proposed Scheme.

Construction of Underpass and Culvert Structures

2.11.29. The proposed Scheme includes the replacement and upgrading of four existing underpasses and one existing culvert. Construction of these will require careful planning with respect to traffic management as existing structures need first to be removed before construction of the new structures can commence.

2.11.30. All structures are likely to be reinforced concrete structures with spans ranging from 2 metres up to 10 metres. Where possible and as agreed with landowners, headroom for underpasses shall be maximised to minimise any restrictions on large vehicles negotiating the new underpasses, which will be a significant improvement to headroom at both the Baldow Smiddy and Lower Milehead Underpasses.

Landscaping and Planting

2.11.31. As some landscape planting along the road will be lost through construction work, new planting will be undertaken as part of the proposed Scheme. New landscape planting will be aimed at minimising negative visual and landscape impacts resulting from the proposed Scheme on road users and surrounding properties. Planting will use native species as appropriate and details of all landscape mitigation measures are given in Section 11 Landscape and Visual Effects.

2.11.32. Following construction, the Contractor will be required to manage and maintain all landscaping for a period of five years.

Post Construction Maintenance

2.11.33. Following completion of the proposed Scheme, the Contractor will be required to carry out defect and maintenance works for a prescribed period. After this time, responsibility for maintenance will revert to the operating company under their trunk road maintenance contract with Transport Scotland.

Construction Activities and Control

2.11.34. The environmental performance of the Contractor throughout the works would be defined and controlled through a CEMP and Site Waste Management Plan (SWMP), both to be prepared by the Contractor.

2.11.35. This will be in compliance with current legislation and regulations and industry best practice. This plan will be approved by the Client before the works commence.

2.11.36. The underlying strategy is to retain on site materials arising from the excavation where possible, reduce construction waste and minimise materials needing to be brought onto site through a combination of good design and industry construction best practice, reuse felled tree and other vegetation for ecological improvement or as part of the landscape scheme, and manage construction traffic movement.

Hours of Work

- 2.11.37. It has been assumed for this EIA that regular construction activities will be undertaken during daytime periods of 7.00am to 7.00pm Monday to Friday and 7.00am to 1.00pm on Saturday. The Contractor will at no time work on a Sunday or public holiday.
- 2.11.38. For works immediately adjacent to Alvie Primary School, the appointed Contractor will be required to liaise with The Highland Council (THC): In general, work will not take place during school operational hours.
- 2.11.39. Prior agreement would be required to obtain permission in advance from the Engineer and THC's Protective Service Department if it is found necessary to work outwith the hours outlined above.

Control of Dust

- 2.11.40. To minimise the risk of causing a statutory nuisance, recommendations are made within Chapter 4 Air Quality to ensure that the chosen Contractor adopts best practicable means (BPM) in controlling dust emissions during construction activities.

Control of Noise

- 2.11.41. In addition to the assumed limitations on hours of work above, the Contractor will be required to comply with the contents and recommendations of BS 5228: "Code of Practice for Noise Control on Construction and Open Sites", together with the site specific restrictions included in the contract as necessary and agreed with THC.
- 2.11.42. The Contractor will also be required to confirm consent from the Engineer for the use of all types of constructional plant used on the basis that this shall be the quietest of its type practical for carrying the work required and that it is maintained in good condition with regard to minimising noise output in accordance with the methodology of BS 5228⁸.

2.12. Environmental Context

- 2.12.1. The previous studies referred to in Section 2.2 above indicated a number of constraints and potential effects which would apply to the development of dualling proposals at Kincaig.
- 2.12.2. The main environmental considerations identified from these previous studies, which informed the decision making process and evolution of the design, are listed in Table 2.1.

Table 2.1 Environmental Considerations

Environmental Criteria	Definition
Air Quality	There are 27 residential properties and Alvie School within 200 metres of the proposed Scheme.
Cultural Heritage	There are two Scheduled Ancient Monuments in the study area and eight listed buildings or structures. Several known archaeological sites were identified within the study area. The landscape of the existing highway corridor is a 'modern' creation; 20th Century in date.
Ecology and Nature Conservation	The proposed Scheme is situated within the Cairngorms National Park. Habitat loss to semi-natural ancient woodland containing regionally important colony of hairy wood ants, located in the proposed Scheme boundary. Potential for a reduction in water quality during construction or from a major spillage during operation, which may affect River Spey Special Area of Conservation (SAC). Potential increase in otter road casualty during construction due to temporary disturbance on watercourses from culvert extension works (Leault Burn and unnamed issue at Baldow Smiddy). Direct impacts on possible protected or notable species including bats and reptiles. Proximity of Insh Marshes SSSI, which is also in part a SAC, a Special Protection Area (SPA) and a Ramsar Site. Potential increase in the severance of wildlife corridors.
Landscape and Visual	The detailed landscape character areas for the proposed Scheme contain landscape relevant designated sites and therefore have a high sensitivity to change. The study area is within The Cairngorms National Park and also includes a National Scenic Area and the River Speyside Tree Preservation Order. Receptors within the study area include listed properties.
Land Use	Land take from Estates. Temporary disruption to accesses. Loss of timber trees.
Traffic Vibration and Noise	There are an estimated 170 residential properties and 11 non-residential including two open areas within 600 metres of the proposed Scheme. However, it is possible that some properties identified as residential are holiday lets or other commercial properties

Environmental Criteria	Definition
Pedestrians, Cyclists Equestrians and Community Effects	<p>The National Cycle Network (NCN) 7 is located approximately 2 kilometres east of the A9. There are no other formal Public Rights Of Ways (PROWs) within the study area.</p> <p>Pedestrians utilise a number of existing underpasses in order to cross the A9. There are a number of locations where at grade crossings of the carriageway by Non-Moterised Users (NEMU) are understood to take place. Tourist attractions in the study area are The Highland Wildlife Park and Leault Working Sheepdog Trials Therefore the proposed Scheme has the potential to cause:</p> <ul style="list-style-type: none"> • Potential for changes in journey lengths and times; • Possible effect on the amenity value of journeys as a consequence of the proposed Scheme; and • Community severance from existing facilities.
Vehicle Travellers	<p>The pattern of traffic using this section of the A9 can result in platoons of traffic building up over the day.</p> <p>Drivers Stress can be impacted upon by road layout, geometry, speed etc.</p> <p>Removal of roadside vegetation and the widening of the A9 will increase the scale of the road and increase its impacts on the road user</p>
Road Drainage and the Water Environment	<p>The environmentally sensitive and ecologically important River Spey, Loch Insh and Loch Alvie lie within close proximity of the proposed Scheme.</p> <p>Potential for water drainage and pollution problems during construction as well as after completion.</p> <p>River Spey and its tributaries are an important and sensitive fishery and wildlife habitat with SAC status.</p> <p>The water quality classification of the River Spey is A1 (excellent).</p> <p>The proposed Scheme has the potential to cause:</p> <ul style="list-style-type: none"> Pollution from increased surface runoff; Pollution from accidental spills; Pollution of groundwater; and Increased risk of flooding.
Geology and Soils	<p>Direct impact on the underlying geology.</p> <p>Direct impact on geological or geomorphological features which are of specific interest or importance.</p> <p>Loss of soils due to increase land take.</p> <p>Potential in-balance of site earthworks operations.</p> <p>Modification to existing hydrogeological regime.</p>
Materials and Waste	<p>Use and consumption of material resources from primary and recycled/ secondary sources, and manufactured construction products required for the construction, improvement and maintenance of the trunk road network.</p> <p>Production and management of wastes arising as a result of the construction, improvement and maintenance of the trunk road network.</p>

2.13. Adjacent Schemes

- 2.13.1. The A9 Dualling Kincaig to Dalraddy forms part of the wider strategy to dual the A9 between Perth and Inverness. Following the Scottish Ministers' announcement in December 2011, as referred to in Section 1 the proposed Scheme will be the first of the wider programme in the delivery of the A9 Dualling.

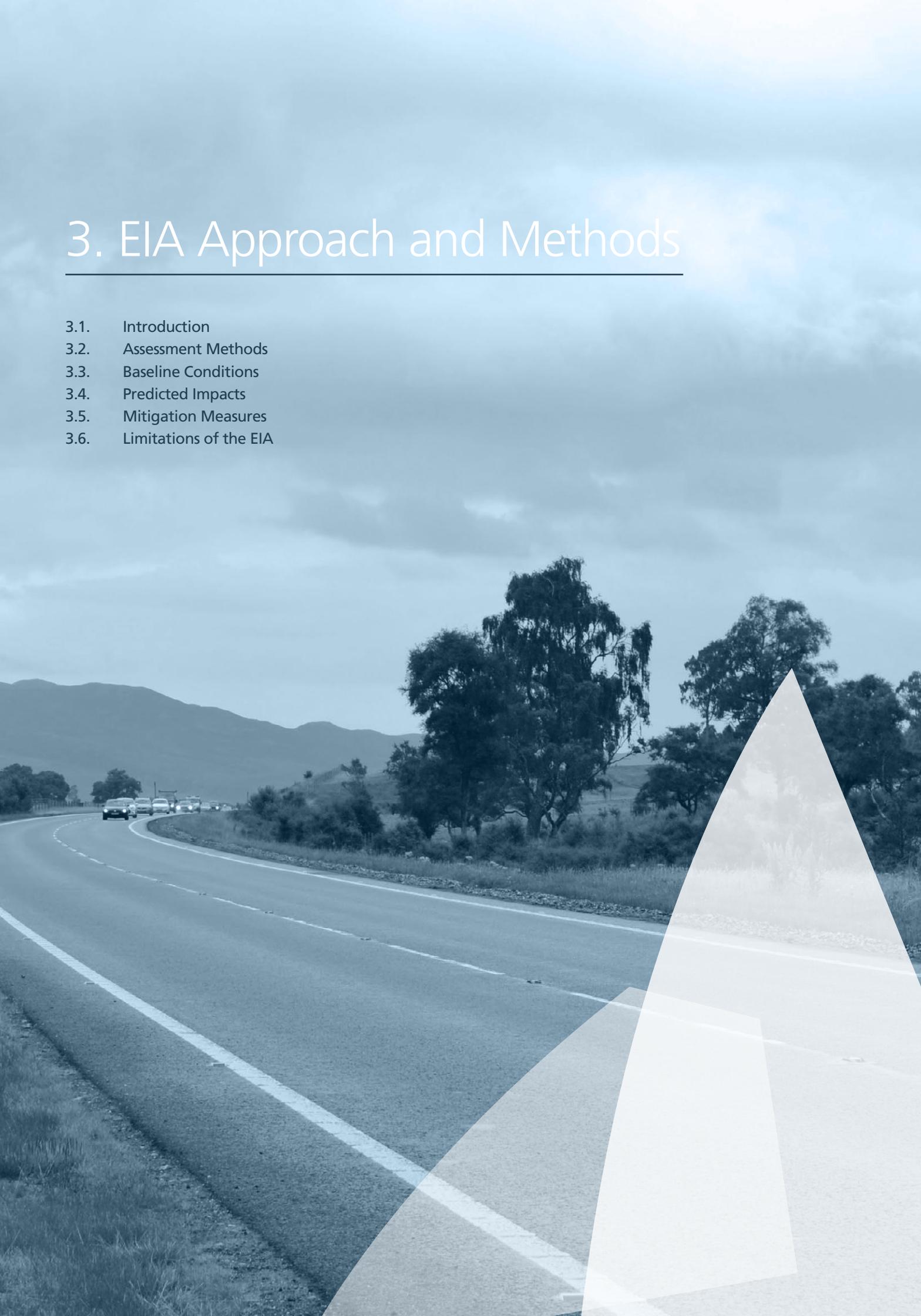
2.14. Overview of the Consultation Process

- 2.14.1. Over the course of the Stage 3 Assessment, the project team and Transport Scotland have organised a range of meetings ensuring that both planning departments and consultees have been involved in the development of the proposed Scheme.
- 2.14.2. During Autumn/Winter 2012 throughout 2013 consultations were carried out with statutory consultees and a range of non-statutory organisations with regard to the EIA scoping and methodologies. These were undertaken through the exchange of correspondence, meetings, workshops and at public exhibitions in December 2012 and June 2013. A community Council/ Public Meeting was also held in September 2013. A summary of consultation relevant to each topic is included within each chapter of this ES. Further details regarding the organisations consulted with, and their responses, are also provided within Appendix 1 in Volume 3 of this ES, including a schedule identifying the mitigation measures incorporated into the proposed Scheme to address any specific concerns, where appropriate.
- 2.14.3. The organisations consulted include:
- the Cairngorms National Park Authority (CNPA);
 - Historic Scotland (HS);
 - the Scottish Environment Protection Agency (SEPA);
 - The Highland Council (THC);
 - SNH (Wildlife Operations Unit);
 - RSPB;
 - Scottish Badgers;
 - TranServ;
 - The Spey District Fishery Board;
 - 'BEAR Scotland'; and
 - Landowners and the Kincaig and Vicinity Community Council



3. EIA Approach and Methods

- 3.1. Introduction
- 3.2. Assessment Methods
- 3.3. Baseline Conditions
- 3.4. Predicted Impacts
- 3.5. Mitigation Measures
- 3.6. Limitations of the EIA



3. EIA Approach and Methods

3.1. Introduction

- 3.1.1. This Chapter outlines the general approach followed for the Stage 3 Assessment and provides an indication of the reporting structure for the ES.
- 3.1.2. The assessment was undertaken in accordance with guidance provided in the DMRB Volume 11, Section 2, Part 6 Reporting of Environmental Impact Assessments (HD 48/08).
- 3.1.3. As well as DMRB guidance, we have taken account of specific landscape and access principles set out within the SEA Environmental Report (June 2013) for the wider A9 dualling scheme to ensure that the unique qualities of the A9 is recognised within this assessment.
- 3.1.4. The objectives of the EIA are to:
- Establish the baseline conditions of the study area through a combination of desk review, consultations and site surveys taking account of any committed development projects etc which could change the baseline in the future;
 - Identify environmental constraints and opportunities associated with the study area which may influence, or be affected by the proposed Scheme;
 - Identify and assess predicted environmental impacts which could result from development of the proposals;
 - Identify and incorporate into scheme design and operation, features and measures to avoid or mitigate adverse impacts and enhance beneficial impacts; and
 - Assess the level of significance of all residual effects (direct and indirect, adverse and beneficial, short-term and long-term, permanent and temporary) taking account of committed mitigation measures.
- 3.1.5. The specific methods used to undertake each element of the assessment is described in detail under the relevant chapter headings. The DMRB specifies three key levels of assessment to be undertaken, comprising Stage 1, Stage 2 and Stage 3. The objectives of each stage, taken from the DMRB Volume 5, Section 1, Part 2 Scheme Assessment Reporting (TD 37/93)⁹ and Volume 11, Section 2, Part 1 General Principles and Guidance of Environmental Impact Assessment (HA201/08)¹⁰ are identified in Table 3.1.

⁹ Highways Agency, 1993, Design Manual for Roads and Bridges (DMRB) Volume 5: Assessment and Preparation of Road Schemes, Section 1, Part 2, Project Development and Environmental Impact Assessment Levels

¹⁰ Highways Agency, 2008, Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 2, Part 1, Project Development and Environmental Impact Assessment Levels

Table 3.1 Stages of EIA according to DMRB, Volume 11

Stage	Objectives
Stage 1	Identification of environmental advantages, disadvantages and constraints associated with broadly defined route corridors.
Stage 2	Identification of the factors and effects to be taken into account in the selection of route options and in the identification of the environmental advantages, disadvantages and constraints associated with these routes.
Stage 3	Assessment to be undertaken in accordance with the requirements of Sections 20A and 55A of the Roads (Scotland) Act 1984 and the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 which implements European Directive 2011/92/EU, with publication of an Environmental Statement or Environmental Assessment Report.

- 3.1.6. The assessment of the route options for the A9 Kincaig to Dalraddy Carriageway Widening Scheme Stage 1 was completed as part of the A9 Route Action Plan Study RAP (1995 -1997). The Stage 2 Assessment was undertaken by Atkins in 2006.
- 3.1.7. The assessment covered in this report comprises a Stage 3 Assessment, undertaken by Atkins between June 2012 and October 2013.
- 3.1.8. The EIA has made best use of information gathered in the different stages of the progress of the proposed Scheme to date and updated the information as required. The approach has also been informed by other Scottish Government and EIA guidance^{11 12} where appropriate. The individual technical assessments have been carried out with reference to relevant legislative and policy requirements and current best practice as well as in accordance with DMRB Volume 11 Section 3: Environmental Assessment Techniques.
- 3.1.9. The assessment process has informed the proposed Scheme decision making process and development of the detailed design to date.
- 3.1.10. Traffic information was provided by Transport Scotland through their LATIS framework commission, and Atkins has developed, modelled and analysed the data required to inform the economic assessment of the proposed Scheme. Forecasts were prepared for the 'Do Minimum' and 'Do Something' scenarios.

11
12

Scottish Development Department Planning Advice Note Pan 58 Environmental Impact Assessment (1999)
IEMA Guidelines for Environmental Impact Assessment (2004)

- 3.1.11. In accordance with DMRB Volume 11¹³, an assessment of the following environmental factors has been made:
- Air Quality;
 - Cultural Heritage;
 - Disruption Due to Construction;
 - Ecology and Nature Conservation;
 - Landscape Effects;
 - Land Use;
 - Traffic Noise and Vibration;
 - Pedestrians, Cyclists, Equestrians and Community Effects (NMUs);
 - Vehicle Travellers;
 - Road Drainage and the Water Environment;
 - Geology and Soils; and
 - Policies and Plans.
- 3.1.12. Although Interim Advice Note 125/09¹⁴ stipulates that Pedestrians, Cyclists, Equestrians and Community Effects and Vehicle Travellers should be combined into one chapter, for the purposes of this ES and in line with DMRB regulations for Scotland, these environmental factors have been discussed in separate chapters. Additionally a separate Policies and Plans chapter had been produced, rather than as stipulated within IAN 125/09, which states that each environmental chapter should outline the relevant planning policies.
- 3.1.13. In addition to the above, a Materials and Waste assessment has also been undertaken. This is in response to an Interim Advice Note¹⁵, which outlines the consideration of material resource use and waste as part of the EIA process together with the identification of impacts associated with materials resource use and waste arisings.

3.2. Assessment Methods

- 3.2.1. The assessment of impacts follows a similar process for all the environmental disciplines:
- An introduction to the study area;
 - Indication of the key issues;
 - Approach and methods used in the assessment;
 - Identification of baseline conditions;
 - Consideration of impacts;
 - Assessment of the significance of potential causes of impact taking into account sensitivity of resources and magnitude of impact;
 - Identification of mitigation measures; and
 - Assessment of residual impacts and conclusions.
- 3.2.2. Further discussion of baseline conditions, predicted impacts, mitigation and the definition of residual impacts is provided below.

13 Highways Agency, 1993, Design Manual for Roads and Bridges (DMRB) Volume 11:Environmental Assessment
 14 Highways Agency, 2009, Interim Advice Note 153/11 'Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment'
 15 Highways Agency, 2011, Interim Advice Note 153/11, Guidance on the Environmental Assessment of Material Resources

3.3. Baseline Conditions

- 3.3.1. The specific assessment for each environmental topic has been undertaken in relation to a 'baseline'. The 'baseline' normally reflects the existing situation and how this would change if the proposed Scheme did not go ahead (i.e., the 'Do Minimum' scenario). In this case, the baseline is the existing situation with the incorporation of limited ongoing maintenance improvements.
- 3.3.2. The baseline situation represents the existing scheme as reviewed through site visits, and desk-based study including review of maps, data, records, information and reports obtained from statutory and non-statutory organisations, including the Trunk Road Operating Company for the North West Unit of the Trunk Road Network (Transerv up to 1st April 2013, BEAR thereafter). Consultation has been undertaken regularly throughout the production of the ES. This can be found in Appendix 1 in Volume 3 of this ES.
- 3.3.3. The study area for the EIA has been defined for each topic in the appropriate chapters and will vary according to the environmental resource potentially affected. Some will relate to the spread of the effect from the proposed Scheme and some will also include effects from the changes in the traffic pattern of the area as a result.

3.4. Predicted Impacts

- 3.4.1. The EIA considers the impacts for different assessment scenarios, comparing the existing situation (baseline) with the predicted impacts at road opening (Year 1) and 15 years after opening (the Design Year) by which time it is expected that measures such as landscape planting will have matured sufficiently to deliver the expected levels of mitigation. Timescales for specific topics may vary from those above and are identified within the individual assessment chapters.
- 3.4.2. The impacts of construction have been considered within individual chapters where appropriate. The construction period is likely to last up to 18 months.
- 3.4.3. For the proposed Scheme the Opening Year (Year 1) is set as 2017.
- 3.4.4. The assessment identifies the potential impacts that might occur due to the dualling and continued operation of the road. Impacts can affect the environment in a variety of ways. The differing parts of the environment affected by a scheme are known as receptors i.e. those things that receive an impact from a scheme. Receptors can range from individual plants, animals or human beings living in or passing through the area, through to the landscape as a whole and the physical and cultural elements within it.
- 3.4.5. The techniques for weighting and balancing the relative influence of impact magnitude and sensitivity on significance will vary from topic to topic. The evaluation of significance for any specific impact may be based upon one or more of the following:
- Comparison with Regulations or standards;
 - Reference to criteria such as protected species, protected sites, landscapes etc;
 - Consultation with consultees and decision makers;
 - Compliance with policy (or plan) objectives;
 - Comparison with experience on similar projects elsewhere; and
 - Experience and professional judgement of the specialist assessor.
- 3.4.6. Potential impacts have been taken into account in the iterative development of the proposals. Where the potential for a significant adverse effect has been identified resulting from an impact either by itself or in combination with other impacts, the environmental team has fed back concerns to the design team who have taken account of the issues in refining the design for the proposed Scheme and the construction methodology.

- 3.4.7. The nature of predicted impacts arising from the proposed Scheme has been described and an assessment of the level of significance (negligible, slight, moderate or substantial) for each effect determined as far as practical, unless stated otherwise within individual Chapters. As noted in DMRB Volume 11 Section 2, Part 5 (HA205/08) item 2.9, in Scotland the assessment of the effects of the proposed Scheme (significance) is undertaken before the effectiveness of the design and committed mitigation measures is considered, as well as with all agreed mitigation measures incorporated, taking account of any change in effectiveness over time, such as growth of planting and establishment of new habitats. The detail of the assessment under each topic will in part reflect the relative importance of the effects.
- 3.4.8. The EIA Regulations require significant effects to be described (EIA Regulations Schedule 4). Significance is not defined in the Regulations. The question of significance varies according to the environmental sub discipline under consideration and the study area in which the assessment is situated. Much depends on the availability of data relating to existing environmental conditions and the value applied to these conditions. However, in general (or unless stated in individual Chapters), the level of significance of impacts has been determined by balancing the value/sensitivity (very high, high, medium low and negligible), of the environmental feature in question against the magnitude of the impact (high, medium, low and negligible), each of which having been assessed independently according to defined criteria set out within Table 2.4 of DMRB Volume 11, Section 2, Part 5, or where specified using STAG.
- 3.4.9. Sensitivity has generally been defined according to the relative importance of the feature, i.e. whether it is of national, regional or local importance or by the sensitivity of the receptor in the case of the Landscape and Visual Effects, Air Quality and Noise assessments. In the definition of magnitude of impact, consideration has been given to any legislative or policy standards or guidelines, and/or the following factors:
- The degree to which the environment is affected, e.g. whether the quality of the resource is enhanced or impaired;
 - The scale of the change resulting from impacts, e.g. the size of land area or number of people affected and degree of change from the existing situation; and
 - Whether the effect is temporary or permanent, short or long term.
- 3.4.10. Impacts may also be wide-ranging in nature, for example, they could result in direct or indirect, secondary, cumulative, short, medium or long-term, permanent or temporary, positive or adverse effects. These factors have also been taken into account.
- 3.4.11. The significance of impacts has been defined for each environmental sub discipline in the individual sections in the remainder of Part Two, with the exception of Policies and Plans which describes whether the proposed Scheme is in conflict or compliance with national guidance and development plans. Effects categorised as being moderate or substantial (adverse or beneficial) are considered in this ES to be significant.
- 3.4.12. A summary of the effects of the proposed Scheme is included in the Environmental Impact Tables presented in Chapter 17, Environmental Impact Summary.
- 3.4.13. Cumulative effects are also considered in terms of the overall importance for a wider area of effects of a similar nature occurring at different locations or in terms of overall importance of effects of a different nature occurring at the same location. In addition the potential for effects from this project to occur at the same time as those from any other developments which have been approved, has also been considered.

3.5. Mitigation Measures

3.5.1. The approach to mitigation measures adopted for this EIA is consistent with the guidance provided in Planning Advice Note (PAN 58) on EIA that considers mitigation as a hierarchy of measures ranging from prevention of environmental effects by avoidance, down to offsetting by remedial or compensatory measures for effects that cannot be prevented or reduced. The mitigation hierarchy is summarised in Table 3.2 and is based on DMRB 11:2:5 paragraph 1.42.

Table 3.2 Mitigation Hierarchy

Level of Mitigation	Definition
Avoidance	Consider and incorporate measures to prevent the effect (for example, consider alternative design options or phase the project to avoid environmentally sensitive periods).
Reduction	Where avoidance is not possible, methods to lessen the effect should be considered and incorporated into the project design. Consultation with the Overseeing Organisation will determine whether any remaining 'residual' effect is considered to be environmentally acceptable.
Remediation	<p>Where it is not possible to avoid or reduce a significant adverse effect, then measures to offset the effect should be considered.</p> <p>In an initial email response on 20th November 2012, the CNPA confirmed that the approved National Park Partnership Plan (NPPP) lays down some key principles for Scottish National Parks. CNPA also suggested that the following proposals are considered:</p> <ul style="list-style-type: none"> • NPPP; • Planning Policy – development plan and supplementary guidance; • Landscape and Visual Effects - Opinion on landscape mitigation proposals and understanding of view regarding most sensitive areas for landscaping. This section of work also needs to consider the landscape special qualities of the National Park. (Addressed in Chapter 8 of this ES); • Ecology – habitat networks, habitat loss particular discussion regarding impacts/mitigation regarding severance of wildlife corridors. (Addressed in Chapter 7 of this ES); • Biological records from the CNPA, either from them direct, or from other organisations they might indicate (e.g. the local badger group). (Addressed in Chapter 7 of this ES); and • Access and recreation – ensuring all current access across the route remains and enhanced links are provided to the wider path and road network. (Addressed in Chapter 11 of this ES)

3.5.2. The approach to the mitigation of adverse environmental impacts has been to avoid them wherever possible. This has been achieved by consideration of ways in which to prevent adverse effects at source, rather than relying on measures to mitigate the effects.

- 3.5.3. Where avoidance of impacts has not been assessed to be feasible, measures have been proposed to minimise or reduce potential impacts through abatement measures either at source, at the site (for example, by the use of noise attenuation measures or screen planting and landscaping), or at the receptor (for example, translocation of plant species).
- 3.5.4. Where adverse effects cannot be prevented or reduced, consideration has been given to the specification of measures in the Contract Documents that offset or, in certain circumstances, compensate for any damage. Some of these are necessarily indicative at this stage (i.e. they have been defined in principle) and will require further detailed consideration and incorporation into proposed Scheme design and Contract Documentation as the proposed Scheme progresses.
- 3.5.5. All mitigation measures have been discussed with Transport Scotland and have only been taken into account in assessments after commitment has been given to their delivery. A collated list of mitigation measures is included in Chapter 18, 'Environmental Commitments'.

3.6. Limitations of the EIA

- 3.6.1. Any limitations to the EIA are summarised in each technical chapter, where relevant, together with the means proposed to mitigate these.
- 3.6.2. The assessment of impacts, the prediction of environmental effects and the proposed mitigation measures are based on a preliminary proposed Scheme design. Where details of the project have still to be finalised (such as detailed construction methods etc) assumptions have been made in the ES to allow potential impacts to be considered and appropriate mitigation to be identified.
- 3.6.3. The proposed Scheme and the environmental mitigation measures will be refined and developed together during the detailed design stage before construction. This may result in some changes to the proposed Scheme as published in this ES. In the main, the detailed design will be informed by this ES and will seek to develop the proposed Scheme in a manner such that it has no material change to the environmental impacts of the scheme. Indeed, opportunities may be identified to reduce the proposed Scheme's environmental impact.

4. Air Quality

- 4.1. Introduction
- 4.2. A9 Dualling Strategic Environmental Assessment
- 4.3. Key Issues
- 4.4. Methodology
- 4.5. Baseline Conditions
- 4.6. Consultation
- 4.7. Impacts (Opening Year 1) without Mitigation
- 4.8. Mitigation
- 4.9. Impacts (Design Year 15)
- 4.10. Conclusions



4. Air Quality

4.1. Introduction

4.1.1. This Chapter presents the results of the Stage 3 Assessment of the impacts of the proposed Scheme on air quality.

4.1.2. The assessment was undertaken in accordance with the guidance provided in the DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07)¹⁶.

4.1.3. It presents a summary of relevant air quality policy and legislation, a review of existing baseline air quality conditions, describes the methodology used to assess the effects of the proposed Scheme and presents the results of the assessment. Mitigation options are considered for any potentially significant adverse effects. The relationship with the A9 Dualling SEA Environmental Report (June 2013) is addressed in Section 4.2.

Pollutants

4.1.4. In many areas of the UK, road traffic is the dominant source of local air pollutants. Currently, the local air pollutants causing most concern are nitrogen dioxide and particulate matter.

Nitrogen Dioxide

4.1.5. Nitrogen dioxide (NO₂) is a secondary pollutant produced by the oxidation of nitrogen monoxide (NO). Nitrogen monoxide and nitrogen dioxide are collectively termed oxides of nitrogen (NO_x). In high concentrations nitrogen dioxide can cause inflammation of the airways; it also enhances the response to allergens in sensitive individuals. Nitrogen monoxide does not have any observable effect on human health at the range of concentrations found in ambient air.

Particulate matter

4.1.6. Particulate matter in vehicle exhaust gases consists of carbon nuclei, onto which a wide range of compounds are absorbed. These particles have an effective aerodynamic diameter of less than 10 micrometers (PM₁₀ and smaller size fractions). Diesel engines produce the majority of particulate emissions from the vehicle fleet. About a quarter of primary PM₁₀ emissions in the UK are derived from road transport. Finer fractions of particulate matter appear to be associated with a range of symptoms of ill health including effects on the respiratory and cardiovascular systems, on asthma and on mortality. Recent reviews by the World Health Organisation (WHO) and the Committee on the Medical Effects of Air Pollutants (COMEAP) have suggested exposure to PM_{2.5}, which typically make-up around two thirds of PM₁₀ emissions¹⁷ and concentrations, has a stronger association with the observed ill health effects than PM₁₀.

Dust

4.1.7. Dust¹⁸ is inevitably encountered in the outdoor environment. Construction activities have the potential to generate dust through materials handling and vehicular movements within the site. Dry ground and stockpiled materials may also be subject to wind erosion. Dust emissions from construction sites potentially arise from a range of diffuse sources and are termed 'fugitive emissions'. Fugitive dust emissions can lead to a localised increase in dust deposition rates that may potentially cause soiling of cars, windows and other surfaces.

¹⁶ <http://dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf>

¹⁷ http://uk-air.defra.gov.uk/reports/cat05/0506061415_Fine_PM25_and_Coarse4.pdf

¹⁸ British Standard BS6069 (Part 2) defines 'dust' as particles with a diameter between 1 and 75 µm

- 4.1.8. Dust that may deposit in the local area close to a source of fugitive emissions comprises particles between 10 and 75 micrometers (μm) in diameter, the larger size particles settling to the ground within a few tens of metres from the source. Small particles, such as PM10 and PM2.5, settle more slowly over a larger area and therefore contribute relatively little to the general ambient dust levels. Such particles are also more susceptible to being blown away. Excessive accumulations of dust on exposed surfaces, particularly in residential locations, may cause a perceived loss of amenity and give rise to public complaint.

Policy Context

Air Quality Legislation

- 4.1.9. Mandatory legislative air quality criteria (also known as Limit Values) are set in European Union (EU) Directives that are implemented nationally by The Air Quality Standards (Scotland) Regulations 2010 (SSI 2010/204). Compliance is the responsibility of central Government. Air quality is further regulated by the Air Quality (Scotland) Regulations 2000 (SSI 2000/97) and the Air Quality (Scotland) (Amendment) Regulations 2002 (SSI 2002/297), which implement the standards and objectives of the UK Government's Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland¹⁹.
- 4.1.10. The air quality standards within the AQS define the level of pollution below which health effects are unlikely to be experienced even by the most sensitive members of the population. These are based upon recommendations of the Expert Panel on Air Quality Standards (EPAQS). The air quality objectives within the AQS are targets for air pollution concentrations, which take account of the costs and benefits of achieving the standard. In the case of short-term targets, the permissible number of hours or days above the objective concentration is also specified. The number of permissible "exceedences" is considered when determining compliance with the short-term objectives over an annual period. Local authorities are not legally obliged to achieve the air quality objectives. They are however, required to work towards the objectives by drawing up action plans setting out the measures they intend to take in pursuit of them.
- 4.1.11. It should be noted that the AQS objectives only apply in locations where there may be a 'relevant exposure'. These human health objectives are applicable where members of the public may be exposed to pollutant levels for periods equal to, or exceeding, the averaging periods set for these criteria. Locations of relevant exposure include: building façades of residential premises; schools; public buildings; medical facilities; and places of work (other than certain community facilities) are excluded.
- 4.1.12. The relevant air quality objectives in the context of this assessment for the protection of human health for nitrogen dioxide and fine particulate matter are presented in Table 4.1.

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Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Department for Environment, Food and Rural Affairs. 2007.

Table 4.1 Air Quality Objectives and Limit Values

Pollutant	Criteria	Compliance Date	
		AQS Objectives	EU Limit Values
NO ₂	Hourly average concentration should not exceed 200 µg/m ³ more than 18 times a year.	31 December 2005	1 January 2010
	Annual mean concentration should not exceed 40 µg/m ³ .	31 December 2005	1 January 2010
PM ₁₀	24-hour mean concentration should not exceed 50 µg/m ³ more than 35 times a year.	31 December 2004	1 January 2005
	7 times a year (Scotland)	31 December 2010	
	Annual mean concentration should not exceed 40 µg/m ³ 18 µg/m ³ (Scotland)	31 December 2004 31 December 2010	1 January 2005
PM _{2.5}	Scotland: annual mean concentration should not exceed 12 µg/m ³ .	2010	-
	EU Stage 1 Limit Value: annual mean concentration should not exceed 25 µg/m ³ .	-	1 January 2015
	EU Stage 2 Limit Value: annual mean concentration should not exceed 20 µg/m ³ *.	-	1 January 2020
	Exposure Reduction: UK urban areas: target of 15% reduction in concentrations at urban background.	Between 2010 and 2020	-
	Exposure Reduction: Target of 20% reduction.	-	Between 2010 and 2020
Notes: * indicative EU Stage 2 Limit Value to be reviewed in 2013			

Designated Site Assessment Criteria

- 4.1.13. The EU has also set limit values for the protection of vegetation for NO_x based on the work of the United Nations Economic Commission for Europe (UNECE) and WHO and these limit values have been incorporated into SSI 2010/204.
- 4.1.14. The limit value for NO_x for the protection of vegetation is 30 µg/m³ as an annual mean. The AQS objective is the same as the limit value. The limit values for the protection of vegetation apply to locations more than 20 kilometres from towns with more than 250,000 inhabitants or more than 5 kilometres from other built-up areas, industrial installations or motorways. As monitoring sites need to be representative of an area of 1,000 square kilometres, the limit does not have a statutory basis in micro-scale environments, such as those close to a road.
- 4.1.15. The UNECE and the WHO have set a critical level for NO_x for the protection of vegetation, therefore the Statutory Nature Conservation Agencies' (in Scotland, Scottish Natural Heritage (SNH)) policy is to apply the 30 µg/m³ criterion, on a precautionary basis, as a benchmark, in internationally designated conservation sites and SSSIs.
- 4.1.16. In addition, critical loads for nitrogen deposition have been set that represent (according to current knowledge) the exposure below which there should be no significant harmful effects on sensitive elements of the ecosystem. The critical loads vary by type of ecosystem and can be obtained from the Air Pollution Information System (APIS) website²⁰.

Local Air Quality Management

- 4.1.17. Under Part IV of the Environment Act 1995 all local authorities are responsible for Local Air Quality Management (LAQM), the mechanism by which the Government's air quality objectives are to be achieved. As part of this LAQM role, local authorities are required to periodically review air quality in their area and to assess the present and likely future air quality against the objectives defined in Regulations. The findings are reported and published following public consultation and review by the Department for Environment, Food and Rural Affairs (DEFRA). Where a local authority determines an AQS objective to be breached it must designate an Air Quality Management Area (AQMA) and develop an action plan to improve pollution levels.

Dust

- 4.1.18. There are no statutory quantitative controls or limits on general dust emissions from construction sites. Such emissions are however, included in Statutory Nuisance provisions under the Environmental Protection Act 1990. Detection of and requiring action to stop any Statutory Nuisance are responsibilities of the local authority. In the context of the proposed Scheme, dust emissions from construction works could result in a Statutory Nuisance if not properly controlled. The defence against this is the use of 'Best Practicable Means' (BPM) to control emissions. In practical terms, application of BPM essentially means the managed, diligent application of 'best practice' techniques to minimise emissions in the context of the receiving environment, changing conditions and cost.

- 4.1.19. The Greater London Authority in partnership with London Councils and with assistance from the Building Research Establishment and the PRECIS Working Group (Partnership in Reducing Emissions from Construction Industry Sites), has produced a best practice guidance document for the control of dust and emissions from construction and demolition works²¹. This guidance builds on other existing guidance, and is also relevant to proposed works outside of London. It establishes best practice that is relevant and achievable, with the overarching aim of protecting public health. This is further supported by the Institute of Air Quality Management (IAQM) document ‘Dust and Air Emissions Mitigation Measures’²².

National and Regional Planning Policy

- 4.1.20. The Scottish Government’s planning guidance of general relevance for air quality is found within the National Planning Framework for Scotland (NPF2)²³. This states that:
- 4.1.21. “The Scottish Government is committed to improving air quality and is giving particular priority to addressing problems in designated Air Quality Management Areas (AQMAs). Where a proposed development could have significant impacts on air quality, close co-operation between planning authorities and those with responsibility for air quality and pollution control will be essential.”
- 4.1.22. NPF2 is supported by an Action Programme for implementation of the NPF strategy. Action 44²⁴ is specific to the improvement of air quality.
- 4.1.23. As identified within Chapter 16 of this statement, guidance at a regional (and local) level consists of the Highland Structure Plan (2001) and the CNPA Local Plan (2010).
- 4.1.24. In relation to air quality, Policy W12 of the Highland Structure Plan (2001) states:
- “The council will work closely with partner agencies to ensure that high standards of air quality are maintained within the Highland area. Where appropriate, new developments will be required to submit an environmental assessment which addresses the subject of air pollution”.*
- 4.1.25. Furthermore, it is stated that “support for the improvement and protection of air quality within Highland is therefore a priority within the Structure Plan Strategy”.
- 4.1.26. The CNPA Local Plan also provides guidance in relation to Air Quality, which states:
- “New developments should not result in breaches of National Air Quality Standards”.*

21 Greater London Authority and London Councils (GLA), 2006. The Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance

22 http://iaqm.co.uk/text/guidance/iaqm_mitigation_measures_2012.pdf

23 National Planning Framework for Scotland. Scottish Government. June 2009. <http://www.scotland.gov.uk/Publications/2009/07/02105627/0>

24 <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/npf/AirQuality>

4.2. A9 Dualling Strategic Environmental Assessment (SEA)

- 4.2.1. The proposed Scheme is subject to a SEA. In relation to air quality, the SEA Scoping Report²⁵ determined that there were “unlikely to be significant issues for consideration, therefore ‘Air’, as a topic, will be scoped out of the SEA”. This is now confirmed within the published A9 Dualling SEA Environmental Report (June 2013). The SEA Scoping Report acknowledged that air quality effects associated with the dualling programme would be subject to Environmental Assessment in line with the DMRB guidance. The assessment presented below, fulfils this requirement.
- 4.2.2. The SEA scoping report also addressed ‘climatic factors’, concluding that this topic may also be scoped out of SEA as the issues identified may more readily be addressed under the topics of ‘Material Assets’ and ‘Water’. This is now also confirmed within the A9 Dualling SEA Environmental Report. The effect of the proposed Scheme on regional emissions is considered within the assessment presented below.

4.3. Key Issues

- 4.3.1. The stretch of the A9 between Kincaig and Dalraddy passes through a predominantly rural setting within the Cairngorms National Park, passing the small settlement of Kincaig. Existing air quality conditions in the vicinity of the proposed Scheme are below national air quality objectives. Objectives of the proposed Scheme are identified in Section 2.7 of the ES. In summary, these aim to reduce journey time and improve safety for road users. As such, there is no expectation that there would be significant change in traffic volume as identified in Appendices 2, 3 and 4 in Volume 3 of this ES. On this basis, it is not anticipated that the proposed Scheme will have a significant effect on air quality. The assessment has been made in accordance with prescribed methodologies to determine the effects of the proposed Scheme on identified sensitive receptors, including residential properties and sensitive ecosystems, during construction and operation.

4.4. Methodology

Construction and Operation

- 4.4.1. Construction activities have the potential to generate dust, which may have an adverse effect on nearby properties. Dust levels that are substantially elevated above the norm can cause annoyance. This commonly relates to increased rates of dust deposition on exposed surfaces and / or soiling (discolouration / contamination), although less commonly the term may relate to levels that are “prejudicial to health”, including airborne dust.
- 4.4.2. A particular complication in determining whether nuisance dust levels constitute a Statutory Nuisance is the absence of a quantitative standard. A limited number of academic studies in the UK have examined this issue by sampling public opinion to various ‘dust levels’ but have yet to define one or more threshold above which Statutory Nuisance can be confidently determined.
- 4.4.3. Quantitative assessments are not usually carried out due to the uncertainty inherent in source emission rates for fugitive sources. Generally, a qualitative assessment of risk is undertaken. The DMRB15 (paragraph 3.45) requires that locations of sensitive receptors within 200 metres of construction activities are identified, including residential and other sensitive properties that could be at risk of being affected. Further guidance is provided by the IAQM²⁶.

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Halcrow. (2013). A9 Dualling Programme. Strategic Environmental Assessment (SEA) Scoping Report.
Institute of Air Quality Management (IAQM), 2012. Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance.

4.4.4. The main purpose of the construction dust assessment is to highlight potentially sensitive receptors so that appropriate mitigation to prevent and control dust emissions can be rigorously applied at the time of construction.

Scenarios Assessed

4.4.5. The assessment considers the following scenarios:

- 2011 base year;
- 2017 'Do-Minimum' (DM) – opening year without the proposed Scheme; and
- 2017 'Do-Something' (DS) – opening year with the proposed Scheme.

Local Air Quality Assessment

4.4.6. The requirement for undertaking an air quality assessment for the operational phase of the proposed Scheme was determined based on traffic change criteria given in the DMRB. A quantitative estimate of the change in air quality is undertaken where the changes on local roads due to the proposed Scheme meet any of the following criteria:

- Daily traffic flow will change by 1,000 AADT or more; or
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
- Daily average speed will change by 10 kilometres per hour (kph) or more; or
- Peak hour speed will change by 20 kph or more; or
- Road alignment will change by five metres or more.

4.4.7. The proposed Scheme does not change daily traffic or HDV flows sufficiently to trigger the requirements for assessment. However, the creation of additional carriageways in both directions does alter the alignment of the A9 by seven metres, and on one stretch of carriageway increases the average daily speed by 12 kilometres per hour, therefore, an assessment in accordance with DMRB air quality assessment methodology has been undertaken.

4.4.8. Traffic data was provided by Atkins Highways and Transportation Engineers - summarised in Appendix 2, Volume 3 of this ES. Affected roads are the A9 and the B9152 through Kincaig. There are a number of properties within 200 metres of these roads, several of which have been selected as representative sensitive receptors for the purposes of this assessment. These are presented in Table 4.2, below, and illustrated in Figure 4.1 in Volume 2 of this ES.

Table 4.2 Human Health receptors used in the Local Air Quality Assessment

Receptor ID	Description	Distance to B9152 (metres)	Distance to A9 centreline DM (metres)	Distance to A9 centreline DS (metres)
1	Meadowside	10	43	43
2	Lodge	22	84	90
3	Dunachton Lodge	>200	120	112
4	Cardingmill Cottage	176	152	146
5	Craigmount	40	140	138
6	Alvie Primary School	52	95	90
7	Alvie Gate Lodge	10	125	118

4.4.9. The DMRB HA207/07 screening method (which is supported by DEFRA for use by local authorities in LAQM) together with DEFRA's Technical Guidance LAQM.TG(09), have been used to estimate annual mean concentrations of road contributed NO_x and PM₁₀ at the selected receptor locations in 2011 and for the 2017 Do-Minimum and 2017 Do-Something scenarios.

4.4.10. In determining total annual mean concentrations of NO₂ and PM₁₀ and, in the case of PM₁₀, the number of exceedences of the 24-hour mean AQS, representative total annual mean background concentrations have been accounted for. Total annual mean NO₂ has then been derived using DEFRA's NO_x to NO₂ calculator²⁷ The number of exceedences of the 24-hour mean AQS objective for PM₁₀ has been derived by applying the following function, which is given in DMRB HA207/07 and DEFRA's Technical Guidance LAQM.TG(09):

- No. 24-hour mean exceedences = $-18.5 + 0.00145 \times \text{annual mean}^3 + (206 / \text{annual mean})$

4.4.11. Note that in the case of the 1-hour mean AQS objective for NO₂, DEFRA's Technical Guidance LAQM.TG(09) states that it can be assumed that if the annual mean NO₂ concentration is less than 60 µg/m³ the hourly mean objective is unlikely to be exceeded.

Background Concentrations

4.4.12. The modelling provides an estimate of the contribution of a road to total pollutant concentrations; it does not take into account the existing background concentrations. A background contribution must therefore be added to the modelled road contribution in order to derive the total pollutant concentration.

4.4.13. Background pollutant concentration maps are provided by DEFRA. These data are based on the extrapolation and interpolation of empirical measurements and modelled dispersion of, amongst others, transport and industrial sources. The latest background concentrations for every one kilometre grid square in the UK are provided for a 2010 base year, calibrated with 2010 monitoring data and are available for future years up to 2030.

4.4.14. The concentrations used in the modelling are described in the Section 4.5 'Baseline Conditions' below.

Assessment of Ecologically Designated Sites

4.4.15. The effect of changes in concentrations of air pollutants on ecologically Designated Sites within 200 metres of affected roads is assessed in accordance with the DMRB Volume 11 Section 3 Part 1 Annex F section F2. A Designated Site, is considered for assessment where it is a:

- Special Area of Conservation (SAC) or Candidate Special Area of Conservation (cSAC);
- Special Protection Area (SPA) or proposed Special Protection Area (pSPA);
- Site listed under the Convention on Wetlands and Wildfowl (Ramsar); or
- Site of Special Scientific Interest (SSSI).

4.4.16. Statutory designated conservation sites were reviewed using information held in the GB datasets on DEFRA's MAGIC website²⁸ and within SNH Information Service²⁹ webpage. This identified two ecological designations, the River Spey and Insh Marshes designation, and Loch Alvie SSSI, both identified on Figure 4.1 in Volume 2 of this ES.

²⁷ NO_x to NO₂ converter Version 3.2 <http://laqm.defra.gov.uk/tools-monitoring-data/no-calculator.html>

²⁸ Selected traffic mix: All non urban UK traffic. Local Authority: Highland Council

²⁹ <http://magic.defra.gov.uk/>

<http://www.snh.gov.uk/publications-data-and-research/snh-information-service/>

- 4.4.17. The River Spey and Insh Marshes designation has been classified as a SSSI, SPA, SAC and Ramsar site. The area is an internationally important wetland site comprising sedge dominated 'poor' fen communities supporting wetland invertebrates and breeding bird populations. This designated area extends to the south east of the B9152. The boundary of the designated site is located approximately 35 metres from the A9 at its nearest point, in the vicinity of Meadowside Quarry, on the southern most section of the proposed Scheme. Adjacent to the B9152 a mix of birch and alder may be found to a depth of approximately 50 metres, where it becomes mixed with wet fen for a further 100 metres, becoming fen only thereafter.
- 4.4.18. In consultation with Northern Ecological Services and SNH (see Appendix 1 in Volume 3 of this ES and section 4.6 below), the habitats assessed in the River Spey and Insh Marshes designations were:
- Broadleaved, deciduous woodland; and
 - Valley mires, poor fens and transition mires.
- 4.4.19. An assessment of the effect of the proposed Scheme on these habitats was undertaken along a single transect into the River Spey and Insh Marshes designation to determine the potential effects on NO_x concentrations and nitrogen deposition within the designated habitats. Traffic data for the A9 and the B9152 used in the assessment of effects on sensitive ecosystems is presented in Appendix 3 in Volume 3 of this ES.
- 4.4.20. Alvie SSSI is located at the northern end of the proposed Scheme. This site is also designated for woodland and fen habitats supporting invertebrate and bird species. At its closest point to the proposed Scheme (a distance of 32 metres in the Do Minimum scenario, reducing to 28.5 metres in the Do Something scenario) the specific habitat is alluvial alder woodland. The B9152 is located over 900 metres to the south east.
- 4.4.21. In consultation with Northern Ecological Services (Appendix 1 in Volume 3 of this ES), the habitat assessed in Alvie SSSI was broadleaved, deciduous woodland.
- 4.4.22. Construction of the proposed Scheme will result in a small loss of habitat within the boundaries of the SSSI adjacent to the A9 due to carriageway widening works and associated realignment of the road centreline by 3.5 metres to the east, nearer to the SSSI.
- 4.4.23. A summary of traffic data for the proposed Scheme at this location is presented in Appendix 3 in Volume 3 of this ES. A review of this traffic data in combination with a change in road alignment of less than 5 metres at this location indicates that none of the DMRB criteria for affected roads (paragraph 4.4.8) are met, and therefore assessment of effects of the proposed Scheme on the habitats within Alvie SSSI is not required. However, a comparison of conditions at Alvie SSSI with those at the assessed River Spey and Insh Marshes designation is presented in Section 4.7 below.
- Uncertainty**
- 4.4.24. The assessment has been made using the DMRB screening tool, in agreement with Environmental Health Officers at The Highland Council (see paragraph 4.6 below, and Appendix 1 in Volume 3 of this ES). While the DMRB screening tool may introduce uncertainties in the assessment results due to it not containing the most up to date vehicle emission factors, its use as a screening tool remains appropriate. The results of the assessment have not identified any requirement to move to more detailed modelling of vehicle emissions associated with the proposed Scheme.
- 4.4.25. The results of the local air quality and sensitive ecosystem assessments have not been verified using monitoring data due to there being no suitable data available (see paragraph 4.5 below).

4.4.26. Recent analysis (2010) of historical monitoring data (1996 – 2009) across the UK suggests that reductions in NO_x and NO₂ concentrations have been smaller than forecast. In April 2012, DEFRA published a guidance note³⁰ suggesting alternative approaches for sensitivity testing of modelling results. The recommendations made in the guidance note are considered in evaluation of the findings of this assessment.

Significance

4.4.27. Descriptors for magnitude of change and consequent significance of effect due to changes in ambient concentrations of NO₂ are provided in the Environmental Protection UK (EPUK) Development Control Guidance (2010) guidance³¹. These criteria, which may be used in the assessment of the annual mean concentrations of NO₂, PM10 and PM2.5, have been used in the interpretation of changes in concentrations of local air pollutants. The changes in magnitude (concentration) may be described as small, medium, large or imperceptible, depending on the percentage change relative to the air quality objective. These are reproduced in Table 4.3 below. The description of the change in terms of adverse, beneficial or negligible depends upon the absolute concentration in relation to the air quality objective of interest, as defined in Table 4.4 below.

Table 4.3 Definition of Impact Magnitude for Changes in Annual Mean Pollutant Concentrations

Magnitude of Change	Change in Annual Mean NO ₂ (UK)	PM10 (Scotland)
Large	Increase / decrease >4 µg/m ³	Increase / decrease >1.8 µg/m ³
Medium	Increase / decrease 2 - 4 µg/m ³	Increase / decrease 0.9 – 1.8 µg/m ³
Small	Increase / decrease 0.4 - 2 µg/m ³	Increase / decrease 0.2 – 0.9 µg/m ³
Imperceptible	Increase / decrease <0.4 µg/m ³	Increase / decrease <0.2 µg/m ³

Table 4.4 Air quality impact descriptors (extract from EPUK guidance)

Absolute Concentration in Relation to Objective	Change in Concentration		
	Small	Medium	Large
Increase with proposed Scheme			
Above AQS Objective with Scheme (>40 µg/m ³)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just below AQS Objective with Scheme (36 - 40 µg/m ³)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below AQS Objective with Scheme (30 - 36 µg/m ³)	Negligible	Slight Adverse	Slight Adverse
Well Below AQS Objective with Scheme (<30 µg/m ³)	Negligible	Negligible	Slight Adverse
Decrease with proposed Scheme			

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Note on projecting NO₂ concentrations. Defra. April 2012. http://iaqm.defra.gov.uk/documents/BureauVeritas_NO2Projections_2766_Final-30_04_2012.pdf

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http://www.iaqm.co.uk/text/guidance/epuk/eq_guidance.pdf

Absolute Concentration in Relation to Objective	Change in Concentration		
	Small	Medium	Large
Above AQS Objective without Scheme (>40 µg/m ³)	Slight beneficial	Moderate Beneficial	Substantial Beneficial
Just below AQS Objective without Scheme (36 - 40 µg/m ³)	Slight beneficial	Moderate Beneficial	Moderate Beneficial
Below AQS Objective without Scheme (30 - 36 µg/m ³)	Negligible	Slight beneficial	Slight beneficial
Well Below AQS Objective without Scheme (<30 µg/m ³)	Negligible	Negligible	Slight beneficial

Regional Assessment

- 4.4.28. In accordance with the requirements of the DMRB methodology, a regional assessment was undertaken to determine the potential effect of the proposed Scheme on emissions. Data used in the regional assessment are presented in Appendix 4 in Volume 3 of this ES. Pollutant mass emissions from all roads in the traffic model for the proposed Scheme were calculated using traffic flow, speed, proportion of HDVs, link lengths and emission rates given in the Emission Factor Toolkit (version 5.2c, released January 2013). Annual emissions were calculated for NO_x only. In addition, total vehicle kilometres were determined. Emissions were calculated for the Do-Minimum and Do-Something scenarios in the opening year (2017). The difference between the base, Do-Minimum and the Do-Something scenarios was determined and expressed as a percentage change.
- 4.4.29. The magnitude of impact is given as the change in pollutant emissions in kg or tonnes per annum, and as the percentage change between the Do-Minimum and Do-Something scenarios. There are no criteria to define significance in terms of regional air quality effects; however, a commentary of the expected changes in emissions brought about by the proposed Scheme is provided in the Impacts section in 4.7 below.

4.5.

Baseline Conditions

4.5.1.

The study area for air quality is defined as the area within 200 metres of the road centreline, as per guidance in the DMRB¹. The description of the baseline air quality has been drawn from the following sources:

- Local authority review and assessment studies;
- Air quality background concentrations and monitoring data collated from DEFRA's UK Air Quality Information Resource (UK Air) and local authorities;
- Designated ecological site information from MAGIC GIS web resource²⁶ and SNH Information Service²⁷; and
- Critical load data for identified habitats was sourced from APIS¹⁹.

Local Air Quality Management

4.5.2.

For the purposes of Local Air Quality Management, the proposed Scheme lies within the local authority area of The Highland Council.

4.5.3.

The Highland Council's 2011 Air Quality Progress Report stated that there was little likelihood of any air quality objectives being exceeded. The Council has not declared any AQMAs. A number of new biomass developments and other development proposals being progressed through the planning process at the time of report publishing have now been addressed within the Council's 2012 Updated Screening Assessment. This concluded that none of the proposed biomass installations are likely to result in exceedences of the Air Quality Objectives. New diffusion tube monitoring data has identified the requirement to move to detailed assessment in the Queensgate area of Inverness in relation to the annual mean and 1-hour objectives for NO₂.

Monitoring

4.5.4.

Measurements of pollutant concentrations can be made by deploying analytical instruments that measure continuously and record average concentrations over specified time intervals. Simpler sampling devices, such as diffusion tubes, absorb pollutants over a longer time period and are subsequently analysed at a laboratory to give an average concentration for the sampling period. National survey results from both types of monitoring are published on UK-AIR³².

4.5.5.

There is no continuous or passive monitoring undertaken in the immediate vicinity of the proposed Scheme.

4.5.6.

The closest continuous monitoring site to the proposed Scheme is located at Telford Street, Inverness. This is a roadside site in an urban area within Inverness at grid reference 265709, 845669, approximately 40 kilometres northwest of the proposed Scheme. This site is operated by DEFRA and is part of the UK Automatic Urban and Rural Network (AURN). Recent monitoring data^{33,34,35} are presented in Table 4.5 below. While recent years have seen an increase in NO₂ concentrations, neither these, or recorded PM₁₀ concentrations are approaching the relevant AQS objectives. This site is not representative of the expected concentrations in the vicinity of the proposed Scheme given its location in an urban area. However, given that concentrations are below relevant AQS objectives at this urban site, concentrations in the proposed Scheme area, which is rural, would be expected to be well below relevant AQS objectives. This is further supported by the very low background concentrations experienced in the vicinity of the proposed Scheme (see Table 4.7 below).

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34
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<http://uk-air.defra.gov.uk/>
Highland Council 2010 LAQM Progress Report
Highland Council 2011 LAQM Progress Report
AURN data archive. <http://uk-air.defra.gov.uk/data>

Table 4.5 Annual mean monitoring results from Telford Street, Inverness ($\mu\text{g}/\text{m}^3$)

Pollutant	2008	2009	2010	2011
NO ₂	20.6	20.7	24.5	27.0
PM ₁₀	12.3	11.6	14.0	12.0

Emissions Sources

4.5.7.

The UK's National Atmospheric Emissions Inventory (NAEI) provides emissions data by one kilometre squares for local authorities. To illustrate the local situation, NO_x and PM₁₀ emissions by UNECE source sector are presented in Table 4.6 for grid square 282500, 805500, where the A9 passes west of Kincaig. It is indicated that emissions are primarily attributable to road transport.

Table 4.6 Emissions of Air Pollutants in 2010 (tonnes) from Different Sectors

UNECE Source Sectors	NO _x	PM ₁₀
01. Energy Production and Transformation	0	0
02. Commercial, Institutional and Residential Combustion	0.11	0.18
03. Industrial Combustion	0	0
04. Industrial Processes	0	<0.01
05. Production and Distribution of Fossil Fuels	0	0
06. Solvent Use	0	0
07. Road Transport	3.16	0.18
08. Other Transport	0.06	<0.01
09. Waste Treatment and Disposal	0	0
10. Agriculture	0	<0.01
11. Nature	<0.01	<0.01

4.5.8.

A review of emissions sources was also undertaken using the searchable map available on the Scotland's Environment website³⁶. This reports on air quality monitoring sites, and releases of air emissions to atmosphere, sourced from the Scottish Pollutant Release Inventory (SPRI) database³⁷. A search in the vicinity of the proposed Scheme identified no local air quality monitoring sites. The nearest regulated air releases are from The Highland Council Granish Landfill site, and Granish Recycling Centre, both at Aviemore, approximately 8 kilometres north of the northernmost extent of the proposed Scheme. In 2011, neither had emissions above their reportable thresholds, with the exception of 138,000 kg of methane emissions from Granish Landfill.

Background Concentrations

4.5.9.

Estimates of current and future year annual mean background pollutant concentrations in the UK are available on DEFRA's air quality website³⁸. The background estimates are available for one kilometre grid squares throughout the UK for years between 2010 and 2030.

36 <http://www.environment.scotland.gov.uk/map.aspx>
 37 Scottish Pollutant Release Inventory. http://www.sepa.org.uk/air/process_industry_regulation/pollutant_release_inventory.aspx
 38 <http://laqm.defra.gov.uk/maps/maps2010.html> Accessed 12.02.13

4.5.10.

The modelled receptors lie within five grid squares on the background maps. Background concentrations ($\mu\text{g}/\text{m}^3$) used in the assessment for the existing baseline year (2011) and future Do-Minimum and Do-Something scenarios in 2017 are presented in Table 4.7.

Table 4.7 Annual mean background pollutant concentrations ($\mu\text{g}/\text{m}^3$) used in the assessment

Receptor ID	Grid Square	2011			2017		
		NOx	NO2	PM10	NOx	NO2	PM10
1	281500, 803500	4.2	3.4	7.0	3.2	2.6	6.8
2	282500, 804500	4.4	3.5	7.1	3.3	2.7	6.8
3							
4	282500, 805500	4.4	3.5	7.1	3.2	2.6	6.9
5							
6	283500, 806500	4.7	3.8	7.3	3.3	2.7	7.0
7	284500, 807500	4.7	3.8	7.3	3.4	2.7	7.1
E1 – E8	281500,803500	4.22	3.39	7.00	3.22	2.61	6.76

Sensitive Ecosystems

4.5.11.

The River Spey and Insh Marshes SSSI, SPA, SAC and Ramsar site is located within 200 metres of the A9, adjacent to the B9152 at the southern end of the proposed Scheme (Figure 4.1 in Volume 2 of this ES). Loch Alvie SSSI is located within 200 metres of the northern extent of the proposed Scheme. The requirement for assessment of effects at this location was scoped out at paragraph 4.4.28. Both designations are identified on Figure 4.1 in Volume 2 of this ES.

4.5.12.

Reference has been made to the APIS website²⁹ to identify Critical Load ranges and baseline nitrogen deposition rates for the location and habitats selected for assessment. These are summarised in Table 4.8 below. The 1 kilometre grid square containing the part of the River Spey and Insh Marshes designated site assessed is 281500,803500. APIS reports data on a 5 km grid resolution. Data presented below therefore cover the 5 kilometre grid square 280000,800000. Comparable data for the Alvie SSSI are presented in Table 4.8 below).

Table 4.8 APIS data used in the assessment of air quality effects on the River Spey and Insh Marshes designated site

Habitat	Critical Load Range (kg N/ha/yr)	N Deposition Rate ³⁹ (kg N/ha/yr)
Broadleaved, deciduous woodland	10-20	10.08
Valley mires, poor fens and transition mires	10-15	5.74

39

3 year average 2006 – 2008, equivalent to 2007

4.6. Consultation

- 4.6.1. Air Quality and Environmental Health officers at The Highland Council have been consulted in relation to obtaining LAQM reports and in regard to acceptance of the assessment methodology. Northern Ecological Services and SNH have been consulted in relation to selection of habitat type for assessment of air quality effects on sensitive ecosystems. Consultation records may be found in Appendix 1 in Volume 3 of this ES.

4.7. Impacts (Opening Year 1) without Mitigation

Construction

- 4.7.1. Twenty seven residential properties and one school have been identified within 200 metres of the proposed Scheme. Of these, ten residential properties and the school are located within 100 metres. Air quality effects during construction will be short term and temporary in nature. Details on the construction methodologies to be employed, including potential requirements for temporary traffic management and locations of construction works compounds, will be defined by the appointed Contractor. However, it is assumed that suitable mitigation measures, as proposed in Section 4.8 below, would be applied to ensure that dust emissions are controlled in the vicinity of sensitive receptors. These would be further specified in a Construction Environmental Management Plan (CEMP) to be submitted to, and approved by the Local Authority.

Operation

Local Air Quality Assessment

- 4.7.2. Results of the local air quality assessment are presented in Tables 4.9 and 4.10 below. In all scenarios assessed, estimated pollutant annual mean concentrations remain well below the AQS objectives. No exceedences of the 1 hour NO₂ and 24 hour PM₁₀ AQS objectives would be expected and these results have not been presented. In considering the annual mean results in the context of EPUK definitions of impact magnitude (Table 4.3), the change in annual mean NO₂ and PM₁₀ concentrations due to the proposed Scheme are imperceptible. Combined with concentrations well below AQS Objectives (Table 4.4), the proposed Scheme would have a negligible effect on local air quality. Although the assessment has not explicitly modelled PM_{2.5} concentrations, the PM₁₀ results infer that PM_{2.5} concentrations are unlikely to approach or exceed the 12 µg/m³ annual mean objective.
- 4.7.3. Application of the methods contained in DEFRA's guidance note on projecting NO₂ concentrations²⁷ would not alter the assessment conclusion that there is a negligible effect due to the proposed Scheme.

Table 4.9 Annual Mean NO₂ concentrations (µg/m³)

Receptor ID	Description	Base 2011	DM 2017	DS 2017	Change with the Scheme (DS-DM)
1	Meadowside	7.7	6.0	6.0	0.0
2	Lodge	5.1	4.0	3.8	-0.2
3	Dunachton Lodge	4.2	3.2	3.3	0.1
4	Cardingmill Cottage	3.9	2.8	2.9	0.1
5	Craigmount	4.0	2.9	2.9	0.0
6	Alvie Primary School	5.3	3.9	4.2	0.3
7	Alvie Gate Lodge	5.3	4.1	4.3	0.2

Table 4.10 Annual Mean PM10 concentrations ($\mu\text{g}/\text{m}^3$)

Receptor ID	Description	Base 2011	DM 2017	DS 2017	Change with the Scheme (DS-DM)
1	Meadowside	7.6	7.2	7.2	0.0
2	Lodge	7.3	7.0	7.0	0.0
3	Dunachton Lodge	7.2	6.9	6.9	0.0
4	Cardingmill Cottage	7.2	6.9	6.9	0.0
5	Craigmount	7.2	6.9	6.9	0.0
6	Alvie Primary School	7.5	7.2	7.2	0.0
7	Alvie Gate Lodge	7.6	7.3	7.3	0.0

Sensitive Ecosystems

4.7.4.

Two ecological designations have been identified within 200 metres of the proposed Scheme, both comprising woodland and fen habitats. The requirement for assessment of effects at Alvie SSSI was scoped out in section 4.4. The effects of the proposed Scheme on habitats within the River Spey and Insh Marshes SSSI have been modelled on a 200 metre transect through the site. Table 4.11 below presents the results for the assessment of NO_x concentrations for the protection of vegetation. In all scenarios, NO_x concentrations are well below the 30 $\mu\text{g}/\text{m}^3$ objective, and improve in the Do-Something scenario as the proposed Scheme increases the distance between the centreline of the A9 and the boundary of the designated sites by seven metres.

Table 4.11 Annual Mean NO_x concentrations ($\mu\text{g}/\text{m}^3$) along the transect into the River Spey and Insh Marshes designation

Receptor ID	Distance from road centreline (m)			Base 2011	DM 2017	DS 2017	Change with the Scheme (DS-DM)
	B9152	A9 (DM)	A9 (DS)				
E1	5	38	45	13.1	10.1	9.0	-1.1
E2	17	50	57	10.9	8.4	7.6	-0.8
E3	42	75	82	7.9	6.1	5.6	-0.5
E4	67	100	107	6.2	4.8	4.5	-0.3
E5	92	125	132	5.3	4.1	3.9	-0.2
E6	117	150	157	4.9	3.7	3.7	0.0
E7	142	175	182	4.7	3.6	3.6	0.0
E8	167	200	207	4.5	3.4	3.4	0.0

4.7.5.

The distribution of habitats types along the modelled transect was described in section 4.4. Baseline deposition rates for each habitat were reported in Table 4.7. Tables 4.12 and 4.13 below present the results of the assessment of the effect of the proposed Scheme on total nitrogen deposition rates for each habitat type within the designated sites. The results indicate a reduction or zero change in deposition rates in the Do-Something scenario, and remain below the lower limit (10 kg N/ha/yr) of the critical load range for both habitat types assessed, for the full length of the 200 metre transect assessed.

Table 4.12 N Deposition within woodland habitat (kg N/ha/yr)

Receptor ID	Critical Load: Broadleaved, deciduous woodland	DM 2017	DS 2017	Change with the Scheme (DS-DM)
E1	10-20	8.5	8.5	0.0
E2	10-20	8.4	8.4	0.0
E3	10-20	8.3	8.3	0.0
E4	10-20	8.2	8.2	0.0
E5	10-20	8.2	8.2	0.0
E6	N/A	N/A	N/A	N/A
E7	N/A	N/A	N/A	N/A
E8	N/A	N/A	N/A	N/A

*There is no woodland habitat present at transect locations E6 – E8.

Table 4.13 N Deposition within wet fen habitat (kg N/ha/yr)

Receptor ID	Critical Load: Valley mires, poor fens and transition mires	DM 2017	DS 2017	Change with the Scheme (DS-DM)
E1	N/A	N/A	N/A	N/A
E2	10-15	4.9	4.9	0.0
E3	10-15	4.8	4.8	0.0
E4	10-15	4.7	4.7	0.0
E5	10-15	4.7	4.7	0.0
E6	10-15	4.7	4.7	0.0
E7	10-15	4.7	4.7	0.0
E8	10-15	4.7	4.7	0.0

*There is no wet fen habitat present at transect location E1.

4.7.6. The results from assessment on the transect through the River Spey and Insh Marshes designations indicate that the proposed Scheme will not have an adverse effect on the identified habitats. The Loch Alvie SSSI is designated for similar habitats and it may be inferred that air quality effects on these habitats may also be considered neutral.

4.7.7. Table 4.14, below, presents a comparison of conditions at both designated sites. This identifies similar habitats at each location, sited at similar distances from the road centreline. Whilst there are some small differences in traffic data and background pollutant concentrations, the comparison supports the conclusions that the results of the assessment at River Spey and Insh Marshes of no adverse effect as a result of the proposed Scheme may be inferred at Alvie SSSI also.

Table 4.14 Comparison of conditions at identified sensitive ecosystems within 200 m of the proposed Scheme

Criteria	River Spey & Insh Marshes designations	Alvie SSSI
2-way AADT (DM / DS)	9410 / 9374	7872 / 7872
%HGV (DM / DS)	17 / 17	18 / 18
Speed (kph) (DM / DS)	84 / 84	78 / 78
Road realignment in DS	7.0 m west (away from SSSI)	3.5 m east (towards SSSI)
1*1 km grid square	281500, 803500	285500, 809500
Background NOx (2017) (µg/m3)	4.22	3.03
5*5 km grid square	280000,800000	285000, 805000
Average background NO2 (µg/m3)	2.15	2.15
Description	<p>The River Spey – Insh Marshes designation, which has been classified as a SSSI, SPA, SAC and Ramsar site, is an internationally important wetland site comprising sedge dominated 'poor' fen communities supporting wetland invertebrates and breeding bird populations. It is located at the southern most extent of the proposed Scheme.</p> <p>This designated area extends to the south east of the B9152. The boundary of the designated site is located approximately 35 metres from the A9 at its nearest point, in the vicinity of Meadowside Quarry, on the southern most section of the proposed Scheme. Adjacent to the B9152 a mix of birch and alder may be found to a depth of approximately 50 metres, where it becomes mixed with wet fen for a further 100 metres, becoming fen only thereafter.</p>	<p>Alvie SSSI is located at the northern end of the proposed Scheme, and is identified on Figure 4.1. This site is designated for woodland and fen habitat supporting invertebrate and bird species.</p> <p>The proposed Scheme requires a small amount of land take from this SSSI. Where the SSSI boundary would be unaffected by the proposed Scheme, its distance to the centreline of the A9 would reduce from 32 metres in the Do Minimum scenario, to 28.5 metres in the Do Something scenario. At this location the specific habitat is alluvial alder woodland</p>
APIS Habitat	Broadleaved, deciduous woodland Valley mires, poor fens and transition mires	Broadleaved, deciduous woodland
Critical Load range (kg N/ha/yr)	10-20 (woodland) 10-15 (mires)	10-20

N deposition rate (kg N/ha/yr)	10.08 ⁴⁰	9.8 ⁴¹
Summary findings	<p>In all scenarios NO_x concentrations are well below the 30 µg/m³ objective, and improve in the Do-Something scenario as the proposed Scheme increases the distance between the centreline of the A9 and the boundary of the designated sites by seven metres.</p> <p>A reduction or zero change in deposition rates in the Do-Something scenario, remaining below the lower limit (10 kg N/ha/yr) of the critical load range for both habitat types assessed, for the full length of the 200 metre transect assessed.</p> <p>The results from assessment on the transect through the River Spey and Insh Marshes designation indicate that the proposed Scheme will not have an adverse effect on the identified habitats.</p>	<p>At this location the requirement for assessment under DMRB criteria is not met and therefore assessment of effects of the proposed Scheme on this designated habitat is not required under the prescribed methodology.</p> <p>In comparing conditions at the two sites, it may be inferred that the proposed scheme will not have an adverse effect on the Alvie SSSI.</p>

40

41

3 year average 2006 – 2008, equivalent to 2007, as used in the assessment presented in the Environmental Statement
3 year average 2009 – 2011, equivalent to 2010. Data obtained from APIS 31/07/13.

Regional Assessment

4.7.8. Assessment of regional NOx emissions indicates that the proposed Scheme will result in a 0.2% reduction in annual vehicle kilometres, and an increase in NOx emissions of 174 kg/year, representing an increase of less than 1% of total NOx emissions. The results are summarised in Table 4.15 below. A regional assessment of all pollutants has not been completed as the change in NOx emissions indicates that the proposed Scheme would not have an effect on regional emissions.

Table 4.15 Summary results of the regional assessment

Measure	Do-minimum	Do-Something	Change due to the proposed Scheme (DS-DM)
All Vehicle Total NOx Annual Emissions (kg/yr)	22016	22190	174 (0.7%)
Vehicle km	59269781	59170708	-99073 (-0.2%)

4.8 Mitigation

Construction

4.8.1. To minimise the risk of causing a Statutory Nuisance it is recommended that the Contractor adopts best practicable means (BPM) in controlling dust emissions during construction activities.

4.8.2. Typical measures include:

- Minimise material handling operations;
- Maintenance of potentially dusty exposed surfaces in a damp condition by application of water sprays/mobile bowsers;
- Storage of waste materials in covered skips (if practicable) or screened areas and as far from potentially sensitive receptors as possible (such materials should be removed from the site for proper disposal as soon as possible);
- Inspection and cleaning of paved surfaces – especially site access points - using appropriate means to minimise dust mobilisation;
- Use of wet suppression or air extraction and filtration during disc cutting operations;
- Clearance of spillages of potentially dusty materials as a matter of priority using appropriate means to minimise dust mobilisation;
- Restriction of vehicle speeds on site to no more than 15 mph (24 kph);
- Sheeting or enclosure of all loads of potentially dusty materials to be transported on the public highway; and
- Provision and supervision of vehicle cleaning facilities before site exits to the public highway.

4.8.3. It is recommended that clear formal procedures for control of dust (and other emissions to air) are developed and, as part of the active management of the works, daily visual inspections of site conditions potential dust sources and control measures are made to ensure appropriate allocation of resources and effectiveness. Weather forecasts should be used to inform control planning, as high winds can increase the potential for windblown dust to arise. The appropriate dust control measures should be incorporated into the method statements for the works and the CEMP.

- 4.8.4. The Highland Council, in partnership with SEPA, SNH and representatives of the Energy Industry, has developed a guidance note on Construction Environmental Management Process for Large Scale Projects⁴². The Contractor should take this into consideration in preparing any Project Environmental Management Process, or Construction Environmental Management documentation. However, this does not provide any specific guidance in relation to mitigation of any potentially adverse air quality effects associated with a project. Further guidance relating to air quality impacts during construction, and mitigation measures for control of emissions, is provided by IAQM⁴³.

Operation

- 4.8.5. The results indicate that the proposed Scheme will have negligible effect on local and regional air quality conditions. Likewise, it is anticipated that the proposed Scheme will have negligible effect on pollutant concentrations within identified sensitive ecosystems. In the absence of potential adverse effects, no recommendations for mitigation are made.

4.9. Impacts (Design Year 15)

- 4.9.1. The results of the assessment in the opening year indicate that the proposed Scheme would result in an imperceptible change in air quality conditions. Based on these results the requirement for assessment of air quality effects in the Design Year (2032) have been scoped out.

Cumulative Effects

- 4.9.2. This Chapter has also taken into account the possibility of potential cumulative effects associated with the proposed Scheme. As a result of the mitigation proposed, the probability of potential cumulative effects is unlikely.

4.10. Conclusions

- 4.10.1. The assessment has considered existing air quality conditions, potential effects of construction, and operation of the proposed Scheme.
- 4.10.2. There is potential for short term elevation of ambient dust levels during the construction phase. There are 27 residential properties and one school within 200 metres of the proposed Scheme that could be affected by dust during construction. The Contractor will be required to ensure that Best Practicable Means are applied to control dust emissions to avoid any adverse effects.
- 4.10.3. The assessment of operation effects on local air quality indicates that changes in annual mean concentrations of NO₂ and PM₁₀ due to the proposed Scheme would be 'imperceptible'. As concentrations are likely to remain well below Government objective levels in both the Do-Minimum and Do-Something scenarios, the overall effect on air quality is considered to be 'negligible'.

⁴² http://www.highland.gov.uk/NR/rdonlyres/485C70FB-98A7-4F77-8D6B-ED5ACC7409C0/0/construction_environmental_management_22122010.pdf

⁴³ http://iaqm.co.uk/text/guidance/construction_guidance_2011.pdf

5. Cultural Heritage

- 5.1. Introduction
- 5.2. A9 Dualling Strategic Environmental Assessment
- 5.3. Key Issues
- 5.4. Methodology
- 5.5. Baseline Conditions
- 5.6. Historic Landscape
- 5.7. Consultation
- 5.8. Impacts
- 5.9. Mitigation Measures
- 5.10. Cumulative Impacts (Design Year 15)
- 5.11. Summary and Conclusions



5. Cultural Heritage

5.1. Introduction

- 5.1.1. This Chapter presents the results of the detailed assessment of the impacts of the proposed Scheme on cultural heritage and describes the mitigation measures proposed to avoid or reduce impacts upon the cultural heritage resource.
- 5.1.2. The assessment was undertaken in accordance with the guidance provided in the DMRB Volume 11, Section 3, Part 2 Cultural Heritage (HA208/07)⁴⁴ in line with national and regional policy guidance set out in chapter 16.
- 5.1.3. The key aims of the assessment are to:
- Identify known and potential features of cultural heritage interest and assess their importance;
 - Characterise the wider historic landscape;
 - Identify and assess the magnitude and significance of the impact of the proposed Scheme on each site;
 - Assess the potential for impacts on unforeseen and unknown features of cultural heritage importance, especially archaeological remains;
 - Propose measures for avoiding or reducing potential impacts;
 - Identify the likely residual impacts taking proposed mitigation into account;
 - Feed into the design process at the appropriate stages;
 - Assist the decision-maker, who may be at government level or within the Overseeing Organisation;
 - Meet the requirements of the appropriate statutory processes; and
 - Assist the Design Organisation in achieving the environmental design objectives for the proposed Scheme.

5.2. A9 Dualling Strategic Environmental Assessment

- 5.2.1. The SEA Environmental Report for the route-wide A9 dualling programme was published in June 2013. In relation to cultural heritage, the SEA considers the special qualities of the Cairngorms National Park, protected sites and historic setting, as well as opportunities for enhancement in strategic principles. The SEA in respect of the Kincaig to Dalraddy section also provided a broad baseline of key heritage assets, highlighting two scheduled monuments and eight listed buildings. This assessment builds on the SEA to provide a detailed review and impact assessment of all designated and undesignated heritage assets within the proposed Scheme boundary and study area and includes assessment of any settings issues associated with designated historic environment features noted in section 5.4 below.

5.3. Key Issues

- 5.3.1. There are no significant environmental impacts reported for the cultural heritage within the study area. However, there are a number of slight adverse effects which shall be mitigated. These included setting impacts to Kincaig House LB 1674 (B); potential loss of archaeological remains associated with two former farmsteads (Milehead MHG26367 and Mid Delfour MHG26380) and a small section of military road (MHG30067). Mitigation proposed includes ensuring construction areas are not located in close proximity to Kincaig House and setting impacts are reduced through screening. An archaeological watching brief is proposed in the areas that are associated with the farmsteads and military road.

5.4. Methodology

Desk Study

Heritage Assessment

- 5.4.1. Scott Wilson Kirkpatrick undertook a Heritage assessment in 1995, as part of the A9 (T) Perth to Inverness Development of a Route Strategy. The report assessed a study area of approximately 250 metres either side of the centre line of the existing carriageway. The assessment highlighted only the principal constraints to potential highway improvements. These only included: Scheduled Monuments; National Trust Properties; and Designed Landscapes recorded on the Historic Scotland Inventory.

DMRB Stage 2 Assessment

- 5.4.2. In 2005, a DMRB Stage 2 Assessment was undertaken. The study aimed to further advance the understanding of the potential effects of a suite of highway improvements options on the cultural heritage resource.

DMRB Detailed Assessment

- 5.4.3. This study follows the principles of HA208/07 Volume 11, section 3, part 2, under the DMRB and updates the information gathered during the previous assessment based on assessing the effects of a single preferred scheme of improvements.

Consulted Sources

- 5.4.4. During this appraisal, the following sources have been consulted from Dec 2012 – October 2013:
- The Highland Council Historic Environment Record for details of known sites and monuments and information on Conservation Areas⁴⁵;
 - Historic Scotland for information on Listed Buildings, Scheduled Monuments, Monuments, Historic Gardens and Designed Landscapes and Protected Wrecks in Scotland⁴⁶;
 - Historic Land-use Assessment (HLA) map⁴⁷;
 - Historic Scotland's Battlefield Inventory⁴⁸; and
 - Cairngorms National Park Landscape Character Assessment: Final Report⁴⁹.

Study Area

- 5.4.5. The study area of 1 kilometre either side of the proposed footprint of options has been used in order to allow for the thorough assessment of the proposed Scheme impacts on the historic landscape and built heritage⁵⁰. An area of 200m either side of the proposed Scheme footprint has been used in assessing the potential impacts to archaeological remains. This conforms to guidance in HA208/07.

Site Visit

- 5.4.6. A site visit was undertaken in early June 2006 to determine the extent and precise location of known cultural heritage assets in relation to the footprint of the proposed Scheme. In particular the nature of the ground (made, disturbed or undisturbed) was assessed, the results of which are incorporated in the

45 <http://her.highland.gov.uk/>

46 <http://jura.rcahms.gov.uk/PASTMAP/start.jsp>

47 <http://hla.rcahms.gov.uk/>

48 <http://www.historic-scotland.gov.uk/index/heritage/battlefields.htm>

49 <http://www.dpea.scotland.gov.uk/Documents/qj12942/1194940.pdf>

50 Historic Scotland, 2010, Managing Change in the Historic Environment: Setting

sections below. This assessment methodology has been supported by The Highland Council Heritage Service (HCHS) (detailed in section 5.7 below).

- 5.4.7. Based on an analysis of this data and the 2006 site visit, this assessment has sought to identify and quantify the likely affects of the proposed Scheme on the cultural heritage resource.

Significance

- 5.4.8. There is no standard scale for determining the significance of the environmental effect with regard to cultural heritage assets. The assessment draws on current approaches and was based on guidance outlined in DMRB⁵¹, along with consideration of planning policy, legislation and professional judgement. Generally, the DMRB approach is founded on the principle that the significance of environmental effect is determined by assessing the magnitude of change and the importance of the affected resource. In this way a minor impact on a high value site may result in the same effect as a major impact on a low value site.
- 5.4.9. To establish the value of a heritage asset, these are considered principally with reference to their value: to the quality and understanding of the asset as set out in national, regional and local heritage legislation, priorities, and frameworks. Table 5.1 below identifies the criteria outlined by the DMRB for determining the value of heritage assets. The magnitude of impact to a heritage asset is identified by the degree of change that would be experienced by the asset and its setting if the proposed Scheme were to be completed as compared with a 'Do Nothing' situation. Table 5.2 identifies the criteria outlined by the DMRB process for establishing the magnitude of impacts on heritage assets. The Significance of Impacts is then determined based on an evaluation using the matrix provided by the DMRB , which is outlined in Table 5.3 below and results in impacts ranging from neutral to very large.
- 5.4.10. This process is used to guide professional judgement and to help qualify conclusions reached in respect of the impact assessment work.

Table 5.1. Criteria for Establishing Value of Heritage Assets

Criteria for Establishing Value of Heritage Assets	
Very High	Structures inscribed as of universal importance as World Heritage Sites. Other buildings of recognised international importance. World Heritage Sites (including nominated sites). Assets of acknowledged international importance. Assets that can contribute significantly to acknowledged international research objectives. Historic landscapes of international value, whether designated or not. Extremely well preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).
High	Scheduled Monuments. Category A Listed Buildings. Conservation Areas containing an exceptional number of Category A and B Listed Buildings. Undesignated structures of clear national importance. Undesignated assets of schedulable quality and importance. Assets that can contribute significantly to acknowledged national research objectives. Designated historic landscapes of outstanding interest. Registered historic battlefields. Undesignated landscapes of outstanding interest.
Medium	Category B Listed Buildings. Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation Areas containing a high number of Category B and undesignated historic buildings. Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures). Designated or undesignated assets that contribute to regional research objectives. Designated special historic landscapes. Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value.
Low	Category C Listed Buildings. Historic (unlisted) buildings of modest quality in their fabric or historical association. Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures). Robust undesignated historic landscapes. Historic landscapes with importance to local interest groups. Asset with some archaeological interest.

Negligible	Buildings of no architectural or historical note. Designated and undesignated assets of local importance. Assets compromised by poor preservation and/or poor survival of contextual associations. Assets of limited value, but with potential to contribute to local research objectives. Landscapes with little or no significant historical interest.
Unknown	Buildings with some hidden (i.e. inaccessible) potential for historic significance. Unknown. The importance of the resource has not been ascertained.

Table 5.2. Assessing the Magnitude of Impact

Factors in the Assessment of Magnitude of Impacts	
Major	Changes to most or all key archaeological materials, key historic building elements such that the resource is totally altered. Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit. Comprehensive changes to setting.
Moderate	Changes to many key archaeological materials, historic building elements, , such that the resource is clearly modified. Changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to historic landscape character. Considerable changes to setting that affect the character of the asset.
Minor	Changes to key archaeological materials, key historic building elements, such that the asset is slightly altered. Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in limited changes to historic landscape character. Slight changes to setting.
Negligible	Very minor changes to archaeological materials, historic buildings elements, or setting. Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No Change	No change to fabric or setting. No change to elements, parcels or components; no visual or audible changes; no changes arising from in amenity or community factors.

Table 5.3. Determining the Significance of Effect

		Significance of Effect Matrix				
Value	Very High	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
	High	Neutral	Slight	Moderate/ Slight	Moderate/ Large	Large/ Very Large
	Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate/ Large
	Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
	Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight
		No change	Negligible	Minor	Moderate	Major
		Magnitude of Impact				

Setting of Heritage Assets

5.4.11.

The setting of heritage assets is key to their understanding, though setting is not considered an asset in itself. Setting is defined by Historic Scotland’s guidance note as the surroundings in which a heritage asset is experienced and the way in which those surroundings contribute to how the asset is experienced, understood and appreciated. The DMRB does not provide advice on specific methodologies for establishing the impact on setting, and as such this assessment follows the Historic Scotland Guidance. Historic Scotland outlines the following factors to be considered in assessing impacts of a change to the setting of heritage assets⁵²:

- The visual impact of the proposed change relative to the scale of the historic asset or place and its setting;
- The visual impact of the proposed change relative to the current place of the historic asset or place in the landscape;
- The presence, extent, character and scale of the existing built environment within the surroundings of the historic asset or place and how the proposed development compares to this;
- The magnitude and cumulative effect of the proposed change – sometimes relatively small changes, or a series of small changes, can have a major impact on our ability to appreciate and understand a historic asset or place;
- The ability of the landscape, which comprises the setting of a historic asset or place, to absorb new development without eroding its key characteristics; and
- The effect of the proposed change on qualities of the existing setting such as sense of remoteness, evocation of the historical past, sense of place, cultural identity, spiritual responses.

5.4.12.

Whereas a separate setting evaluation has not been completed for each individual heritage asset, these factors have been incorporated into the overall assessment of the magnitude of impact to heritage assets and are outlined in table 5.5.

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Historic Scotland, 2010. *Managing Change in the Historic Environment: Setting*

5.5. Baseline Conditions

Known Archaeological Remains and Historic Buildings

- 5.5.1. The known cultural heritage sites identified within the study area are recorded in Table 5.4 below, along with an ascribed value according to the DMRB guidance, planning policy and professional judgement. No Conservation Areas or Gardens & Designed Landscapes are present within 1 kilometre either side of the proposed Scheme centre line. Figures 5.1-5.7 in Volume 2 of this ES shows the location of these sites within the study area.

Table 5.4: Known Cultural Heritage Sites within the Study Area

Period	Designated Asset Ref. (if applicable) ⁵³	HER Number	Name	Description	Value
Prehistoric	-	MHG4450	Findspot of flints, Loch Insh	A quantity of flintwork has been collected from the banks of the shore of this loch, largely consisting of flakes and a few cores.	Low
	-	MHG48596	Flint scraper - Kinraig, Baldow Park, Alvie	A single undated flint scraper found in August 2004 on the site of a proposed housing development at Kinraig.	Low
Nesolithic	-	MHG32975	Dunachton	Charcoal rich deposits were revealed during an investigation of a ditch at this location.	Low
Neolithic	SAM898	MHG4428	Easter Delfour Stone Circle	Delfour 'stone circle' - a Clava ring-cairn comprising an outer kerb of about 58 ft diameter, of substantial boulders and a carefully built inner ring of smaller stones. Outside the kerb is a turf-covered bank of small stones (an original feature but increased by field-gathered stones formerly heaped on the site): very little of the cairn material survives. To the SW of the cairn and 22ft from the kerb is a monolith 9ft 6ins high, and to the N of this a prostrate slab 8ft long; these may be the remains of the monolithic surrounding circle.	High

Period	Designated Asset Ref. (if applicable) ⁵⁴	HER Number	Name	Description	Value
Neolithic	-	MHG3127	Ballinluig	Cairn.	Medium
Neolithic to Late Iron Age	-	MHG4431, MHG40203	Loch Alvie Ring Cairn	A ring-cairn on a broad shelf overlooking Loch Alvie.	Medium
Early Medieval	SAM937	MHG4440, MHG45368	Dunachton Lodge Symbol Stone	Class I early medieval (AD 561 to AD 1057) symbol stone. Moved from original location.	High
Early Medieval to Late Medieval	-	MHG30076, MHG34529	Badden Cottage	The site of an unenclosed settlement comprised of five low earthen banked rectangular structures.	Low
	-	MHG30080, MHG34528, MHG42767, MHG42768	Kincaig Farm Cairn	A series of low earthen banks which form possible rectilinear structures with a clearance cairn and two stone-lined bowls (possible corn drying kiln).	Medium
Medieval to 9th Century	LB 4337 (B)	MHG41433, MHG47592	St. Drostan's Chapel & Graveyard, Dunachton	Small simple late- or post-medieval ruinous church, with plaques mounted in later pilasters flanking entrance dated 1780. Sole survivor of 3 early chapels in parish.	Medium
	-	MHG30055	Alvie Gardens	The site of an unenclosed settlement or farmstead consisting of a group of three rectangular structures and an oval feature with earthen banks containing stone material that may represent clearance.	Low
	-	MHG30056, MHG34518	Alvie Gardens	The site of a farmstead with rectangular structure about 12m long by 5m wide, of earthen and stone banks around a sunken floor with an enclosure attached to the south-east, about 18m long by 15m wide.	Low

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SM = Scheduled Monument; LB = Listed Building

Period	Designated Asset Ref. (if applicable) ⁵⁵	HER Number	Name	Description	Value
Medieval to 19th Century	-	MHG30069, MHG34524	Leault	The site of an unenclosed settlement consisting of a complex of structures, field banks and clearance situated on a terrace of higher ground in a field of rough grazing.	Low
	-	MHG30081	Kincraig House	The site of an unenclosed settlement comprised of two buildings and two enclosures, all sub-rectangular and all of low earthen banks up to 0.2m high.	Low
	-	MHG4441, MHG45368	Dunachton Lodge Castle	The castle is first mentioned in a precept in 1380, burnt down by the MacDonalds of Keppoch (in Lochaber) c. 1689.	Low
Post-medieval	LB 1672 (B)	MHG3137	West Lodge, Dunachton, Kincraig	John Rhind-designed Dunachton Lodge, built circa 1869, with the cat crest of Clan Chatten.	Medium
	LB 1675 (C)	MHG4425	Baden Cottage, Kincraig House	Early 19th century, single-storey, 3-bay rubble cruck-framed cottage.	Low
	LB 1674 (B)	MHG15357, MHG44011, MHG46528	Kincraig House & Meat Larder	Late 18th century house and associated meat/game larder. House is set within a relatively open landscape with views to the south and east, now looking onto the A9 carriageway and beyond. Meat larder sited on knoll to catch cooling winds. Unusual survival. Small privy and rubble walled garden stand at East of house; icehouse (now blocked) built into slope at West.	Medium
	-	MHG30078, MHG34527	Kincraig House	The remains of a drystone and earthen banked rectangular structure.	Low

Period	Designated Asset Ref. (if applicable) ⁵⁶	HER Number	Name	Description	Value
Post-medieval	LB 1651 (C)	MHG15388, MHG47797	Alvie Manse (Former Church of Scotland Manse) & Steading	John MacCulloch, architect, 1807-8, repaired 1834. Baronialised with substantial additions by Thomas MacKenzie, 1848-9.	Low
	LB 49689 (B)	MHG22735, MHG47690, MHG47691	Alvie House Including Estate Office (Former Laundry) and Motor House	Mid 19th century shooting lodge significantly enlarged and altered in early/earlier 20th century. Although Alvie house has undergone some alterations in the later 20th century (with the conversion of the rear servant's quarters) it remains a well preserved earlier 20th century shooting lodge. The interior of the main house still contains many of the original fittings, a collection of 1920s Maple and Co bathrooms are of particular note. The house in the late 19th and early 20th century was in the ownership of the famous engineer R B Whitehead, credited with developing the first fully operational torpedo, (it is reputed that a prototype torpedo was stored at Alvie).	Medium
	-	MHG4430, MHG41946	Loch Alvie	A depopulated settlement of at least four construction phases and field systems of at least two periods. A township, which comprised four unroofed buildings and one enclosure was depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG4457	Kincaig Station (HR)	Railway Station opened 1863 by the Inverness and Perth Junction Railway. Closed to regular passenger traffic on 18 October 1965.	Low

Period	Designated Asset Ref. (if applicable) ⁵⁷	HER Number	Name	Description	Value
Pt Medieval	-	MHG30066, MHG34520, MHG42863	Meadowside Quarry	A group of up to fourteen small cairns, circular to oval in shape and between approx. 5 and 3m in diameter, together with a small quarry (circa 5 by 4m overall).	Medium
	-	MHG30067	General Wade's Military Road, Alvie	Alvie portion of the road that linked garrisons as Ruthven, Fort George, Fort Augustus and Fort William; constructed 1725 – 1737.	Low
	-	MHG30068, MHG34521	Leault Lime Kiln	Lime kiln.	Low
	-	MHG30071, MHG34525	Possible Corn-Drying Kiln, Leault	A drystone built circular structure, approx. 1.8m diam. with collapsed walls forming banks externally, possibly used for drying corn, is situated to the east of Leault farmhouse.	Low
	-	MHG30072	Leault	A drystone built sub-rectangular field enclosure situated on a downsloping bank in a semi-improved field.	Low
	-	MHG30073, MHG45749	Leault Burn	A drystone boundary with a small enclosure attached at its terminus to the north. Also classed as boundary dyke.	Low

Period	Designated Asset Ref. (if applicable) ⁵⁸	HER Number	Name	Description	Value
Post-Medieval	-	MHG30074	Kincaig House	The site comprises three structures; (i) circular drystone built structure, circa 4m diam. With a turf-clad roof, (ii) a two-storey mortar-built stone rectangular structure approx. 4m wide by 5m long and 2.5m high, and (iii) a rectangular mortared stone building with more recent annex added.	Low
	-	MHG30079	Kincaig House Well	A well marked on the OS 1st edition is now truncated by a defunct curvilinear dyke (partly mortared) that used to form the northern boundary of a garden attached to Kincaig House. The well is now a wet depression in the ground.	Low
	-	MHG30082, MHG34530	Meadowside House Lime Kiln	A limekiln located to the north of the reception area of the Highland Wildlife Park.	Low
	-	MHG30086	General Wade's Military Road, Alvie	A section of Wade's military road at Highland Wildlife Park survives as an earthwork. A short section of walling runs alongside the road.	Low
	-	MHG34304	Dunkeld – Dalnacardoch - Ruthven – Aviemore – Inverness Military Road	A portion of General Wade's military road.	Low
	-	MHG34310	Dunkeld – Dalnacardoch - Ruthven – Aviemore – Inverness Military Road	A portion of General Wade's military road.	Low

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SM = Scheduled Monument; LB = Listed Building

Period	Designated Asset Ref. (if applicable) ⁵⁹	HER Number	Name	Description	Value
Post-Medieval	LB 1650 (B)	MHG29781	Alvie Parish Church and Burial Ground (Church of Scotland)	Church, built 1768, repaired 1833, 1880 and 1952. Ecclesiastical building in use as such. Commanding site between Loch Alvie and Loch Beag.	Medium
Medieval to 21st Century	LB 4609 (B)	MHG15367	Former Meadowside Hospital	Hospital built 1906 by architect Cattanach. The former Meadowside Hospital at Kinraig is typical of the many small infectious diseases hospitals built around the turn of the century. It is now rare to find an example as well preserved and unaltered as this, particularly as regards the link corridors and the original glazing. The ventilators have been removed from the link corridors and the sanitary annexes. By 1937 the hospital had been disused for some years, but it was kept on a care and maintenance basis. Converted to flats 1990-91.	Medium
Post-medieval to 21st Century	-	MHG30463	Kinraig Military Installation	Rail Block.	Low
	-	MHG4422	Alvie	The remains of a heather-covered shieling.	Low
Undated	-	MHG4429, MHG44891	Loch Alvie	A heather-covered cairn with a possible cist. The possible cist, apparently disturbed, consists of eight rounded boulders.	Medium
	-	MHG4439	Possible Quarry, Hillview	A circular depression on the summit of a small knoll is probably an old quarry scoop.	Negligible
	-	MHG4451	Findspot, Dunachton	A quantity of flintwork and a fine whetstone.	Medium

Period	Designated Asset Ref. (if applicable) ⁶⁰	HER Number	Name	Description	Value
Undated	-	MHG4452	Dunachton Bridge	Bridge over Dunachton Burn.	Low
	-	MHG4459	Dunachton Burgh	Erected burgh of barony.	Low
	-	MHG22306	Leault, Threshing Mill	Threshing Mill.	Low
	-	MHG22735	Alvie Lodge	Lodge.	Low
	-	MHG23951	Baldow, Old and New Bridge on A9	Exact location is uncertain, one possibility is the given grid reference.	Low
	-	MHG26354	Alvie Gardens	A former farmstead, comprising seven roofed buildings, four of which are arranged around a courtyard, one unroofed building and three enclosures is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG26360	Ballourie	A former township of three foci comprising a total of ten roofed buildings, two unroofed buildings and seven enclosures are depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG26361	Ballourie	A former farmstead, comprising two roofed buildings and two enclosures is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG26362	Ballourie	A former farmstead, comprising one unroofed building and one enclosure is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low

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SM = Scheduled Monument; LB = Listed Building

Period	Designated Asset Ref. (if applicable) ⁶¹	HER Number	Name	Description	Value
Undated	-	MHG26363	Ballourie	A former farmstead, comprising five roofed buildings and two enclosures is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG26367	Milehead	A former farmstead, comprising one unroofed building and one enclosure is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG26368	Mid Delfour	A former farmstead, comprising three unroofed buildings is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG26370	Alvie Lodge	A former farmstead, comprising two unroofed buildings and a short length of field wall is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG26380	Mid Delfour	A former farmstead, comprising one roofed building and two unroofed buildings is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1874).	Low
	-	MHG26385	Dunachton-more	A former township comprising four unroofed buildings, three partially roofed buildings, two of which are long buildings, five roofed buildings and three enclosures is depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1872).	Low
	-	MHG32752	Kincraig Boundary Stone	Possible boundary marker (with carved cross on S and N sides) between Alvie/Insh (old) parishes.	Low
	-	MHG34522	Dunachton Burn	Unenclosed settlement.	Low
	-	MHG34526	Kincraig House	Unenclosed settlement.	Low
	-	MHG34983	Badden	The remains of a township consisting of at least six unroofed buildings immediately to the SE of Kincraig house.	Low

Period	Designated Asset Ref. (if applicable) ⁶²	HER Number	Name	Description	Value
Undated	-	MHG37694	Alvie Lodge Kennels	Kennels.	Low
	-	MHG40567	Kincaig	Enclosure including one unroofed building and an as depicted on the 1st edition of the OS 6-inch map (Inverness-shire 1873).	Low
	-	MHG44892	Loch Alvie Cairn Field	A heather-covered cairn with a possible cist lies on flat ground on undulating moorland and is accompanied by field clearance heaps. The possible cist, apparently disturbed, consists of eight rounded boulders and two flat slabs which may have been capstones. Extending from the cairn are the indistinct remains of up to fifteen field clearance cairns.	Medium

5.6. Historic Landscape

5.6.1. The assessment of significance contained within this section is based on a review of secondary research material, principally the Cairngorms National Park Landscape Character Assessment (2009).

Royal Commission on the Ancient and Historical Monuments of Scotland

5.6.2. The Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) Historic Land-use Assessment (HLA) map documents the historic land uses of Scotland and maps changes to these uses. The current study area falls within several HLA Types: on the western section of the study area the landscape is dominated by rectilinear fields to the north and drained rough grazing to the south. Belts of managed woodland run parallel to the A9, and remnants of a designed parkland can be found near Dunachton Lodge (LB 1672). The eastern part of the study area, from Alvie School to Dalraddy, is dominated by managed woodland, with another remnant designed parkland near Alvie House (LB 49689).

Cairngorms National Park Landscape Character Assessment

5.6.3. The 2009 Cairngorms National Park landscape character assessment was undertaken by the CNPA to characterise the general landscape of the National Park. The 2009 study built on earlier landscape character assessments and took into consideration the HLA studies done by RCAHMS. The 2009 assessment defines the study area as part of the lowland character areas of the park, within three distinct character areas: the Badenoch Insh Marshes and Badenoch Kincaig to Loch Alvie areas. See Chapter 8 Landscape and Visual Effects for impact assessment of CNP.

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SM = Scheduled Monument; LB = Listed Building

Badenoch Insh Marshes

- 5.6.4. The historic nature of the Insh Marshes character area includes large lodges, such as the one at Dunachton (LB1672), on the south-facing slopes overlooking the A9. The setting of these lodges often includes designed elements that make them distinctive within their surrounding landscape. Views within the Insh Marshes character areas are limited from adjacent areas by trees. These trees, along with the natural geography of the land, obscure views of the designed landscapes from the A9 corridor. The Badenoch Insh Marshes character area varies between unimproved wild wetland, belts of managed but naturalistic woodland and designed landscapes. It also features substantial areas of eighteenth and nineteenth century improved agricultural land and evidence of earlier pre-enclosure agricultural use. It is therefore of high historical interest. It has been assessed as being of High Significance.

Kincraig to Loch Alvie

- 5.6.5. The character of the Kincraig to Loch Alvie area is defined by its containment within hillslopes, particularly along the A9 corridor, lending a secluded feeling to many parts of the area. This is augmented by dense commercial plantations using coniferous varieties immediately adjacent to the highway corridor along much of the A9 in this area. The exception to this containment of views is along the A9, where the landscape opens up to grazing near Kincraig House (LB 1674). The farmland near Kincraig House is also distinctive in its use of dykes and stone walls as field boundaries rather than the more common fences. Remnants of designed landscapes at Alvie Lodge and Kincraig House are also visible, though these have been truncated in both cases. Given that the historical significance of the area has been somewhat degraded by twentieth century tree planting, the area has been assessed as being of Moderate Significance.

Loch Alvie to Inverdrue

- 5.6.6. The character of the Loch Alvie to Inverdrue area is defined by containment within steeply sided and densely wooded valleys. Areas of unimproved wetlands surrounding Loch Alvie and other smaller lochans are commonplace within the area. There are significant areas of deciduous tree planting associated with nineteenth century estate improvements in the area, with particularly well preserved parkland at Doune House. Prehistoric man made features are also visible south of Polchar, where the tree cover thins out somewhat. Due to the presence of these prehistoric features, the area has been assessed as being of High Significance.

Ground Conditions

- 5.6.7. Information derived from site visits and aerial photographs show that the A9 is an existing highway corridor that has probably been subject to ground disturbance during its construction and ongoing maintenance. There are also areas adjacent to the actual carriageway that have been used to form embankments and areas of dense tree planting. Therefore, there are considerable pockets either side of the carriageway where the existing A9 carriageway has been subject to some level of ground disturbance and will therefore have partially, if not wholly truncated any surviving archaeological remains in these areas.

5.7.

Consultation

- 5.7.1. Historic Scotland (HS) and The Highland Council Heritage Service (HCHS) were consulted during the Stage 1 and Stage 2 DMRB Assessment (see Chapter 8 Landscape and Visual Effects for consultations with CNPA). HS and HCHS were consulted on the updated design for this detailed assessment.

Historic Scotland

- 5.7.2. During a meeting in February 2013, HS provided information on recent research that suggests a site for the Battle of Dunachton (Dun Nechtain) on the west side of Loch Insh near Dunachton Lodge⁶³. The battle has long been associated with Dunnichen in Angus; where a pictish stone is thought to record the events of the battle. The historian Alex Woolf has suggested that the north west shore of Loch Insh is another possible location for the battle event, though the Historic Scotland register of battlefield sites records that there are no known physical remains to tie the battle to either possible site:

*“Both locations rely on conjecture. Based on currently available evidence it cannot be determined whether the battle took place in Angus... or in the vicinity of Dunachton, or indeed in another location entirely”.*⁶⁴

- 5.7.3. The location of the battle is unknown and no known physical evidence exists for its location near Dunachton Lodge.
- 5.7.4. HS were also consulted about the timetable and proposals for archaeological fieldwork, which may be required.

The Highland Council Heritage Service

- 5.7.5. The HCHS were consulted on the requirements for archaeological fieldwork which may be required, namely the proposal for an archaeological watching brief on topsoil stripping in areas outside of cuttings and the existing highways corridor. This approach was accepted by The HCHS via email in April 2013.

5.8.

Impacts

- 5.8.1. The assessment has been undertaken in accordance with the three-part process set out in DMRB and following the historic environment principles set out in the SEA Environmental Report (June 2013). First, the value of the heritage asset is assessed (set out in Table 5.1); then the magnitude of impact is identified before and then taking into account agreed mitigation measures; and finally the significance of the effect is determined by using a matrix and professional judgement to combine the magnitude of the impact and the value of each asset. The criteria for assessing the value of assets; the magnitude of the impacts and the significance of effect can be found in DMRB Volume 11:3:2. The impacts and overall significance of effects are identified in Table 5.5.

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Woolf, Alex (2006). "Dun Nechtain, Fortriu and the Geography of the Picts". *The Scottish Historical Review* 85: 182–201
Historic Scotland (undated). "Inventory of Historic Battlefields – Research Report". Unpublished.

Design Assumptions

- 5.8.2. The assessments of impacts takes into account the following assumptions and design parameters (also see Chapter 8 Landscape and Visual Effects):
- New land take will be limited in particularly sensitive locations (as identified in table 5.4);
 - Locations of proposed compound sites and offsite facilities will be subject to assessment for their impact on any cultural heritage sites and will be dealt with by the Contractor through the planning process;
 - Stone will be saved and stored in any locations where sections of stone walling will be removed. Following construction, the stone walls will be reinstated using traditional techniques on their original field boundaries lines as far as possible;
 - Where tree planting is removed which currently acts as screening to the wider landscape, it will be replanted along the line of the new highway boundary in order to maintain the effect of the original screening resource; and
 - New tree planting is not proposed along the A9 highway around Kinraig House as this will be out of character and a detracting element from the existing historic landscape character in this area.

Impacts and Significance of Effects on Known Sites

- 5.8.3. The majority of known sites will not be physically affected due to their distance from the proposed Scheme footprint. In addition, the presence of dense vegetation planting and / or the location of the highway within a cutting that separates the road corridor from the wider landscape will contain views and limit the potential for changes to the setting of sites such as Listed Buildings and upstanding Scheduled Monuments. Therefore, the majority of known heritage sites will remain unaffected by the proposed Scheme, with a small number of exceptions outlined below.
- 5.8.4. The proposed Scheme would have no direct physical impact on designated cultural heritage sites (i.e. the Scheduled Monuments or Listed Buildings). However, earthworks may encroach near St Drostan's Chapel and Graveyard (LB 4337 and MHG41433), which could affect the setting of these sites.
- 5.8.5. In general, the nature of the existing highway corridor, which is of limited historic landscape value would not be affected by the proposed widening other than through the further formalising of an existing dominating element of the immediate landscape. The proposed Scheme would therefore be in keeping with the landscape's character as a transport corridor. Impacts to characteristic historic land-use would be minimal due to the contained nature of the highway corridor and the existing vegetation cover and the proposals for online widening, as opposed to the construction of an entirely new highway network. This would mean a minor impact on a negligible asset resulting in a neutral / slight adverse significance of effect.
- 5.8.6. The only location where there are wider views with little screening of the existing carriageway, and therefore proposed widening, would be in the area of Kinraig House (LB 1674). At this location, the carriageway is at grade with open, multi-directional views. Kinraig House is around 300 metres to the north-west of the carriageway, but has been designed in particular to take in the views over the wider landscape to the south and east where the carriageway is located. In addition, in this area there are also dykes and stone-walled field boundaries that are characteristic of this small clearing in the otherwise constrained and well-wooded landscape. This would mean a minor impact on a medium asset resulting in a slight adverse significance of impact.

5.8.7.

In addition, the known undesignated cultural heritage sites set out below lie close to the footprint of the proposed Scheme:

- Portion of General Wade’s Dunkeld – Inverness Military Road (MHG 34304)
- The Alvie portion of General Wade’s military road (MHG30067);
- Dunachton Bridge (MHG4452);
- Leault Burn (MHG30073) – drystone boundary with enclosure;
- Possible quarry at Hillview (MHG4439);
- Site of undated farmstead at Milehead (MHG26367);
- Site of undated farmstead at Mid Delfour (MHG26380); and
- The historic landscapes that the proposed Scheme passes through as outlined in 5.6 above.

5.8.8.

The impact and resulting significance of the effects on these sites have been set out in Table 5.5 below, taking into account mitigation where possible and the design assumptions discussed above.

Table 5.5 Impact Assessment of Cultural Heritage Assets

Designated Asset Reference (If Applicable) ⁶⁵	HER Number	Name / Value	Impact	Significance of Effect	Proposed Mitigation	Significance of Effect after mitigation
LB 4337 (B)	MHG41433 and MHG47592	St. Drostan's Chapel & Graveyard, Dunachton Medium Value	The chapel and surrounding graveyard are approximately 20 metres to the east of the current A9 carriageway. Currently a dense belt of trees obscures views of the carriageway from the chapel. The dualling of the existing carriageway (on the opposite side to the chapel) will not affect the setting and character of the chapel and its relationship to the surrounding graveyard. The proposed Scheme would therefore have a negligible impact.	This would result in a neutral effect on the setting of the listed building and graveyard.	Widening road on the eastern side would ensure no direct physical impact. Limited land-take in the vicinity of the site, plus maintaining existing screening and no temporary compounds or lay-down areas during construction would avoid impact on setting of assets.	This would result in a neutral effect on the setting of the listed building and graveyard.

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Designated Asset Reference (If Applicable) ⁶⁵	HER Number	Name / Value	Impact	Significance of Effect	Proposed Mitigation	Significance of Effect after mitigation
LB 1674 (B)	MHG15357, MHG44011, MHG46528	Kincraig House & Meat Larder Medium & Low Value	The proposed Scheme will be clearly visible from the house which although 300 metres to the north-west does have clear and open views in this direction, having been designed on this orientation to take advantage of the vistas. The proposed Scheme would therefore have a minor adverse impact on the setting of these assets.	This would result in a slight adverse effect on the setting of Kincraig House due to duelling of existing carriageway.	No tree screening would ensure development is in keeping with current open landscape. Land-take should be limited in this location and no temporary compounds or lay down areas sited in this area.	This would result in a slight adverse effect on the setting of Kincraig House due to duelling of existing carriageway.
-	MHG4439	Possible Quarry, Hillview Low Value	The proposed Scheme would result in the partial or total removal of the quarry, which is of low value. The proposed Scheme would therefore have a negligible impact.	This would result in a neutral effect following removal of the quarry.	Further archaeological recording of this feature would be of limited value. Therefore no mitigation is proposed.	This would result in a neutral effect following removal of the quarry.

Designated Asset Reference (If Applicable) ⁶⁵	HER Number	Name / Value	Impact	Significance of Effect	Proposed Mitigation	Significance of Effect after mitigation
-	MHG 34304	General Wade's Military Road, Dunkeld – Inverness Low Value	The proposed Scheme may result in the removal of a small portion of the road recorded north of Meadowside Quarry, which would not affect its overall character and significance. The proposed Scheme would therefore have a minor adverse impact on the setting of this asset	This would result in a slight adverse effect as a result of the loss of a small portion of a former military road.	Land-take should be limited in this location and no temporary compounds or lay down areas sited in this area.	This would result in a slight adverse effect as a result of the loss of a small portion of a former military road.
-	MHG30067	General Wade's Military Road, Alvie Low Value	The proposed Scheme may result in the removal of a small portion of the road recorded north of Meadowside Quarry, which would not affect its overall character and significance. The proposed Scheme would therefore have a minor adverse impact on the setting of this asset.	This would result in a slight adverse effect as a result of the loss of a small portion of a former military road.	Land-take should be limited in this location and no temporary compounds or lay down areas sited in this area.	This would result in a slight adverse effect as a result of the loss of a small portion of a former military road.

Designated Asset Reference (If Applicable) ⁶⁵	HER Number	Name / Value	Impact	Significance of Effect	Proposed Mitigation	Significance of Effect after mitigation
-	MHG30073, MHG45749	Leault Burn, drystone walling Low Value	The proposed Scheme would result in the removal of a small portion of stone wall already dissected by the existing road. This would not affect its overall character and significance. The proposed Scheme would therefore have a minor adverse impact on this asset.	This would result in a neutral effect.	Limited land-take in this location would reduce removal of dry stone walling. Reinstated along the new line of the carriageway would further reduce the impact.	This would result in a neutral effect following reinstatement of the portion of wall affected.
-	MHG26367	Milehead, former farmstead Low Value	The site is noted on the 1874 OS and may lie within the proposed Scheme footprint. Construction work has the potential to partially or wholly truncate any surviving archaeological remains, which would result in a moderate adverse impact.	Slight / moderate adverse effect.	Archaeological Watching Brief would monitor and record potential buried remains during construction. This would include appropriate finds and environmental analysis, and reporting of results.	This would result in a slight adverse effect as a result of the loss of this site.

Designated Asset Reference (If Applicable) ⁶⁵	HER Number	Name / Value	Impact	Significance of Effect	Proposed Mitigation	Significance of Effect after mitigation
-	MHG26380	Mid Delfour, former farmstead Low Value	The site is noted on the 1874 OS and may lie within the proposed Scheme footprint. Construction work has the potential to partially or wholly truncate any surviving archaeological remains, which would result in a moderate adverse impact.	Slight / moderate adverse effect.	Archaeological Watching Brief would monitor and record potential buried remains during construction. This would include appropriate finds and environmental analysis, and reporting of results.	This would result in a slight adverse effect as a result of the loss of this site.

Designated Asset Reference (If Applicable) ⁶⁵	HER Number	Name / Value	Impact	Significance of Effect	Proposed Mitigation	Significance of Effect after mitigation
-	N/A	Badenoch Insh Marshes Historic Landscape Character Area – High Value	<p>The existing A9 runs along the historic transport corridor of the valley floor; historic transport routes have become fossilised in the landscape, such as Marshal Wade's Military roads. The widening of the route would be clearly seen as a further development of this transport corridor, which includes the former A9 trunk road and the railway line.</p> <p>Views from the wider landscape are largely screened by existing tree planting. Therefore the proposed Scheme would result in a minor adverse impact.</p>	This would result in a moderate / slight adverse effect.	Where woodland areas would be lost through additional landtake strengthened planting is proposed to verges.	This would result in a moderate / slight adverse effect.

Designated Asset Reference (If Applicable) ⁶⁵	HER Number	Name / Value	Impact	Significance of Effect	Proposed Mitigation	Significance of Effect after mitigation
-	N/A	Kinraig to Loch Alvie Historic Landscape Character Area – Moderate Value	Views from the wider landscape are largely contained by twentieth century conifer plantations, apart from in the stretch of road at Kinraig House, where open vistas were a key part of the original landscape design. Given that the widened road will feature prominently in this section of the landscape it will result in a minor adverse impact.	This would result in a minor adverse effect	Where woodland areas would be lost through additional landtake strengthened planting is proposed to verges. No planting is proposed to the open area adjacent to Kinraig House, as this would obscure the original design intent.	This would result in a moderate/ slight adverse effect.

Designated Asset Reference (If Applicable) ⁶⁵	HER Number	Name / Value	Impact	Significance of Effect	Proposed Mitigation	Significance of Effect after mitigation
-	N/A	Loch Alvie to Inverdrue Historic Landscape Character Area – High Value	Views from the wider landscape are largely contained by historic tree planting, and, as the road is largely contained within cuttings, it does not feature prominently in any key views within the area. The widening of the road will therefore result in a minor adverse impact.	This would result in a moderate / slight effect.	Where woodland areas would be lost through additional landtake strengthened planting is proposed to verges.	This would result in a moderate / slight adverse effect.

Potential Unknown Cultural Heritage Sites

- 5.8.9. Although there is a postulated location for the Battle of Dunachton near to Dunachton Lodge, it is not an accurate location by any means and other documentary evidence suggests that the battle may have taken place in the Forfar area instead. Given the uncertainty in location, it is not possible to limit land take in the vicinity of the Battle since its location (or even presence) is unknown at this time.
- 5.8.10. It is possible that other buried archaeological remains lie in proximity to these sites; features such as further buildings, wells or settlement boundary walls may be associated with the farmsteads. In addition, in the wider study area there is the presence of ring cairns and flint scatters suggesting prehistoric activity and utilisation of the landscape. The site walkover survey and this assessment indicates that the ground within the existing A9 highway corridor and associated drainage and tree planting immediately adjacent to the carriageway will have already heavily disturbed, if not removed any archaeological remains in these areas. However, where the proposals include new land take outside of these disturbed areas, there is the potential to affect as yet unknown buried archaeological remains. In these areas, a programme of archaeological works shall be agreed with HCHS to address any potential impacts. A detailed mitigation strategy is set out in the next section.

5.9. Mitigation Measures

General mitigation principles

- 5.9.1. The SEA for the A9 Trunk Road between Perth and Inverness provides recommendations and guidance on route-wide strategic historic environment principles. Those that have informed the archaeological mitigation measures applied between the Kincaig and Dalraddy section of the A9 road corridor as described in the table 5.6 below.

Table 5.6 – SEA Mitigation Principles

Strategic Historic Environment Principles (A9 Perth-Inverness)	Principles applied along A9 Kincaig-Dalraddy
Conserve and enhance the special and distinct landscape character and qualities of the Cairngorms National Park.	See Chapter 8 Landscape and Visual Effects.
Avoid and minimise effects on designated landscapes through sensitive design and consultation.	See Chapter 8 Landscape and Visual Effects.
Conserve, preserve and record architectural and archaeological heritage.	The road alignment has been developed to closely follow that of the existing A9, which forms a part of the existing character of this section of Cairngorms National Park. Limited land take in areas of archaeological sensitivity will ensure impact is mostly avoided (conserved). Where land take is necessary archaeological monitoring will be undertaken (recording) prior to removal.
Avoid and minimise effects on historic environment features through sensitive design and consultation.	Design measures have focussed on the conservation of the historic landscape and its component assets, such as maintaining open vistas at Kincaig House and moving/reinstating dry stone walling adjacent to the road at Leault Burn.

Specific mitigation measures

- 5.9.2. Mitigation of adverse effects through the design process will be on going. However, specific historic environment mitigation measures should be undertaken in consultation with the HS and the HCHS Archaeologist as follows: Limited land-take and no temporary compounds or lay down areas at the following sensitive locations:
- St Drostan’s Chapel and Graveyard (LB 4377);
 - Kincaig House (LB 1674);
 - Leault Burn dry stone wall (MHG30073 & 45749); and
 - General Wade’s Military Road (MHG30067 and MHG3404).
- 5.9.3. Detailed design and construction programming must ensure no impacts on the dykes and stone field boundaries on the hillslopes between Kincaig House (LB 1674) and the A9 corridor. This is to safeguard the important character of this historic landscape.

5.9.4. Strengthened tree planting is proposed in areas where additional landtake will necessitate the removal of existing woodland. No additional planting is proposed within the area adjacent to Kincaig House, where open vistas across the landscape are a key component of the original design intent.

5.9.5. Due to the presence of known archaeological sites i.e. the former farmsteads of Milehead and Mid Delfour, and the potential for further archaeological remains to be present, an Archaeological Watching Brief must be in place to monitor and record any areas of new land take outside of cuttings, the existing highway corridor and its adjacent planting regime. The exact scope of the archaeological watching brief will be defined in a Written Scheme of Investigation (WSI) and approved by HS and the HCHS Archaeologist in advance of enabling and construction work. Furthermore, the WSI must include provision for recording potential remains associated with the Battle of Dunachton.

5.10. Cumulative Impacts (Design Year 15)

5.10.1. In regards to the cultural heritage resource, the proposed Scheme would have the same impact at either Opening Year 1 or Design Year 15. It is not anticipated that routine maintenance and upkeep of the road would result in any additional impacts to heritage assets. Consultation with HS and THC did not identify any reasonably foreseeable projects that would have a cumulative impact on the existing historic environment resource.

5.11. Summary and Conclusions

5.11.1. This assessment has shown the proposed Scheme would affect a small number of known heritage assets, and would be limited to potential truncation of two former post-medieval farmsteads, a post-medieval quarry, two short sections of an 18th century military road, and a short length of post-medieval dry stone wall. It would also cause minor adverse impact on the setting of Kincaig House and associated buildings resulting in a slight adverse effect. There would be a minor adverse impact on the Badenoch Insh Marshes Historic Landscape Character Area, resulting in a moderate/slight adverse effect.

5.11.2. Additionally, there would be a minor adverse impact on the Kincaig to Loch Alvie Historic Landscape Character Area leading to a slight adverse effect. Similarly there would be a minor adverse impact on the Loch Alvie to Inverdrue Historic Landscape Character Area, leading to a moderate/slight adverse effect. The nature and scale of the project means the wider historic landscape would not be adversely affected by the proposed Scheme.

5.11.3. The assessment proposes to mitigate effects described above through screen planting and a programme of Archaeological Watching Brief, the scope of which would be agreed with the HCHS prior to any enabling or construction proceeding and would include an appropriate level of post-fieldwork reporting.

5.11.4. Based on the results of this assessment, the overall effect of the proposed Scheme on the cultural heritage resource is considered to be slight adverse.

5.11.5. This assessment has followed national and regional policy guidance recommendations for the identification and impact assessment of the cultural heritage resource affected by the proposed Scheme. It has also proposed appropriate mitigation where avoidance of impacts is not possible, in consultation with HCHS, and in compliance with national and regional planning policies, as detailed in Chapter 16 Policies and Plans.

6. Disruption Due to Construction

- 6.1. Introduction
- 6.2. A9 Dualling Strategic Environmental Assessment
- 6.3. Methodology
- 6.4. Baseline Conditions
- 6.5. Consultation
- 6.6. Impacts
- 6.7. Mitigation Measures
- 6.8. Significant Residual Effects



6. Disruption Due to Construction

6.1. Introduction.

- 6.1.1. The objective of this Chapter is to provide an assessment of the factors and effects associated with disruption due to the construction of the proposed Scheme.
- 6.1.2. This assessment has been undertaken in accordance with guidance given in DMRB Volume 11, Section 3, Part, 'Disruption Due To Construction'.

6.2. A9 Dualling Strategic Environmental Assessment

- 6.2.1. The SEA Environmental Report for the A9 Dualling, published in June 2013, provides a Policies, Plans and Strategies (PPS) Review. This recognises that A9 Dualling related effects must be carefully sensitively managed through construction phases and the following assessment takes cognisance of the SEA.
- 6.2.2. The SEA Environmental Report notes that construction related effects will generally be temporary, e.g. use of land for site compounds, noise, vibration, etc. It also considers that effects on biodiversity may be permanent if related to habitat losses to hard standing, or temporary and reversible where related to construction.
- 6.2.3. The SEA specifically notes that A9 Dualling should schedule and control the timing of construction activities to minimise noise impacts on sensitive receptors. This principle is considered with respect to the proposed Scheme in section 6.7 of this chapter.
- 6.2.4. The key issues that may arise from disruption due to construction include:
- Localised increases in noise and dust during construction;
 - Loss of amenity due to traffic management or use of the local roads by construction traffic;
 - Delays to traffic caused by construction operations;
 - Disturbance due to material haulage to and from the site;
 - The effect of surplus of earthworks materials;
 - Potential for ecological impacts including potential timing constraints; and
 - Potential for pollution of the River Spey including Loch Insh and other water bodies.
- 6.2.5. These key issues should however be considered and balanced against the existing influence of the A9 and associated traffic.

6.3. Methodology

- 6.3.1. This assessment follows the guidance given in DMRB Volume 11 as noted in Section 6.1.
- 6.3.2. The identification of properties within 100 metres of the proposed Scheme and the approximate amount of earth moving associated with the proposed Scheme is assessed. The assessment comments on the effect and potential mitigation where disruption and/or disturbance are likely to occur. For the purposes of the assessment, typical construction methods have been assumed. It is not anticipated that specialist activities such as piling will be required for construction of the proposed Scheme.
- 6.3.3. The proposed Scheme has been designed as parallel widening wherever possible and it is anticipated that the Contractor will construct the proposed Scheme in discrete sections such that the improvements would be constructed in parts along the full length of the works. This approach would limit the extent of traffic management measures and reduce delays on the A9.
- 6.3.4. It is expected that temporary diversions will require to be constructed around the proposed structures to allow off line working.

- 6.3.5. The shortest potential construction period is estimated to be 18 months and this timescale has been considered for this assessment as it is likely to give rise the highest concentration of construction impacts and therefore presents the worst case scenario.
- 6.3.6. National Cycle Network (NCN) route 7 is located approximately 2 kilometres to the east of the A9 and there are no formal public rights of way within the study area and there are therefore unlikely to be significant impacts on Non-Motorised Users at a route wide level as a result of the proposed Scheme.
- 6.3.7. Pedestrians and other users wishing to cross the existing A9 generally do so at one of the existing underpasses at Dunachton Burn, Baldow Smiddy, Lower Milehead, or Allt an Fhearna. However these tend to be used in the main by the adjacent landowners, their staff and tenants. There are a total of 16 existing private accesses onto the A9, frequency of pedestrian and other users has not been confirmed but is anecdotally understood to be low. It should be noted that the equestrian centre located at Easter Delfour is understood to make use of the accesses across the A9 at the northern section of the proposed Scheme.
- 6.3.8. However, there are likely to be localised impacts on pedestrians, cyclists and equestrians during construction of the road improvements and underpass crossings of the existing A9. Careful sequencing of construction and routing of non-motorised users during construction will therefore be required by the Construction Environmental Management Plan (CEMP) to ensure disruption to access and recreation is minimised during construction. This principle also applies to landowner vehicular access to the two affected estates as noted in section 6.7.5.

6.4. Baseline Conditions

- 6.4.1. The location of the proposed Scheme is entirely rural in character. As noted in Section 6.4, the proposed Scheme requires on-line, asymmetrical widening to the existing A9 Single carriageway with one crossover from widening to the west to the east as discussed in Chapter 2 of this ES.
- 6.4.2. The village of Kincaig lies to the east, adjacent to the line of the improvements. This village was “bypassed” by the A9 Trunk Road when it was upgraded in 1977.
- 6.4.3. There are a total of 12 properties within 100 metres of the proposed Scheme. These total 10 residential properties, one garage and one school. These are:
- Meadowside;
 - Dunachton Lodge;
 - Dunachton Gate Lodge;
 - Hillview;
 - Montcoffer;
 - Upper Milehead;
 - Kirkbeag;
 - Lower Milehead;
 - Lower Milehead;
 - Alvie Gate Lodge;
 - Baldow Smiddy (garage); and
 - Alvie School.

6.5. Consultation

- 6.5.1. No specific consultation was carried out for this part of the report. However, the assumed restrictions on site working hours as discussed in Chapter 2 apply to this chapter. Consultation relating to noise is recorded in Chapter 10 and within this Chapter where relevant. Consultations regarding air quality are referred to in Chapter 4.
- 6.6.2. Wider consultation with The Highland Council for the proposed Scheme has confirmed that the parallel and adjacent B9152 side road will not be signed as a diversion route for trunk road traffic during construction to minimise the impacts of traffic transferring to this route during the works.

6.6. Impacts

Land Use Sensitivity to Disruption

- 6.6.1. The proposed Scheme follows the existing road alignment and will require earthworks to accommodate an additional carriageway and drainage features.
- 6.6.2. 2.73 hectares of land were purchased by Scottish Ministers in 2009 for the previous WS2+1 scheme. The proposed Scheme will require a further 9.26 hectares of land to be acquired.
- 6.6.3. However, as the land purchased by the Scottish Ministers in 2009 is still in use by the original landowners, for the purposes of this assessment the total land (11.99 hectares) out with the existing road boundary are considered to be affected by the proposed Scheme.
- 6.6.4. The majority of land take will result in a minor amount of land take within the existing soft estate with the exception of re-graded cuttings and embankments situated adjacent to the new carriageway. These areas will be re-planted as part of the proposed Scheme landscaping proposals with native tree, scrub and grassland species, as discussed in Chapter 8 of this ES. There will be minimal or no land returned to agriculture following construction and loss of this land will be financially compensated as appropriate as assessed by the District Valuer.
- 6.6.5. Access to farmland, buildings, commercial, industrial and residential premises will be maintained throughout the construction period. Where necessary this will be by alternative means. It is therefore, anticipated that all accommodation works access tracks to be agreed with landowners will require to be constructed early in the construction phase to ensure access is not disrupted by construction. Similarly, phasing of underpass construction with stopping up of accesses through liaison with affected landowners will be critical and therefore a contract requirement to ensure that operation of the affected estates is minimised.

Property Sensitivity to Disruption

- 6.6.6. With the exception of Dunachton Lodge, none of the properties listed in Section 6.4 have formal direct junction access to the A9. The Residents of these properties all gain access to the A9 via the B9152 (which lies parallel to, but east of the A9 along the full length of the proposed Scheme). Through careful phasing of construction of underpasses, accommodation access tracks and permanent closure of access on to the A9, these properties will suffer minimal disruption due to site traffic movements on the B9152.
- 6.6.7. Dunachton Lodge has associated direct access to the existing A9, however there is alternative access to the B9152 via Dunachton Underpass which is upgraded by the proposed Scheme. It is proposed that the phasing of the works will require existing access to the A9 to be maintained until such time as the upgraded underpass is constructed and can be used by this property.

- 6.6.8. A number of domestic and estate properties take access to the local road network via the A9. These are located to the west of the A9 and include: Kincaig House, Kincaig Farm, Loch Cottage, Ballourie, Alvie Home Farm, Woodside Cottage, Gardeners Cottages, Keeper Cottage, Alvie Gardens, The Bungalow, Alvie House and Estate Management Offices and Outbuildings, Wester Delfour, Mid Delfour, New Easter Delfour, Easter Delfour, Baden Cottage (derelict), and Loch Cottage.
- 6.6.9. Private estate accesses will be removed by the proposed Scheme. Two northbound left in, left out junctions forming private accesses are proposed, one at Leault Farm for Dunachton Estate and another at Delfour for Alvie and Dalraddy Estates. Southbound access to the A9 will be via accommodation underpasses and the existing B951, joining the A9 using the existing junctions at Aviemore and Kingussie.
- 6.6.10. The underpass accesses at Dunachton, Baldow Smiddy and Lower Milehead will be directly affected by traffic management operations. Dependent upon construction phasing and methods, temporary diversion of the A9 may be required to facilitate construction of the new underpasses.
- 6.6.11. Access to properties will be subject to temporary diversions whilst work is undertaken adjacent to their route to the A9.
- 6.6.12. Furthermore, those properties which are located less than 100 metres from the A9 may suffer some slight temporary effects of construction noise and dust. The impacts during construction associated with air quality and dust are reported in Chapter 4.
- 6.6.13. Properties to the east of the existing carriageway in Kincaig and the surrounding area are known to use the existing private accesses to reach the A9. These will be removed as part of the proposed Scheme. However, no change will be made to the formal junction provision at Aviemore and Kingussie as part of the proposed Scheme. These properties should not be adversely affected by noise or dust.

Road User Sensitivity to Disruption

- 6.6.14. For the majority of the proposed Scheme the route will be widened online. Some alterations to the existing carriageway will be required. At the south of the proposed Scheme the existing carriageway will form the southbound carriageway of the new road, at the north the existing carriageway will form the northbound carriageway of the new road. At crossover, and tie-ins some disruption will occur when switching traffic from west to east to facilitate construction. It is anticipated that one lane in each direction should be open for the majority of the works, with occasional use of single lane tidal operational working during changes in traffic management layouts. In summary however, construction work on the proposed Scheme may affect some journey times for through traffic, particularly as a result of reduced speed limits in force to protect the workforce.

Noise and Vibration Sensitivity to Disruption

Noise

- 6.6.15. A detailed construction programme is unlikely to be available until Contractors have been appointed and have fully devised their methods of working and decided on what equipment, plant and construction schedule they will use. In order to provide an indication of typical noise impacts during the construction phase, however, a generic assessment has been carried out in accordance with the methodology of BS 5228⁶⁷.

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BS 5228 (2009) Code of practice for noise and vibration control on construction and open sites.

- 6.6.16. BS5228 Part 1 provides guidance on the prediction and assessment of construction noise as it affects those exposed to it. Calculation procedures are set out in Annex F for predicting the likely noise levels from specific construction activities at a point of interest; taking into account distance, ground absorption, screening, reflections and the percentage on-time for an activity. Annexes C and D provide generic noise data for various items of plant, which can be used for undertaking predictions where no specific information is available.
- 6.6.17. In Annex E, BS 5228 describes methods for identifying the likely significance of noise levels from construction activity at noise sensitive receptors based on a combination of fixed noise thresholds and noise change criteria.
- 6.6.18. Example Method 1(BS 5228 E.3.2), the “ABC” method, sets out that for the appropriate period (day, night or evening/ weekends), the measured ambient noise level is rounded to the nearest 5 dB and then compared with the total noise level, including construction. If the total noise level exceeds the appropriate category value, then a significant effect is deemed to occur. The example threshold for significant effects at dwellings is shown below in Table 6.1.

Table 6.1 Example Threshold of Significance Effect

Assessment category and threshold value period (LAeq)	Threshold value, in decibels (dB)		
	Category A	Category B	Category C
Night-time (11.00pm to 7.00am)	45	50	55
Evenings (7.00pm to 11.00pm weekdays). Weekends (1.00pm to 11.00pm Saturdays and 7.00am to 11.00pm Sundays)	55	60	65
Daytime (7.00am to 7.00pm) and Saturdays (7.00am to 1.00pm)	65	70	75

*BS 5228 Table E.1.

- 6.6.19. The values in Category A, B and C are the threshold values to be used when ambient noise levels (when rounded to the nearest 5 dB) are less than, equal to, or higher than the values in Category A column, respectively.
- 6.6.20. The Highland Council also have guidelines for noise from construction operations on Trunk Roads in its document entitled “Suggested General Noise and Vibration Levels During Operations on Trunk Roads”. The noise limits set out in this document are replicated below in Table 6.2 below.

Table 6.2 Noise Limits

Days	Times	Maximum Noise Levels dB(A)*	
		LAeq (1 hour)	LAm _{ax}
Mondays to Saturdays	0700 to 1900 hours	75	-
	1900 to 2200 hours	65	-
	2200 to 0700 hours	40	50
Sundays and Public Holidays	0000 to 2400 hours	40	50

* Level at 1m in front of the nearest or the worst affected facade

- 6.6.21. In addition to this, The Highland Council’s standard planning condition for construction noise is as follows:
“Operations for which noise is audible at the boundary of the site shall only be carried out between 0800 hours and 1900 hours Monday to Friday, between 0800 hours and 1300 hours on Saturdays and at no time on a Sunday or public holiday”.
“Work requiring to be carried out outwith these times shall only commence with the prior written approval of the Planning Authority”.
- 6.6.22. In keeping with this, the normal construction hours for the proposed Scheme have been assumed to be 08:00 – 19:00 and prior agreement will need to be sought from The Highland Council if it is found necessary to work outside of these hours.
- 6.6.23. In assessing the possible construction noise impacts, the following work phases have been assumed:
- Site Clearance;
 - Construction of earthworks; and
 - Construction of road pavement.
- 6.6.24. A site compound will also be necessary. A full assessment has not been undertaken for this, however it should be positioned as far as is reasonably practicable from any noise sensitive locations and where any light would be cast on the Insh Marshes SPA. Provided this distance is greater than 50 metres, noise from the site compound would not be expected to cause a significant effect.
- 6.6.25. Detailed calculations have been undertaken in accordance with the BS 5228 methodology; the full results of which are presented in Appendix 13 in Volume 3 of this ES.
- 6.6.26. The baseline noise levels used in the assessment were determined from the noise survey that was undertaken in March 2013 as reported in Chapter 10 and Appendix 14 in Volume 3 of this ES.
- 6.6.27. The highest daytime noise levels are predicted during the construction of the earthworks. The resulting BS 5228 assessment for this phase is shown in Table 6.3 below.

Table 6.3 Construction Noise Impacts – Earthworks Phase

Location	Estimated Distance to Construction Works (m)	Measured Ambient Noise Level (facade) dB LAeq,day*	BS 5228 ABC Method Threshold dB LAeq,day	Predicted Construction Noise Level (Highest Phase) dB LAeq,day	Predicted Combined Noise Level dB LAeq,day	Significant (> 65 dB LAeq,day)
Alvie School	50	58.7	65	78	78	YES
Hillview Cottage	70	58.5	65	75	75	YES
Loch Insh	170	46.3	65	65	65	YES
Kincaig House	400	53.2	65	56	58	NO
Alvie House	265	46.6	65	60	60	NO
Wester Dalraddy	245	49.8	65	61	61	NO
Craigmount	120	57.5	65	69	69	YES

*Day = daytime period between 08:00 – 19:00 in line with The Highland Council's standard planning conditions for construction.

6.6.28. The above example together with the detailed tables shown in Appendix 13 in Volume 3 of this ES, show that noise from the construction works has the potential to exceed The Highland Council's absolute noise limit of 75 dB L_{Aeq, 1hr} at Alvie School during the site clearance and earthworks phases. Noise levels at Hillview and other surrounding properties may also exceed the limit during the construction of the earthworks phase.

6.6.29. A summary of the significance of the effects of construction noise for the three phases is shown below.

Table 6.4 Significance of Noise Effects Due to Construction

Location	Estimated Distance to Construction Works (m)	Construction Phase (Significant Effect?)		
		Site Clearance	Earthworks	Road Pavement
Alvie School	50	YES	YES	YES
Hillview Cottage	70	YES	YES	YES
Loch Insh	170	NO	YES	NO
Kincraig House	400	NO	NO	NO
Alvie House	265	NO	NO	NO
Wester Dalraddy	245	NO	NO	NO
Craigmount	120	YES	YES	NO

6.6.30. The effects of construction noise are predicted to be significant at Alvie School and Hillview together with other properties at similar distances from the construction works for all phases of the works. It should be noted, however, that this assessment is based on the worst case scenario when the plant is being operated at the closest distance to the property. This scenario is only likely to exist for a relatively short period within the whole construction period. For the larger part of the construction period, work will be undertaken at much greater distances from these locations and hence impacts will be lower than predicted and effects will not be significant. Furthermore, no account of screening effects due to local topography have been taken into account in the assessment which could potentially result in lower predicted noise levels at any, or all, receptors.

6.6.31. At distances in excess of around 170 metres, the effects of construction noise are predicted to be not significant for all phases.

Vibration

6.6.32. BS 5228 Part 2, gives guidance on vibration levels that could be used to assess the likely impacts of construction activities on the environment and people. Annex B gives guidance on the significance of vibration effects in terms of human response to vibration and structural response to vibration. These tables are reproduced below in Tables 6.5 and 6.6.

Table 6.5 Guidance on effects of vibration levels perceptible to humans

Vibration level	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration
0.3 mm/s	Vibration might be just perceptible in residential environments
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level

*Table B.1 of BS 5228-2:2009

Table 6.6 Transient vibration guide values for cosmetic damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15Hz and above
1. Reinforced or framed structures Industrial and heavy commercial buildings	50mm/s at 4Hz and above	50mm/s at 4Hz and above
2. Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4Hz increasing to 20 mm/s at 15Hz	20 mm/s at 15Hz increasing to 50 mm/s at 40Hz and above

Note 1 Values referred to are at the base of the building.
 Note 2 For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6mm (zero to peak) is not to be exceeded.

*Table B.2 of BS 5228-2:2009

- 6.6.33. The Highland Council recommends in its document “Suggested General Noise and Vibration Levels During Operations on Trunk Roads” that vibration levels should not exceed 5mm/s peak particle velocity (ppv) as measured at the building nearest to the operations for activities other than blasting. Whilst for blasting activities, the specified limit is 10mm/s ppv.
- 6.6.34. Vibration problems during construction works are most frequently related to blasting or piling activities. It is not anticipated that either of these methods will be required for the construction of the widened carriageway. Due to the proximity of rock cuttings required by the proposed Scheme to the existing trunk road, blasting will not be permitted adjacent to the live carriageway and excavations will require to be undertaken using excavators equipped with rock breaking equipment.
- 6.6.35. TRL Report 429⁶⁸ contains data acquired from various other highway construction activities. This data indicates that vibration levels typically fall to imperceptible levels (<0.2 mm/s) at distances of around 50m from the activity.
- 6.6.36. As the closest property, Alvie School, is situated at a distance of 50m from the proposed works, it is unlikely that any effects due to vibration will be felt and no risk to structural integrity would be expected. Vibration impacts are therefore judged to be neutral.

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Hiller, D.M. & Crabb, G.I. 2000. “Groundborne Vibration Caused By Mechanised Construction Works”. TRL Report 429.

- 6.6.37. Should it be decided that blasting is required, further assessment of the likely impacts should be undertaken.

Visual Sensitivity to Disruption

- 6.6.38. The visual envelope of the proposed Scheme is narrow and to some extent is restricted due to the extensive woodland strip following the route of the existing A9. Views towards the surrounding hills are also restricted due to the tree and shrubs in the road verge, which extends over almost the full length of the proposed Scheme to the west and over approximately 4 kilometres of the northern section of the proposed Scheme to the east. The existing A9 also lies in a heavily wooded cutting where it passes through Alvie Estates.
- 6.6.39. The proposed Scheme uses the footprint of the existing A9 and maintains similar cuttings and embankments, the visual effects during construction will therefore be localised. Limited minor impacts may be observed during construction on both sides of the existing A9 where the earthworks require the felling of existing stretches of tree and shrub cover. It is noted that in all locations no clear cutting of tree cover is required and therefore the existing mature tree screening will be thinned at the side of the road but will be retained.

Ecological and Archaeological Sensitivity to Disruption

- 6.6.40. The preferred route is situated in proximity to the following designated sites, comprising EC Directive and National nature conservation designations:
- River Spey Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) with the road alignment around 250 metres from the river at its closest point (within the Insh Marshes SAC);
 - Insh Marshes SAC, Special Protection Area (SPA), Ramsar and SSSI; 35 metres from the A9 at its closest point, and
 - Alvie SSSI, the boundary of which is probably contiguous with the base of the eastern embankment of the A9 north of the Allt an Fhearna bridge.
- 6.6.41. Key issues during construction will be an increased risk of pollution in the Dunachton burn, part of the Spey SAC, and other watercourses that drain into the Spey system (including the Insh Marshes) due to aqueous run-off from the construction areas, and the potential for construction noise and possibly visual disturbance that may adversely affect the breeding bird population, including some rare and vulnerable species, in the Insh Marshes SPA. However, the retention of the existing mature trees on the embankment between the A9 and the marshes, and the dualling works being conducted here on the western side of the retained operational eastern carriageway will provide some screening of the visual activity associated with construction. There may be temporary disturbance to otters and fish populations associated with the Dunachton burn, and the other tributaries of the Spey during construction.
- 6.6.42. Construction will be undertaken to best practice with due regard to the implications of construction run-off for the scheduled sites. No evidence has been found for any permanent habitat or resting places for sensitive, protected species within the zone of likely construction disturbance. However, repeat surveys will be undertaken for protected species such as otter, badger and pine marten prior to construction. The new permanent drainage outfalls will form part of the overall drainage strategy agreed in consultation with SEPA and shall be constructed as early in the construction sequence as possible to ensure that run-off from the site is directed to the appropriate location. Where appropriate the Contractor may need to construct temporary primary treatment facilities to prevent dirty water from the site reaching the receiving watercourse.

- 6.6.43. In relation to construction works, where there is a risk of high or percussive noise being generated by works on rock cuttings in the south of the existing A9 (around 600 metres from the Inch marshes) it is proposed that any such operations are scheduled so as to avoid the bird breeding season, thereby minimising the risk of construction noise adversely affecting the notified bird species of the Insh Marshes SPA.
- 6.6.44. The ecological assessment has identified that, with appropriate mitigation, there should be no significant impacts on the EC Directive sites (SACs and SPAs). There may be some minor land take along the boundary of the Alvie SSSI from the road proposals with the extent of any incursion into the SSSI depending on the precise boundary location and the development of more definitive engineering proposals for the extended road embankment here. Mitigation will be undertaken for the temporary but long-term losses of riparian woodland and the permanent land-take to the additional carriageway by establishing new wet woodland in liaison with SNH and the CNPA.
- 6.6.45. Additional ecological impacts will arise from the proposed Scheme including disruption to habitats located along the length of the proposed Scheme boundary. This will include temporary and permanent habitat loss of wet riparian woodland at the Dunachton crossing and by the Alt an Fhearna on the boundary of the Alvie SSSI, with around 0.3 hectares lost to construction, with subsequent replacement, and around 0.6 hectares of permanent loss to the second carriageway. Permanent losses to wet woodland habitat will be mitigated by planting new woodland as noted above. Around 0.2 hectares of pine plantation (on a non-ancient woodland site with a species-poor ground flora) will be lost to the re-aligned access for the Alvie Estate.
- 6.6.46. Additional losses outside the highway boundary include some small areas of old oak parkland and semi-improved but fairly species-rich wildflower grasslands. Areas of soft estate within the highway boundary will also be lost but these rarely have any significant ecological interest apart from a locally to regionally significant number of wood ant nests in the area of the Alvie pine woods. Two nests are situated within the construction footprint and these will be translocated to a more favourable site within the highway boundary in an area proposed for management by the highway maintenance authority to maintain wood ant populations over the long term.
- 6.6.47. In addition, breeding birds along the road corridor could be affected by vegetation removal and disturbance. The construction timetable will observe sensitive periods for ecological receptors (e.g. avoiding night time works to reduce impacts on bats and otter and avoiding vegetation clearance during the bird breeding season).
- 6.6.48. Due to the nature of the proposed Scheme (principally on-line widening), construction of the new carriageway would not adversely affect the setting of any of the identified Scheduled Monuments or Listed Buildings.
- 6.6.49. The likely nature of the ground with the footprint of the proposed land-take suggests that no known or potential archaeological remains would be affected by the proposed Scheme.
- 6.6.50. Equally, the wider historic landscape would not be adversely affected by the proposed Scheme.

Watercourse Sensitivity to Disruption

- 6.6.51. The River Spey comes within approximately 250 metres of the north bank of the proposed Scheme. Its closest point is opposite Meadowside Quarry, near the southern end of the proposed Scheme. The River Spey is one of the largest rivers in Scotland and is designated as a SAC and a SSSI. The water quality classification of the River Spey is A1 (Excellent). There are 6 watercourses that cross the proposed Scheme. These are the unnamed watercourse at Meadowside, crossing under the road at 281158, 803712, Dunachton Burn, Leault Burn, Baldow Smiddy, Allt an Fhearna and the unnamed watercourse at Dalraddy, crossing under the road south of the Allt an Fhearna at 285220, 808890. The Allt an Fhearna flows into Loch Alvie, which is a SSSI. The Dunachton Burn flows into Loch Inch. This borders the Insh March which is an area of major conservation significance; the site has been given SAC, SPA, SSSI and Ramsar status.
- 6.6.52. It is expected that the works will interrupt the above watercourses during demolition of existing and construction of new watercourse crossings. There may therefore be temporary disturbance to otters and fish during construction works (e.g. from noise or barriers to passage). Some bed regrading may be required for the minor watercourse as part of the modification of an adjacent underpass in order to allow for continued drainage from the underpass.
- 6.6.53. These water features are sensitive to any inflow of pollutants including increased silt generated by construction activity, or accidental spillage of fuel oil, cement or other harmful substances. The Contractor appointed to undertake construction of the proposed Scheme will be required to comply with the Controlled Activities (Scotland) Regulations and the appropriate pollution prevention guidelines issued by SEPA and to follow good working practices to avoid pollution incidents.
- 6.6.54. The new permanent drainage outfalls will form part of the overall drainage strategy agreed in consultation with SEPA and shall be constructed as early in the construction sequence as possible to ensure that run-off from the site is directed to the appropriate location. Where appropriate the Contractor will need to construct temporary primary treatment facilities to prevent dirty water from the site reaching the receiving watercourse.

Control of Site Drainage during Construction

- 6.6.55. Control of site drainage during construction has been covered in this Chapter.
- 6.6.56. Any construction work undertaken close to a watercourse has an inherent risk of surface water and groundwater contamination. Potential contaminants include fuel oils from mechanical plant, dirty water runoff from site, cement, site disturbance within the river channel and general debris from the construction site. All watercourses and water bodies adjacent to the proposed Scheme are sensitive and any contamination could have significant effects on water quality, wildlife and plant life. These effects could arise through, for example, the direct toxicity of contaminant spills, through blanketing by deposited sediment or through water quality impact such as dissolved oxygen depletion.
- 6.6.57. Site drainage and surface run-off will require to be controlled by the Contractor to avoid pollution of watercourses. The Contractor's methods of construction are required by law to comply with the requirements of the Controlled Activities Regulations (CAR) 1995 and associated licensing and general binding rules.
- 6.6.58. The Contractor will be required to consult and comply with the requirements of SEPA when planning and implementing construction. It is anticipated that the Contractor will adopt recognised and established construction practices including storage and attenuation, to avoid impacts on watercourses during construction. Site specific measures should also be set out in the Construction Environmental Management Plan.

Earthworks Excavation and Fill

6.6.59. Carriageway widening generally follows the topography and alignment of the existing road. The preferred route does require the upgrading of structures under the A9 and these may require significant traffic management operations including temporary diversions that require materials and associated earthworks. As a result, there will be an imbalance in the earthworks materials for the proposed Scheme. The estimated bulk cut and fill volumes, excluding topsoil which is largely re-used for the proposed Scheme is as set out in Table 6.7 below. Materials are discussed in further detail in Chapter 15.

Table 6.7 Estimated Excavation and Fill Volumes

	Cut (m3)	Fill (m3)	Net Export (m3)
Proposed Scheme	327,325	203,260	124,065

6.6.60. The above quantities assume that sufficient suitable material can be obtained from the bulk cut quantities to construct the proposed Scheme. Site won material will generally be utilised where possible. Where site won materials are found to be unsuitable, resources could potentially be sought from the local area to avoid increased haulage distances.

6.6.61. The overall volume of exported earthworks materials generated by construction of the proposed Scheme is significant. Based on 188,080m³ net export, this would be approx 19,000 movements in total (based on a 15 Tonne lorry). This assessment assumes that material will be removed to landfill, and material movements for disposal off site are likely to be significant.

6.6.62. There are strict legal controls on the movement and disposal of surplus fill / waste materials that will need to be adhered to. There are four active licensed landfills within the Highland region, three of which are registered non hazardous landfills and the fourth is an inert landfill. See Chapter 15 for further information on their location and capacity. Environmental factors associated with these disposal sites will already have been considered through the planning process and are therefore not considered in this report. The decision on the location of disposal sites used is ultimately the Contractors responsibility.

6.7. Mitigation Measures

6.7.1. Through reference to the baseline conditions and assessment, mitigation measures are likely to aim to:

- Minimise the impact on traffic on the A9;
- Minimise the impact on local traffic on adjoining local roads;
- Restrict contracted working hours to socially accepted periods;
- Take cognisance of seasonal constraints;
- Take appropriate measures to minimise vibration, noise dust and mud;
- Ensure the most reasonable re-use of site won material; and
- Ensure that surplus material arising from construction is disposed of locally to minimise traffic movements off site for disposal.

6.7.2. Mitigation of the effects of disruption due to construction through the design process and through the construction period is an ongoing process. Specific mitigation measures will ultimately be incorporated into contract documentation, and may include specific references such that:

- The site compound is positioned where the least adverse impact will be experienced;
- SEPA are be fully informed of the site operations and the Contractor's control measures are acceptable;
- The risk of pollution can be significantly reduced by the adoption of good working practices and with strict adherence to the appropriate SEPA Guidelines. The key guidelines are listed below:
 - PPG 1 General Guide to the Prevention of Water Pollution
 - PPG 5 Works in, near or liable to affect a watercourses
 - PPG 6 Working at Construction and Demolition Sites
 - PPG 21 Pollution Incident Response Planning
 - PPG 22 Dealing with Spillages on Highways
- Little or no construction traffic should use the local roads;
- Requirements which limit noise and vibration are set by the local Environmental Health Department;
- The Contractor develops an acceptable site management plan to minimise disturbance to watercourses, wildlife and otherwise take all reasonable steps to minimise disturbance and nuisance caused by dust and mud on the roads, etc;
- Mitigation will be required to reduce the predicted significant effects of noise. For the closest and worst affected properties, creating a temporary noise barrier or bund that completely screens the works from view at the property could reduce noise levels at these properties by around 5 to 10 dB. Taking this into account, noise levels at the properties would be likely to be less than The Highland Council's absolute noise limit of 75 dB $L_{Aeq, 1hr}$ for all phases but a significant effect during site clearance and construction of earthworks phases is likely to remain. Noise related impacts will require to be minimised by the Contractor through careful planning and phasing of works with particular regard to school opening hours. The quietest plant available should be used where possible;
- For works immediately adjacent to Alvie Primary School, the Contractor will be required to programme these activities to coincide with school holidays and through consultation with The Highland Council;
- Careful consideration should be given to the siting and orientation of particularly noisy items of plant; where it is not possible to site such items at sufficient distance from noise sensitive

premises, localised screening should be provided;

- Where non-stationary noise sources such as bulldozers, dump trucks and excavators are likely to cause disturbance at nearby receptors, consideration should be given to providing a temporary noise barrier to totally screen the works. Such a barrier would provide around 5 - 10 dB(A) reduction in noise for properties situated within around 100 metres of the works. Additional details of best practice and noise mitigation can be found within Appendix 13 in Volume 3 of this ES;
- Further detailed assessment and planning to minimise construction noise impacts should be undertaken, in consultation with the local EHO, once a Contractor has been appointed;
- It is the responsibility of the Contractor to identify the requirements to locate the site compound; and
- Areas required temporarily during construction will be reinstated and vehicular routes to all farmland and buildings, other commercial and industrial premises and residential premises will be maintained throughout the construction period through careful phasing of the works to ensure access and/or alternative access is available.

6.8. Significant Residual Effects

- 6.8.1. The proposed Scheme does not deviate significantly from the existing alignment.
- 6.8.2. The proposed Scheme requires the formation of embankments and cuttings including reconstruction and widening of the existing road pavement. Due to the constraints associated with following the existing alignment closely, there is a surplus of excavated material.
- 6.8.3. The construction contract will include penalties for prolonged occupation of the A9. This will minimise disruption to road users and drive down the projected construction duration and thus minimise the potential effects of construction.
- 6.8.4. The type of work involved will require temporary traffic management, and some nuisance created by construction in the form of noise, dust and vibration, which is controllable.
- 6.8.5. There will also be the potential for some temporary visual impacts.

7. Ecology and Nature Conservation

- 7.1. Introduction
- 7.2. Key Issues
- 7.3. A9 Dualling Strategic Environmental Assessment and Habitats Regulations Appraisal Screening
- 7.4. Methodology
- 7.5. Baseline Conditions
- 7.6. Consultation
- 7.7. Impacts (Opening Year 1) without Mitigation
- 7.8. Mitigation
- 7.9. Impacts (Design Year 15)
- 7.10. Conclusions



7. Ecology and Nature Conservation

7.1. Introduction

7.1.1. This Chapter provides the ecological impact assessment, and habitats regulations assessment screening for the proposed Scheme based on the current baseline condition established by surveys undertaken in 2012 and 2013, supplemented by information from the previous ecological surveys undertaken by Atkins for the 2007 ES for the Scheme proposed at that time. The current surveys have included the additional sections of the alignment to the north and south of the 2007 scheme. The description considers designated sites in the locality, existing habitats, and the presence of rare or uncommon species, in particular those protected by law.

7.1.2. The assessment was undertaken in accordance with DMRB Volume 10, Section 3, Part 4 Ecology & Nature Conservation, has followed the assessment methodology of the Scottish Transport Appraisal Guidance and has been further advised by The Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines on Ecological Impact Assessment.

7.1.3. Details of the methods used for data collection are given, together with the rationale for ecological assessment and impact assessment. Ecological effects are considered arising from construction up to the opening of the proposed Scheme at Year 1 and from the operational Scheme in Year 15. Based on these assessments, mitigation to avoid or ameliorate adverse effects are given, together with proposals for securing biodiversity gains following construction in keeping with national and regional policies on nature conservation.

7.2. Key Issues

7.2.1. Key issues, identified from the current data collection, consultation and field survey are considered to include:

- The alignment under the proposed Scheme is situated in the Cairngorms National Park, one of the UK's most bio-diverse and natural areas and which supports some of the nation's rarer plants and animals;
- The River Spey and Insh Marshes, notified for wildlife conservation under European directives, are in close proximity to the A9 with part of the alignment crossing a notified tributary of the Spey (the Dunachton Burn);
- There is the potential for the permanent loss to land-take of small areas of notable habitat, including ancient and long-standing woodland, old and veteran trees, sections of water course and wetland habitats;
- There may be the potential for the loss of rare or uncommon species;
- There may be an increase in the severance or barrier effect on mainly terrestrial mammals and an increased risk of road mortality; and
- There is the potential for construction disturbance from temporary land-take, noise, run-off pollution, particularly in relation to sensitive receptors including the European Directive sites and Loch Alvie SSSI.

7.3. A9 Dualling Strategic Environmental Assessment and Habitats Regulations Appraisal Screening

7.3.1. The assessment of these proposals and the mitigation proposed have been undertaken in the light of the intention to dual the remaining sections of the A9 between Perth and Inverness, for which a SEA Environmental Report was produced by Halcrow in June 2013. In addition a Habitats Regulations Appraisal Screening (HRA) was also produced by Halcrow in May 2013. Further details of the SEA and HRA and how they relate to this assessment is outlined in section 7.4 below.

7.4.

Methodology

Desk Based Study

7.4.1.

The desk study commenced with a review of the ecology chapter of the 2007 ES and the sources consulted for that assessment were re-visited. The key sources of information have therefore been:

- The SNH web site⁶⁹ for information on statutory sites and the SNH database on the distribution of ancient woodlands;
- The National Biodiversity Network (NBN) Gateway⁷⁰ for information on species and species distributions;
- The UK Biodiversity Action Plan⁷¹ and Cairngorms Local Biodiversity Action Plan (LBAP)⁷² for information on wildlife conservation objectives applicable to the proposed Scheme. The "Cairngorms Nature Action Plan 2013-2018 carries the vision of the LBAP forward;
- The Scottish Environment Protection Agency's River Basin Planning website⁷³ to check the current ecological status of those burns which are large enough to have been classified;
- Key references arising from web-searches relating to specific issues, e.g. Hughes (2008), Fullarton (2012) in relation to wood ant ecology, Hetherington & Campbell (2012) in relation to wild cats;
- Other general web-based sources providing aerial imagery and mapping;⁷⁴
- A9 Dualling Programme Strategic Environmental Assessment (SEA) Environmental Report June 2013 (Halcrow 2013 for Transport Scotland);
- A9 Dualling Programme Habitats Regulations Appraisal (HRA) Screening Report May 2013, (Halcrow 2013 for Transport Scotland); and
- the SNH response to the HRA screening in a letter of 28 June 2013, Ref: CNS/TR/A9 HRA.

7.4.2.

The SEA has identified a number of key objectives with respect to biodiversity, which have been considered in the production of this assessment.

- Conserve and enhance the special and distinct landscape character and qualities of the Cairngorms National Park;
- Avoid and minimise effects on landscapes through sensitive design and consultation;
- Conserve and enhance biodiversity at all levels;
- Avoid and minimise effects on nationally and internationally rare and threatened species and habitats through sensitive design and consultation, recognising ecological connectivity;
- Facilitate species and habitat adaption to climate change;
- Avoid and minimise habitat fragmentation and seek opportunities to improve habitat connectivity;
- Ensure careful consideration of non-native invasive species issues; and
- Seek opportunities to increase carbon sequestration.

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<http://gateway.snh.gov.uk/sitelink/index.jsp>

<http://data.nbn.org.uk/>

<http://jncc.defra.gov.uk/default.aspx?page=5155>

<http:// Cairngorms.co.uk/look-after/conservation-projects/biodiversity-action-plan>

http://www.sepa.org.uk/water/river_basin_planning.aspx

<http://www.bing.com/maps/> and <http://www.old-maps.co.uk/index.html>

7.4.3. Both the SEA and HRA considered the implications for the following designated sites:

- Insh Marshes Ramsar;
- Insh Marshes SAC;
- Drumochter Hills SAC;
- Monadhliath SAC;
- River Spey SAC;
- Drumochter Hills SPA;
- River Spey and Insh Marshes SPA;
- Creag Dhubh SSSI;
- River Spey and Insh Marshes SSSI;
- Drumochter Hills SSSI (mixed);
- 21 areas of Ancient Woodland;
- 4 recorded Semi-Natural Ancient Woodland sites; and
- Insh Marshes National Nature Reserve (NNR).

7.4.4. Not all of the above sites pertain to the proposed Scheme but the principles of ensuring that the road design takes account of these core areas and their connecting ecological networks will be followed. The SEA and HRA reports noted that the A9 dualling has the potential to cause likely significant effects on the River Spey and Insh Marshes protected sites and that a project level appropriate assessment screening of likely impacts would be needed.

7.4.5. A draft Trunk Road Biodiversity Action Plan for Scottish Roads emerged in 2000 as a consultation document, however it was never formally published. The approach to road construction and nature conservation is outlined in Transport Scotland's Cost Effective Landscape - Learning from Nature (1998)⁷⁵. Policy in this area is currently being revised and updated. Additional information gained through consultation with statutory and non-statutory nature conservation organisations is considered in section 7.5 below.

Study Area

7.4.6. The study area for habitat surveys is indicated by the coverage of the Phase 1 habitat plans. The corridor of land surveyed varied from a minimum width of 50 metres where access beyond this distance was limited (e.g. by the wetlands of the Insh Marshes or dense young woodland plantation) up to between 200 - 250 metres from the existing highway boundary and included outlying areas of land that might be needed for construction or accommodation works. This surveyed area is shown on the Phase 1 habitat plans in Volume 2 of this ES.

7.4.7. The survey corridor was further extended laterally to cover possible zones of influence from construction works and to assess particular features of the landscape as wildlife corridors, therefore surveys along the watercourses extended for a distance of 500 metres upstream and downstream from the highway boundary to evaluate these features both for their habitat quality and for the presence of protected species. Similarly, survey boundaries were extended in habitats of particular interest or where it was considered that evidence of protected species might be found and in general the wooded areas were more comprehensively surveyed than the open farmland.

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<http://www.transportscotland.gov.uk/strategy-and-research/publications-and-consultations/cost-effective-landscape>

Scope of Surveys

- 7.4.8. The scope of the surveys was guided by the previous work undertaken for the 2007 ES and the findings of those surveys with certain modifications reflecting changing standards. Hence, with an increasing emphasis on the objectives of the Water Framework Directive (2000/60/EC), watercourses were surveyed according to the river habitat survey methodology. Bat surveys and great crested newt surveys, undertaken for the 2007 ES, were not repeated as it was judged that in the light of the current surveys habitat conditions in relation to the resources required for these species had remained essentially the same over the intervening 5 years, though trees that could provide suitable roosting habitat for bats were noted. Given the sensitive nature of the data and for the protection of species protected by EU law, and in particular the Habitats Directive, the results of all the protected species surveys undertaken for the 2007 ES can be made available on request (Appendix 8 of Volume 3 of the ES).
- 7.4.9. Dedicated breeding bird surveys were not undertaken for the 2007 ES, and, with the final area for survey of the proposed Scheme defined after the 2012 bird breeding season, such surveys were similarly not undertaken. Bird species present were noted during the 2012 and 2013 field surveys. In the light of the findings of the 2007 ES study, and the updated habitat surveys, it was judged that the disturbed habitats alongside the active carriageway offered generally poor breeding habitat for birds and the evaluation of biodiversity along the road corridor could be satisfactorily completed on habitat and other protected species criteria. Species protection in relation to any nesting birds will be dealt with by pre-construction surveys and advance site clearance works as required outside the breeding season. To facilitate the assessment of potential impact on the Insh Marshes SPA, data on bird distribution has been obtained from the RSPB.

Survey Methodology

Habitats and Flora

- 7.4.10. Habitats present in the area under potential effect from the project were surveyed by Dr W. Latimer of Northern Ecological Services according to the methodology of the Joint Nature Conservation Committee's Phase 1 Habitat Survey (JNCC 1993). Records were made of plant species present sufficient to analyse the more extensive communities of particular botanical interest according to the National Vegetation Classification (NVC, see Rodwell 1991 et seq.). Smaller, complex mosaics, particularly those outside the works footprint, and requiring a higher level of sampling effort to provide a higher level of fit to the NVC communities, have not however been subject to the level of analysis needed to define every community present. Emphasis was also placed on identifying any habitats dependent on ground water (groundwater dependent terrestrial ecosystems - GWDTE) as guided by the document A Functional Wetland Typology for Scotland (SNIFFER 2009). The surveys were conducted over three visits, all in good weather conditions, in August 2012 and early October 2012. A third visit was undertaken in March 2013 to look in further detail at the land proposed for bridge diversions during the construction phase.
- 7.4.11. The results of the survey are shown on the Phase 1 Habitat plans (Figures 7.1 – 7.11) in Volume 2 of the ES. Details of the vegetation in the more notable areas, or features either too small to accurately map, or which fall outside of the classification convention are described under the numbered Target Notes (TN) and referred to in the following text. The target note text is provided in, Appendix 5, of Volume 3 of the ES together with a series of photographs illustrating the described features.
- 7.4.12. Plant names follow those of the New Flora of the British Isles (2nd edition), Stace (2010). Assessment of the significance of plant species or plant communities present were undertaken with reference to key publications such as the NVC, atlases of British flora (Preston et al. 2002) or plant field guides (e.g. Blamey et al. 2003). Common names of plants are qualified, in the following text and in the target notes, at first mention by their scientific name.

Watercourses

- 7.4.13. Ordnance Survey 1:25,000 maps were examined to establish the location of watercourses within the survey area. Each of these watercourses was then visited by Tamsin Morris and Chris York in September 2012 to undertake two surveys for each watercourse, the River Habitat and protected species surveys along the riparian corridor. Surveys were timed to ensure that water levels within the watercourses were suitably low to allow classification of in-channel habitat features. The surveyors hold SNH licences to survey for freshwater pearl mussel.
- 7.4.14. Where watercourses were of a sufficient size, they were walked for 500 metres upstream and downstream of the A9 crossing point. A River Habitat Survey was completed for each 500 metre section and the data collected used to establish Habitat Modification Indexes and Habitat Quality Assessment figures, using the Environment Agency's standard methodology (Environment Agency 2003). The presence and identity of any fish species observed was noted and habitat potential for salmonid fish (brown trout, sea trout (*Salmo trutta*) and salmon (*Salmo salar*)) was also mapped for each 500 metre section (where burns were large enough), using the habitat types defined in the Hendry and Cragg-Hine walkover methodology (Hendry and Cragg-Hine, 1997). River Habitat Survey plans of the two major watercourses, the Dunachton and Allt-an-Fhearna burns are given in Figures 7.12 and 7.13 (in Volume 2 of this ES) and summary data on the habitat modification and habitat quality scores for the watercourses surveyed are provided in Appendix 6, Volume 3 of this ES.
- 7.4.15. Fish habitat, potential fish passage barriers and other relevant information for those burns large enough to support fish, was transferred to digital maps, and the results shown in Figures 7.12 and 7.13 in Volume 2 of this ES. In general, areas of spawning habitat were too small to be marked on these maps. Further surveys for fish, i.e. by electrofishing, were not undertaken as no significant channel diversions were envisaged as necessary for the dualling works. Such surveys will be undertaken in the event of any loss of instream habitat.
- 7.4.16. Each watercourse was also surveyed to establish the presence of, or potential habitat suitability for protected species, in particular, water vole (*Arvicola amphibius*), otter (*Lutra lutra*) and freshwater pearl mussel (*Margaritifera margaritifera*).

Protected Species

- 7.4.17. Evidence for the presence of protected species was sought during both the Phase 1 habitat walk-over surveys and the River Habitat surveys. The extent of survey is therefore indicated by the Phase 1 habitat plans, though not all ground in the farmland was covered and survey effort was concentrated in the less intensively managed land, principally wooded areas. Surveys for protected species extended for 500 metres upstream and downstream along the riparian corridors. Habitat surveys within the road corridor included a search for any clear signs of animal pathways through the vegetation on the verges or evidence of road kill to indicate points where animals may be attempting to cross the alignment.
- 7.4.18. Freshwater pearl mussel. Surveys were undertaken by two licensed surveyors, guided by the SNH protocols available on <http://www.snh.gov.uk/about-scotlands-nature/species/invertebrates/freshwater-invertebrates/freshwater-pearl-mussel/>. Where areas of suitable habitat were found during the River Habitat Surveys, i.e. areas of sand or gravel substrate, in the 500 metre reach upstream and downstream of the A9 crossing, particularly where such habitats appeared to be protected from scour by large boulders or bedrock upstream, mussels were searched for using a bathyscope. Small habitat patches were numerous and scattered throughout the 1 kilometre reach surveyed and, given the very small areas of potentially suitable habitat, it was possible to inspect all areas of potential habitat rather than resort to sampling.

- 7.4.19. Otter and Water Vole. Signs that were sought for the presence of otter included trails and pathways through the vegetation and entry points into the water, spraints, holts (underground resting places with at least one chamber), lying-up sites or couches (resting places above ground), footprints and feeding remains (Chanin 2003 and SNH guidance⁷⁶) For water voles, habitats along the burns were assessed and any suitable areas examined for burrows, both in banks and tussocky vegetation (WildCRU 2004), runs, footprints, feeding stations, latrines and their characteristic droppings (Strachan & Moorhouse 2006). Searches were conducted along the 500 upstream and downstream reaches subjected to the River Habitat Survey and were repeated during the Phase 1 survey visits in 2012 & 2013 for a reach of around 100 metres upstream and downstream. With otters known to be present on these watercourses and the limits to pragmatic surveys placed by the marshlands of Loch Insh and Loch Alvie, the SNH survey guidelines were followed in preference to those recommended by the DMRB.
- 7.4.20. Badgers. For badgers field signs include pathways, trails and footprints, shed hair or hair caught on vegetation and fences, "push-through" conduits through dense scrub or under fences, "snuffle holes", claw marks, latrines and setts⁷⁷.
- 7.4.21. Pine marten and Wild cat. Surveys for these species concentrated on the detection of resting places (dens) and other signs such as droppings, remains of prey, footprints and claw marks. Habitats were assessed for their suitability to provide safe refuges and den areas for these species and any features such as large burrows, hollows within tree roots or under rocks were investigated.
- 7.4.22. Red squirrel. In the areas of mature pine, red squirrel surveys were guided by the protocol of the Forestry Commission Practice Note 2009. The surveys were limited to slowly walked transects with regular pauses, aimed at observing live squirrels, and searches for feeding remains. These surveys also allowed observations of any bird species present in these woods, e.g. capercaillie, or nests of raptors.
- 7.4.23. No dedicated surveys were undertaken for amphibia and reptiles but habitats were assessed for their suitability to host such species and particular resources, such as good foraging or resting habitat, or hibernation sites, were noted.

Invertebrates

- 7.4.24. As a result of the recording of significant numbers of wood ant nests belonging to the relatively uncommon species *Formica lugubris* during the surveys for the 2007 ES, the current distribution of nests was investigated during the walk-over surveys. A plan showing the distribution as determined by the 2012 survey is outlined in Figure 7.17 of Volume 2 of this ES.

Survey Limitations

- 7.4.25. While early August represents the optimum season for much of Scotland's flora, certain plants that typically flower earlier in the year or where above-ground material can quickly die down (e.g. vernal plants of the woodland floor, some orchid species) may have been missed.
- 7.4.26. Access proved difficult in some areas of densely regenerating young pine and birch and such stands were not fully surveyed though the boundaries of these stands were examined for any signs of animal pathways under the scrub. Given the dense shade cast by this vegetation type, the ground flora was generally suppressed and it is unlikely that habitats of ecological value were missed. Similarly, it was not possible to survey the deep-water wetland habitats of the Insh Marshes. These wetlands and the private housing at Kincaig resulted in the B9152 forming the eastern boundary of the survey area.

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<http://www.snh.org.uk/publications/on-line/wildlife/otters/effects.asp>.
<http://www.scottishbadgers.org.uk/surveying.html>

Ecological Evaluation and Impact Assessment

Evaluation

- 7.4.27. In the UK, approaches to the setting of criteria for the assessment of the nature conservation value of a defined area of land commenced with the A Nature Conservation Review (Ratcliffe 1977). A range of primary qualities were identified: size, diversity, naturalness, rarity, fragility and typicalness. These, together with the secondary criteria, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal, provide a framework for the selection of national sites for statutory protection and has been used as a basis for ecological evaluation.
- 7.4.28. In parallel to this process of evaluation of ecological interest for nature conservation objectives, the UK Department of Transport developed guidance for the assessment of ecological value as one of the sub disciplines of EIA for transport schemes in the New Approach to Appraisal (DETR 1998). The appraisal approach has gained national acceptance for a range of developments and is outlined in the DMRB, Volume 11, Section 3, Part 4. Transport Scotland also provides guidance for evaluation and impact assessment in its STAG.
- 7.4.29. This appraisal methodology addresses the geographical scale at which the feature, or ecological receptor, is important and confers a scale of value according to the national hierarchy of site designation from the highest, international scale to undesignated sites deemed to be of some ecological interest at the local scale. This methodology has further been modified by the Institute of Ecology and Environmental Management (IEEM 2006) in their Guidelines for ecological impact assessment which proposes the following scale of ecological importance:
- International importance;
 - UK importance;
 - National importance (England / Northern Ireland / Scotland / Wales);
 - Regional importance;
 - County (or Metropolitan);
 - District (or Unitary Authority, City or Borough);
 - Local or Parish; and
 - Site level only (limited to the site boundary).
- 7.4.30. The scale is intended to provide a proportional gradation but exceptions can arise, e.g. the Highlands are both a unitary authority (normally District level) but with the geographical extent of a Region. The accuracy of the evaluation is also dependent on the availability of area-based biological information and therefore where data are lacking, it may be difficult to attribute the correct scale of importance. The SNH Natural Heritage Zones (NHZ) can also provide a measure of geographical scale at a regional level with the advantages of some measure of ecological cohesion and a broad database of habitat types. The section of the A9 under proposed improvement falls within Zone 12, the North-East Glens. Table 7.1 below provides a summary of the evaluation criteria.

Table 7.1 Nature Conservation Value and Criteria

Nature conservation value	Criteria
International	<p>An internationally designated site or candidate site, e.g. Special Protection Area (SPA) Special Area of Conservation (SAC), , Ramsar Site, Biogenetic Reserve).</p> <p>A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat that are essential to the maintenance of the viability of a larger whole.</p> <p>Any regularly occurring population of an internationally important species that is threatened or rare in the UK, i.e. a Red Data Book species, or listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK Biodiversity Action Plan), or of uncertain conservation status, or of global conservation concern in the UK BAP.</p> <p>A regularly occurring, nationally significant population of any internationally important species.</p> <p>A regularly occurring, nationally significant number of an internationally important species during a critical phase of its life cycle.</p>
National	<p>A nationally designated site, e.g. Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR) or a discrete area that meets the published selection criteria for national designation (e.g. SSSI selection guidelines).</p> <p>A viable area of a priority habitat identified in the UK BAP, or smaller areas of such habitat that are essential to maintain the viability of a larger whole.</p> <p>Any regularly occurring population of a nationally important species that is threatened or rare in the region or county.</p> <p>A regularly occurring, regionally or county significant population of any nationally important species.</p> <p>A regularly occurring, regionally or county significant number of a nationally important species during a critical phase of its life cycle.</p>
Regional	<p>Viable areas of key habitat identified as being rare in the NE Coastal Plain NHF, or nationally scarce; small areas of such habitat that are essential to maintain the viability of a larger whole.</p> <p>Any regularly occurring, locally significant population of a regionally important species.</p> <p>A regularly occurring, locally significant number of a regionally important species during a critical phase of its life cycle.</p> <p>Sites that exceed the county-level designations but fall short of SSSI selection guidelines, where these occur.</p>

Nature conservation value	Criteria
County	<p>County sites and other sites that meet the published ecological selection criteria for designation, including Local Nature Reserves (LNR) and variously named local sites of wildlife interest.</p> <p>A viable area of habitat identified as rare in the county or regionally scarce or localised.</p> <p>Any regularly occurring, locally significant population of a county important species.</p> <p>A regularly occurring, locally significant number of a county important species during a critical phase of its life cycle.</p>
Local (i.e. within 10km radius of the study area)	<p>Areas of habitat considered to appreciably enrich the habitat resource within approximately a 10km radius of the study area.</p> <p>Areas of habitat that are rare within approximately a 10km radius of the study area, or scarce or localised on a county scale.</p> <p>A regularly occurring, locally significant population of a locally important species.</p> <p>A regularly occurring, locally significant number of a locally important species during a critical phase of its life cycle.</p> <p>A regularly occurring, locally significant total number of more than one locally important species.</p>
Site and its immediate environs	<p>Areas of habitat considered to enrich the habitat resource within the site or immediate study area.</p>

Assessment of Impact

7.4.31. Guidance in STAG on the assessment of the nature of any impact is given in Box 7.1 below⁷⁸.

Box 7.1 Impact Terminology

Direct - arising as a result of the option itself (e.g. changes in traffic volumes leading to changes in emissions affecting properties adjacent to a new or improved road or rail link, or land take to construct new transport infrastructure);

Indirect - arising from effects associated with measures required to accommodate the option (e.g. land take for planting required to screen a new transport facility);

Secondary/induced - arising from development induced by the option (e.g. additional traffic generated by new development attracted by improved transport infrastructure);

Short, medium or long term - the duration of effects where short term may be less than one year, medium term one to five years and long term over five years;

Permanent or temporary - whether or not change is reversible or irreversible, given mitigation measures, or whether the effect is for a limited duration;

Positive or negative - whether the effects are beneficial or detrimental to resources or receptors;

Cumulative - arising from the combined effect of a number of effects (e.g. loss of woodland over the length of route of a new railway, impact of land loss, noise and visual intrusion on a property), or from the combined effects of a plan or project with other plans or projects; and

Synergistic - a form of cumulative effect where the combined impact of several options may exceed the sum of their individual effects.

7.4.32.

The evaluation of impact significance takes into account impact magnitude and receptor sensitivity. Under the STAG methodology, this is assessed on a seven point scale as shown in Table 7.2 below.

Table 7.2 Evaluation of Impact

Impact magnitude and direction	Assessment criteria
Major negative;	Loss of, permanent damage to, or adverse impact on the integrity of any part of a site of international or national importance; Loss of a substantial part or key feature of a site of regional importance; Loss of favourable conservation status (FCS) of a legally protected species; and Loss of or damage to a population of nationally rare or scarce species.
Moderate negative	Temporary disturbance to a site of international or national importance, but no permanent damage; Loss of or permanent damage to any part of a site of regional importance; Loss of a key feature of local importance; A substantial reduction in the numbers of legally protected species such that there is no loss of FCS but the population is significantly more vulnerable; and Reduction in the amount of habitat available for a nationally rare or scarce species, or species that is notable at a regional, district or local level.
Minor;	Slight temporary disturbance to a site of regional or district value, but no permanent damage; Loss of, or permanent damage to, a feature with some ecological value in a local context but that has no nature conservation designation; A minor impact on legally protected species but no significant habitat loss or reduction in FCS; and A minor impact on populations of nationally rare or scarce species or a species that is notable at a regional, district or local level.
Neutral;	No impacts on sites of international, national, regional or district importance; Temporary disturbance or damage to a small part of a feature of local importance; Loss of or damage to land of negligible nature conservation value; and No reduction in the population of legally protected, nationally rare, nationally scarce or notable (district/local level) species on the site or its immediate vicinity.
Minor positive;	A small but clear and measurable gain in general wildlife interest, e.g. small-scale new habitats of wildlife value created where none existed before or where the new habitats exceeds in area the habitats lost.
Moderate positive	Moderate larger-scale new habitats (e.g. net gains over 1ha in area) created leading to significant measurable gains in relation to the objectives of biodiversity action plans.
Major positive	Substantial gains in new habitats (net gains of at least 10ha) of high significance for biodiversity being those habitats, or habitats supporting viable species populations, of national or international importance cited in Annexes I and II of the Habitats Directive or Annex I of the Birds Directive.

7.4.33. The assessment of significance of impacts on species caused by disturbance uses the definition of the threshold of deliberate disturbance used by The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007 (SI 2007/80). A significant impact of disturbance is assumed if the work adversely affects the ability of any significant group of animals of that species to survive, breed or rear or nurture their young or likely to significantly affect the local distribution or abundance of the species (see Paras. 39 (b) v and vi in the above Regulations).

7.4.34. The prediction of impact significance is completed taking the mitigation measures into account. This requires an assessment on the likelihood of successful mitigation being achieved (Oxford 2001) and the mitigation proposed needs to be qualified in terms of the probability of success. The assessment of success of mitigation can be based on both professional judgement and experience of other mitigation schemes. Where habitat processes or species requirements may not be fully understood, there may be uncertainty over the effectiveness of such mitigation and a precautionary approach is advisable in determining the outcome. It should also be noted that some habitat creation schemes may require a significant timescale for the objectives to be achieved, e.g. replacement woodland. Mitigation should therefore be qualified according to the following scheme set out in Table 7.3 below.

Table 7.3 Qualification of Mitigation

Probability of Success		Probable timescales and habitat examples		
Very low	> 95%	Very long	> 100 years	Mature woodlands, raised mires, flushes and deep peat formations.
Low	70 – 95%	Long	50 – 100 years	Immature woodlands, some shallower peatlands
Moderate	30 – 70%	Moderate	10 – 50 years	Mature scrub, heathland
High	30 – 5%	Short	5 – 10 years	Grasslands
Very high	< 5%	Very short	< 5 years	Ponds

7.4.35. With road schemes typically having adverse implications for the connectivity of ecological networks and the corridors for animal movements across the landscape, particular emphasis has been placed on determining any additional severance arising from the proposed Scheme and in identifying opportunities for enhanced connectivity.

Habitats Regulations Assessment

7.4.36. An “Appropriate Assessment” of any plan or project that could affect SPAs or SACs (collectively termed Natura 2000 sites) is required under Article 6(3) of the 1992 European Habitats Directive, a requirement originally transposed into national legislation under Regulation 48 of the Conservation (Natural Habitats &c) Regulations, 1994. The requirements for “appropriate assessment” have been considered in a series of guidance documents:

- Habitats Regulations Guidance Notes (HRGN 1 - 3, English Nature 1997);
- the European Commission document, Assessment of plans and projects significantly affecting Natura 2000 sites, methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC’ (Oxford Brookes 2001); and
- Habitats regulations appraisal of plans. Guidance for plan-making bodies in Scotland. D. Tyldesley and Associates for SNH. August 2010.

7.4.37. Articles 6(3) and 6(4) state that:

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned.....”

“If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted”.

7.4.38. The application of the Habitats Directive involves the precautionary principal; that is that plans and projects can only be permitted having ascertained no adverse effect on the integrity of the site. A Test of Significance is undertaken as a preliminary analysis of the likely effects of any proposed plan or policy upon a European Site (whether or not the effects are likely to be adverse or beneficial), so directing attention to those, which require further assessment. The assessment must determine whether the plan or project is “likely to have a significant effect” on the integrity of the site in terms of its nature conservation objectives. Where negative effects are identified, other options should be examined to avoid any potential damaging effects.

7.4.39. A HRA is the cumulative name for all assessments undertaken by a staged process to comply with the Habitat Regulations. There are four broad stages to a HRA, which are as follows:

- Screening / Test of Significance: which identifies any likely impacts of a project or plan upon a Natura 2000 site as a result of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;
- Appropriate Assessment: which considers the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site’s structure, function and its conservation objectives. Where there may be adverse impacts, an assessment of the potential mitigation of those impacts is made. If mitigation cannot prevent adverse impacts upon the site, the following stages must be completed if consent is to be given;
- Assessment of Alternative Solutions: examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site; and
- Assessment where no Alternative Solutions Exist: and where Adverse Impacts Remain involves the development of compensatory measures where, for reasons of imperative overriding public interest (IROPI) it is deemed that the project or plan should proceed.

7.4.40. Each stage may be further subdivided into its component processes and thirteen stages are recognised by Tydesley (2010,) shown in a flow diagram in Figure 2 of the document. Screening the dualling proposals, assessing likely significant effects, considering mitigation and re-considering the residual impacts (Stages 5 - 7 of Figure 2, Tydesley 2010) have been undertaken as part of this ecological assessment and the conclusions given to inform upon any requirement for an appropriate assessment, a process which is undertaken by the competent authority.

7.4.41. The project level HRA screening has taken account of the strategic A9 Dualling Programme Habitats Regulations Appraisal (HRA) Screening Report (Halcrow 2013 for Transport Scotland), and the response

by SNH in their letter of 28 June 2013, Ref: CNS/TR/A9 HRA.

7.5. Baseline Conditions

Statutory Designations

- 7.5.1. A plan of the designations is given in Figure 7.14 of Volume 2 of this ES. The proposed Scheme is situated in the Cairngorms National Park with the Cairngorms Massif across the Spey valley to the east while to the west of the alignment the land rises to the Monadhliath Mountains. The River Spey is notified as an SSSI and SAC with the designation including its tributaries, one of which, the Dunachton Burn which flows into the Insh Marshes (see below), is bridged by the A9 in the southern section of the proposed Scheme. The Spey is notified as of international importance for its populations of Atlantic salmon, sea lamprey, freshwater pearl mussel and otter. There are, however, no records for sea lamprey in the upstream reaches of the Spey system in the study area (APEM 2004), though it is considered that good areas of habitat exist in the river and in Loch Insh.
- 7.5.2. The Spey system also includes the Insh Marshes SSSI, which is also notified as an SAC, an SPA and Ramsar site, qualifying under the Habitats Directive as an example of an oligotrophic to mesotrophic loch with shoreweed and quillwort, transition mires and quaking bogs, alluvial alder and ash woodlands and its otter population. SPA criteria include breeding osprey, wigeon, wood sandpiper and the nationally rare spotted crane, together with migratory and overwintering hen harrier and whooper swan. Loch Insh is also known to hold a population of arctic char (*Salvelinus alpinus*) which, while primarily a fish of still waters in highland lochs such as Loch Insh, may extend into the Dunachton Burn to spawn. Typical spawning habitat would be gravels in the more slowly flowing reaches (Walker 2007) with the fry migrating downstream to the loch soon after hatching. At its closest, the western boundary of the Insh Marshes lies around 35 metres from the A9 highway boundary along its southern extent and around 320 metres (linear distance) from the A9 at its crossing over the Dunachton Burn. Part of the site is notified as a National Nature Reserve and managed by the RSPB.
- 7.5.3. Around 3.5 kilometres to the north and east of the northern extent of the proposed Scheme, Kinveachy SPA and Cairngorms SPA are notified for their capercaillie populations. These sites, together with other more distant sites along the northern edge of the Cairngorms (Craigmore Wood, Anagach Wood and Abernethy Forest SPAs) provide for the regional metapopulation of this rare and vulnerable species.
- 7.5.4. The northern section of the A9 under proposed improvement runs to the west of the Alvie SSSI, impinging on the SSSI boundary as it extends up the valley of the Allt an Fhearna to the A9 bridge. The site is notified for its upland oakwoods, fen and mire habitats, breeding goldeneye and its assemblage of invertebrate species dependent on aquatic habitats and the range of mire habitats around the loch (e.g. the rare net winged caddis, (*Hagenella clathrata*) dependent on small fen pools). The A9 crosses three watercourses that drain into the loch, a small burn that runs in farmland past Dalraddy Farm, the Allt an Fhearna and a smaller hill burn to the north, the Allt Chrioichaidh where the proposed Scheme terminates.

Non-statutory Designations

- 7.5.5. Woodlands indicated in the SNH Ancient Woodland Inventory (see Figures 7.15 and 7.16 of Volume 2 of this ES) are distributed along the proposed Scheme and include deciduous woodland, mainly along the south of the alignment, dominated by old oak trees, and coniferous woodland in the central section, of which the woods of mature Scots pine to the west of the A9 at Alvie Lodge are particularly notable. These comprise planted stock over an ancient and well-expressed woodland ground-flora (TN 24). These woods provide habitat for the northern wood ant (*Formica lugubris*). In contrast, the conifer plantations on the eastern side of the A9 in this area, also planted on an ancient woodland site, comprise mainly dense stands where the ground flora is suppressed. The distribution of ancient woodland sites (though these include replanted sites) along the proposed Scheme is shown in Volume 2, Figures 7.15 and 7.16

of this ES.

Habitats and Flora

- 7.5.6. The alignment under proposed improvement passes through 5 main landscape areas, each dominated by distinctive habitat types with some additional detail provided by watercourses and wetlands. The road corridor within the highway fence provides habitats derived from these adjacent formations but at an earlier stage of ecological succession, which commenced around 30 years ago when the original trunk road was built and influenced by highway management and the passage of traffic. The following sections describe these broad habitat areas outside the highway fence starting in the south and working northwards. Habitat descriptions include the results of the river habitat surveys and an assessment of conditions in relation to fisheries. The final section deals with the habitats along the roadside verges within the highway fence.

Southern Section - Wood pasture (Chainage 0.00 - 1,650)

- 7.5.7. This section of the proposed Scheme passes through a predominantly wooded landscape with a distinctive, complex topography of rolling small hills of oak (*Quercus rober*) dominated parkland, much, though not all (TN7), under grazed, and interspersed with generally small fields of semi-improved grassland (e.g. Photographs 1,2,4,5 and 6 of Appendix 5, Volume 3 of this ES). Old coppiced hazel is typical, along with birch, rowan, occasional aspen, goat willow, common willow, wild cherry and blackthorn. Some of the older oaks have potential to provide roosting habitat for bats, particularly those in the enclosed woodland at TN7.
- 7.5.8. The grazed grasslands on the western side of the A9, while mainly dominated by fine-leaved species (*Festuca rubra*, *Agrostis capillaris*, *Anthoxanthum odoratum*) tend not to be particularly species-rich though a few areas support a good range of common herb species, e.g. at TN2 where an open stand of mature, spaced, parkland oaks grow in a largely unimproved, though grazed acid grassland with harebell (*Campanula rotundifolia*), autumn hawkbit (*Leontodon autumnalis*), devil's bit scabious (*Succisa pratensis*), bird's foot trefoil (*Lotus corniculatus*), mouse-ear hawkweed (*Pilosella officinarum*), germander speedwell (*Veronica chamaedrys*), tormentil (*Potentilla erecta*), heath dog violet (*Viola canina*) and heath bedstraw (*Galium saxatile*). These parkland oaks, particularly where associated with wildflower grasslands, are likely to be of Local ecological value. General Wade's Road is evident at this site in a shallow cutting with bumblebee nests in the bare earth face. The A9 is bounded here by a steep cutting face with rock exposures and areas of fine-leaved grassland with occasional juniper shrubs and a limited array of herb species including autumn hawkbit, violet and mouse-ear hawkweed. The structure of the cutting with its southerly facing rock exposures probably provides good habitat for certain insect species.
- 7.5.9. In the southern section around Meadowbank Quarry, the land tends to slope more uniformly down to the Spey valley and the narrow strip of unmanaged steeply sloping ground between the A9 and the B9152 again supports numerous old oak trees with birch over rather species-poor grasslands (*Festuca rubra*, *Agrostis capillaris*, *Holcus mollis* and *H. lanatus*) with occasional patches of heathy vegetation (*Calluna vulgaris*, *Vaccinium myrtillus*, *Deschampsia flexuosa*) and stands of bracken (*Pteridium aquilinum*).
- 7.5.10. The Dunachton Burn forms the northern boundary to this distinctive southern section. The burn is flanked by wet riparian woodlands of alder (*Alnus glutinosa*) and downy birch (*Betula pubescens*) over an ancient woodland ground flora and with occasional bankside clearings of damp grassland (TN 8). The burn is part of the River Spey Special Area of Conservation and is classified by SEPA as being at good ecological status. The riparian woods (see Photograph 10 in Appendix 5 of Volume 3 of this ES) would be valued at the Local scale.

- 7.5.11. Upstream of the A9 the burn is approximately 5.5 metres wide with a cobble substrate. Water depths were around 30 centimetres at the time of survey. Much of the bankside has continuous tree cover, but the upstream part of the site was also being used for grazing, with cattle crossing the burn causing poaching of the banks. The Habitat Modification score (Appendix 6 of Volume 3 of this ES) for this site showed a severely modified site, as a result of two bridges, two weirs, bank reinforcing and re-sectioning. Habitat quality was reasonably high, despite the modifications.
- 7.5.12. There is plentiful habitat for trout within this site, with extensive areas of fry, parr and mixed juvenile habitat, as well as glides and pools. The A9 bridge contains a fish pass, which should be providing adequate passage upstream for sea trout, although salmon may occasionally use the burn as well. Fry were also seen moving into cover at the edges of the channel. Some potential spawning areas were recorded, although these were becoming silted up, with silt inputs coming from both cattle induced bank erosion and natural bank erosion. Away from the eroded banks, there were extensive areas of cover for fish, provided by both the draped vegetation and undercut banks.
- 7.5.13. Downstream of the A9 there is a short section of river between the two bridges (A9 and B970). Then the burn meanders through a broadleaved woodland area, with some sheep grazing. The river is clearly quite mobile in this section and has high inputs of large woody debris, so its habitat quality is high. Much of the bankside has continuous tree cover and the substrate dominated by cobbles. The River Habitat Survey (see plans in Appendix 6 of Volume 3 of this ES) showed a site with signification modification as a result of three bridges with associated re-sectioning and reinforcement. However, it also showed reasonably high habitat quality, with a range of erosional and depositional features. Grazing appears to be limited to a few sheep, so there is very little poaching of the banks. This means there is extensive cover for fish from both draped vegetation at the bank sides, larger boulders and undercut banks and tree roots
- 7.5.14. The site contains extensive fish habitat with plenty of fry, parr and mixed juvenile habitat, as well as several pools and glides. Previous electrofishing studies have found reasonable densities of trout fry and parr, although these were considered likely to be resident trout, rather than sea trout or salmon (Spey Research Trust, 2009). The Spey Fisheries Board consider that the burn may provide spawning areas for the arctic charr population of Loch Insh.

Central Section: Kincaig farmland (Chainage 1,650 - 3,520)

- 7.5.15. The Dunachton Burn is taken as the boundary between the southern parkland and the central zone mainly dominated by farmland to the west of Kincaig, with some small areas of heath and heathy woodland in the south. Northwards from the Dunachton burn, the land rises from the floodplain into dense birch woods that appear to have colonised dwarf-shrub heath with a small section of open dry heath remaining, mostly on the east of the A9 south of Kincaig (see Phase 1 habitat plans in Volume 2 of this ES) which grades, via a damp depression, into a field of largely unimproved grassland with a number of common herb species (TN 10). Continuing on the east, the fields, with a more undulating landform than to the west and with scattered mature birch trees, are mostly semi-improved with a low cover and diversity of herb species but with occasional, very sparse, remnants of a former flora typical of slightly acid grasslands, devils-bit scabious, eyebright (*Euphrasia* spp), harebell and lady's bedstraw (*Galium verum*). Raised landforms on the eastern edge of the A9 at TN 18 show a remnant area of more species-rich grassland. To the west of the A9 in this area is a small, heterogeneous mire system in the south dominated by cotton grasses and sedges with some cross-leaved heath (TN 9). These habitats quickly give way to open farmland of improved pastures with a low botanical diversity and demarcated by post and wire fences in the south and stone walls in the north.

- 7.5.16. Some areas along the access tracks to the west of these fields have been surveyed in respect of accommodation works. Habitats of note include the woods to the north of Leault Farm (TN 12), wet grassland and flush at TN13, a small fen at TN 14, damp species-rich, apparently unimproved grasslands in an unmanaged paddock by the Baldow Smiddy underpass (TN18) and a flush draining into a small burn north of this (TN 19). The open, grazed grasslands around these sites, while apparently semi-improved, show a reasonable range of herb species (described under TN 14) providing a moderate biodiversity that tends to be absent from the enclosed and improved pastures closer to the A9.
- 7.5.17. The Leault Burn runs through this section with a treeline along much of its length of old alder and ash, particularly along the stone wall at TN 15 where some veteran ash trees provide potential bat roosts. Sections along the burn on the western edge of the A9 have been fenced and planted with mixed native woodland. Exclusion of grazing stock has allowed the grasslands in these areas to develop a varied flora comprising a number of common herb species (see TN 15). The burn passes under the A9 in a large culvert with a concrete ledge on the north site, which provides connectivity for farm stock, as well for wildlife (otter was recorded here during the Atkins 2007 study). On the eastern edge of the A9 as the burn emerges from culvert, a low hill by the north bank supports a number of mature aspen (TN 16).
- 7.5.18. The unfenced sections of the burn upstream of the A9 crossing suffer erosion from farm stock and further upstream towards Leault Farm the burn appears to have been dredged and the boulder spoil placed on the left bank, forming an embankment. The substrate of the burn is mostly boulders and cobbles, but much of the flow is a smooth glide where the burn has been re-sectioned. The river habitat survey data showed a severely modified burn, affected by the A9 bridge and the extensive re-sectioning. Habitat quality in this burn is lower than in the other burns, mostly as a result of the limited bank vegetation and the lack of erosional and depositional features. Fish habitat within this burn is minimal due to its small size, shallow depth and the eroded banks in the grazed section.
- 7.5.19. Downstream of the A9 the burn goes through a short section of grazed grassland. It then enters an area with a wide ungrazed buffer strip, before passing under the B970 and into the Kincaig housing estate. Within this section the burn has been resectioned, but the banks have been left ungrazed / uncut and planted with trees. The burn then passed under the railway, through a wide bridge which has a cobbled base, giving a shallow water depth of approximately 10 centimetres. Again the Habitat Modification score for this site showed a severely modified site, due to the re-sectioning and the presence of several bridges. The habitat quality at the site is also low, with no erosional and depositional features and only limited bankside vegetation diversity. Fish habitat is limited by the small size of the burn and the poached banks – the area may occasionally be used by trout fry during periods of high water levels, but is generally too small for fish usage.
- 7.5.20. To the north, before the land-use changes from farmland to coniferous plantation, another small burn passes under the A9 in a corrugated iron circular cross section culvert (Burn C in the River Habitat Survey analysis, Appendix 7 of Volume 3 of this ES) on the northern edge of the Baldow Smiddy underpass. Immediately to the west of the A9, this burn splits into two. One section heads west, whilst the larger section turns north and runs directly parallel to the A9. Both are small burns, with minimal water flow and some dry sections. Much of the burn is choked with vegetation and in places it was dry, therefore it was not considered to contain suitable fish habitat.

- 7.5.21. The westerly section runs for about 200 metres before it enters a marshy area and loses any distinct course. For the majority of its course it runs through grazed grassland, so is subject to some poaching as a result of livestock trampling. For approximately 20 metres immediately upstream from the A9 the burn has been heavily reinforced and has a concrete bed and banks. The burn is approximately 20 centimetres wide and had a water level of around 10 centimetres at the time of survey, so it was not considered likely to support any fish. A river habitat survey was not completed on this section of burn as it is too short to produce meaningful data. The northerly section of this burn runs alongside the A9 for around 600 metres before swinging west and entering a marshy area where it loses any distinguishable course. A river habitat survey was completed on this section, although it could be considered more of a drainage ditch than a natural burn. The entire length of the burn has been extensively re-sectioned, resulting in an over deepened channel and a severely modified Habitat Modification score. Habitat quality was reasonably poor, due to the lack of diversity within the burn. However, it contained a reasonable mix of vegetation, including both bankside trees and aquatic macrophyte species with species such as meadowsweet (*Filipendula ulmaria*), water mint (*Mentha aquatica*), bog pondweed (*Potamogeton polygonifolius*), brooklime (*Veronica beccabunga*), monkeyflower (*Mimulus* sp), marsh marigold (*Caltha palustris*), lesser spearwort (*Ranunculus flammula*) and bottle sedge (*Carex rostrata*).
- 7.5.22. Downstream from the A9 this burn becomes a little wider (approximately 40 centimetres) and is not as densely choked with vegetation. The substrate is predominantly gravel, with a fairly gentle gradient. However, the entire channel has been re-sectioned, resulting in uniform bed and bank structure and reducing habitat quality. Unsurprisingly, the river habitat survey resulted in a Habitat Modification score of severely modified.
- 7.5.23. The railway bridge is essentially a very long culvert, with shallow flows of approximately 10 centimetres depth. The burn is considered too small to support a viable salmonid fish population, particularly upstream of the railway bridge.
- 7.5.24. This burn receives drainage from two roadside verge channels extending to the north, the eastern channel being only around 150 metres in length while the western channel represents a diversion of a field burn rising in land in the coniferous woodland to the north. Both channels contain an array of common wetland plants though the channel on the western verge of the road is the more diverse of the two with a similar community as described above.
- Central Section: Coniferous plantation (chainage 3,250 - 6,330)**
- 7.5.25. Coniferous plantation, predominantly Scots pine with occasional smaller blocks of western hemlock, dominates this section of the proposed Scheme, both as mature plantation and areas of dense regeneration of younger Scots pine and birch in the south of this section (note that these younger, dense, possibly self seeded woods north of Kinraig have been coded on the Phase 1 plan as deciduous and the distinction has not been made between areas of respective dominance by Scots pine or birch). Dense, probably naturally seeded Scots pine around 15 -20 years old occupies the strip of highway land between the managed grass verge and the highway fence, here provided by deer fencing along the entire roadside edge of these plantations. For the most part these pine and younger mixed woodlands cast a fairly dense shade, particularly to the east of the A9, and the ground flora is very limited.
- 7.5.26. Notable exceptions to this are the mature, low density pinewoods between the A9 west towards Alvie Lodge where a lush ericaceous ground flora is well developed (TN 24) and northern wood ant nests present where sunshine lights up the glades. The best tracts of these securely deer-fenced woodlands lie between Chainage 4,710 - 5,410 and are recorded as ancient woodland on the SNH Ancient Woodland Inventory. These woods, together with their wood ant population would be considered of ecological value at the Local to District scale. North of this, habitat quality declines with the understory grazed and grading northwards to a grassland community under the pines (TN 27). These woodlands are outside the ancient woodland boundary and this may also have a bearing on the species-poor, grass-dominated ground flora.

- 7.5.27. A few other localised habitats punctuate the woodland continuum. The 2007 ES describes a seasonal pond south of the Alvie Lodge underpass (TN 22) which, on revisiting in August 2012 was dry with a continuous cover of redshank over the centre, suggesting a continued drying out of this site with occasional inundation. At TN 29 a small mire system is present with a well vegetated ditch draining, very slowly, into an extensive bog complex to the west (not fully surveyed during this study but fully described in the Atkins 2007 ES). A culvert under the A9 has been provided at this location but now appears to be normally dry.
- Northern Section: Dalraddy farmland (chainage 6,330 - 7,000)**
- 7.5.28. Open farmland of improved pastures occupies the section between the pinewoods to the south and the Allt an Fhearna to the north. Both the Allt an Fhearna and a small burn in the south of this compartment (Burn B in the River Habitat Survey data, Appendix 7 of Volume 3 of this ES) drain eastwards into Alvie SSSI. Burn B, upstream of the A9 was mainly dry at the time of the survey apart from a constructed northern arm which forms a drainage ditch of around 200 metres in length draining from the north along the western edge of the road. The burn passes eastwards under the A9 in a small culvert. Downstream, the burn is joined by a short (80 metre) drainage ditch which runs parallel with the eastern side of the A9 and which contained a mix of slow flow / still water macrophyte species (TN 30). Eastwards, towards Dalraddy farm, the burn has been resectioned in places and runs through a grazed field, which has resulted in poaching of both banks. A River Habitat Survey score of severely modified registers for the burn, due to a combination of culverts, re-sectioning and bank poaching. Habitat quality in the burn was fairly poor, with limited flow and substrate diversity and little tree cover. The burn is not considered big enough to be suitable for salmonid fish.
- 7.5.29. The Allt an Fhearna flows through a fairly narrow strip of mature alder woodland west of the A9, passing under the A9 bridge with a parallel farm track (TN 31). Alder woods extend along the burn to the east of the A9, here within the Alvie SSSI. A fairly even-aged stand of younger alder dominate the narrow flood plain between the river and the road embankment (Photograph 32 in Appendix 5 of Volume 3 of this ES) with a ground flora dominated by tufted hair grass, Yorkshire fog, soft rush, greater woodrush and Polytrichum mosses. Northwards, downy birch tends to replace alder as the dominant species. These riparian woodlands would be considered of Local ecological value.
- 7.5.30. The Allt-an-Fhearna is classified by SEPA as being at poor ecological status due to barriers to fish passage, resulting from aquaculture. Additional information from SEPA staff confirmed this to be just upstream of a licensed abstraction for Delfour fish hatchery, with no plans to address the barrier until after 2015. Upstream of the A9 the burn is reasonably wide (c. 6 metres water width), with a cobble / boulder substrate and continuous tree cover along both banks. The trashline on the trackside fence under the road bridge indicates that water levels can rise to around 1.2 metres, although they were closer to 30 centimetres at the time of survey. This section of burn scored highly for habitat quality, due to the mature vegetation along both banks and the unconstrained nature of the burn itself. It also scored as significantly modified, due to the presence of the A9 bridge and a small ford, which has caused consolidation of the bed material.
- 7.5.31. Downstream of the road crossing the burn is at a reasonably shallow gradient and so contains a mix of pebble, cobble and boulder substrates. It appears to have been re-sectioned at the upstream end and some of the spoil has been left on the bankside, resulting in an embankment which constricts the river's natural movement. This reach was scored as severely modified, due to the presence of the bridge and the extensive re-sectioning. However, it scores reasonably highly for habitat quality, due to the erosional and depositional features and the extensive bankside vegetation.
- 7.5.32. The burn provides good fish habitat, with areas suitable for fry and parr as well as some potential spawning bed locations. However, further downstream, the burn appears to change to a braided channel and it is possible that this area is not suitable for fish passage during low flows. Given its size, the burn is more likely to support trout than salmon.

- 7.5.33. Damp rushy grassland on the slowly rising floodplain to the west of the A9 (TN 31) appears surprisingly species poor and may have been under cultivation or improved grassland in the past. There is a notable stand of veteran wych elm and ash on the southern edge of the wet grassland, some trees with significant potential to provide roosting habitat for bats.

Northern Section: Heathland (Chainage 7,000 - 7,455)

- 7.5.34. From the Allt an Fhearna northwards the land rises fairly steeply through coniferous plantation on the west of the A9 to open Calluna dry heath on the hill. To the east of the road, the land similarly rises through a mosaic of coniferous plantation, birch woods, bracken stands and acid grassland clearings (e.g. on the northern bank of the Allt Chriochaidh) with a distinctive heathy character comprising red fescue, common and brown bent (*Agrostis capillaris*, *A. vinealis*), wavy hair-grass (*Deschampsia flexuosa*), heath-grass (*Danthonia decumbens*), green ribbed sedge (*Carex binervis*), wood sage (*Teucrium scorodonia*), tormentil and heather. Northwards, this mosaic of habitats opens out onto a tract of acid grassland/heathland mosaic sloping down to the shores of Loch Alvie.
- 7.5.35. Another burn draining into Loch Alvie, the Allt Chriochaidh (Burn A in the River Habitat Survey data, Appendix 7, Volume 3 of this ES), flows through this section, flanked by open birchwoods. It passes under the A9 roadbridge situated just beyond the northern end of the alignment proposed for improvement in a channel flanked by dry ledges at the bridge abutments. This burn is reasonably steep, with fast flowing water and a boulder dominated substrate. The burn is clearly quite mobile, with many depositional and erosional bank features. Flow types were dominated by chute flow over the unconsolidated substrate. The upstream section of this burn scored reasonably in terms of habitat quality, although it has limited diversity as much of the habitat is the same throughout the entire 500 metre length. The impact of the A9 bridge, with reinforced banks and bed, results in the burn scoring as significantly modified, although the rest of the survey section is unmodified and not constrained by human activity.
- 7.5.36. The downstream section of this burn is at a shallower gradient and so has less coarse substrate. However, after approximately 250 metres the burn splits into a braided channel which runs through a wet woodland 'delta', before entering the loch. Water depths in this area were variable, with some areas at approximately 30 centimetres depth and others at only a few centimetres. A full River Habitat Survey could not be completed on this section as it was less than 500 metres long. However, 6 spot checks were completed and habitat modification and quality indexes calculated for the available data – these should be treated with caution due to the smaller survey section. This section of burn scored as significantly modified due to both the presence of the A9 bridge and an old bank top dyke which is acting as an embankment. The habitat quality assessment of the burn is reasonably high, given that only a reduced amount of data could be collected.
- 7.5.37. Fish habitat within this burn is limited by the small size of the burn; the low, fast flows; the large substrate and the mobile nature of the burn itself. For approximately 50 metres north from the A9 bridge there is a short section which is a shallower gradient and so has a more cobbly substrate which could potentially be suitable for salmonid fry. However, fish passage into the burn is probably limited by the 'delta' area upstream from Loch Alvie and the culvert / bridge under the A9 where the constructed channel includes three steps of approximately 30 centimetres each, spanning a distance of approximately 1.5 metres with water depths of around 4 centimetres. Although there is a suitable jumping pool at the base of the steps, there is no resting pool part way up and water depths are too shallow to allow fish to jump over the remaining steps. It is therefore likely that this design prevents fish passage except at very high flows. Fish passage is also limited between the river Spey and Loch Alvie, although fish passage has been known to occur in the past (Laughton et al, 2006). Even if fish passage to this area is possible during high flows, it is unlikely that the site provides much suitable fish habitat.

Habitats within the Trunk Road Boundary

7.5.38. The trunk road corridor is typified by broad managed verges on each side of the carriageway. Management by mowing of the immediate roadside verges has produced a semi-improved grassland habitat that is largely independent of the effects of the dominant habitat types around and which comprises a range of common plant species, tolerant of the mowing regime. Beyond this intensively managed zone, habitats tend to be more semi-natural, reflecting conditions of soil and aspect and the seed sources from the habitats beyond the highway fence.

7.5.39. The species composition of the mown grass verge is generally rather species-poor though over the length of the alignment a significant number of common plant species can be found as indicated in Box 7.2 below. Semi-improved grasslands beyond the mown strip tend to have a similar species composition but are often species poor and dominated by the taller coarse grasses such as cocksfoot, false oat and Yorkshire fog. The few areas showing grasslands of greater species diversity are described in the target notes.

Box 7.2 Plant species of the mown, semi-improved grasslands of the A9 verge

Autumn hawkbit	<i>Leontodon autumnalis</i>	Heath dog violet	<i>Viola canina</i>
Birdsfoot trefoil	<i>Lotus corniculatus</i>	Moss	<i>Rhytidiadelphus squarrosus</i>
Broad-leaved dock	<i>Rumex obtusifolius</i>	Meadow vetchling	<i>Lathyrus pratensis</i>
Cats ear	<i>Hypochaeris radicata</i>	Moss	<i>Pleurozium schreberi</i>
Cocksfoot	<i>Dactylis glomerata</i>	Moss	<i>Rhytidiadelphus triquetris</i>
Common bent	<i>Agrostis capillaris</i>	Oxeye daisy	<i>Leucanthemum vulgare</i>
Common dog violet	<i>Viola riviniana</i>	Common hogweed	<i>Heracleum sphondylium</i>
Common nettle	<i>Urtica dioica</i>	Pignut	<i>Conopodium majus</i>
Common ragwort	<i>Senecio jacobaea</i>	Red fescue	<i>Festuca rubra</i>
Common sorrel	<i>Rumex acetosa</i>	Ribwort plantain	<i>Plantago lanceolata</i>
Common vetch	<i>Vicia sativa</i>	Self heal	<i>Prunella vulgaris</i>
Cow parsley	<i>Anthriscus sylvestris</i>	Sheep's sorrel	<i>Rumex acetosella</i>
Creeping soft grass	<i>Holcus mollis</i>	Spear thistle	<i>Cirsium vulgare</i>
Creeping thistle	<i>Cirsium arvense</i>	Sweet vernal grass	<i>Anthoxanthum odoratum</i>
Curled dock	<i>Rumex crispus</i>	Tormentil	<i>Potentilla erecta</i>
Daisy	<i>Bellis perennis</i>	Tufted vetch	<i>Vicia cracca</i>
Dandelion	<i>Taraxacum spp.</i>	Yarrow	<i>Achillea millefolium</i>
Ground elder	<i>Aegopodium podagraria</i>	Yorkshire fog	<i>Holcus lanatus</i>
Heath bedstraw	<i>Galium saxatile</i>		

7.5.40. Dwarf-shrub heath and acid grassland/heathland mosaics form the other non-wooded habitat of the roadsides with heather and fine-leaved grasses such as fescues and wavy-hair grass predominating (Box 7.3). Dwarf shrubs tend to be suppressed by mowing and heath is therefore poorly expressed adjacent to the road, but is locally well developed on the unmanaged slopes of the adjacent cuttings and embankments. Scattered trees and shrubs are typical.

Box 7.3 Plant species of the roadside heathlands

Autumn hawkbit	<i>Leontodon autumnalis</i>	Juniper	<i>Juniperis communis</i>
Bell heather	<i>Erica cinerea</i>	Larch	<i>Larix decidua</i>
Billberry	<i>Vaccinium myrtillus</i>	Mouse-ear hawkweed	<i>Pilosella officinarum</i>
Birdsfoot trefoil	<i>Lotus corniculatus</i>	Pignut	<i>Conopodium majus</i>
Bracken	<i>Pteridium aquilinum</i>	Red fescue	<i>Festuca rubra</i>
Broom	<i>Cytisus scoparius</i>	Rowan	<i>Sorbus aucuparia</i>
Cat's ear	<i>Hypochaeris radicata</i>	Scots pine	<i>Pinus sylvestris</i>
Cocksfoot	<i>Dactylis glomerata</i>	Sheep's fescue	<i>Festuca ovina</i>
Common bent	<i>Agrostis capillaris</i>	Sheep's sorrel	<i>Rumex acetosella</i>
Devil's-bit scabious	<i>Succisa pratensis</i>	Silver birch	<i>Betula pendula</i>
Gorse	<i>Ulex europaeus</i>	Sweet vernal grass	<i>Anthoxanthum odoratum</i>
Harebell	<i>Campanula rotundifolia</i>	Tormentil	<i>Potentilla erecta</i>
Heath bedstraw	<i>Galium saxatile</i>	Wavy hair-grass	<i>Deschampsia flexuosa</i>
Heath dog violet	<i>Viola canina</i>	Wood sage	<i>Teucrium scorodonia</i>
Heath speedwell	<i>Veronica officinalis</i>	Yorkshire fog	<i>Holcus lanatus</i>
Heather	<i>Calluna vulgaris</i>		

7.5.41.

Where mature woodland is present beyond the trunk road boundary, the zone between the mown verge and the trunk road fence tends to be dominated by pioneer woodland, reflecting the species composition beyond and therefore normally dominated by either Scots' pine or birch. Elements of the former semi-improved grassland, or heathland, remain in the sparser stands, but in many areas the dense growth of young trees has suppressed the ground flora.

Fauna**Mammals**

7.5.42.

The previous studies for the 2007 ES recorded evidence for a number of animal species around the A9 corridor. Bat surveys recorded the presence of common and soprano pipistrelles, Daubenton's and brown long-eared bat, and of the other fully protected species, evidence was found for the presence of otter, red squirrel and pine marten. No "resting places" e.g. bat roosts, otter holts, pine marten dens, were found for these protected species within the area of the then scheme, but red squirrel dreys were found in the mature pine woods between Alvie Lodge and the A9 at a distance of around 50 metres from the edge of the road and, through consultation it was established that bat roosts were known to be present in a number of buildings in the locality. The closest roosts to the proposed Scheme were at Alvie House (300 metres with a pipistrelle roost) and a bungalow by Alvie School (100 metres with a brown long-eared bat roost). A suspected pipistrelle roost was located under the Meadowside underpass to the south of the current scheme. No evidence was found for the presence of badger in the area around the road, a result confirmed by consultation though it was considered that badgers in the wider locality might use the underpasses for longer range movements. Other protected species such as water vole were not recorded during the survey work, nor were they indicated as present from the 2007 desk study and consultation exercise.

- 7.5.43. The current survey work (2012) confirmed the continued presence of red squirrel in the mature pine woods (TN 24) to the west of the A9, between Alvie Lodge and the road though, as for the 2007 ES studies, no dreys were recorded in the immediate roadside corridor. As for the 2007 ES surveys, no evidence was found for the presence of badger, though sections of the alignment, in particular the landscape in the south, appear suitable for this species and a record of a road kill of two badgers in 2009 in the area of Dunachton Lodge (in the area of Chainage 1,040) supports this view (see Section 7.6. Two other records for dead badgers along the A9 in 2006 and 2009 respectively are in the Baldow/Alvie school area, probably from animals crossing at the location of the at-grade track here (Chainage 4,520).
- 7.5.44. Scats of both mink and pine marten were found along the Allt an Fhearna by the A9 bridge during the 2012 field work and a pine marten scat was also found by the Allt an Fhearna just west of the bridge in March 2013. Habitat conditions for water vole were judged to be largely unsuitable in the larger burns and surveys in the few areas of sub-optimal habitat recorded no signs of presence. The downstream reach of the small Dalraddy burn (TN30) was considered suitable for water vole though no signs were detected and the presence of mink in the catchment may also be a factor in rendering this area unsuitable for this species. Similarly, some downstream reaches of the Leault Burn were considered potentially suitable though no signs were recorded.
- 7.5.45. Neither the extended Phase 1 habitat survey nor the River Habitat surveys completed in the late summer of 2012 recorded any recent evidence for the presence of otter along the watercourses though habitat quality for this species was judged to be high and it was considered likely that otters pass along the main watercourses under the A9 as indicated by the 2007 ES surveys and previous records for this species in the area (see Section 7.6 on Consultation). However, the March 2013 visit recorded recent and well-used sprainting points on boulders (see Photographs 12, 13 & 33 within Appendix 5 of Volume 3 of this ES) in the Dunachton Burn and the Allt an Fhearna and it is probable that otter populations centred on the Spey and Insh marshes extend their ranges up the tributaries during the winter months. Otters appear to be successfully negotiating the existing A9 alignment in this area with no recent road kills reported.
- 7.5.46. Recent work by the Cairngorms National Park (Hetherington & Campbell, 2012) have indicated that the wider valley of the River Spey represents an important core area for the wild cat population of the Park. A number of road mortalities of wild cat have been found south of the alignment in the Lynchat area. Table 7.4 shows data abstracted from the National Park records for wildcat observations along and in the immediate area of the alignment. The records suggest three main areas of activity, at the very southern end of the alignment by the Highland Wildlife Park, in the area just north of Kincaig by the Baldow Smiddy underpass and Alvie School, and further north in the extensive old pine woodlands by Alvie Lodge with a number of observations recording animals crossing the A9.

Table 7.4 Wild cat Records for the A9 Kinraig - Dalraddy Alignment

Date	Quality*	Grid ref	Location & Scheme Chainage	Notes
02/10/2010	A1	NH804034	Highland Wildlife Park (HWP), just south of alignment.	Walking along track
18/01/2010	A1	NH804034	HWP, just south of alignment	Walking along track
20/02/2010	A2	NH805034	HWP, just south of alignment	Walking along track
23/02/2010	A1	NH805034	HWP, just south of alignment	Walking along track
24/02/2010	A2	NH805034	HWP, just south of alignment	Walking along track
01/09/2009	A1	Not given	Alvie, possibly around Ch. 4,520	Found apparently abandoned
09/11/2009	B3	NH874087	Kinrara (S.W of Loch Alvie)	Hunting around pheasant pens
16/02/2010	B1	NH847080	A9 at Dalraddy, Ch. 5,580 approx	Crossing road
29/03/2011	B1	NH813038	200 m north east of HWP entrance, Ch. 180 approx	Crossing road
02/03/2011	B3	NH834065	A9 embankment, Kinraig, Ch. 3,640 approx.	Appeared to be waiting for voles
09/04/2011	B3	NH845077	A9 just north of Kinraig, Ch. 5,400 approx	Bounded across road in 3 leaps
16/06/2011	B1	NH845077	A9 at Alvie, Ch. 5,400 approx.	Loped' across road
19/07/2011	B1	NH841071	Layby 125 on A9 near Kinraig, Ch. 4,600.	Bounded across the road, east to west
18/06/2011	B1	NH835065	Baldow, Kinraig, Ch. 3,640	Ran across B road into thick shrubbery
16/02/2009	B1	NH850085	A9 South of Aviemore, Ch. 6,220	Crossing road

* Quality Key:

A1 – A record substantiated with physical evidence such as a photo or carcase of a probable wildcat (i.e. a tabby-marked cat, with no white feet and which has a thick, ringed, blunt tail with no continuing dorsal stripe).

A2 – A substantiated record of a probable hybrid

A3 – A substantiated record of a possible wildcat (not enough detail discernible to identify the cat as a wildcat or hybrid)

B1 – An unsubstantiated record (e.g. eye witness account) of a probable wildcat (i.e. described a tabby-marked cat, with no white feet and which has a thick, ringed, blunt tail with no continuing dorsal stripe)

B2 – An unsubstantiated record of a probable hybrid

B3 - An unsubstantiated record of a possible wildcat (not enough detail described to identify the cat as a wildcat or hybrid)

- 7.5.47. The 2012 and 2013 surveys found no evidence of wildcat on the site in the form of dens or other readily detectable signs. Overall, given that much of the landscape around the proposed Scheme is quite intensively managed and much of the wooded ground supports trees of no great age, good denning habitat is largely unavailable, apart from, possibly the immediate corridors of the two larger watercourses where occasional cavities in rocks along the banks or under fallen trees are present. Such refuges are likely to be temporary in nature and subject to inundation during spate flows.
- 7.5.48. While bat surveys were not repeated, potential roosting habitat in some of the older trees was noted (TN 7, 15 & 29) and some of the old oaks along the road in the south of the alignment may also have suitable crevices for roosting bats (e.g. around TN 1, 2 3 & 4). Similarly, some of the older alder trees along the Dunachton burn and Allt an Fhearna show crevices that may have potential for at least transitory roosts for bats. An old downy birch in the field south-east of the Dunachton Burn crossing, in the area of the proposed bridge diversion during construction, has a significant cavity in the trunk, apparently suitable as a bat roost (TN 6, Photographs 7 & 8 of Appendix 5, Volume 3 of this ES). With habitat conditions in respect of bats remaining essentially the same as previously described by Atkins in the 2007 ES, it should be concluded that the pattern of bat activity and the species present will remain the same. Habitats along the southern extension, particularly along the Dunachton burn and in the oak woods by the A9 to the south of the burn are regarded as particularly favourable for foraging bats. The roost formerly identified at the Meadowside underpass, leading to the Highland Wildlife Park, will remain undisturbed as this section of the A9 lies outside the proposed Scheme. The results of the bat surveys undertaken for the 2007 ES are given in Appendix 8, Volume 3 of this ES.
- 7.5.49. Roe deer were encountered on a number of occasions, mainly in wooded habitat, throughout the survey area. Deer fencing (the main deer fences along the alignment are indicated on the Phase 1 habitat plans, in Volume 2 of this ES), that remains in good condition, around large tracts of conifer plantation, poses a barrier to movement by this, and other terrestrial mammals, and serves to reduce road traffic accidents in these areas. However, deer can cross the at-grade junctions in these areas and two roe deer skeletons were found by the Alvie Lodge crossing on the north-bound verge. Elsewhere along the alignment, lower stock and mesh fences (not marked on the Phase 1 plans) are present along the highway boundary, often fitted with rabbit-proof mesh, which is likely to pose a barrier to the less agile mammals such as badger with favourable consequences for the risks of road kill, but posing a barrier to dispersal and limiting routes for this species to underpasses and culverts with dry ledges.

Birds

- 7.5.50. As for the previous studies for the 2007 ES, dedicated bird surveys were not undertaken and with the field work undertaken well after the optimum season for detecting breeding birds by display and song, relatively few observations were made of bird species along the road corridor. As for bat populations, habitat conditions along the road corridor in relation to birds are judged to have remained the same as assessed for the 2007 ES. Land within the existing highway fence offers very few nesting sites for birds, with the canopy structure of the young trees that have colonised in many areas being unsuitable as yet for nest construction while the more open habitats are subject to disturbance from passing traffic. Searches for red squirrel dreys in the mature woodlands recorded also no evidence for the presence of breeding raptors in close proximity to the road corridor. Scottish crossbill (*Lorixia scotica*) has been recorded in the locality (NBN Gateway) and goshawk, recorded by Atkins (2007) in the mature pine woods north of the Allt an Fhearna. Capercaillie (*Tetrao urogallus*) is also recorded from the 10 kilometre grid square but the only habitat that this species might be present in are the mature pine woods between Alvie Lodge and the A9. This species was not detected during the walk-over surveys within this woodland block

Reptiles and Amphibians

- 7.5.51. No observations were made of reptiles or amphibians during the 2012 survey and, apart from the slower flowing roadside ditches (e.g. north of TN30) there is no open, still water habitat in the immediate road corridor that would provide good habitat for breeding amphibia within the construction zone. The 2007 ES concluded that great crested newt was, as a result, unlikely to occur in the area, though in the wider area under survey, some good habitat was recorded for common frog and palmate newt. Reptiles are likely to occur in the more open heathy habitats where there is good cover, warm sunlit conditions and an abundance of insect prey. Elsewhere, intensive farming and dense conifer plantations have rendered habitats unsuitable for significant reptile populations. A potential refuge habitat and possible hibernation site is present on the northern edge of the stand of mature aspen on the east of the A9 on the north bank of the Leault burn (TN 16 and coded as (S) on the Phase1 habitat plan) where a large pile of stones lies on the field edge.

Wood ant

- 7.5.52. The area in which the northern wood ant (*Formica lugubris*) was recorded during the field work for the 2007 ES was revisited, in addition to other areas of suitable habitat (Hughes 2006), to assess current distribution based on the characteristic nests. The species is very much restricted to sunny margins and open glades in the pine woods. The 2007 ES recorded 74 nests in the Alvie Lodge woods and along the north-bound roadside verge with the distribution illustrated in Figure 7.9 of Volume 2 of this ES. The current survey in 2012 recorded a reduced number of 37 nests in this location (see Figure 7.17 in Volume 2 of this ES) and two nests on the eastern (southbound) verge (TN 21). The reduction in recorded nests is attributed to the continued growth in height and spread of the young pines along the roadside verge and the increased shading as a result. A number of old nests, now long abandoned, were located in areas shaded by the continued growth of the roadside pines. The western verge with a warmer south-east aspect provides the more favourable habitat along the A9. Only two nests were located along the more shaded eastern verge with its cooler north-west aspect.

Freshwater Pearl Mussel

- 7.5.53. All watercourses in the study area, apart from the Leault burn, are high energy systems with channel beds dominated by cobbles and coarse gravels, most probably mobilized in spate flows, and there is little suitable habitat for freshwater pearl mussels. The few areas of possible habitat were surveyed with no mussels recorded. Habitat conditions in the Leault burn are also unsuitable and no mussels were recorded.

7.6.

Consultation

7.6.1.

Consultation has been undertaken in order to gather additional data relating to the ecological baseline condition and to invite views on the proposed Scheme and approaches to mitigating any perceived adverse impacts. Primary consultees have included SNH, the CNPA and the Spey Fishery Board. Through these primary consultees, some other organisations were approached, including the RSPB, the maintenance agency Transerve and Scottish Badgers. Topics under discussion with, and the views given by, these organisations are considered below and the consultation record is given in Appendix 1 of Volume 3 of this ES.

Scottish Natural Heritage

7.6.2.

SNH was consulted primarily over the implications of the proposed Scheme for the scheduled sites in the locality and in particular in relation to the appropriate assessment screening of potential effects on the European Directive sites (the River Spey SAC, the Insh Marshes SAC and SPA). Data on bird distribution in the Insh Marshes were requested, as advised by SNH, from the RSPB, managers of the Insh Marshes National Nature Reserve. SNH provided advice on the scope of the required Habitats Regulations Assessment in relation to the EC Directive sites and upon species protection issues.

7.6.3.

In view of the potential small area of land-take from Alvie SSSI by the Alt an Fhearna, SNH was also consulted over proposals for mitigation woodland planting. SNH recommended a possible compensation site in an area of partly wind-thrown conifer plantation east of the alignment near the edge of Loch Alvie, and currently outside the SSSI, adjacent to a very good stand of riparian alder woodland. This area is identified as number 3 in the mitigation plan, Figure 7.18. Volume 2 of this ES.

Cairngorms National Park Authority (CNPA)

7.6.4.

The CPNA was consulted over its database of sites and species for the area of the proposed works and for its views on potential effects and the scope for mitigation and enhancements. The CPNA provided records for wild cat in the area of the project and their comments sent by e-mail in relation to the proposed Scheme were as follows:

- It is essential that the appraisal of ecological impacts of dualling are considered strategically along the whole stretch of the road rather than in a piecemeal fashion, e.g. the Kincaig-Dalraddy section.
- The current permeability of the A9 within the Cairngorms National Park to wildlife must be systematically assessed along its length.
- Camera trapping should be used, in tandem with field signs, to assess the level of use by existing crossing structures such as underpasses and culverts.
- Roadkill carcasses should be systematically collected and collated along the length of the A9, while historical records should also be collated, so as to better understand where wildlife chooses to cross the road, and the levels of mortality experienced.
- A strategic assessment should be undertaken by specialists into how the permeability of a dualled A9 could be enhanced for a variety of key species, including deer, bearing in mind the need for species migration for climate change adaptation. This should consider the efficacy of new, purpose-built crossing structures.
- The loss of semi-natural habitats to dualling should be compensated through the off-site enhancement in the National Park of habitats at a rate which is greater than that being lost; and
- For very site-specific species, e.g. notable plants, wood ant nests etc., the feasibility of translocation from ground identified for clearance should be seriously explored.

7.6.5. At a meeting held between Atkins, the CPNA and SNH on the 25th of April 2013, on discussing the impacts upon riparian woodland from the construction of new bridge crossings, the CPNA indicated its requirement for a replacement ratio of 3:1 of new planted woodland to that lost where the habitat lost is of good quality.

7.6.6. The CPNA noted that Scotland TranServe, the road maintenance Contractors, also held information concerning local wildlife including wildlife mortality statistics and the maintenance undertaken for the green estate.

TranServe

7.6.7. Records from TranServe indicated:

- Evidence collected in 2006 for the presence of otters along the Dunachton Burn and the Leault Burn, with additional records in the Spey valley by, and south of, Loch Insh, and in the north by Loch Alvie;
- An incidence of road mortality in 2009 of two badgers along a section of the A9 by Dunachton Lodge (around Chainage 1,040);
- Red squirrel mortality on the A9 to the north of the current works area (at lay-by 130, southbound, 50m north of Ballinluig Farm, just south of Aviemore);
- Salmon, trout, lamprey and eel recorded at the Dunachton Burn fishpass under the Dunachton Lodge underpass, (the fishpass was retrofitted in the 1980s); and
- Attempts to monitor the use by wildlife of the existing underpasses with camera traps failed due to vandalism and the loss of cameras.

Scottish Badgers

7.6.8. Scottish Badgers indicated that, from their records, no setts were present within the study area but provided information on two road kills in 2006 & 2009 in the Alvie School/Baldow area.

Spey Fishery Board

7.6.9.

The Spey Fishery Board is a statutory body with a remit to conserve and protect the fisheries of the River Spey. Its partners are Spey Foundation, a charitable organisation responsible for amongst others for gathering of scientific data and conducting research on all aspects of riparian and riverine ecology, and Spey Catchment Initiative, which delivers catchment wide habitat and environmental improvements within the Spey catchment. The Board commented that:

“Regarding salmon stock improvements the emphasis is very much towards habitat improvements and we would see the proposed works on the A9 as providing an opportunity to enhance the environment locally both within and outwith the study area.

This part of the River Spey supports a range of important habitat and species some of which are listed below:

- *Atlantic salmon in the River Spey and tributaries,*
- *Brown (sea) trout in River Spey and tributaries,*
- *Arctic charr in Loch Insh. It is thought that the Dunachton Burn is used for spawning,*
- *Eels and other fish species present according to watercourse,*
- *Loch Alvie/Beag are known to support non-native fish species,*
- *Freshwater pearl mussels are present in the River Spey although their extent in the immediate area of the proposed works are not known,*
- *Sea lampreys known to spawn in the River Spey,*
- *Otters present throughout the area,*
- *Ospreys use River Spey and lochs for feeding.*

In delivering your environmental statement we would be keen to (see) specific statements on the following:

1. *Appropriate fish passage provision at all watercrossings.*
2. *Invasive/ Biosecurity procedures to help maintain the high quality status of the local area, e.g. the washing of all plant at their last site before transport.*
3. *Installation of SUDS in initial construction phase to control dirty water run-off.*
4. *Full drainage plan to minimise volume of potentially dirty site run-off.*

RSPB

- 7.6.10. The RSPB provided species distribution data for the Insh Marshes NNR, requesting that data on the nesting sites and areas for rare or vulnerable bird species be kept confidential. The RSPB expressed some concerns in relation to the potential for damage to plants and plant communities within the reserve from road run-off, particularly during construction, and from construction noise (Karen Sutcliffe, Insh Marshes Reserve Manager pers.com 18/03/2013).

7.7. Impacts (Opening Year 1) without Mitigation

- 7.7.1. This section considers potential impacts arising from construction works and those arising from the land-take required for the proposed Scheme and any associated accommodation works. Effects arising from construction would generally be regarded as temporary in nature, though the period of impact is related to the time taken for habitats to be fully restored, whereas land-take for the proposed Scheme clearly must be regarded as a permanent impact.

Potential Impacts on Scheduled Sites

- 7.7.2. The conclusions of the screening of potential significant impacts (required under a HRA) is considered below and summarised in the Tables given in Appendix 9, Volume 3 of this ES. At the time of writing, no other projects are considered to contribute to any cumulative effect and hence the assessment concerns the effects of the proposed Scheme alone.

Scheduled Sites of International Importance

- 7.7.3. The River Spey SAC runs parallel with the section of the A9 under proposed improvement, and the ecological receptors for which the site is designated include freshwater pearl mussel, salmon, otter and sea lamprey. The reach of the Dunachton burn bridged by the A9 is included in the designated site. The Insh Marshes, part of the Spey system, are also notified as an SAC for its alluvial alder and ash forests, oligotrophic to mesotrophic standing waters and transition mires, and as an SPA for its bird populations (section 7.4 above). The Dunachton burn discharges into Loch Insh, part of the Insh Marshes site. Another very small burn (TN 3) culverted under the A9 connects with the Insh Marshes site, here draining directly into the River Spey at around 330 metres (linear distance) from the construction area.
- 7.7.4. The Dunachton bridge will be subject to improvements associated with the dualling of this section of the A9. Construction works will entail the removal and re-construction of the existing crossing, providing a larger span to accommodate the north bound 2-lane carriageway on the western edge of the existing crossing. During these works, a temporary crossing will need to be provided to the east (downstream) of the works alignment. The small burn at TN 3, currently culverted under the A9 together with a very broad embankment at this point, will require additional culverting over the new extended embankment to the west of the alignment. Construction works at these locations will pose a risk to water quality and create visual and noise disturbance within the immediate reach with implications for water quality downstream to Loch Insh and the new bridge will result in an additional reach of the river, albeit a small section of around 10 metres being subject to permanent changes relating to shade and potentially bankside modifications.
- 7.7.5. Construction disturbance could affect otters and salmon, though use of the reach by otters appears possibly to be seasonal or sporadic and no holts or other resting places have been found in the 1 km reach surveyed around the new crossing. The burn is considered on the small side for a significant salmon population and this species has not been reported from the electro-fishing studies. Similarly, freshwater pearl mussel is not considered to be present in the reach surveyed and habitat within Loch Insh downstream would not be suitable for this species. There appears little risk, therefore, that bridge construction would affect the notified interests of the River Spey SAC.

7.7.6.

The Insh Marshes SPA, while around 320 metres downstream from the area of potential construction could be adversely affected in the event of a major pollution event, or from more chronic releases of sediment from site run-off, which may affect the nutrient status in the loch or its quillwort and shoreweed plant populations. While the notified interests of the Insh Marshes are unlikely to be particularly sensitive to bridge and culvert works, construction works further south along the alignment particularly within the Chainage 0.0 north to 1,150, where the A9 corridor is close to the edge of the notified site, disturbance to bird populations might arise, either to wintering or migratory hen harrier or whooper swan, or the notified breeding species (osprey, wigeon, wood sandpiper and spotted crane). The section of the marshes known as Dunacton fen, occupying the strip between the railway line and the Spey, is the closest section to the A9 and records of birds using that strip is given in Table 7.5 below.

Table 7.5 Breeding Birds of the Dunacton Fen, 2010

Species	Pairs	Notes
Curlew	4	-
Grasshopper warbler	3	-
Greylag	1	-
Lapwing	2	-
Mallard	13	-
Oystercatcher	1	-
Redshank	2	-
Reed bunting	4	-
Sedge warbler	23	-
Snipe	7	-
Spotted crane	0	Breeds on the marshes sporadically - occasionally 1 pair in Dunacton fen
Teal	6	-
Tufted duck	1	-
Water rail	1	Up to 5 pairs in some years
Wigeon	0	Up to 4 pairs in some years

7.7.7.

Modalities for disturbance include construction noise, night-time lighting of construction compounds or traffic diversions and possibly the visual disturbance from new forms of activity though this will be mitigated by works being carried out on the western side, the opposite side of the alignment from the SAC, and by the retention of much of the tree screen on the eastern embankment. Further northwards, the A9 is effectively screened from the SPA by woodland and raised landforms and hence the risk of construction disturbance effects declines markedly north of Chainage 1,150.

7.7.8.

Air quality and the potential for any change in the traffic emissions from the improved road could have implications, particularly with reference to nitrogen deposition, on the plant communities of the Insh Marshes SAC. Such nutrient enrichment can lead to community change with the loss of certain sensitive species adapted to low nutrient conditions and the replacement by other, often more commonplace plants. The change in species composition and community structure can have added implications for dependent fauna.

- 7.7.9. Further north along the alignment, construction works by all watercourses that drain into the Spey system raises the risk of pollution events though with increased distances between the works area and the receptor (generally around 1 kilometre of watercourse between the road crossings and the Spey), the magnitude of any effect at the receptor would be low and temporary and the likelihood of permanently affecting the scheduled interests of the Spey appear remote, though temporary effects could arise from serious pollution events.
- 7.7.10. The proposed Scheme seems unlikely to adversely affect the capercaillie population present in the nearby Cairngorms and Kinveachy SPA, or the more distant sites. There is little typical habitat available for this species along the alignment, and while the mature open pinewoods east of Alvie Lodge provide some localised potential habitat, the species was not recorded here during the field work. Links in the ecological network whereby these species may move from site to site may be better developed north of the current proposed Scheme where the appropriate habitats in the Cairngorms and Kinveachy SPAs lie in relatively closer proximity.

Scheduled Sites of National Importance

- 7.7.11. The SSSI designation for the above sites include some additional qualifying species, e.g. arctic charr in the Spey SAC/SSSI, additional breeding birds for the Insh Marshes SPA/SSSI, for which the implications and potential impacts arising from the project are essentially the same as considered above.
- 7.7.12. In the north of the proposed Scheme, works at Dalraddy, the Allt an Fhearna and the Allt Chrìochaidh have the potential to affect Alvie SSSI via pollution events in the watercourses. This would have possible implications for the mire and fen communities and species dependent on the range of aquatic habitats where some species of clean-water gravels may be vulnerable to excess siltation or plant communities subject to impact from a change in water nutrient status. Bridge works and road widening to the east at the Allt an Fhearna crossing may result in a small strip of land-take across the river and in the wet alder woods to the east between the burn and the existing embankment, land that may lie just within the boundary of the SSSI at this location.

Impacts on non-scheduled areas

- 7.7.13. Construction works throughout the proposed Scheme will inevitably cause temporary disturbance to fauna in the immediate environs of the carriageway from noise and the visual effects of plant and personnel movements while plant communities may be affected by surface run-off, dust deposition or changes to local hydrology. As considered above, in respect of the scheduled sites, there are elevated risks of pollution in all watercourses with implications for aquatic wildlife in general in the affected reach. There will be some habitat loss, both to temporary land-take for construction, and permanent land-take for widening, to some sensitive habitats including those dependent on ground water (GWDTE) as considered below.
- 7.7.14. Road widening over the Dunachton burn and the Allt an Fhearna will result in the permanent loss of some areas of wet alder and riparian deciduous woodland to the widened footprint of the dualled alignment. During re-construction works on both of these bridges, there will be additional loss of habitat due to the need to provide an adjacent temporary off-line crossing, though habitats here can be reinstated following construction. However, such temporary habitat loss will need to be considered as a long-term impact as it will take around 60 years or more for the re-planted woodlands to mature. However, ecological value, though different to the mature stage, will accrue at the shrub stage and will increase through to maturation of the woodland. Wet woodland habitats are included in Annex 1 of the EC Habitats Directive (Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*) as habitats for which member states are to undertake conservation action, enacted in the UK by the notification of the best examples as SAC. In view of their conservation importance, and hydrological function, wet woodlands are also listed as priority habitats in the UK BAP, the Cairngorms LBAP and are included in the Scottish Biodiversity List as habitats for which competent authorities must have regard for during development.

The widening of the A9 will result in a relatively small but permanent loss of around 0.6 hectare of wet woodland with a further long-term temporary loss of up to 0.31 hectare to construction activity (see Table 7.6. below).

- 7.7.15. Land take for construction will also result in temporary habitat loss and disturbance in some other areas, e.g. works at the Baldow Smiddy underpass may require a temporary diversion on the western edge of the existing carriageway which will affect primarily an area of birch wood and potentially some of the species rich grassland described above in this location (TN 18) in addition to the permanent loss of existing birch woodland habitat adjacent to the road corridor. Similarly, at the Lower Milehead underpass, a temporary diversion will be needed which will affect coniferous woodland plantation, here of relatively low ecological interest.
- 7.7.16. Provision of the cyclepath along the northern verge of the alignment at the Alvie Lodge woods will result in the loss of the dense fringe of young pine trees within the current highway land and, whilst this habitat is of little inherent interest, re-grading works will displace the wood-ant nests along the ecotone (edge habitat) between the pines and the grass verge (see Figure 7.17 and Photographs 24 & 25 (Appendix 5) in Volumes 2 and 3 of this ES). As the land affected will extend, in most places, up to the existing highway fence, and in some places, possibly slightly beyond, it should be assumed that all nests currently within the highway boundary (22 nests as recorded in 2012, 59% of all nests counted at this site) will be lost. Two additional nests will be lost to widening on the eastern side (see Table 7.6 below). Without successful mitigation, this scale of loss of this uncommon species would be considered a moderate negative impact of at least local significance.
- 7.7.17. Elsewhere, there are relatively few ecological receptors that would be considered of significance at scales other than the site or local level and the impacts of construction are not anticipated to have major implications for wildlife.
- 7.7.18. Apart from wood ant and possibly red squirrel, there are no notable concentrations of fauna, or particular resting places for protected mammals, recorded along the road corridor, though a few trees that may be situated in the construction zone have the potential to host roosting bats or hole-nesting birds. In addition, some of the more mature trees, or areas of dense scrub, may support nesting birds which could be vulnerable to disturbance, though again, there appears to be little risk of the works affecting any of the species listed in Schedule 1 of the Wildlife & Countryside Act or on Annex 1 of the Birds Directive with the possible exception of Scottish crossbill (*Lorixia scotica*) which has been recorded in the locality (NBN Gateway) and goshawk, recorded by Atkins (2007) in the mature pine woods north of the Allt an Fhearna. Capercaillie, which could occur in the mature pine woods between Alvie Lodge and the A9 where the lush ericaceous ground flora is suitable for this species, would similarly not be affected as there is no land-take from this section of woodland. Pre-construction surveys will be undertaken for this species to ensure that no disturbance takes place from construction noise should this species be present and breeding in the zone of potential disturbance.
- 7.7.19. The more sensitive sites and receptors are considered in Table 7.6 below for the A9 alignment and the offsite accommodation works areas. Areas are also identified by Target Note number (TN: see Phase 1 habitat plans (Figures 7.1-7.11 in Volume 2 of this ES).

Table 7.6 Potential Impacts on Sensitive Receptors outside the Scheduled Sites

No.	Location	Receptor & Evaluation	Impacts
Sites & habitats: A9 Alignment			
1.	Ch. 630 – 750 on the west side (northbound). TN 2	Old parkland oaks and moderately species-rich grassland above the present cutting. Listed as Ancient - of Semi-natural Origin (1750) in the Ancient Woodland Inventory. Local value.	Possible permanent loss of a small number of old oaks, moderately species-rich grasslands and sites for solitary bumble-bee and wasps nests in small cutting faces along the route of General Wade's Way. Implications for potential bat roosts in trees requires further survey following definition of precise working corridor.
2.	Ch. 1,680 - 1,780 approx, west (northbound), Dunachton Burn floodplain. TN 8	Wet alluvial woodland with alder (UK BAP Priority habitat, Annex 1 habitat, EC Habitats Directive, GWDTE). Local value.	Permanent loss of around 0.2 ha of mature wet woodland together with ancient-woodland ground flora to the west of the current road alignment. Temporary loss of wet woodland dominated by a fairly even-aged stand of downy birch (up to 0.18 ha approx) to carriageway diversion for bridge works on the east side of the current alignment.
3.	Ch. 2012 – 2100, west (northbound) TN 9	Wet grassland and mire (GWDTE). Site value.	Land-take to farm track. Therefore, no direct impact but a small area of land-take from mire may be initiated if landowner wishes to retain access.
4.	Ch. 2,650 - 2,840 approx, west (northbound) TN 11	South-east facing cutting slope on N-bound carriageway of acid grassland/heather mosaic. Site value.	Probable loss to land-take and re-grading.
5.	Ch. 3,090. East (southbound) (S - spoil heap, Phase 1 Figure 7.5 in Volume 2 of this ES) TN16	Stand of mature aspen on a low hill over semi-improved grassland. Potential reptile habitat in boulder pile on northern edge of hill outside current highway fence. Site value.	Up to 35% loss of mature aspen stand with possible disturbance to potential reptile habitat.
6.	Ch. 3,360 - 3,520 approx. East (southbound) TN 17	Moderately species-rich semi-improved grassland. Site value.	70% permanent loss of area likely.

No.	Location	Receptor & Evaluation	Impacts
7.	Ch. 3,480 - 3,520 approx. West (northbound) by Baldow Smiddy underpass TN 18	Damp birch woods with species-rich heterogeneous grassland to west.	Loss of birch woods to temporary carriageway diversion during construction of elevated road deck over the Baldow Smiddy underpass. Potential for some slight incursion into the wildflower grasslands. Approx. 0.07 ha. of wet woodland/grassland mosaic affected.
8.	Ch. 4,280 approx. East (southbound) TN 21	Scots pine glade with two nests of wood ant (Formica lugubris). Site value.	Permanent loss to land-take for 2nd carriageway.
9.	Ch. 4,700 - 5,410 approx. West (northbound). Alvie Lodge woodlands	Young Scots pine woodland edge with nests of wood ant (Formica lugubris). At least Local value.	Loss of all nests within the highway land from cycle path works and embankment re-grading.
10.	Ch. 6320 – 6680, east (southbound). TN 30	Moderately species-rich grassland on cutting slope. Site for greater butterfly orchid. Site value.	Permanent loss to land-take for 2nd carriageway and re-grading of embankment. Potential for disturbance to similar grasslands on north-bound verge.
11.	Ch. 7030 - 7170, Allt an Fhearna floodplain).	Wet alluvial woodland with alder on the floodplain (UK BAP Priority habitat, Annex 1 habitat, EC Habitats Directive GWDTE). Local value.	Permanent loss of the much of the existing stand between the existing A9 embankment and the river on the north-east edge of the crossing (approx. 0.4 ha), part of the Alvie SSSI. Temporary loss of wet woodland (up to approx. 0.13 ha) to carriageway diversion for bridge works to the west of the current alignment.
Sites & habitats: Accommodation Works Areas			
12.	Ch 3,520. Baldow Smiddy underpass. TN 18	Species-rich unimproved grassland (UK BAP Priority habitat). Small area but possibly of Site - Local value.	Minor land take along roadside verge to vertical re-alignment and cutting formation.
13.	Leault Farm TN 12	Old deciduous woodland of alder, birch and hazel. Site value.	Potential for minor impacts from track improvements.
14.	Kincaig House TN13	Springline and flush community (GWDTE). Site value.	Potential for minor impacts from track improvements.

No.	Location	Receptor & Evaluation	Impacts
15.	Kincraig Farm TN14	Sedge swamp and willow carr with flushed grassland around (GWDTE). Site value.	Potential for minor impacts from track improvements.
16	Ch 6,100 approx Alvie Estate Junction	New section of access road through secondary pine woodland over a grass-dominated ground flora. Negligible ecological value.	Potential for impacts on smaller passerine birds and their nests.
Fauna			
17.	Dunachton Burn, Allt an Fhearna.	Otter (Annex II EC Habitats Directive, Schedule 5, 1981 Wildlife & Countryside Act, Schedule 2, Conservation Regulations, UK BAP priority species). Local value.	Minor potential for disturbance during construction. No impacts on resting places identified.
18.	Alvie Lodge Woodlands, west of A9 alignment	Red squirrel (Schedule 5, 1981 Wildlife & Countryside Act, UK BAP priority species). Local value.	Minor potential for disturbance during construction. No potential for loss of dreys identified.
19.	Ch. 4,280 approx. East (southbound) & 4,710 - 5,410 approx. West (northbound) Alvie Lodge Woods	Wood ants: see under Site numbers 7 & 8 above. Classified as Nationally Scarce in the UK and Near Threatened on the IUCN Red List. Local value.	Loss of 2 nests on the east fence-line and 22 nests on the western verge by Alvie Lodge woods, 61% of the local population.

7.7.20.

Land-take in other areas affects small areas of habitats that are often extensive in the locality (e.g. coniferous plantation, improved pastures) and, which are of low ecological interest, or the secondary formations that have developed on the roadside verge such as birch and pine re-generation, improved and semi-improved grassland, that are again not considered to be of any significant ecological value even at the site scale and which can be readily re-established. Some of the roadside drainage ditches that were established during the construction of the original scheme will be lost to the footprint of widening but will be re-established as swales, which will also be added elsewhere to the proposed Scheme where and as necessary and these will naturally re-colonise over time with a wetland flora.

Severance of Wildlife Corridors and Transmission Routes

- 7.7.21. This section of the A9 alignment, situated in the Cairngorms National Park, is located in an area of particular importance for some of the UK's larger and rarer mammals. Construction of the original A9 alignment resulted in habitat fragmentation and severance of the alignment, together with its deer fencing and stock fencing with rabbit mesh, continues to provide a significant barrier to movement by ground dwelling mammals in particular. The addition of a second carriageway will increase the risk of road kill to animals that can negotiate the existing fences (e.g. wild cat, pine marten, red squirrel). There are a limited number of safe conduits across the alignment, provided by the existing underpasses, watercourse bridges and those culverts either with a dry ledge (the Leault Burn) or where shallow water in the base of the culvert may provide passage, at least during low flow conditions.
- 7.7.22. The increase in the width of the A9 may arguably increase the resistance of the conduits across the alignment thereby increasing the severance effect, in particular along for those conduits provided by the smaller, narrower culverts and possibly for some bat species that are behaviourally disinclined to fly over wider open spaces (e.g. long-eared bats, though this species is already likely to be deterred by the existing width of the carriageway and its managed open verges). However, it should be noted that the current road alignment is provided with wide, managed verges in many areas so that the corridor of open ground in these areas following construction may be not much wider than at present. Thus, some new culverts may not need to be significantly longer than at present and with respect to bats crossing over the alignment conditions may change little in such areas over the current baseline.
- 7.7.23. Though this is unrelated to the A9 highway and its management, the severance effect of the road is exacerbated by estate fences along the side roads, which have often been netted, presumably against rabbits (e.g. see Photographs 21 & 22 in Appendix 5, Volume 3 of this ES). The effect is to limit the ability of mammals such as badger to access the available underpasses.

7.8. Mitigation

Construction Works by Watercourses in relation to Protected Sites and Species

- 7.8.1. Pollution risks will be reduced by ensuring that all works are undertaken to best practice and appropriate precautionary measures put in place as informed by the Pollution Prevention Guidelines published by SEPA⁷⁹ of, which PPG5, Pollution Prevention Guidelines, Works and Maintenance in or near Water, published by SEPA and the Environment Agency is the most relevant. Construction will proceed under the guidance of a Construction Environmental Management Plan (CEMP) and specifically a Surface Water Management Plan, both documents agreed with SNH and SEPA.

7.8.2.

The construction Contractors will be made aware of the conservation importance of the River Spey and Insh Marshes SAC and the implications of the Environmental Liability (Scotland) Regulations 2009. They will be required to provide Method Statements for the key phases of work indicating how pollution control measures will be applied throughout construction and the equipment and materials that will be available on the construction site to remediate any pollution incident. The Contractors will be required to undertake daily visual inspections of the burns during ongoing construction works and will be responsible for undertaking prompt remedial action to prevent any pollution from entering the watercourses. Measures that may be considered include:

- Advance preparation as far as possible of pollution prevention measures such as swales, detention basins, site soak-away/infiltration pits and zones for disposal of surface run-off with use of sand-bag or geotextile mesh bunds at critical locations to direct surface run-off and prevent run-off into the burns and any feeder ditches;
- Construction where necessary of temporary primary treatment facilities to prevent dirty water from the site reaching the receiving watercourses during construction;
- Buffer zones to be established wherever possible between works areas and watercourses and demarcated by a temporary barrier with no earthworks or storage of materials beyond;
- Awareness of impending poor weather with no earthworks to be permitted under conditions of heavy rain;
- On completion of earthworks, bare ground to be topsoiled and seeded with a grass seed mix or otherwise treated to prevent erosion;
- All excess topsoils, subsoils and surplus material to be promptly removed from the site; and
- The work site to be subject to regular inspections by an appointed ecological or environmental clerk of works, in particular for the operational measures for environmental protection during construction works.

7.8.3.

Works at river crossings will take place during normal day-time working hours. No night-time working will be undertaken and watercourses will not be illuminated during construction, thereby avoiding disturbance to nocturnally active otters and the mainly nocturnal movements of any migratory fish in the larger watercourses, though for the latter, significant movements under the A9 alignment appear unlikely. Given good site management, the risks of pollution should be reduced to a very low and acceptable level. Construction works are therefore, not expected to adversely affect the integrity of the river Spey SAC given the apparent absence, in the reach under potential impact, of sea lamprey and freshwater pearl mussel, the probable absence of salmon, the low level of activity by otters and the lack of identified resting places for this species. At the time of writing, there appear to be no other projects or plans that could give rise to in-combination effects that would require additional mitigation. Both the temporary off-line crossings, and the new on-line bridges shall be constructed in a manner so as to retain terrestrial strips along both river banks to allow safe passage by otters, and other fauna, and prevent adverse impacts to the bankside or in-channel habitats of the watercourses (further consideration to the mitigation of the potentially enhanced severance effect from the proposed Scheme on animal transmission corridors is given below).

7.8.4.

The proposed design for the Dunachton bridge will seek to ensure no detrimental impact upon, and will aim to improve, the channel for fish migration. The existing fish pass was installed as occasional low flows in the Dunachton Burn hindered fish passage. The proposed design of the crossing is likely to retain current flow conditions within the channel under the new bridge, but options will be examined for a re-designed fish pass to ensure that flow conditions within the channel are suitable for fish passage across an agreed range of flows and target species. No in-channel works will be undertaken during the spawning period from the beginning of October to the end of May to avoid any risk of disturbance to spawning sites further downstream. Further details on enhancements for fish passage will be agreed with SEPA, the Spey Fisheries Board and SNH, but provisionally, in the absence of good spawning sites for salmonid fish and arctic charr in this reach of the Dunachton Burn (see River Habitat Survey plans in Figure 7.12 Volume 2 of this ES) no adverse effects are anticipated from the works.

- 7.8.5. New drainage structures along the dualled A9 alignment will comprise naturally vegetated swales and detention basins (see Chapter 13), which will provide improved control over the quality of surface run-off from the operational road surfaces compared to the current situation. Before the onset of construction, repeat surveys will be undertaken for otter along the Dunachton Burn and Allt an Fhearna and for water vole along the Leault and Dalraddy burns and the findings taken into account in works planning.

Disturbance during Construction to Fauna of the Insh Marshes SPA & Ramsar Site

- 7.8.6. As noted above, this potential impact would only apply to the southern section of the alignment from Chainage 0.0 north to 1,150 where there is a risk of construction noise, lighting and possibly visual disturbance, affecting sensitive bird species that use the marshes, including rare species such as the nationally rare spotted crane, in addition to other notified bird species of the site. The nesting season is considered the most critical period for those species, though wintering and migratory whooper swans also use Dunachton Fen, next to the southern section of the A9 alignment, but also use the greater extent of the Marshes. Osprey traditionally nests at some distance from the proposed Scheme, by the north shore of Loch Insh, but it has used a site east of the Spey, around 0.5 kilometres from the A9 alignment.
- 7.8.7. It is assumed that birds currently nesting under the zone of influence from passing traffic (see Table 7.5 above) may equally well habituate to much of the construction disturbance, but there are concerns that new stimuli such as the percussive noise of rock excavation or other similar construction noise over and above the sounds of passing vehicles may pose a particular disturbance to species such as spotted crane during the breeding season. Construction works in the Chainage section 0.00 - 1,110 that involves the risk of high noise emissions such as the excavation of the extended rock cutting at Chainage 500 - 800 will therefore avoid the nesting season from April to July inclusive and be scheduled during the period in later summer through to late winter. Disturbance impacts to wintering species such as whooper swan is not considered to be as critical as this species does use other extensive areas of the marsh well beyond the disturbance zone of the works. The appointed ecological clerk of works will nevertheless liaise with the RSPB to determine bird use of the marshes and whether noise controls are required at other sensitive times of year.
- 7.8.8. No night-time working is envisaged and hence there should be no impact arising from additional lighting during construction. The construction compound(s) shall not be located within this section of the alignment to further reduce the risk of disturbance to the SPA/Ramsar site. Major temporary traffic diversions are unlikely to be required in the section adjacent to the protected site and where temporary road signs need to be illuminated, this will be by low-level, low-dispersion, sign-specific lighting rather than overhead structures. No new lighting is to be provided in the final proposed Scheme for this section of the alignment.
- ### **Air Quality and Potential Impacts upon the Insh Marshes SAC**
- 7.8.9. Using the existing traffic flows, nitrogen deposition has been modelled along a 200 metre transect in the SAC by the southern alignment of the A9 (see Chapter 4 Air Quality). The data suggest that current rates of deposition along the entire transect are well below the levels at which there is any risk of community change resulting from traffic emissions, with a possible small increase in benefit due to the westerly shift in the centre line of the road alignment away from the SAC. With these results, and no projected significant increase in traffic levels by design year 15, the issue of air quality has not been considered any further in relation to sensitive ecological receptors.

Mitigation for the Loss of Wet Woodland and Potential Impacts upon the Alvie SSSI

- 7.8.10. In Year 1 after opening, around 0.91 hectares of wet woodland by the Dunachton Burn and Allt an Fhearna will have been lost to the proposed Scheme, though of this, around 0.3 hectares lost to temporary bridge diversions can be re-instated following construction (see Table 7.8 below). The re-instated land must be restored to the original ground levels, or slightly lower (which would provide additional flood storage) and re-stocked with native wet woodland species comprising alder (*Alnus glutinosa*), willows (*Salix cinerea*, *S. caprea*) and aspen (*Populus tremula*), the last species occupying slightly higher ground on the edge of the restored area. The quality of re-instatement will be much improved where the original topsoils from the woodland removed for the temporary crossings can be retained, used to cover the temporary embankments of the diversion, and reinstated to the lowered ground surface on removal of the temporary diversion. This will increase the chances of the original woodland herb layer re-generating in the re-planted woodlands.
- 7.8.11. Wet woodland restored to the temporary construction footprint will take around 60 years before baseline conditions are restored. To compensate for the temporary loss, and the permanent loss to dualling, (of this important habitat type, including part within the Alvie SSSI) mitigation is proposed to be undertaken by off-site land purchase and the planting of approximately 3 hectares of wet woodland. The site selected for this is indicated by site no. 3 marked in the plan in Volume 3 of this ES, Sites for Mitigation and Enhancement. The site has been proposed by SNH, on being consulted over the possible land-take from the Alvie SSSI by the Alt an Fhearna crossing. It is understood that the site, which was not inspected during the field work, comprises a windblown conifer plantation and replacement of conifers here would enable the creation of wet alder woodland of area over 3 times that lost to the second carriageway, a replacement ratio required by the Cairngorms National Park (discussed during a meeting between Atkins, SNH and the CNPA on 25/04/2013). The precise area and details for planting will be taken further by continued consultation with the CNPA, SNH and other stakeholders. Further details on mitigation for the loss of riparian woodland are given in Lines 2 & 11 in Table 7.8 below.

Severance of Wildlife Corridors

- 7.8.12. Preferred pathways for animals crossing the landscape typically follow watercourses, or boundaries defined by field edges, hedges and woodland edges though pathways independent of these features can be established between resting areas (e.g. badger setts) and foraging areas. Wetlands and the margins between woodland and open pasture or meadow provide good hunting areas for some predators e.g. wild cat, and the presence of these habitats may indicate desired crossing points over road alignments. In addition, animals will learn to use features such as underpasses and culverts. In the absence of any clear, regularly used animal pathways across the KinCraig to Dalraddy alignment, improvement of existing bridges, culverts and underpasses (see Table 7.7 below) represents the optimum strategy for improving corridors for wildlife movement across this section of the A9. Figures 7.19 to 7.27 in Volume 2 of this ES, Mammal Records & Mitigation, show where mammals, or road kills, have been sighted and the locations of improved crossing points. Improvement of the existing structures will provide a suitable frequency of crossing points, e.g. for wildcats, a crossing at least every 1.5 kilometres is recommended (Klar et al.2009); animals with smaller home ranges may need a higher frequency of crossing points. Research results on the use of culverts by the elusive wild cat are scant and equivocal. The work of Klar et al. (2009) suggested that wild cat preferred underpasses to overpasses and that wider underpasses may be preferred to narrower conduits. Yanes et al (1995) examining mammal use of culverts under roads and railways in central Spain found use of such culverts by wild cat. A number of studies have found that domestic cats readily use culverts under roads (e.g. Ascensão & Mira A 2012).

- 7.8.13. Additional mitigation that will be applied to new structures over the main watercourses will include either the retention of terrestrial strips connecting both banks under new bridges, including the temporary crossings at the Dunachton Burn and the Allt an Fhearna, or the provision of ledges so that access will be available on both sides of the watercourse to ensure the continued scope for safe passage of mammal species under the A9 alignment. Existing culverts (the Leault Burn) with a dry ledge shall be extended so that the new section contains a similar structure to facilitate passage by mammals. Where watercourse crossings are accompanied by a parallel underpass (e.g. at the Dunachton Burn, the Baldow Smiddy underpass and the Allt an Fhearna) the road or track will suffice, as long as traffic movements are very low, as one of the bankside crossing conduits, and as long as fences between the tracks and the watercourse are fully permeable to passage by the larger mammals (in some cases, close mesh netting will need to be removed from the fences at these locations).

- 7.8.14. Where bridge works retain the original abutments that descend directly into the watercourses dry ledges will be attached to the wall. Smaller culverts that cannot be fitted with dry ledges will be provided with a parallel dry culvert above the level of the watercourse. Where there is sufficient clearance between average ground-water levels and the road sub-base, 900 millimetres culverts will be provided in preference to 600 mm culverts in order to maximise the likelihood of use by mammals such as wild cat (Design Manual for Roads and Bridges, Volume 10, Environmental Design and Management, Section 4 Nature conservation, Part 4). It must be ensured that dry culverts penetrate the highway boundary fencing to allow animals access to the countryside beyond (at present some culverts terminate within the highway verge, e.g. see Target Note 29). New culverts will be kept as short as possible, again to maximise the probability of use by terrestrial mammals.

- 7.8.15. By retaining terrestrial strips under the new bridges, it is expected that no in-channel works will be required. Should any modifications be necessary to the existing channels of the major watercourses these will be assessed for their effects on fish passage and where needed, new or improved fish passes will be constructed as considered above in section. 7.7. Should any such modifications be necessary, consideration will be given to ensuring lamprey passage as well as salmonid/artic charr passage. Table 7.7 below identifies the locations of the underpasses and culverts that either currently provide passage for wildlife, or where they may be scope for mitigation to improve access for mammals under the dualled alignment.

Table 7.7 Mitigation for Severance of Animal Pathways

Location	Type of Crossing	Mitigation & Rationale
Ch. 10	Small to moderate size burn in cylindrical culvert.	Located at the southern commencement of the Kincaig to Dalraddy improvement and may not come under the current works. Should ultimately be provided with a parallel dry culvert with appropriate fencing to guide animals to the entrances. Likely transmission corridor for otters. May be used by wild cat.
Ch. 880	Small pipe culvert under extended embankment carrying a small burn with woodland/field edge corridor upstream, draining into the Insh Marshes SAC.	Provide a parallel 900 millimetre dry culvert with appropriate fencing to guide animals into the entrances. Would find use as a connection between woodland and pasture mosaics and old parkland habitats to the west and the Insh Marshes SAC.

Ch. 1,640	Dunachton Burn Bridge	<p>Provide terrestrial strips down both banks of the burn for the temporary and new crossings (or retrofit dry ledge to retained abutment). Retain functional integrity of the existing fish-pass.</p> <p>Ensure fences along each site of the access road are permeable to the larger mammals to allow access, in particular between burn and underpass.</p> <p>Otter and fish passage along the Spey SAC.</p>
Ch. 2,040	Small pipe culvert draining wetland to west.	<p>Provide parallel dry culvert with appropriate fencing.</p> <p>Provides a connection between landscape to west and woods adjacent to Loch Insh.</p>
Ch. 3,070	Leault Burn culvert.	<p>Retain and extend existing dry ledge/farm stock crossing. Otter movements recorded here (Atkins 2007).</p>
Ch. 3,520	Baldow Smiddy Underpass and burn.	<p>Provide dry culvert to allow access for mammals passing along the course of the burn.</p> <p>Ensure fences along each side of the access road are permeable to the larger mammals to allow access, in particular between burn and underpass. May be used by wild cat.</p>
Ch. 5,200	Lower Milehead Underpass.	<p>Ensure fences on both sides of the access road by the underpass are permeable to the larger mammals to allow passage from woodlands into the underpass. May be used by wild cat.</p>
Ch 6,025	Pipe culvert provided for drainage into ditch and mire system at TN 29, but above ditch level and dry.	<p>Provide 900 mm dry culvert if feasible between ground water level and road sub-base and ensure adjacent highway/deer fencing is modified to wrap around the culvert entrance or is made permeable to mammals such as badger, otter and wild cat.</p>
Ch. 6,690	Pipe culvert carrying burn to Dalraddy Farm.	<p>Provide parallel dry culvert with appropriate fencing.</p> <p>Provides a connection between landscape to west and Alvie SSSI and the River Spey SAC. May be used by wild cat.</p>
Ch. 7,010	Allt an Fhearna Bridge.	<p>Provide terrestrial strips down both banks of the burn for the temporary and new crossings (or retrofit dry ledge to retained abutment).</p> <p>Ensure fences along each site of the access road are permeable to the larger mammals to allow access, in particular between burn and underpass.</p> <p>Otter and pine marten passage, connects landscape to west to Alvie SSSI and the River Spey SAC.</p>

- 7.8.16. With the retention of the existing underpasses, and safe conduits for mammals under the watercourse bridges and through the larger culverts, the addition of the extra carriageway is unlikely to significantly increase the severance effect over the current baseline condition though the risk to certain animals that might cross the road at ground level, e.g. red squirrel, pine marten, may increase. There is, however, little evidence of these mammals currently using the road surfaces to cross, in preference to use of the underpasses. Pipistrelle bats, the most numerous species recorded along the route, are unlikely to be affected as this species readily crosses open spaces while brown long-eared bats are unlikely to cross over the existing alignment but may use the underpasses where available. Side roads and underpasses will remain unlit to facilitate use by those bats that avoid illuminated conditions (brown long-eared and Daubenton's bat). Severance of flight corridors for bats is therefore unlikely to change significantly from the existing condition.
- 7.8.17. Highway fencing provides both a barrier to animal dispersal but at the same time protects many species from road traffic accidents. Deer fencing will be installed as a minimum requirement along wooded sections of the proposed Scheme with "fold-backs" at the new access road to Alvie Lodge to meet a deer grid across the access track. The need for additional deer fencing along the remainder of the proposed Scheme will be discussed with SNH, the CNPA and other relevant stakeholders. Mesh fencing will be restored to a specification suitable to deter badgers and livestock from pushing through elsewhere along the proposed Scheme, though species such as red squirrel, wildcat and pine marten would be able to negotiate such fences. Secure fencing places additional emphasis on the provision of readily accessible underpasses and culverts to provide transmission corridors across the landscape. Re-fencing works must ensure that entrances to underpasses and in particular culverts are readily accessible and not occluded in any way.
- 7.8.18. The issue of cumulative severance of animal pathways posed by the estate fencing along the side roads where close-mesh netting has been applied to the fence (see Photographs 21 and 22 in Appendix 5, Volume 3 of this ES) lies outside the direct remit of Transport Scotland. However, the opportunity should be taken, in liaison with the CNPA, to discuss with local landowners, initiatives to improve the permeability of the landscape around the A9 so that mitigation for severance arising from the road can function to its intended efficiency.
- 7.8.19. The dualling works will result in the stopping up of the at-grade junctions of side roads and tracks that currently open onto the road. There is sufficient evidence to indicate that these areas are accident "hot spots" for some animals such as roe deer, badger and potentially wild cat. Closure of these roads and the extension of the appropriate fencing along the former openings should serve to reduce the incidence of such mortality but again places emphasis on ensuring that the retained underpasses and improved culverts are made safe as animal crossings.

Species Protection and Conservation

- 7.8.20. Surveys of the watercourses and adjacent land that could provide habitat for otters will be re-surveyed prior to the onset of any works on new culverts or bridges and the results used to inform the approach to construction or the need for any works to proceed under conditions of a European protected species (EPS) licence. Similarly, all trees to be removed for the works will be inspected for the presence of cavities or crevices that could provide roosts for bats. Where the nature of any cavities are not evident at ground level, closer inspection should be undertaken by a tree climber and/or ecologist to determine if the cavity extends sufficiently far into the wood to provide a refuge for bats (or for nesting birds). Internal examinations of the deeper recesses of any cavities can be undertaken using an endoscope by a licensed. Where inspections are unable to render a conclusion as to whether any suitable cavity provides a viable roost, it will be necessary to undertake dusk and dawn, exit-entry surveys. An EPS licence will be required where positive evidence for the presence of a bat roost emerges. Any suspected tree roosts lost to the proposed Scheme will be mitigated by the provision of long-lasting "woodcrete" bat boxes attached to retained mature trees in the immediate locality and provided in a ratio of 3 boxes to every potential roost lost.

- 7.8.21. It is considered that the risk of encountering badger setts or wild cat and pine marten dens during the course of the works is low, but areas coming on stream for construction clearance should be re-inspected prior to any intrusive works. It is recommended that an ecological clerk of works is retained for such phases of the proposed Scheme and surveys will need to extend to around 200 metres from the works corridor in areas of suitable habitat. Works should also proceed in the light of the legislation that protects all wild birds, their nests, eggs and dependent young and appropriate surveys conducted to ensure compliance with the legislation. It may be appropriate to clear high-risk areas of woody vegetation outside the bird breeding season, during late summer to late winter, end of July to mid February, given that some species such as crossbill, mistle thrush and some raptors can commence breeding activity early in the year.
- 7.8.22. Two wood ant (*Formica lugubris*) nests lie within the construction footprint on the eastern highway fence-line (TN 21) and at least 22 nests on the western verge. These should be translocated, under the supervision of the ecological clerk of works, to a suitable safe refuge area (receptor sites) on the western verge in the area of the old pinewoods between Alvie Lodge and the road (see lines 8 & 9 in Table 7.7 below), taking into account the previous experience of such translocations (Hughes 2008, Fullarton 2012) and ensuring that the correct habitat, i.e. the ecotone providing dappled shade but sunlit conditions along the woodland edge, is selected. It is likely that such mitigation will require a thin strip of land currently outside the western highway boundary in this area. Fullarton's study reported that of the translocated nests, only 3 out of 23 survived in the works area, though translocations were more successful (5 out of 10) in a control area where no works were taking place. Based on this experience, the percentage survival of translocated nests may be between 13% and 50%. However, the same study reported an increase in the number of nests from 33 to 77 over the subsequent 4 years of monitoring, brought about primarily by good receptor-site selection and continued site management for the species. The habitat along the western verge will therefore, be brought into management by the maintenance agency through the long-term control of seeding pine to prevent the formation of dense stands, and by thinning and scalloping any remaining young pines to enhance the edge habitat favoured by this species. The periodicity of woodland thinning and the consequent effect on the wood ant population will be monitored by site visits and nest counts within the highway land.

Additional Mitigation along the A9 Alignment and in Accommodation Works Areas

7.8.23.

Table 7.6 above identifies sites where particular ecological features have some value, generally at the site level, or in some cases at the local scale. This table is repeated below with the proposed mitigation indicated in the final column together with an assessment of residual impact.

Table 7.8 Mitigation for the identified Receptors along the A9 and Accommodation Areas

Location (Chainage & Target Note)	Receptor	Mitigation & Residual Impact (opening year 1)
Ch. 630 – 750 on the west side (northbound). TN 2	Old parkland oaks and moderately species-rich grassland.	<p>Minimise land-take by adopting a steep-gradient cutting, within acceptable standards, at this location. Include oak (<i>Quercus robur</i>) in tree planting specification for highway land throughout this landscape area (Chainage 0.00 - 1,650) and plant in locations where trees can be allowed to develop full stature without impinging on the safety of the highway.</p> <p>Retain cut timber on site where possible as dead-wood habitat.</p> <p>Establish wildflower grasslands where practicable on south-east facing cutting slopes (northbound carriageway) in this landscape area (see Box 7.4.).</p> <p>Minor negative given loss of mature oaks and ground flora and the time taken to re-establish woodland.</p>
Ch. 1,680 - 1,780 approx, west (northbound), Dunachton Burn floodplain. TN 8	Wet alluvial woodland with alder	<p>Minimise land-take by adopting a steep-gradient embankments, within acceptable standards, at this location.</p> <p>Location 3 (see Figure 7.18, Potential Offsite Mitigation or Enhancement areas, Volume 2 of this ES) at the northern end of the proposed Scheme by Loch Alvie provides a mitigation area for establishing a new wet woodland habitat.</p> <p>Include alder (<i>Alnus glutinosa</i>) in tree planting mixes and establish in damper locations at the base of embankment slopes along the proposed Scheme.</p> <p>Retain cut timber on site where possible as dead-wood habitat.</p> <p>Seek new planting areas by offsite agreement for wet alder woods in Location 1 (ECO 18 Potential Offsite Mitigation or Enhancement areas, Volume 3) for light re-enforcement of existing downy birch stand with underplanted alder and aspen (without impinging onto the central area of mire TN 9).</p> <p>Moderate negative given loss of mature community with ancient-woodland ground flora and the time taken to re-establish mature woodland with a varied ground flora.</p>
Ch. 2012 – 2100, west (northbound) N 9	Wet grassland and mire.	<p>Minimise land-take in this area, determine land-owner requirement for field access and facilitate as necessary to allow retention of mire.</p> <p>Most likely Neutral.</p>

Location (Chainage & Target Note)	Receptor	Mitigation & Residual Impact (opening year 1)
Ch. 2,650 - 2,840 approx, west (northbound) TN 11	South-east facing cutting slope on N-bound carriageway of acid grassland/ heather mosaic.	Restore new cutting face to species-rich acid grass/heathland mosaic. Neutral with potential for minor positive given successful re-establishment of a more diverse plant community.
Ch. 3,090. East (southbound) (S - spoil heap, Phase 1 Figure 7.5 in Volume 2 of this ES) TN 16	Stand of mature aspen over semi- improved grassland. Potential reptile habitat in boulder pile.	Incorporate aspen into tree planting mix and establish in suitable locations along highway boundary where trees can grow to full stature. Seek off-site planting agreement in this location to reinforce remaining aspen stand. Retain cut timber on site where possible as dead-wood habitat. Minimise as far as possible extent of works on boulder pile and remove in summer as necessary. Where entire pile needs to be removed consider trapping and relocation of reptiles to a pre-formed receptor pile (cut timber and brash) in the immediate locality. Re-form boulder pile as mitigation habitat following works. Neutral.
Ch. 3,360 - 3,520 approx. East (southbound) TN 17	Moderately species-rich semi-improved grassland.	Establish wildflower grasslands within highway boundary at this location and elsewhere along the alignment according to the Landscape Proposals (see Chapter 8). Seek to retain topsoils from existing wildflower areas lost and re-use on new verges. Enter into off-site management agreement (see below) to conserve species rich grasslands at TN 16 (Area 2 in Figure 7.18 Potential Offsite Mitigation or Enhancement Areas in Volume 2 of this ES). Minor Positive, given overall proposals for verge re-seeding.
Ch. 3,480 - 3,520 approx. West (northbound) by Baldow Smiddy underpass TN 18	Damp birch woods with species-rich heterogeneous grassland to west of the drainage ditch running down the site, parallel to the A9.	Minimise incursion by bridge diversion into the grasslands. Retain topsoils from any areas of species-rich grassland removed for the road diversion, store on the diversion embankments and replace onto the restored grasslands after construction. Restore native deciduous woodland planting to re-formed embankments with species to include aspen (<i>Populus tremula</i>) and alder (<i>Alnus glutinosa</i>). Re-seed land lost to construction at the base of the embankment as necessary with a wildflower seed mix (see Box 7.3.). Seek to manage the whole of the grassland area (see Figure 7.18, Offsite Mitigation or Enhancement Areas in Volume 2 of this ES) by offsite management agreement to retain current floristic interest and prevent encroachment by trees and shrubs.

Location (Chainage & Target Note)	Receptor	Mitigation & Residual Impact (opening year 1)
Ch. 4,280 approx. East (southbound) TN 21	Scots pine glade with two nests of wood ant.	<p>Nests are just outside current highway boundary and likely to be abandoned as canopy develops. Translocate nests to a suitable location on the western (northbound) verge and enhance wood-ant populations along the more favourable western (with a warmer south-eastern aspect) verge, between Chainage 4,700 to 5,700, adjacent to the mature Alvie pine woods (see below).</p> <p>Monitor success of any translocations for the following 5 years.</p> <p>Minor negative with potential for moderate positive gains where management successful.</p>
Ch. 4,700 - 5700 approx, West (northbound).	Scots pine woodland edge with nests of wood ant.	<p>Excavate all nests to be lost and re-establish in suitable locations along the adjacent verge of the A9 following the methodology of Fullarton 2012. Translocations to be supervised by the ecological clerk of works.</p> <p>Manage for wood ants along the western verge Ch. 4,700 to 5,700, along the road verge and the cycle path verges, by controlling pine seeding, cutting back and thinning colonising young pine to give areas of dappled shade and scallop edges to maximise length of favourable edge habitat.</p> <p>Undertake monitoring at appropriate intervals (e.g. once every years) to determine response of nesting population to management.</p> <p>Moderate negative with potential for positive gains over time where management successful (see Table 7.9).</p>
Ch. 6320 – 6680, east (southbound). TN 30	Moderately species-rich grassland on cutting slope. Site for greater butterfly orchid.	<p>Undertake search for orchids during late June/early July prior to works taking place. Any orchids found to be transplanted as whole cohesive turves to a suitable receptor site.</p> <p>Restore new cutting face by seeding with wildflower grasslands.</p> <p>Monitor establishment success of any orchid transplant over the next two years.</p> <p>Neutral.</p>

Location (Chainage & Target Note)	Receptor	Mitigation & Residual Impact (opening year 1)
Ch. 7030 - 7170, Allt an Fhearna).	Wet alluvial woodland with alder.	<p>Minimise land-take, and impacts upon Alvie SSSI, by adopting a steep-gradient embankments, within acceptable standards, at this location, for both the temporary bridge diversion works and the new carriageway for the final scheme.</p> <p>Establish around 3 ha of new alder-dominated wood off-site in the SNH advised site by Loch Alvie (Areas 3 in Figure 7.18 Offsite Mitigation or Enhancement Areas, Volume 2 of this ES). Details to be taken forward by consultation with CNPA, SNH and other stakeholders. Species and percentage cover will be determined by soils and hydrology with at least the following species planted: Alder (<i>Alnus glutinosa</i>), aspen (<i>Populus tremula</i>), grey willow (<i>Salix cinerea</i>), goat willow (<i>S. caprea</i>), downy birch (<i>Betula pendula</i>), wych elm (<i>Ulmus glabra</i>).</p> <p>Add alder and aspen to the tree planting specification within the highway corridor in this landscape area and plant at the base of embankment slopes and as scattered trees adjacent to roadside ditches.</p> <p>Retain cut timber on site where possible as dead-wood habitat.</p> <p>Minor negative.</p> <p>As the plantings mature there will be a high potential for minor to moderate positive gains (see Table 7.7)</p>
Accommodation Works Areas		
Ch 3,520. Baldow Smiddy underpass. TN 18	Species-rich unimproved grassland.	<p>Retain and manage by off-site management agreement (as for Site 6 above). Ensure control of water levels in on-site ditches during works with maintenance of existing water levels.</p> <p>Neutral to Minor Positive.</p>
Leault Farm TN 12	Old deciduous woodland of alder, birch and hazel.	<p>Ensure no access to works vehicles and minimise land take and operations on the verges during any improvement works on the farm access.</p> <p>Neutral.</p>
Kincraig House TN13	Springline and flush community by track to Leault Farm.	<p>Ensure no access to works vehicles and minimise land take and operations on the verges during any improvement works on the farm access. Ensure appropriate controls of run-off from working areas into the drainage channels.</p> <p>Neutral.</p>

Location (Chainage & Target Note)	Receptor	Mitigation & Residual Impact (opening year 1)
Kincaig Farm TN14	Sedge swamp and willow carr with flushed grassland around.	Ensure no access to works vehicles and minimise land take and operations on the verges during any improvement works on the Kincaig house and farm access. Ensure appropriate controls over site runoff. Neutral.
Ch 6,100 approx AlvieEstate Junction	Secondary pine woodland over a grass-dominated ground flora. Negligible ecological value.	Re-survey for red squirrel dreys and fell trees along the new section of access road outside the bird breeding season. Deer fencing and a deer grid on the access road will be provided to prevent deer from accessing the A9 alignment.
Dunachton Burn, Allt an Fhearna.	Otter.	Re-survey watercourses prior to the onset of any works. Ensure control of site works to avoid potential hazards to wildlife, e.g. uncovered pits. Neutral.
Alvie Lodge Woodlands, west of A9 alignment	Red squirrel.	No land-take in the area with red-squirrel dreys and the woodland buffer between works site and area of drey distribution is considered adequate in terms of breadth and screening to minimise disturbance during construction. Thinning and scalloping of the highway pine edge as described under Site 8 above should take place after road construction is complete in this section. Neutral.
Ch. 4,700 - 5700 approx, West (northbound).	Scots pine woodland edge with nests of wood ant.	Seek to excavate any nests lost and re-establish nests in suitable locations along the adjacent verge of the A9. Manage for wood ants along the western verge Ch. 4,700 to 5,700 by cutting back and thinning colonising young pine to give areas of dappled shade and scallop edges to maximise length of favourable edge habitat. Minor negative with potential for moderate positive gains where management successful.

7.8.24.

Plant species used for mitigation by new plantings and habitat creation will take account of the following principles:

- Species should be native to the UK and preferably of Scottish provenance;
- New tree plantings in the south of the proposed Scheme should comprise deciduous species with oak predominant and other species planted according to soil conditions and factors relating to highway safety over the long term. Other species should include alder, aspen, wych elm and juniper. Coniferous species should be avoided in the southern section unless required as year-round screening and therefore necessitating the planting of species such as Scots pine and holly;
- Re-seeded embankments should employ the use of fine-leaved fescue (*Festuca rubra* & *ovina*) and bent (*Agrostis* spp.) grasses only unless other grass species are introduced as part of a specific wildflower mix;
- Fine-leaved grasses with heathers (*Calluna vulgaris*, *Erica cinerea*) and juniper (*Juniperus communis*) should be regarded as a default community for restored cutting faces and embankments, particularly on steeper slopes and those with a warmer south-east facing aspect;
- Areas taken for construction and which are of noted interest for their wildflower communities should be restored using, where possible, the original topsoils taken and retained at the onset of earthworks; and
- Where restoration with a wildflower mix is required, a community appropriate to slightly acid grasslands should be used. A typical mix is indicated in Box 7.4. below and this accords to the NVC community U4 (Fescue/bent/heath bedstraw grassland) which is the typical semi-improved grassland community along the proposed Scheme, together with elements of U2 (wavy hair-grass grassland) which also occurs in some areas with heather and bilberry. Detailed proposals for the seeding of the roadside verges with such wildflower grasslands are given in Chapter 8, Landscape and Visual Effects. Long-term maintenance should aim to keep these seeded grassland areas largely free of self-seeding and colonising trees and shrubs. Given the proposals for re-seeding the identified verges with wildflower grasslands there should be a net benefit for biodiversity in those areas where the new grasslands are situated outside the zone of impact of passing traffic and the effects of winter maintenance by de-icers.

Box 7.4. Appropriate wildflower mix for restoration in areas of former botanical interest.

Yarrow	<i>Achillea millefolium</i>	White clover	<i>Trifolium repens</i>
Heather	<i>Calluna vulgaris</i>	Common speedwell	<i>Veronica officinalis</i>
Bell heather	<i>Erica cinerea</i>	Common dog violet	<i>Viola riviniana</i>
Harebell	<i>Campanula rotundifolia</i>	Common bent	<i>Agrostis capillaris</i>
Heath bedstraw	<i>Galium saxatile</i>	Sweet vernal grass	<i>Anthoxanthum odoratum</i>
Lady's bedstraw	<i>Galium verum</i>	Wavy hair-grass	<i>Deschampsia flexuosa</i>
Bird's-foot trefoil	<i>Lotus corniculatus</i>	Red/sheeps fescue	<i>Festuca rubra/ovina</i>
Ribwort plantain	<i>Plantago lanceolata</i>	Poa pratensis	<i>Smooth-stalked meadow-grass</i>
Tormentil	<i>Potentilla erecta</i>		
Selfheal	<i>Prunella vulgaris</i>		
Meadow buttercup	<i>Ranunculus acris</i>		
Sheep's Sorrel	<i>Rumex acetosella</i>		
Devils-bit scabious	<i>Succisa pratensis</i>		

7.9. Impacts (Design Year 15)

7.9.1. This section refers to the assessment of operational impact at Year 15 with respect to those impacts considered to be significant at Year 1 above and where the passage of time may alter or ameliorate the magnitude of impact, and those impacts relating specifically to the projected use of the road at Design Year 15. In cases where traffic flows increase as a result of either the road improvements or growth in the local and regional economy, there may be implications for noise and aerial emissions and a possible increase in the risk of road traffic accidents for species attempting to cross the live carriageways. For this proposed Scheme, however, there is no significant increase in the projected traffic flows over the period from opening to Design Year 15 and hence significant impacts upon wildlife over this period are unlikely to change from opening Year 1.

Impacts in relation to Scheduled Sites

7.9.2. No change in impact is anticipated upon the River Spey SAC with effects of the proposed Scheme remaining Neutral. With the maturation of vegetation in the naturally vegetated swales and detention basins, there may be some Minor Positive effect upon water quality in the burns adjacent to the road. In relation to the Insh marshes SPA and SAC, given that no significant increase is projected for traffic flows up to Design Year 15, there will be no change over the current baseline condition in relation to noise and air quality.

Impacts in relation to Protected Species

7.9.3. With the provision of improved means of access for wildlife under the road alignment via the retained underpasses and new culverts, there may be a reduction in the risk of road mortalities as animals learn to use the new routes under the alignment. With improved permeability, the overall change in severance impact may be Minor to Moderately Positive.

7.9.4. With no significant increase in the projected traffic flows, general impacts along the road alignment at Design Year 15 due to disturbance from road noise is unlikely to change from the Opening Year, and may decrease slightly with changing technology in relation to engine and road noise.

7.9.5. Other impacts considered significant at Opening (Year 1) above are re-considered for Design Year 15 in Table 7.9 below. In general, where mitigation has been undertaken by planting schemes (woodland, wildflower grassland) and that the community has successfully established and is, where necessary under favourable management, potential gains in biodiversity may be realised by Design Year 15.

Table 7.9 Mitigation for the identified Receptors along the A9 and Accommodation Areas

Location (Chainage & Target Note)	Original Receptor and Mitigation	Impact at Year 15
Ch. 630 – 750 on the west side (northbound). TN 2	Old parkland oaks and moderately species-rich grassland. Replanting of oaks and wildflower grassland seeding.	Remains as Minor negative given the time taken to re-establish mature oak woodland over a varied ground flora.

Location (Chainage & Target Note)	Original Receptor and Mitigation	Impact at Year 15
Ch. 1,680 - 1,780 approx, west (northbound), Dunachton Burn floodplain. TN 8	Wet alluvial woodland with alder. Offsite compensation planting.	Remains as Minor negative given loss of mature community with ancient-woodland ground flora and the time taken to re-establish mature woodland with a varied ground flora.
Ch. 2,650 - 2,840 approx, west (northbound) TN 11	South-east facing cutting slope on N-bound carriageway of acid grassland/heather mosaic.	Restore new cutting face to species-rich acid grass/heathland mosaic. Minor Positive given successful re-establishment of a more diverse plant community.
Ch. 4,280 approx. East (southbound) TN 20	Scots pine glade with two nests of wood ant. Manage pine growth on western embankment Ch. 4,700 to 5,700, to maximise edge and prevent excess shading.	Minor to Moderate Positive where the establishment of new nests is encouraged by management and maintained over the long term.
Ch. 4,700 - 5.700, west verge (northbound).	Scots pine woodland edge with wood ant nests. Manage pine growth on western embankment Ch. 4,700 to 5,700, to maximise edge and prevent excess shading.	Minor to Moderate Positive where the translocation is successful and establishment of new nests is encouraged by management and maintained over the long term.
Ch. 7030 - 7170, Allt an Fhearna, east (southbound).	Wet alluvial woodland with alder. Offsite mitigation planting at the SNH advised plot by Loch Alvie.	Moderate Positive from maturation of the woodland.
Ch 3,520. Baldow Smiddy underpass. TN 16	Species-rich unimproved grassland. Control of water levels, increase area of grassland by thinning back birch and management for botanical diversity by off-site agreement.	Minor Positive.
Ch. 4,700 - 5.700, west verge (northbound).	Wood ant (<i>Formica lugubris</i>). Manage pine growth on western embankment Ch. 4,700 to 5,700, to maximise edge and prevent excess shading.	Minor to Moderate Positive.

7.10. Conclusions

- 7.10.1. This ecology assessment has considered the implications of the proposals for dualling along the Kincaig to Dalraddy section of the A9 and has been informed by data collection and review, including the ES for the former scheme under consideration in 2007, consultation and surveys undertaken in 2012 and 2013. Land-use and habitats remain essentially the same as described in the 2007 ES and that document therefore, together with the updated information presented in this chapter, provide sufficient information for a comprehensive assessment of the proposals.
- 7.10.2. The River Spey SAC and the Insh Marshes SPA and SAC are situated to the east of the A9 alignment with the boundary of the latter site close to the southern alignment under proposed Scheme (Ch 0.0 north to 1,150). With adherence to best standards during construction in relation to minimising the risk of water pollution, no significant impacts are anticipated upon the Spey SAC. Risks of catastrophic or chronic pollution during construction is considered to be very low, probably equating to, or less than, the risk of such accidents arising from the use of the current unimproved alignment. An improvement in water quality might be expected following construction of the new SuDS. With the Insh marshes situated close to the southern section of the A9 alignment there is the potential for disturbance to breeding birds from construction noise, in particular any percussive noise arising from rock excavation. To minimise the risk of disturbance to the notified breeding species within the SAC any works, such as rock excavation, that may generate high impact noise above the ambient level of vehicle movements, will be undertaken outside the bird breeding season (the breeding season here taken to be from April to July inclusive) and liaison with the RSPB will be maintained during construction by the Insh Marshes to determine any other periods of particular sensitivity.
- 7.10.3. The alignment under proposed Scheme is situated in the Cairngorms National Park, home to many of the UK's rarer mammal species including wild cat, pine marten and red squirrel. Dualling may increase the severance effect on animal transmission routes across the alignment and increase the risk of road kill to animals attempting to negotiate the surfaces of the carriageways. With the probable exception of the main watercourses, no predominant crossing points have been identified for the larger mammals (deer, badger) across the route, but records of road kills and observations of wild cat crossing over the road indicate the need to improve the facilities for wildlife to safely cross the A9 alignment. Access corridors will include the retained and improved existing underpasses with fencing on the adjacent side roads made permeable to wildlife, the provision of dry culverts and dry ledges on each side of the major watercourses at bridging points, thereby improving the permeability of landscape networks for wildlife movements. The closure of the current at-grade junctions and appropriate highway fencing along the proposed Scheme will remove a number of "hot spots" for wildlife mortality. These measures are consistent with the need to improve the functionality of ecological networks as identified in the emerging SEA of the improvement proposals for the Perth-Inverness A9 alignment.
- 7.10.4. Land take for temporary diversions and for the construction of the new carriageway will result in the loss of riparian wet woodland, a European Habitats Directive Annex 1 and Biodiversity Action Plan habitat, along the Dunachton burn and Allt an Fhearna. Land-take at the latter site may result in a minor incursion into the Alvie SSSI. To mitigate this loss, a new area of wet woodland will be planted to provide a habitat at least three times that of the area under impact on an area suggested by SNH, a windblown site of planted conifers adjacent to existing alder woods by Loch Alvie. Detailed plans for the precise area and planting schedule will be carried forward for a final decision by discussion with the CNPA, SNH and other stakeholders.

- 7.10.5. The colony of wood ants at the Alvie Lodge section of the alignment will be severely disrupted with a loss of around 60% of nests. Experience with translocations suggests that somewhere between 13 and 50% of nests may survive the move, but that with good receptor site selection and suitable habitat management for this species, new nests should form and the colony should expand. It is likely that the mitigation needed for successful conservation of this species will require a thin strip of land outside the existing western boundary fence.
- 7.10.6. Otherwise, overall, there are few habitats present under potential impact from the proposed Scheme that would be considered of ecological value at scales beyond that of site value and much of the affected area is of negligible ecological interest (improved grasslands, dense young pine plantation and areas of birch regeneration). The potential receptors of more notable ecological value are:
- Parkland oakwoods, often associated with moderately species-rich semi-improved grasslands in the south of the proposed Scheme (local value);
 - Wood-ant nests associated with pine plantations over an ancient woodland ground flora in the area between Alvie Lodge and the western edge of the A9 (local to district value); and
 - Localised areas of moderately species-rich grassland (site value).
- 7.10.7. Key approaches to general mitigation include:
- The replanting of the roadside verges, in appropriate locations, with native tree and shrub species, in particular including oak, alder, aspen, wych elm and juniper;
 - Management of the woodland edge of young Scots pine along the western verge of the Alvie woodlands to the benefit of wood ant with the translocation of two known wood ants' nests within the construction footprint to safe sites; and
 - Restoration of wildflower grasslands by seeding sections of the new roadside verges and the management, by agreement, to maintain over the long-term, a species-rich grassland paddock by the Baldow Smiddy underpass free of encroaching trees;
- 7.10.8. With this mitigation put in place and supervised by a suitably qualified ecological or environmental clerk of works, there is unlikely to be any significant adverse ecological effects arising from the construction of the additional carriageway and subsequent operation of the proposed Scheme. There is the opportunity, through the mitigation described above and appropriate management adopted by the highway maintenance authority, for biodiversity gains, significant at the site and, local levels.

8. Landscape and Visual Effects

- 8.1. Introduction
- 8.2. A9 Dualling Strategic Environmental Assessment
- 8.3. Key Issues
- 8.4. Methodology
- 8.5. Baseline Conditions
- 8.6. Consultation
- 8.7. Impacts (Opening Year) Without Mitigation
- 8.8. Mitigation Measures
- 8.9. Impacts (Design Year 15)
- 8.10. Conclusions



8. Landscape and Visual Effects

8.1 Introduction

- 8.1.1. The Landscape and Visual Effects Chapter identifies the potential landscape character and visual amenity impacts of the proposed Scheme.
- 8.1.2. The baseline assessment describes the existing landscape character and visual amenity receptors within the identified study area, which is approximately 1400 hectares. The baseline assessment forms the basis against which the significance of the impact of the proposed Scheme is reviewed.
- 8.1.3. Mitigation measures are developed and proposed to avoid, reduce or compensate for the identified impacts and to make positive contributions to the environment.
- 8.1.4. The methodologies used to collect this information are detailed in Section 8.4 and the proposed Scheme is illustrated in Figure 2.1 of Volume 2 of this ES.
- 8.1.5. The assessment of landscape character and visual amenity are two distinct but related areas:
- Landscape character assessment is the systematic description, analysis and classification of the features within the landscape such as landform, vegetation cover, settlement, transport patterns and land use; and
 - Visual amenity assessment is the description of the views of the landscape from locations inhabited and frequented by people such as from public open space, roads, Public Rights of Way and residential or business properties.

8.2. A9 Dualling Strategic Environmental Assessment

- 8.2.1. The methodology has also been influenced by the Strategic Environmental Assessment (SEA)⁸⁰ Environmental Report for the dualling of the entire A9 corridor between Perth and Inverness. The SEA preliminary environmental principles (SEA Environmental Report Table 2.2 Summary of Environmental Principles from PPS Review) relevant to landscape are:
- Conserve and enhance the special and distinct landscape character and qualities of the Cairngorms National Park;
 - Avoid and minimise effects on landscapes through sensitive design and consultation;
 - Enhance the view from the road/ driver/ touring experience; and
 - Avoid and minimise effects on historic environment features through sensitive design and consultation.
- 8.2.2. As noted in one of the SEA Environmental Report 'Key Findings' with regard to landscape, it is stated that:
- 'more detailed Landscape and Visual Impact Assessment will be required through later detailed design stages for A9 dualling, at the local level; informed by the strategic level work being undertaken by the landscape review'.*

8.3.

Key Issues

8.3.1.

The key issues relating to the proposed Scheme, from a landscape and visual perspective, include:

- Direct loss or alteration of key landscape elements, such as landform, mature trees and woodland;
- Loss of designated landscape elements such as Ancient Woodland;
- Indirect impacts on the wider landscape character, including designated sites such as the Cairngorms National Park, National Scenic Area (NSA), Ancient Woodland, Tree Preservation Orders (TPO's); Scheduled Monuments and Listed Buildings;
- Changes in the perception of the wider landscape character as a result of the construction of the proposed Scheme and associated loss of vegetation;
- Changes in views obtained by the adjacent visual amenity receptors as a result of the construction of the proposed Scheme and associated loss of vegetation; and
- These key issues should however, be balanced against the existing influence of the A9 and the associated traffic.

8.4.

Methodology

8.4.1.

The assessment of landscape and visual effects has been based on advice given in Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 5⁸¹. General landscape and visual assessment guidance was also obtained from the Guidelines for Landscape and Visual Impact Assessment (GLVIA2)⁸². It is noted that the third edition of Guidelines for Landscape and Visual Impact Assessment (GLVIA3) has recently been published. However, as this assessment was already in progress at the time of publication of GLVIA3, it has been undertaken with reference to the now superseded GLVIA2, in line with Landscape Institute guidance, The Countryside Agency and SNH, Landscape Character Assessment Review No.75⁸³ and the Cairngorms National Park Landscape Character Assessment were also studied for the description of existing landscape character at regional and local levels.

8.4.2.

This section of the ES addresses the requirement for a more detailed landscape and visual assessment.

8.4.3.

The assessment has been undertaken by a Chartered Landscape Architect and involved a combination of desk studies, field surveys and consultation. The consultation is outlined in detail in Section 8.5 of this chapter.

8.4.4.

A desk study was carried out to review existing maps and written data relating to the overall area. The following sources of information were studied:

- The Highland Structure Plan (2001);
- Cairngorms National Park Local Plan⁸⁴ (October 2010);
- SNH, Report: The Special Landscape Qualities of the Cairngorms National Park⁸⁵ (2010);
- SNH, Cairngorms Landscape Assessment No 75 (1996), Turnbull Jeffrey Partnership;
- Cairngorms National Park Landscape Character Assessment, December 2009;
- Ancient Woodland Inventory, SNH, (no date); and
- The National Catalogue of Rights of Way, Scot Ways (no date).

81

Highways Agency, 1993

82

Landscape Institute and the Institute of Environmental Management and Assessment, 2002

83

Turnbull Jeffrey Partnership, 1996

84

Cairngorms National Park Authority, 2010

85

Commissioned Report No. 375, in partnership with Cairngorms National Park Authority, 2010

8.4.5. Site surveys were undertaken in August 2012. These have helped to gain an understanding of baseline landscape character and visual amenity and to supplement the information collected during the desk study. The surveys were undertaken from the public highway and public footpaths; access to private properties was not obtained. Views were taken from the nearest accessible point to the property and professional judgement made as to the likely nature of the views; therefore views from such properties are predicted. The weather conditions during the survey involved short periods of intermittent rain interspersed with sunshine, with fair to good visibility. In August 2013 photographic views were updated. The purpose of this update was to reflect the amendment to the previous proposed Scheme design and to reflect the requests from the CNPA.

8.4.6. When deciding the extent of the assessment, it is important to distinguish between landscape character and visual amenity. The study area for the landscape character assessment included the full extent of the proposed Scheme and the wider landscape context. This extended to a minimum of 750 metres on either side of the road, (to the east and west) and 500 metres from the northern and southern extents of the proposed Scheme. This is considered to be appropriate given the nature of the landform, vegetation and confined nature of the proposed Scheme.

8.4.7. The 'Zone of Theoretical Visibility' is defined in the visual amenity assessment and identified on Figures 8.5 and 8.6 in Volume 2 of this ES.

Landscape Character, Quality and Sensitivity

8.4.8. Following Natural England and SNH⁸⁶ guidance, the landscape has been described as a 'hierarchy' of landscape character descriptions.

8.4.9. SNH has undertaken a national programme of landscape character assessments in partnership with local authorities and other agencies. The Cairngorms Landscape Assessment⁸⁷ that covers the study area identifies Landscape Character Areas (LCA) and landscape character types. Regional character areas are distinct landscape regions at a broad scale and provide a framework for strategic planning and land use policies. Landscape character types are defined at a more detailed level and are areas that have a unity of character.

8.4.10. The SNH Landscape Character Assessment (1996) and the more recent Cairngorms National Park Landscape Character Assessment (2009) was used to aid the identification of LCAs within the study area. Following the identification of the LCAs, the study area was assessed to identify different areas of landscape quality. The determination of landscape quality was based on a review and analysis of the relevant landscape and cultural heritage designations outlined in the Local Plans and on the landscape character descriptions. The landscape quality descriptions are outlined in Table 8.1.

Table 8.1 Criteria used to assess landscape quality (*)

Landscape Quality	Criteria
Poor	Land use dominates and includes industrial development with no aesthetic value. The area is lacking in a positive character and there is much scope for positive enhancement. No landscape designations apply.
Ordinary	Primarily a functional area including roads, isolated housing, vegetation and open countryside resulting in an area of mixed character. Not of high attraction but includes areas that exhibit a positive character that are potentially sensitive to inappropriate change. Land may have a local landscape designation.

Landscape Quality	Criteria
Good	There is a large distribution of vegetation and the overall view of the area is pleasant. Isolated settlements may be present within extensive areas of open space. Landscape designations of cultural or historic value may be present.
Very Attractive	Areas may include ancient woodlands or designated landscape. There is an extensive distribution of mixed vegetation including woodland, high proportion of trees, hedges and shrubs. Attractive landscape features are present including unpolluted water corridors i.e. streams or brooks. Several landscape designations may apply.
High	Includes the most aesthetically attractive landscape considered to be of particular importance to conserve and which is extremely sensitive to change. Areas of particular natural beauty are identified in this category. Nationally designated landscapes of historical, ecological or national scenic value are present.

(*)This table has been compiled by Atkins through reference to the SNH 'Landscape Character Assessment' and the GLVIA. The definitions are specific to the context of the area.

8.4.11. In addition, the sensitivity of each LCA was assessed. The determination of sensitivity was based on the evaluation of each key element or characteristic feature of the landscape likely to be affected. This included factors such as landscape quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. The criteria used to assess landscape sensitivity are derived from the methodology and by reference to examples as outlined in GLVIA and include:

High – distinctive landscape character, susceptible to change;

Medium – moderately valued landscape character, tolerant of change; and

Low – generally developed landscape, tolerant of substantial change.

8.4.12. The descriptions of landscape character, quality and sensitivity helped to assess the capacity of the landscape to accept the proposed Scheme.

Visual Amenity Receptors and Sensitivity

8.4.13. Visual amenity receptors were identified and the extent and nature of their views described.

8.4.14. As with landscape character, visual amenity receptors were also described according to their sensitivity. The sensitivity of the visual receptors is dependent on the location, context and the importance of the viewer. The criteria used to assess the sensitivity of the visual receptors are derived from the methodology and examples as outlined in GLVIA and include:

High – Occupiers of residential properties including communities, users of outdoor recreational facilities including public rights of way;

Medium – Users of community facilities and temporary or transient users such as caravan parks and holiday cottages; and

Low – People at their place of work; people travelling through or past the affected landscape in cars or other modes of transport.

8.4.15. Designations, such as listed buildings and scheduled ancient monuments, increase the sensitivity of the receptor.

Impact Assessment

- 8.4.16. The baseline information forms the basis against which to review the magnitude and significance of the predicted landscape character and visual amenity impacts of the proposed Scheme.
- 8.4.17. The significance of the predicted landscape character and visual amenity impacts were determined by considering the relationship between the sensitivity of the landscape and visual impact receptors and the nature, scale, duration and magnitude of change.
- 8.4.18. The criteria used to describe the magnitude of change were derived from the methodologies and examples as outlined in GLVIA and included:
- High** – total loss of or major alteration to key elements, characteristics or views of the existing conditions. Introduction of elements considered to be totally uncharacteristic of the existing character and views;
- Medium** - partial loss or alteration to one or more elements, features, characteristic or views of the existing conditions. Introduction of elements that will be prominent but not necessarily considered to be substantially uncharacteristic of the existing character and views;
- Low** – minor loss or alteration to one or more key elements, features, characteristics or views of the existing conditions. Introduction of elements that may not be uncharacteristic when set within the existing landscape and views; and
- Negligible** - very minor loss or alteration to one or more key elements, features, characteristics or views of the existing conditions. Introduction of elements that are not uncharacteristic with the surrounding existing landscape and views.
- 8.4.19. The broad connections between the sensitivity of the receptor, the magnitude of change and the significance of impacts are outlined in Table 8.2 below.

Table 8.2 Relationship between Sensitivity of Receptor and Magnitude of Change

Magnitude of Change	Sensitivity of Receptor		
	High	Medium	Low
High	Substantial	Substantial or Moderate	Moderate or Slight
Medium	Substantial or Moderate	Moderate	Moderate or Slight
Low	Moderate or Slight	Moderate or Slight	Slight or Neutral
Negligible	Neutral	Neutral	Neutral

8.4.20.

Impacts are described as either adverse or beneficial and range from slight to substantial. The significance of impacts is described in Table 8.3 below.

Table 8.3 Significance of Landscape Character And Visual Amenity Effects (*)

Grade	Description
Substantial adverse	Would cause a considerable variance to the integrity of the landscape; effects could not be fully mitigated and may cumulatively amount to a severe impact; would cause major damage to a high quality, sensitive landscape; the development would form a major and immediately apparent part of the scene that fundamentally affects and changes its overall visual amenity.
Moderate adverse	Would be out of scale with the landscape or at odds with the local pattern and landform; would adversely affect an area of recognised landscape quality; where development may form a visible and recognisable new element within the scene and may be readily noticed by the observer.
Slight adverse	Would not quite fit the landform and scale of the landscape; would affect an area of recognised landscape character; where development may form a visible new, but not very noticeable element within the scene; views may be long distance.
Neutral	Would complement the scale and form of the existing landscape; would maintain existing landscape quality; where the development would be scarcely appreciated and, on balance, would have little effect on views.
Slight beneficial	Would fit the scale, landform and pattern of the landscape; potential to improve the landscape quality and character; enable restoration of valued characteristic features that have been partially lost, would partially screen existing adverse views.
Moderate beneficial	Would fit the landscape character well; would improve the quality of the landscape by removal of damage caused by existing uses; would screen and improve existing adverse views.
Substantial beneficial	Would enhance the landscape character and greatly improve the quality of the landscape; would significantly improve existing views. Very few, if any, proposals are likely to merit this grade.

(*)This table was compiled through reference to GLVIA and DMRB by Atkins.

8.4.21.

The potential impacts were assessed at significant stages during the development of the proposed Scheme and include the following:

Year 1: Opening Year: Winter, when it is assumed that landscape mitigation measures have not had time to mature. Essentially it is the 'worse-case' scenario; and

Year 15: Design Year: Summer, when it is assumed that landscape mitigation measures have matured. Essentially it is the 'best-case' scenario.

8.5. Baseline Conditions

Landscape Relevant Designations

- 8.5.1. The Cairngorms National Park Local Plan, SNH Cairngorms Landscape Assessment and Ancient Woodland Inventory (AWI) have identified a number of landscape relevant policies and designations within the study area. These are illustrated on Figure Number 8.1 in Volume 2 of this ES.
- 8.5.2. The study area lies within the Cairngorms National Park and the CNPA is afforded regulatory powers under the National Parks (Scotland) Act 2000 to conserve and enhance the natural and cultural heritage characteristics of the area.
- 8.5.3. Policy 6: Landscape of the Cairngorms National Park Local Plan, (October 2010) states that there will be a presumption against any development that does not complement and enhance the landscape character of the National Park. Policy 7: Gardens and Designed Landscapes considers development affecting a Garden or Designed Landscape as identified by Historic Scotland, with a presumption against development which would adversely impact on character, important views or setting. Policy 11: The Local and Wider Cultural Heritage of the Park states that there will be a presumption against development that does not protect or conserve and enhance a site, feature, or use of land of local or wider or cultural historic significance, or its setting.
- 8.5.4. The CNPA Local Plan identifies the following relevant landscape designations within the study area:
- A National Scenic Area is located approximately 500 metres from the A9 and runs parallel to the east of the road. The boundary of the NSA follows the line of the railway. Policy 2: National Natural Heritage Designations states that development in a National Scenic Area will only be permitted where it has been demonstrated that the objectives of designation and the overall integrity of the designated area would not be compromised.
 - River Speyside TPO (HRC45) is located approximately 500 metres to the east of the A9 at Kincaig village. The council will protect trees and established woodland areas that are important to wildlife and that form important features of the landscape.
- 8.5.5. The Cairngorms National Park Partnership Plan 2012-2017 includes policy priorities to help it deliver identified five-year outcomes. Policy 2.3 aims to conserve and enhance the special landscape qualities of the Park. Policy 2.7 aims to conserve and enhance the cultural heritage that helps to create the sense of place and identity of communities within the Park. Policy 2.8 aims to enhance the design and sense of place in new development and existing settlements enabling new development to contribute positively to sense of place, supporting the retention and enhancement of local character and specifically ensuring road upgrades and improvements respond to local landscape character.
- 8.5.6. From reference to the SNH AWI, Ancient Woodland has been identified within the study area. This encompasses a substantial area particularly in the central and southern sections of the study area through which the A9 passes. There is also a smaller area of Ancient Woodland to the north-east of the study area. Baseline information relating to the position of Ancient Woodland is provided in detail within Chapter 7, Ecology and Nature Conservation.
- 8.5.7. From reference to 'A List of Scheduled Monuments, Properties in Care and Protected Wrecks in Scotland' 2002 and the Sites and Monuments Record, there are a number of Scheduled Ancient Monuments and Listed Buildings identified within the study area. Only features or structures that have a physical presence within the landscape and contribute to the landscape character have been assessed. Please refer to Chapter 5, Cultural Heritage for a description of features of Cultural Heritage.

8.5.8. From reference to 'Geo-diversity of the Cairngorms National Park - Geology and Landscape Scotland Programme Open Report OR/10/019' prepared for CNPA (2011) by the British Geological Survey there is one bedrock geodiversity site within the study area (B22 ground to the south and east of An Suidhe, north-west of Kincaig). This will not be affected by the proposed Scheme.

Landscape Character

Regional Landscape Character

8.5.9. A Landscape Character Assessment (LCA) for the Cairngorms area was prepared by SNH in 1996. According to this LCA, the study area largely falls within the 'Straths' landscape type - one of the three broad landscape types that describe the Cairngorms.

8.5.10. Straths contain the major river systems of the area and are relatively low lying compared with other landscape types that border them. They are characterised by cultivated land containing a diverse mix of farmland, woodlands, forests and settlements which combine to create a variety of landscape patterns on the valley floors and lower hill slopes. This provides a distinctive visual contrast with the other less human influenced landscape types adjacent to them.

8.5.11. The SNH, Report: The Special Landscape Qualities of the Cairngorms National Park⁸⁸ (2010) describes the Straths as being the main 'arteries' of the Park. Forming natural transport corridors they provide the main access routes through the area. They contain large rivers which meander across the flat valley floor and with their fields, crofts, farms and villages; they provide a sense of continuity and security amongst a landscape of hills and mountains. Their slopes are characterised by pockets of native woodland, rough grazing, heather moor and plantation forest.

8.5.12. Within the Strath landscape type, the study area sits within the 'Badenoch LCA'. This area is characterised by:

- A broad open strath flanked by gently undulating hills leading to the Monadhliaths in the west and the Cairngorms massif in the east;
- An open flat strath floor forms that forms a dominant feature with knolls and small hills penetrating its floor;
- Loch Insh and Loch Alvie; the River Spey meanders through the strath floor; the flat broad character of the floodplain allows extensive views to the adjacent hills and mountains;
- Improved pastures enclosed by small scale coniferous plantations, mixed and broadleaved woodlands and stands of native pinewoods; and
- Numerous tourist-related developments and features, many of these being well-screened within the Character Area.

8.5.13. The Cairngorms National Park LCA was commissioned by the CNPA in December 2009. This is more detailed than the LCA commissioned by SNH and is focussed on taking a 'landscape character area' based approach. The landscape has been divided into distinct and recognisable 'places', which are named according to local place names. These LCAs are all different, but within each one there is a consistency of character formed by the topography, land use, history, settlement and development pattern and the way the landscape is experienced.

8.5.14. According to the Cairngorms National Park LCA, the study area lies within a 'lowland' area in the 'Badenoch and Strathspey' region, which includes some of the most inhabited straths and glens of the Park. Within this region, the study area lies within three LCAs: Badenoch: Insh Marshes, Badenoch: Kincaig to Loch Alvie and Badenoch: Loch Alvie to Inverdrue. These have been described in further detail below.

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Commissioned Report No. 375, in partnership with Cairngorms National Park Authority, 2010

Badenoch: Insh Marshes

- 8.5.15. The main characteristics of this area are:
- Extensive wetland, marsh and occasional pools that reach across most of the floor of this wide stretch of strath, interrupted by occasional hummocks of gravelly deposit;
 - The north western side of the strath is contained by low, rocky hills along the edge of the Monadhliath, while along the south eastern edge, the vast conifer woodland of Inshriach forest extends across low, undulating terrain;
 - The River Spey meanders in generous loops across the strath floor to join with the calm expanse of Loch Insh to the north. The river seasonally floods to transform the strath into a vast shallow, temporary loch;
 - Geometrically shaped, improved fields sit on top of the well drained terraces and frequently appear surrounded by broadleaved woodland;
 - Large lodges, at Balavil and Dunachton, and more prominent farms occupy the south facing slopes above the A9, where conifer shelter woods, occasional policies, roundels and specimen trees add to the diversity of the vegetation pattern;
 - The roads clearly occupy land which is elevated above the flood-prone strath, and are often enclosed in woodland, while the railway sits, at east in large part, on top of an embankment across the floodplain; and
 - The Insh marshes are a visitor attraction, as is the Highland Wildlife Park, which is largely hidden in woodland, and Ruthven Barracks.
- 8.5.16. The report also states that the experience of travelling along the roads, through a sequence of enclosed woodland and open farmland is particularly striking on the south side of the Spey. Views of the marshes are surprisingly infrequent as they are surrounded by trees, through which there are only glimpsed views.
- 8.5.17. However, they are very visible from the train, which is elevated on embankments.
- 8.5.18. The distinctiveness of this LCA is stated to arise from the naturalistic, dynamic and unpredictable character of the flood-prone marshes which is a striking feature. This is reinforced by the extensive areas of Semi-natural woodland.

Badenoch: Kincaig to Loch Alvie

8.5.19.

This area is contained to the north-west by hill slopes which have been steepened by the flow of ice along the strath to form the edge of the Monadhliath. The main characteristics of this area are:

- Containment to the south east is dominated by the densely wooded slopes of Inshriach Forest, which sit below the ice roughened crags of Creag Mhigeachaidh;
- Gravelly glacial-fluvial deposits underpin a series of well-drained ridges and terraces stepping up from the floodplain of the Spey; Extensive commercially managed pine forest planted either side of the river conceals the hummocky landform of dips and knolls;
- Farmland occupies a long, level terrace at the foot of the Monadhliath and on open land south of the Spey. The rectilinear, late 18/19th century improved fields are enclosed by fences, although dykes are a particular feature across farmland around Kincaig House;
- Wetter un-grazed fields and areas of scrub fringe the meandering River Spey in places;
- Roundel plantings and richly diverse woodlands of the Allt an Fhearna are evidence of a formerly more extensive designed landscape associated with Alvie Lodge;
- A fragmented pattern of development is a feature of this character area. Gravel extraction, estate sawmill and fish farming activities are well-screened by terraces in a dip at the foot of the Monadhliath while a chalet park and quarry are located within the forested areas but more visible from elevated areas and transport routes;
- Estate farms and cottages are located at intervals possibly associated with former settlement and elevated above the farmland along the foot of the Monadhliath, buildings often set on localised hummocky terrain;
- The A9, B9152 and railway pass through dense woodland on the north side of the Spey while the B970 takes a more circuitous route on the edge of Inshriach Forest;
- Transport routes, and much of the development, are frequently enclosed by dense woodland and hummocky landform, which also limits views of the River Spey and floodplain farmed areas;
- The A9 emerges into open, grazed land at Kincaig, which contrasts with the generally enclosed experience from the road; and
- The Alvie Estate and the deeply cut valleys and craggy hill slopes of the foothills to the Monadhliath is more secluded.

8.5.20.

The distinctiveness of this character area arises from dispersed development (including industrial and chalet development and several transport routes) that can give this area a slightly cluttered character in some places, although development is not always highly visible. The presence of extensive commercial woodland extending onto the floor of Strathspey is an unusual feature. This hides the subtle undulations of the landform and inhibits views of the River Spey and its more open floodplain.

Badenoch: Loch Alvie to Inverdrue

8.5.21.

The main characteristics of this area are:

- Steep sided, irregularly shaped hills contain the area to the north-west, while to the south east, the undulating terrain of Inshriach and Rothiemurchus extend either side of the prominent Ord Ban;
- There are several smaller lochans in addition to the larger Loch Alvie, set in rough, scrubby wetlands, probably lying above deep rock basins;
- This character area has a richly diverse vegetation cover comprising naturalistic wetlands and extensive policy woods as well as juniper and birch scrub and extensive broadleaved and native pine woodland;
- Straight edged, late 18th/19th Century improved fields, surrounded by woodland, are sited on well-drained hummocky terrain at the edge of the strath floor;
- Beech woods cling to steep, curving banks above the flood plain of the Spey. Avenue trees of lime, oak and beech line the B970 and estate roads and ornamental conifers punctuate broadleaved woodlands at the foot of Torr Alvie;
- Mansion houses and estate buildings, gate lodges, Alvie church and other built features such as hill-top monuments and stone walls have a strong architectural integrity and add significantly to the visual diversity and cultural interest of this area;
- Small settlements, of a handful of houses or a cluster of farm buildings are located predominantly on the north side of the strath;
- The B970 is elevated on the south-eastern edge of the strath, edged by a low stone wall and skirting the sinuous floodplain of the Spey; and
- The A9 is frequently in cuttings through this character area, and both it and the railway are often hidden in woodland.

8.5.22.

The Report also states that the occasional openness of the grazed land and fields offers a contrast to the dominant enclosure created by woodland throughout this area. A strong sense of seclusion can be experienced within the core parts of this character area, particularly within the River Spey floodplain, which is not readily visible from public roads. While open views from the B970 are rare, glimpses of the meandering River Spey and the intricate pattern of wetlands and pastures on the floodplain backed by the wooded Torr Alvie are highly scenic in their contrast of form, texture and colour.

8.5.23.

The B9152 offers more open views of Torr Alvie and Loch Alvie than the A9, which is frequently in cutting. Views of the pronounced hills rising suddenly above the farmed strath are quite dramatic when they are suddenly revealed on the intermittent, open stretches of road. There is much visual and cultural interest in the rich policy woodlands, designed landscapes and historic buildings.

8.5.24.

In terms of landscape distinctiveness, the abrupt steepness of Ord Ban and Torr Alvie, rising from the floor of the strath is a striking feature. The pattern of these small hills, the meandering River Spey and the indented Loch Alvie contributes to the intimate scale of the area. The broadleaved woodlands, wetlands, parkland and avenues as well as the built estate features further contribute to the rich scenic diversity.

Local Landscape Character

- 8.5.25. Based on the above published descriptions, field surveys and analysis the study area has been further divided into areas of similar characteristics called 'detailed LCAs'. These LCAs are described in terms of their character, quality and sensitivity below. Their location is illustrated in Figure 8.2. Photographs illustrating the LCAs can be found on Figures 8.3 and 8.4 with individual viewpoint locations identified on Figures 8.5 and 8.6 (Figures 8.2 to 8.6 can be found in Volume 2 of this ES).
- 8.5.26. The SEA Environmental Report notes that its Landscape Review has combined the CNPA and SNH assessments to determine distinct character areas at a local level along the A9 route and this is consistent with the approach adopted in this LVIA. A Landscape Review Report is in the process of being produced. The indicative sensitivities and key design implications for the character areas appropriate to the proposed Scheme (taken from SEA Environmental report Table 5.15 Landscape Review Indicative LCA sensitivity and design implications) are:
- Badenoch: Loch Alvie to Inverdrue (Dalraddy to Aviemore) Indicative sensitivity low; key design implications – Minimise impact on the road. Keep the A9 mostly in cutting through this character area and screen with woodland;
 - Badenoch: Kincaig to Loch Alvie (Kincaig to Dalraddy) Indicative sensitivity medium; key design implications – retain the contrast of open, grazed land at Kincaig, with the generally enclosed road enclosed in cuttings and by woodland; and
 - Badenoch: Insh Marshes (Ruthen Bridge to Kincaig) Indicative sensitivity medium; key design implications – retain a sequence of enclosed woodland and open farmland.

Dunachton Estate and Extensive Broadleaved Woodland (LC 1)

- 8.5.27. This detailed LCA is situated to the south of the study area and forms part of a wide, expansive valley. The area predominantly consists of the extensive Dunachton Estate and associated broadleaved woodland. The area includes Dunachton Lodge designated as a listed and historic building. The house is surrounded by a loosely structured landscape of fields and woodland, with a walled garden and small park.
- 8.5.28. Meadowside Quarry is located to the south of this area, to the west of the A9 and is accessed by a minor road off the B9152, which passes under the A9 and also serves the Highland Wildlife Park, Dunachton Estate and the group of tourist accommodation cottages at Meadowside House. The quarry lies on land, which is elevated relative to the surrounding land to the south west, south and east.
- 8.5.29. The A9 and B9152 run through the centre of this character area, in a north-south direction. Some sections of the A9 road corridor are flanked by engineered embankments that contrast with the surrounding gently undulating topography. Vegetation on either side comprises a mixture of heather, grassland and broadleaved woodland, parts of which are identified as Ancient Woodland. This gives the A9 a more enclosed character as it passes through this Character Area. Semi-improved grassland associated with Dunachton Farm is set back behind the broadleaved woodland dominated by oak and birch. The Cairngorm Mountains National Scenic Area (NSA) lies to the east of this study area.
- 8.5.30. The whole of this detailed LCA is located within the Cairngorms National Park. The extent of woodland comprising areas of Ancient Woodland and the presence of nationally designed sites and listed buildings in the area create a character that is considered to be of very attractive quality and of high sensitivity to change.

Kincraig Village and Pastoral Grassland (LC2)

- 8.5.31. This detailed LCA is situated centrally within the study area. It encompasses Kincraig village located in the east and large areas of pastoral grassland on either side of the A9 that provide uniformity of character. A few elevated, isolated properties and agricultural buildings lie to the west of the A9 and are accessed via tracks. Built form is well assimilated into the landscape due to the combination of topography, vegetation and use of local building materials.
- 8.5.32. The A9 and B9152 form narrow linear elements running through the centre of this character area in a north - south direction. A series of vehicular and pedestrian underpasses run under the A9. Vegetation in the area consists predominantly of small groupings of semi-mature birch trees located within the lowland pastoral grassland. This gives the area an open, expansive character on the valley floor. Wooded hillsides are located on either side of the valley and lead up to the Monadhliath Mountains in the west and Cairngorms to the east. A small area of Ancient Woodland is located to the north of the study area around Alvie School/Baldow. The Cairngorm Mountains NSA runs along the east of this study area.
- 8.5.33. Kincraig village is located to the east of the A9 and consists of a mixture of large, old stone properties and modern semi-detached houses centred on Suidha Crescent. In addition, approximately five detached properties are located to the east of the B9152 and there are a further 28 detached properties within a new development at Baldow Park. Kincraig village also contains two small hotels, a local store / post office, a church and school. Loch Insh is located to the east of Kincraig village and the A9.
- 8.5.34. The pastoral grassland to the west of the A9 rises to the Monadhliath Mountains and contains a number of small knolls and hills which form local undulations in the landform. A small number of isolated detached properties are located on slightly elevated land and are set well back from the A9. These are predominantly farm properties and include Kincraig House. This house has been designated as a listed and historic building. The landscape around Kincraig House is one of enclosure, loosely structured with patches of woodland at the heart of which stands Kincraig House on a low terrace, with Kincraig Farm a short distance to the north.
- 8.5.35. The whole of this local LCA is located within the Cairngorms National Park and there are a number of designated sites in the area including an NSA, Ancient Woodland, TPO and Historic and Listed Buildings.
- 8.5.36. This detailed LCA is considered to be of good landscape quality which is typical of the area and has been influenced by the dramatic surrounding landscape. The area has a number of designated buildings but is considered to be of medium sensitivity on account of its residential nature.

Alvie Estate and Extensive Coniferous Forest (LC 3)

- 8.5.37. This detailed LCA is situated to the north of the study area and also forms part of a wide valley. The area predominantly consists of the extensive Alvie Estate and associated coniferous woodland. The landscape associated with Alvie Lodge is mainly woodland. Alvie Lodge itself stands on terraced ground overlooking Loch Bourne. The Lodge together with the Estate Office (former laundry) and Motor House are designated as listed and historic buildings.
- 8.5.38. The A9 and B9152 run through the centre of this detailed character area, in a north-south direction. The A9 is flanked on both sides by an extensive area of Ancient Woodland towards the south of this character area that gives it an enclosed character; however woodland cover reduces at Dalraddy and views are more open and expansive. Loch Alvie is located to the east of the A9 within this character area.
- 8.5.39. Vegetation in the area predominantly consists of semi-mature Scots pine plantations with small areas of larch and groupings of semi-mature birch within the pastoral grassland.

- 8.5.40. Isolated properties are scattered between the woodland and are predominantly located to the west of the A9. The Alvie Estate consists of a large Edwardian style shooting lodge, estate office, and a number of holiday cottages. Other buildings in the area include farm cottages and associated outbuildings. The area provides a number of tourist related properties and outdoor activities including the Dalraddy Caravan Park which is set in extensive woodland to the west of the A9.
- 8.5.41. This detailed LCA lies within the Cairngorms National Park and is considered to be of very attractive landscape quality and with a high sensitivity to change which has been influenced by the extensive areas of Ancient Woodland and designated heritage sites.

Visual Amenity

Existing visual context

- 8.5.42. Vast and distant panoramic views are frequent throughout the Cairngorms National Park, made possible by open landscapes and elevated viewpoints. Views range from broad pastoral straths of green, improved pasture, middle distance open, rolling hills of brown heather moor, with woodland at lower levels, and far distant, exposed, wild mountain terrain.
- 8.5.43. The assemblage of landscape features is aesthetically pleasing, with views of hill slopes and glens often framed by vegetation and landform.

General Views and Receptors

- 8.5.44. A combination of field survey and desk study has been used to establish a Zone of Theoretical Visibility (ZTV) and identification of visual amenity receptors illustrated in Figures 8.5 and 8.6 in Volume 2 of this ES. A schedule of all visual receptors within the study area and a description of their views and sensitivity is provided in Appendix 11 in Volume 3 of this ES.
- 8.5.45. There are a variety of visual amenity receptors located within the study area. Receptors range from a large number of properties located within Kincaig village to isolated rural cottages accessed via remote rural tracks. Receptors identified within the study area have varying degrees of visibility of the existing A9 road corridor and descriptions of the receptors and associated views are discussed below.

To the east of the A9

- 8.5.46. **Craigmont** (visual amenity receptor E1) is a detached 2 storey bungalow that fronts onto the B9152. This property is located approximately 150 metres from the A9 and is set back from the B9152, behind a large open front garden. Elevated, relatively open views of vehicles and the adjacent section of the A9 and road junction are obtained to the south, but are obscured by the landform to the north.
- 8.5.47. **Suie Hotel** (visual amenity receptor E2) is a three storey bed & breakfast that fronts onto the B9152 and is located approximately 190 metres to the east of the A9. Views to the west in the direction of the A9 are of pastoral grassland located in the foreground and the Monadhliath Mountains in the distance. Elevated views of the A9 and embankment to the west of the A9 across gently rolling grassland from ground floor level are partially screened by mature trees in the foreground. Distant views of vehicles travelling on the A9 and isolated sections of the A9 are obtained. Elevated and more extensive views of the A9 are obtained from first and second storey windows that look out to the west.
- 8.5.48. **Birchfield Cottage and House** (visual amenity receptor E3) comprises a large two storey property and a single-storey detached bungalow fronting on to the B9152 located approximately 190 metres to the east of the A9. Relatively open elevated views of certain sections of the A9 and vehicles travelling on the A9 in the middle ground set against the Monadhliath Mountains in the distance are obtained from these receptors.

- 8.5.49. **The Cairngorms Christian Centre** (visual amenity receptor E4) consists of a Church and small single-storey building fronting on to the B9152, located approximately 200 metres to the east of the A9. In addition, a large single storey hall is set back slightly from the B9152 behind an area of grassland and located approximately 240 metres to the east of the A9. The western end of the boundary is open and the church and small hall obtain views of vehicles travelling on the A9 across open grassland (which were set up with football goals at the time of the visit). Open views across B9152 of amenity grassland in the foreground, embankment to the west of the A9 and passing traffic in the middle-ground and the Monadhliath Mountains in the distance. No views of vehicles or the A9 are obtained from the large hall which is set back from the road at a lower level and is screened by a number of semi-mature trees (including some coniferous species) located on the north-eastern boundary.
- 8.5.50. **Manse** (visual amenity receptor E5) is a two storey house fronting onto the B9152 located approximately 225 metres to the east of the A9. A tall boundary hedge restricts views out from this property to upper-storey windows and the driveway. Views obtained by this receptor include rural fields located in the foreground and the Monadhliath Mountains in the distance. Views of the A9 and vehicles are partially obscured by the undulating nature of the landform between the A9 and this receptor. Views of the vehicles and isolated sections of the A9 are obtained. See Viewpoint 2 Figure 8.8 in Volume 2 of this ES.
- 8.5.51. **The Telephone Exchange** (visual amenity receptor E6) is a single story building set back slightly from the B9152 located approximately 225 metres to the east of the A9. This building has a small parking area to the front and one frosted window facing the A9. Open views are obtained from the front of this building across the B9152 to rolling pastoral grassland in the foreground and the Monadhliath Mountains in the distance. Views of the A9 and vehicles in the middle ground are largely obscured by the undulating topography.
- 8.5.52. **No. 1 – 6 The Knoll** (visual amenity receptor E7) comprises a bungalow and approximately four two-storey properties located approximately 250 metres to the east of the A9 that front on to the B9152. Views obtained by these receptors include gently rolling pastoral grassland in the foreground and the Monadhliath Mountains in the distance. Views of the A9 in the middle distance are largely obscured by the undulating nature of the landform between the A9 and these receptors. Glimpses of the tops of large vehicles on isolated sections of the A9 are obtained. Views will be more prominent from upper storeys.
- 8.5.53. **No. 2 Suidhe Crescent** (visual amenity receptor E8) is a two story semi-detached house facing south. This property is located approximately 340 metres to the west of the A9. Windows on the side of this property face west in the direction of the A9 as does part of its garden. Views of the B9152 and an area of open amenity grassland are obtained in the foreground and the Monadhliath Mountains are visible in the distance. Views of the A9 and vehicles travelling on the A9 from the lower floor are restricted by vegetation and topography. Views of the tops of vehicles travelling on isolated sections of the A9 are obtained from the upper storey. Visibility of the A9 will be increased in the winter months due to the absence of screening provided by foliage. See Viewpoint 3, Figure 8.9 in Volume 2 of this ES.
- 8.5.54. **No. 11 and 12 Suidhe Crescent** (visual amenity receptor E9) are both two storey semi-detached houses facing the A9. These properties are located approximately 300 metres to the west of the A9. Views of the B9152 and an area of open amenity grassland are obtained in the foreground and the Monadhliath Mountains are visible in the distance. No views of A9 are obtained on account of intervening landform and vegetation. Filtered glimpse views of the tops of vehicles travelling on isolated sections of the A9 are obtained from the upper storey. Visibility of the A9 will be slightly increased during the winter months.

- 8.5.55. **No. 14 and 15 Suidhe Crescent** (visual amenity receptor E10) are both single story semi-detached houses facing in a south west direction and located approximately 225 metres to the west of the A9. Both properties front on to the B9152 and obtain views of the A9 and vehicles travelling on isolated sections of the A9 in the middle ground. The Monadhliath Mountains are visible in the distance and existing vegetation within and out-with the properties screens views. Visibility of the A9 will be slightly increased during the winter months.
- 8.5.56. **No. 1, 2 and 3 Baldow Park** (visual amenity receptor E11) are two-storey properties located on the entrance road of Baldow Park, located approximately 200 – 250 metres to the west of the A9. These properties are two storey detached houses that face to the north. Oblique views of the tops of vehicles travelling on the A9 are obtained across the B9152 and adjacent grassland. No views of the A9 are obtained. See Viewpoint 4 Figure 8.10 in Volume 2 of this ES.
- 8.5.57. **No. 4 - 7 Baldow Park** (visual amenity receptors E12) includes detached houses located approximately 225 metres to the west of the A9. The backs of these properties face west, towards the A9. A bund to the west of these properties restricts views towards the A9 to upper storey windows only. Distant filtered views of the tops of large vehicles only will be obtained by these receptors. Views of vehicles travelling on the A9 from upper storey windows are partially screened by a line of mature trees along the B9152. Vegetation on the bund is not yet mature but is likely to screen views once established.
- 8.5.58. **No. 25 - 28 Baldow Park** (visual amenity receptor E13) includes detached houses, located approximately 225 – 275 metres to the west of the A9. These properties are oriented east-west and views of the A9 from the lower floor are partially restricted by a grassed bund located to the west of these properties. Planting on the bund is not yet mature and thus open views of the tops of vehicles travelling on the A9 are obtained. It is likely that the vegetation will screen views once established.
- 8.5.59. **Alvie School** (visual amenity receptor E14) consists of a number of low classroom blocks and a small hard surfaced playground located approximately 100 metres to the east of the A9. Alvie School is located on elevated ground and is accessed via a narrow driveway off the B9152. The playground and classrooms face the A9 which is located in a slight cutting and adjacent to a small area of deciduous semi-mature woodland and highway planting located between this receptor and the A9. No views of the A9 are obtained. However, heavily screened views of the tops of large vehicles travelling on the A9 are obtained from the boundary of the school through the dense woodland. Such views of vehicles will be slightly increased during the winter months.
- 8.5.60. **Easter and Wester Dalraddy Cottages** (visual amenity receptor E15) are two detached bungalows accessed from the B9125 via a long driveway. The rear of this property faces in the direction of the A9 which is located approximately 300 metres to the west. The cottages are set among open pastoral grassland and a small number of semi-mature trees are located around the property. Pine woodland runs adjacent to the A9, to the southwest and there is less roadside vegetation adjacent to the east of the A9 in this area. Views of the A9 and vehicles travelling on the A9 are partially screened by localised planting within these properties and by intervening landform as a section of the A9 is located in a cutting. Views will be more open during the winter months than at other times of the year. See Viewpoint 7, Figure 8.13 in Volume 2 of this ES.
- 8.5.61. **B9152** (visual amenity receptor E16) is a minor road running parallel to the A9 to the east. Views of the A9 vary from not being visible at all (due to intervening built form, vegetation and landform) to being openly visible. Views to the A9 are screened along the majority of the northern and southern sections. Within the central section, views are obtained given the limited depth of planting, but still remain restricted. Over this area, views in the winter months will become significantly greater due to the lack of screening afforded by foliage.

To the west of the A9

- 8.5.62. **Minor roads/access tracks to the west of the A9 – General Wade’s Military Road (at Dunachton Lodge)** (visual amenity receptor W1) – Views of the A9 and vehicles travelling on the A9 are in most part heavily screened by mature woodland vegetation. However, transient views of the A9/vehicles are obtained from some minor roads leading to Leault Farm, Kincaig House, Loch Cottage and Alvie Estate.
- 8.5.63. **Leault Farm** (visual amenity receptor W2) is a single storey bungalow with associated farm buildings located approx 350 metres to the west of the A9. The bungalow is oriented north-south. Views of the A9 towards the south are restricted by natural earth mounding between the A9 and this property. Oblique views of the tops of vehicles travelling on the A9 are obtained before they ‘disappear’ behind earth mounding.
- 8.5.64. **Kincaig House** (visual amenity receptor W3) is a large three storey historic property located approximately 400 metres to the west of the A9. The front of this property faces east towards the A9 and looks out over extensive pastoral grassland from an elevated position. Long distance views of vehicles travelling on the A9 are obtained across largely open grassland containing isolated trees and low stone walls to Kincaig and the Cairngorm Mountains beyond. During the winter months, views of the A9 and vehicles travelling on the road will not be significantly increased as there is little intervening vegetation to filter views.
- 8.5.65. **Loch Cottage** (visual amenity receptor W4) is a small two storey property located approximately 270 metres to the west of the A9. This property is located on slightly elevated land and open grassland is located between this property and the A9. The front of this property faces south. A small mound located in close proximity to the east prevents views of the A9 from within this property. Distant views of small isolated sections the A9 are obtained between undulating topography from areas within the garden where the mound does not restrict views. During the winter months, views of the A9 and vehicles travelling on the road will not be significantly increased as there is little intervening vegetation that filters views.
- 8.5.66. **Kincaig Farm** (visual amenity receptor W5) is a two storey historic house located on slightly elevated land approximately 450 metres to the west of the A9. An extensive area of pastoral grassland is located between the A9 and this receptor. The front of this property faces the A9. Existing mature trees located within the front garden of this property help filter views out during the summer months. Glimpse views of vehicles travelling on the A9 are obtained between the undulating open grassland. In addition, views of small isolated sections of the A9 are obtained. Views are more open during the winter months. See Viewpoint 5, Figure 8.11 in Volume 2 of this ES.
- 8.5.67. **Mid Delfour** (visual amenity receptor W6) is a single storey bungalow located approximately 610 metres to the west of the A9. This property faces east and has views to the immediately adjacent horse training area and open pastoral grassland beyond. The mature pine woodland surrounding the Alvie Estate in the distance prevents more extensive views. Glimpses of the tops of large vehicles using the A9 are obtained to the northeast of an isolated area of the A9, where the coniferous woodland ends.
- 8.5.68. **East Delfour Cairn and Stone Circle** (visual amenity receptor W7 – listed as Ring Cairn on the OS Plan) is a stone circle which is designated a Scheduled Ancient Monument (SAM). Ring Cairn is located approximately 560 metres to the west of the A9. Views to the east are across open pastoral grassland to the mature pine woodland surrounding the Alvie Estate. Glimpses of the tops of large vehicles travelling on the A9 are obtained to the northeast of an isolated area of road where the mature pine woodland ends.

- 8.5.69. **New East Delfour** (visual amenity receptor W8) is a single storey holiday cottage that forms part of the Alvie Estate and is located approximately 625 metres to the west of the A9. The rear of this bungalow faces to the northeast and this property has an open back garden. Open views are obtained from this property and garden of open pastoral grassland. The mature pine woodland that surrounds Alvie House prevents more extensive views. Long distance glimpses of the tops of large vehicles using a short section of the A9 are obtained to the northeast where the mature pine woodland ends. See Viewpoint 6 on Figure 8.12 in Volume 2 of this ES.
- 8.5.70. **East Delfour Farm** (visual amenity receptor W9) is a two storey bungalow and associated riding stables located approximately 625 metres to the west of the A9. The front of this property faces to the east in the direction of the A9. Open views are obtained from this property of open pastoral grassland. The mature pine woodland that surrounds Alvie House prevents more extensive views. Long distance glimpses of the tops of large vehicles using the A9 are obtained to the north east of a short length of road where the coniferous woodland ends.
- 8.5.71. The greatest number of receptors will be road users on the A9 carriageway. Views from receptors at various points along the road have been assessed in Chapter 12 Vehicle Travellers and are illustrated in Figures 12.1 to 12.5 in Volume 2 of this ES.

8.6. Consultation

- 8.6.1. Consultation took place to gather baseline information and to discuss the landscape and visual issues relating to the proposed Scheme. Below is a summary of the consultation relating to the landscape and visual assessment:
- The CNPA and SNH were consulted on January 18th 2013 to gain baseline data and preliminary advice on designated sites, impacts and design;
 - Consultation took place with The Highland Council Planning and Development Services and the Forestry Officer on January 24th 2013 to introduce the overall scheme and approach to mitigation; and
 - The CNPA provided comments on the landscape mitigation proposals for the previous A9 Carriageway Widening Scheme (2007) on Jan 21st 2013.
- 8.6.2. Following consultation, landscape plans were produced that identify designated sites, key landscape and visual features. CNPA's comments were taken into account in the preparation of suitable landscape mitigation proposals for the proposed Scheme.

8.7. Impacts (Opening Year) Without Mitigation

Landscape Character Impacts

- 8.7.1. Landscape character impacts are changes in the fabric, character and quality of the landscape as a result of development. Landscape character impact assessment is concerned with:
- Direct impacts on acknowledged and recognised areas of interest or value, such as designated landscapes and conservation sites. Such impacts will be considered against the existing effect of the A9 road corridor;
 - Direct impacts on specific landscape elements, such as the loss of woodland, grassland and heathland; and
 - Indirect impacts on the overall pattern of elements that give rise to landscape character and regional and local distinctiveness.

8.7.2. Impacts have been considered for both the construction and operation phases of the proposed Scheme. Operation impacts are associated with changes which result in a long-term or permanent change in existing fabric or character after completion of the proposed works. These are described in this section. Construction phase related impacts are described in Chapter 6, Disruption Due to Construction.

8.7.3. Direct and indirect impacts are considered in relation to the three detailed LCAs and are summarised below.

Dunachton Estate and Extensive Broadleaved Woodland (LC1)

Impacts on Landscape Elements

8.7.4. The proposed Scheme will necessitate the removal of some areas of broadleaved woodland including Ancient Woodland on either side of the existing A9 road corridor to accommodate the dualling works. The proposed Scheme will also involve re-profiling of the existing embankments, which will result in loss of some scrub planting and areas of meadow grassland. **Slight adverse impacts** will be caused to this LCA on account of this loss of vegetation.

Impacts on Landscape Designations

8.7.5. The proposed Scheme will be located within the Cairngorms National Park. The impacts upon this designated area are considered **neutral** as the route does not deviate significantly from the current alignment of the A9 and the scale of the proposed Scheme is considered to be insignificant in relation to the wider context of the National Park.

8.7.6. The proposed Scheme will entail the removal of varying areas of Ancient Woodland located immediately adjacent to the existing A9 in order to accommodate the dualling and closure of side access roads. Direct impacts associated with the removal of areas of Ancient Woodland will be **moderate adverse**.

8.7.7. The overall significance of impact of the proposed Scheme on the Dunachton Estate & Broadleaved Woodland LCA is likely to be **moderate adverse** as the sensitivity of this LCA is high and the magnitude of impacts on the landscape character area is low. The moderate adverse impact is primarily due to the loss of vegetation, particularly Ancient Woodland that gives this detailed LCA local distinctiveness. New earthworks and the extended rock face will be higher than existing and more intrusive in the local landscape. As initially the new embankments will be un-vegetated and exposed, for a number of years the road will form a very visible, prominent linear feature in the landscape which will have a negative impact and result in a **moderate adverse impact**.

Kincraig Village & Pastoral Farmland (LC2)

Impacts on Landscape Elements

8.7.8. The dualling will also involve the creation of new embankments along some sections of the A9 as it passes along Kincraig village which are likely to contrast with the otherwise gently rolling landscape. As initially these embankments will be un-vegetated and exposed, they are likely to have a negative impact. However, when considered in the overall context of the existing A9 road corridor the impacts are unlikely to be significant and will be **slight adverse**.

Impacts on Designated Sites

8.7.9. The proposed Scheme will be located within the Cairngorms National Park. The impacts upon this designated area are considered **neutral** as the route does not deviate significantly from the current alignment of the A9 and the scale of the proposed Scheme is insignificant in relation to the wider context of the National Park.

8.7.10. The proposed Scheme will necessitate the removal of a small area of Ancient Woodland located immediately adjacent to the existing A9, towards the north of this character area at Alvie School/Baldow. Direct impacts associated with the removal of areas of Ancient Woodland will be **slight adverse**.

8.7.11. The overall significance of impact of the proposed Scheme on the Kincaig Village & Pastoral Farmland LCA is likely to be **slight adverse** as the sensitivity of this LCA is medium and the magnitude of impacts on the landscape character area is **low**. The slight adverse impact is primarily due to the creation of new embankments, which in an un-vegetated state, will result in the road forming a prominent linear feature in the landscape, thus contrasting with the undulating topography and pastoral nature of this LCA.

Alvie Estate and Extensive Coniferous Forest (LC3)

Impacts on Landscape Elements

8.7.12. The A9 road corridor passes through extensive coniferous woodland within this character area. The proposed Scheme will involve loss of areas of coniferous woodland immediately adjacent to the road which is likely to result into a **slight adverse** impact in the short-term.

Impacts on Designated Sites

8.7.13. The impacts upon this designated area are considered **neutral** as the route does not deviate significantly from the current alignment of the A9 and the scale of the proposed Scheme is insignificant in relation to the wider context of the National Park.

8.7.14. The proposed Scheme will necessitate the removal of fringes of Ancient Woodland located immediately adjacent to the existing A9, to the east and west. Direct impacts associated with the removal of areas of Ancient Woodland will be **moderate adverse**.

8.7.15. The overall significance of impact of the proposed Scheme on the Alvie Estate and Extensive Coniferous Woodland LCA is likely to be **moderate adverse** as the sensitivity of this LCA is high and the magnitude of impacts on the landscape character area is low. The moderate adverse impact is largely due to the loss of fringes of coniferous Ancient Woodland that forms a key component of this character area.

8.7.16. The Landscape Character impacts are summarised below:

Table 8.4 Opening Year 1: Landscape Character Impacts – Summary Table

LCA	Sensitivity	Magnitude	Significance of Effect
LC1 Dunacthon Estate & Broadleaved Woodland	High	Low	Moderate adverse
LC2 Kincaig Village and Pastoral Farm Land	Medium	Low	Slight adverse
LC3 Alvie Estate & Extensive Coniferous Woodland	High	Low	Moderate adverse

Visual Amenity Impacts (Year 1 - Opening Year)

- 8.7.17. Visual amenity impacts relate solely to changes in available views of the landscape and the effects of those changes on people. As with landscape character impacts, any changes in views from identified receptors were compared with the existing views and influence of the A9.
- 8.7.19. The extent of the visual envelope and the location of the visual amenity receptors are illustrated in Figures 8.5 and 8.6 in Volume 2 of this ES. A schedule of receptors, the magnitude of change and the significance of effects are outlined in Appendix 11 of Volume 3 of this ES.
- To the east of the A9**
- 8.7.20. **Craigmont** (visual amenity receptor E1) - A9 will be more prominent in the view as the minor road leading to the A9 will be stopped up and a new junction will be created to the west. Views of vehicles will be slightly increased and new embankments are likely to be visible. Visual amenity effects will be **slight adverse**.
- 8.7.21. **Suie Hotel** (visual amenity receptor E2) - Existing filtered views of vehicles and isolated sections of the A9 will be slightly increased by the improvements. Views of new embankments will be more prominent from upper stores and more open during the winter. Visual amenity effects will be **slight adverse**.
- 8.7.22. **Birchfield Cottage and House** (visual amenity receptor E3) - Existing filtered views of vehicles and isolated sections of the A9 obtained will be slightly increased by the improvements. Re-profiled embankments will be visible and the A9 will form a slightly more prominent feature in views obtained from first-storey windows. Views will be more open during the winter months. Visual amenity effects will be **slight adverse**.
- 8.7.23. **Cairngorms Christian Centre** (visual amenity receptor E4) - Existing views of vehicles travelling on isolated sections of the A9 obtained from the Church and small hall will be unchanged by the proposed scheme. No views will be obtained of the A9 itself and the large hall will continue to have its views restricted by topography and boundary vegetation. Visual amenity effects will be **neutral**.
- 8.7.24. **Manse** (visual amenity receptor E5) – Glimpse views of vehicles from driveway/upper storey windows through natural mounding will be slightly increased by the A9 improvements. New embankments will be visible. Visual amenity effects will be **slight adverse**.
- 8.7.25. **Telephone exchange** (visual amenity receptor E6) - Views of vehicles from parking area/frosted window will be slightly increased by the A9 improvements. New embankments will be visible, and in their un-vegetated state, will result in **slight adverse** effects.
- 8.7.26. **No. 1-6 The Knoll** (visual amenity receptor E7) – Glimpse views of the vehicles travelling on the A9 will be slightly increased. New embankments will be visible. Views will be more prominent from properties with upper stores and impacts on these properties will be slightly greater. Visual amenity effects will be **slight adverse**.
- 8.7.27. **No 2 Suidhe Crescent** (visual amenity receptors E8) – Views of the A9 improvements from upper-storey windows will continue to be restricted by vegetation and topography. Glimpse views of top of large vehicles obtained from upper storey windows will be marginally increased, however visual amenity effects will remain **neutral**.
- 8.7.28. **No. 11 and 12 Suidhe Crescent** (visual amenity receptors E9) - Filtered glimpse views of the tops of tall vehicles travelling on isolated sections of the A9 will be unchanged following the improvements. Views of the road itself will not be obtained. Views will be slightly increased during the winter months when intervening vegetation cover is reduced. However visual amenity effects will be **neutral**.

- 8.7.29. **No.14 and 15 Suidhe Crescent** (visual amenity receptors No.E10) - Screened views of the A9 and vehicles travelling on isolated sections of the A9 obtained by properties will be slightly increased by the improvements. The A9 and vehicles travelling on the A9 will form a slightly larger feature in the views obtained by these receptors as re-profiled embankments will be visible. Views will be more open during the winter months than at other times of the year. Visual amenity effects will be **slight adverse**.
- 8.7.30. **No. 1, 2 and 3 Baldow Park** (visual amenity receptor No. E11) – Oblique views of the tops of vehicles travelling on isolated sections of the A9 will be slightly increased following the improvements. Views of the road itself will not be obtained; however re-profiled embankments will be visible in the middle distance. Views will be slightly increased during the winter months when intervening vegetation cover is reduced. Visual amenity effects will be **slight adverse**.
- 8.7.31. **No. 4 to 7 Baldow Park** (visual amenity receptor No. E12) – The grassed bund located to the back of these properties will continue to screen views of the A9 improvements. However new embankments will be visible from upper floors and views of vehicles will be slightly increased. Visual amenity effects will be **slight adverse**.
- 8.7.32. **No. 25 to 28 Baldow Park** (visual amenity receptor No. E13) – New/re-profiled embankments will be visible from upper floors until bund vegetation matures sufficiently to screen views. Visual amenity effects will be **slight adverse**.
- 8.7.33. **Alvie School** (visual amenity receptor E14) - The removal of a small amount of woodland located adjacent to the A9 will slightly open up views of vehicles from the school boundary. It is proposed that a close boarded timber screen fence will be provided to replace vegetation lost to the proposed Scheme. Vehicles travelling on the A9 will form a slightly more prominent feature in the views obtained by this receptor. Views will be more open during the winter months. Visual amenity effects will be **slight adverse**.
- 8.7.34. **Easter/Wester Dalraddy Cottage** (visual amenity receptor E15) – Views of vehicles travelling on certain sections of the A9 (as it emerges from cutting) will be slightly increased by the improvements. New embankments will be visible and thus the A9 will form a slightly more prominent feature in the view obtained by these receptors. Visual amenity effects will be **slight adverse**.
- 8.7.35. **B9152** (visual amenity receptor E16) - The removal of existing mature vegetation between the A9 and the B9152 and the creation of new/re-profiling of existing embankments at certain locations along the route will result in **slight adverse** effects upon the visual amenity of this receptor.
- To the west of the A9**
- 8.7.36. **Minor roads/Access track to the west of the A9 – General Wade’s Military Road (at Dunachton Lodge)** (Visual amenity receptor W1) – Woodland vegetation that screens views of the A9 from these tracks will be removed as a result of the improvements. In the initial stage, this will result in **moderate adverse** visual effects as new woodland vegetation proposed will take time to mature.
- 8.7.37. **Leault Farm** (visual amenity receptor W2) – Oblique views of the tops of vehicles travelling on the A9 will slightly increased. New earthworks required to accommodate the dual carriageway and new access road junction will be visible and (in their un-vegetated state) will result in **slight adverse** visual effects.
- 8.7.38. **Kincaig House** (Visual amenity receptor W3) – Long distance largely open views of vehicles travelling on isolated sections of the A9 will be slightly increased. New earthworks required to accommodate the dual carriageway will be visible and (in their un-vegetated state) will result in **slight adverse** visual effects.

- 8.7.39. **Loch Cottage** (Visual amenity receptor W4) – The small mound to the east will continue to screen views of the A9 from within this property. Distant views of small isolated sections the A9 obtained from areas within the garden will be slightly increased, however these will not result in significant impacts. Visual amenity effects will be **neutral**.
- 8.7.40. **Kincraig Farm** (Visual amenity receptor W5) – Existing mature trees located within the front garden of this property will continue to filter views. Glimpse views of vehicles travelling on the A9 will be slightly increased following the improvements and new embankments may be visible. Visual amenity effects will be **slight adverse**.
- 8.7.41. **Mid Delfour** (Visual amenity receptor W6), **Ring Carn (SAM)** (Visual amenity receptor W7), **New East Delfour** (Visual amenity receptor W8) and **East Delfour Farm** (Visual amenity receptor W9) - Existing long distance glimpses of the tops of large vehicles travelling on isolated sections of the A9 will be slightly increased following the A9 improvements and new embankments may be partially visible. Visual amenity effects will be **slight adverse**.

8.8. Mitigation Measures

General mitigation principles

- 8.8.1. As noted in 8.2.2 above, the SEA Environmental Report identified preliminary environmental principles through the Policies, Plans and Strategies Review to inform the development of a set of strategic environmental principles for the A9. Key considerations (which the SEA states may subject to further discussion and refinement) form the basis of strategic environmental principles in relation to landscape. These general mitigation principles have informed the landscape mitigation measures applied between the Kincraig and Dalraddy section of the A9 road corridor as described below:
- 1. Ensure that respect for the distinctive local landscape character and qualities of the A9 corridor shall inform all aspects of the dualling process.**
- 8.8.2. The Landscape Proposals have been informed by the Cairngorms LCA, which identifies distinctive local landscape characters for each LCA through which the A9 passes. In this section the A9 passes through the Badenoch: Insh Marshes, Badenoch: Kincraig to Loch Alvie and Badenoch: Loch Alvie to Inverdrue Character areas and the landscape characteristics/qualities of each of these areas has been used to guide the landscape approach. For example:
- Native woodland has been proposed along the new/re-profiled embankments to the north and south of the proposed Scheme as the landscape in this area is characterised by the presence of large areas of Semi-natural Ancient Woodland; and
 - New meadow grassland has been proposed in the central area of the proposed Scheme (around Kincraig village) as this area is dominated by farmland and is more rural in character.
- 2. Ensure road alignment and design responds to the landscape qualities and key characteristics of each landscape character area through which the route passes**
- 8.8.3. The road alignment and design has been developed to closely follow that of the existing A9, which forms a part of the existing character of this section of Cairngorms National Park.
- 8.8.4. The horizontal and vertical geometry of the road alignment closely matches that of the current route and only at underpass locations does the geometry rise above existing to ensure that accessibility and headroom is optimised at these locations. The key engineering constraints include the existing trunk road, existing structures and watercourse crossings and the adjacent B9152 side road, which have influenced the nature of the road widening along the existing corridor.

- 8.8.5. Despite these constraints, the road alignment has been designed to maintain and enhance the landscape qualities and key characteristics of the landscape areas through which the route passes such as 'dominance of natural landforms', 'grand panoramas and framed views' etc. The road alignment/ landscape proposals have also been informed by the Cairngorms LCA as described above.
- 3. Whilst respecting the distinctive character qualities of the landscape and places along the route, ensure a consistency of approach to design to reinforce the overall identity of the A9 between Perth and Inverness.**
- 8.8.6. Detailing of elements such as the verges, central reserves, central reserve barriers etc. shall be designed to be consistent across the entire A9 corridor and reinforce its identity whilst respecting the distinctive local character.
- 4. Enhance the views from the road to maximise the positive traveller experience.**
- a) key views shall be agreed to inform the siting of lay-bys, around appropriate opportunities**
- b) View management plans should be developed**
- 8.8.7. The SEA Environmental Report includes 19 primary views along the A9 Perth to Inverness route; only one of which is relevant to the Kincaig to Dalraddy section. This is at Dalraddy and is too close to the end taper of the proposed Scheme to allow the creation of a specific lay-by/viewpoint, although this might be possible at a later date as part of the full dualling upgrade. In recognition of the key view across the strath where the road rises on embankment to cross the Alt an Fhearna river, landscape mitigation proposals allow views from the road through distinct woodland blocks, whilst the planting will also soften /filter views to the A9 from Dalraddy Cottages.
- 8.8.8. The SEA emerging 'View from the Road' document indicates a view north from the A9 where it emerges from woodland to open pastoral fields and attractive 'parkland' views to the north. This is consistent with the mitigation proposals for this proposed Scheme where the open views have been retained in recognition of the historic designed landscape associated with Kincaig House.
- 8.8.9. Creating an enclosed corridor through this section has been avoided by only proposing new woodland where it is required for screening or habitat connectivity. Wildflower grassland has been proposed on new/re-profiled embankments (where appropriate) in order to retain/enhance key views and create a pleasant environment for the road-user. The siting of lay-bys in this section is constrained by road design standards. Finishes and verge treatments at lay-bys is to be discussed, and also forms part of the wider route strategy.
- 8.8.10. Landscape proposals aim to enhance views from the road at key locations (refer to Chapter 12 Vehicular Travellers). The potential to open up new views by thinning trees in agreement with local landowners or establishing view cones through proposed planting will be explored at the detailed design stage.
- 5. Ensure both construction and long term [25 years plus] potential landscape effects inform the landscape design of the road**
- 8.8.11. A detailed landscape/visual assessment has been carried out by a Chartered Landscape Architect and impacts have been assessed at Year 1 and Year 15, in accordance with DMRB. The design of the road and landscape mitigation proposals has been informed by this. In order to ensure successful establishment of the mitigation proposals within this period, the proposed species mix draws from trees and shrubs already present in the immediate landscape and therefore well suited to the site characteristics (e.g. ground conditions, climate). In addition, the detailed design will consider the use of increased planting densities and inter-planting with 'nurse' species (e.g. willow coppice) throughout proposed woodland areas to ensure successful establishment of mitigation within the 15-year period.

- 8.8.12. We are aware of RWE proposals for a 31 turbine windfarm development – Allt Duine Wind Farm - on land in the vicinity of the proposed Scheme in the Monadhliath Mountains. As the Reporter's decision on this scheme is still awaited, this does not form part of our assessment at this stage. However, if the application was to be successful, we will produce an addendum to the assessment to assess the potential cumulative effects of this development on the A9 dualling proposals in this section.
- 8.8.13. Besides the windfarm proposal, we are not aware of any significant changes in land-use proposed that would materially affect any of the assumptions made in the assessment.
- 6. Design for low maintenance and to accommodate future change**
- 8.8.14. The proposed Scheme has been designed to be as low-maintenance as possible, in accordance with Transport Scotland Guidance 'Cost Effective Landscape: Learning from Nature'. As such the proposed landscape design is based upon an understanding of the site and the habitats it has the capacity to support, with minimal long-term intervention.
- 8.8.15. Habitats proposed include native woodland (three species mixes have been proposed to reflect existing woodland composition), low maintenance verge mix and species- rich acid grassland mix.
- 8.8.16. Drainage elements such as drainage ponds and swales have been introduced which will avoid the need for expensive roadside kerbs, gullies and related maintenance.
- 7. Use natural characteristics in design and encourage the use of sensitive and innovative methods to mitigate adverse environmental and visual effects including rock cuttings, to deliver appropriately balanced solutions.**
- 8.8.17. The profiles of the earthworks have been shaped to reflect existing landscape. Commitments will be made within the ES to avoid long, consistent profiles.
- 8.8.18. Slopes have been designed either to limit land-take (and the subsequent removal of existing vegetation) or achieve best fit with existing landscape forms.
- 8.8.19. Soil excavated from site will be placed on niches and ledges naturally occurring on the rock face to encourage natural regeneration.
- 8. Protect prominent features and local landmarks and enhance their setting, where possible.**
- 8.8.20. It has been proposed that prominent features and local landmarks such as large areas of Semi-natural Ancient woodland, hummocky landform of dips and knolls, rectilinear fields enclosed by fences, dykes across farmland at Kinraig House, Estate farms and cottages often set on localised hummocky terrain etc. as described in the Cairngorms National Park Landscape Character Assessment will be retained, protected and enhanced wherever possible. For example, stone wall features have been introduced at new lay-bys to form a feature along the A9 corridor.
- 8.8.21. It has also been proposed that existing dry stone walls will be extended and enhanced to reinforce the unique identity of the A9 corridor.
- 9. Where appropriate, minimise the effect of the road on the experience of the wider landscape including lighting and noise.**
- 8.8.22. The A9 road corridor, access roads and underpasses along this section will not be lit (unless expressly required by landowners) to minimise visual effects. This will help maintain the 'Dark skies' which is one of the Special Landscape Qualities of the Cairngorms National Park.

8.8.23. Screen planting has been proposed to mitigate adverse visual impacts from properties in the vicinity of the proposed Scheme. At the boundary of Alvie School it is intended to provide Fencing to provide screening and security as requested by The Highland Council. The details for this fencing will be confirmed with The Highland Council.

10. Minimise the landscape impacts of verge and boundary treatments within the context of safety standard requirements

8.8.24. Verge and boundary treatments will be designed to be in keeping with the principles proposed in the emerging Landscape Strategy document. Verges will incorporate filter drains and road restraints where required. Finishes will be low-maintenance and designed to integrate as much as possible with the surrounding context to minimise landscape impacts. Through consultation with Stakeholders, including CNPA, Concrete Step Barriers will not be permitted in the design.

11. As far as possible, avoid, or reduce effects on, landscape features, retain and make best use of existing vegetation and re-use site won materials wherever possible.

8.8.25. The removal of important landscape features such as Ancient Woodland will be limited as far as practically possible to reduce both direct and indirect impacts. Any losses will be replaced with locally native and characteristic plant species and species mixes.

8.8.26. Existing trees will be retained wherever possible. Losses will be mitigated by replacement planting. The potential to manage individual and groups of trees as landscape features will be considered at the detailed design stage. Soil excavated from site will be placed on niches and ledges naturally occurring on the rock face. Details of material removal, storage and re-use will be documented within the relevant works information e.g. Construction Method Statement (CMS), Construction Environment Management Plan (CEMP) and Site Waste Management Plan (SWMP).

8.8.27. Topsoil for reuse will be stored in low mounds in line with best practice guidance and British Standards, to be specified at the detailed design stage.

12. Maintain and where possible enhance ecological and landscape connectivity and minimise fragmentation

8.8.28. The proposed Scheme will retain the existing underpasses and improvements with respect to fencing along the side roads will be made to ensure unfettered passage by mammals under the A9 alignment.

8.8.29. Replacement bridges over the major watercourses (the Dunachton burn and Allt an Fhearna) will ensure that, where needed, dry ledges are provided along both banks of the rivers which, with appropriate fencing, is designed to encourage the passage of wildlife under the bridges.

8.8.30. Smaller watercourses carried in culvert under the existing alignment will be improved so as to allow terrestrial mammals to readily gain access under the road, by ensuring a dry ledge is provided where no other crossing facility (such side-road underpasses) is available, or by providing a parallel dry culvert.

8.8.31. Species expected to benefit in particular from the above measures are otter, wild cat, pine marten and badger while bats will continue to use the watercourses and side-road underpasses as foraging and transmission corridors.

13. Protect species and habitats to support biodiversity, natural processes and LBAP targets.

8.8.32. Enhanced permeability of the road corridor with respect to safe crossing points for terrestrial mammals will assist in the conservation objectives for protected species by reducing the risk of road mortality.

8.8.33. Areas of colonising pine along the roadside verges will be managed to encourage the development of new nests of the northern wood ant, which occurs along the A9 in the area of the Alvie woods. The species is classified as Nationally Scarce in the UK and Near Threatened on the IUCN Red List and management that increases its population along the A9 alignment could make a significant contribution to local biodiversity.

8.8.34. Losses to habitats of local or national biodiversity value from the proposed Scheme will be mitigated by replacement plantings. These concern primarily areas of wet woodland by the river crossings and some small areas of semi-improved wildflower grasslands. Wet woodlands will be replaced with new off-site plantings of three times the area of habitat lost.

14. Use locally native and characteristic plant species and species mixes

8.8.35. The species replanted to form compensation woodlands will use species typical of the local riparian woods with willows, alder and aspen. Re-seeded wildflower grasslands will use seeds of local provenance to form a community appropriate to slightly acid grasslands, based on the NVC community U4 (Fescue/bent/heath bedstraw grassland) which is the typical semi-improved grassland community along the proposed Scheme, together with elements of U2 (wavy hair-grass grassland) which also occurs in some areas with heather and bilberry. Final grass seed mixes will be agreed with CNPA.

8.8.36. Juniper, a Biodiversity Action Plan species, present as scattered small individuals along the A9, will be included in the mix of woody species to be planted along the re-formed roadside verges.

8.8.37. The indicative planting works landscape Figures 8.14-8.21 (Volume 2 of this ES) include an indicative plant schedule and specification.

15. Secure adequate land for integrated landscape solutions

8.8.38. The landscape scheme has been designed to integrate as much as possible into the surrounding landscape.

8.8.39. Potential sites for on and off-site mitigation have been identified primarily to mitigate losses of semi-natural Ancient Woodland as a result of the proposed Scheme.

8.8.40. The mitigation measures proposed also take cognisance of The SNH, Report: The Special Landscape Qualities of the Cairngorms National Park⁸⁹ (2010). The measures aim to:

- Respect the distinctive local landscape characteristics and qualities of the A9 road corridor;
- Enhance the local sense of place and landscape character through innovative design using natural characteristics such as rock cuttings, local materials/design detailing and indigenous planting with emphasis on environmental quality and sustainability;
- Avoid, retain and protect prominent features and local landmarks such as dry stone walls and areas of landscape value such as existing woodlands, including the Ancient and Semi-natural Ancient Woodlands;
- Minimise the footprint of the new works including construction works, to avoid both direct and indirect impacts;
- Design the re-profiled slopes to limit land take and the subsequent removal of existing vegetation. Propose re-vegetation of slopes with woodland and wildflower grassland so that they integrate into the surrounding landscape character;
- Maximise opportunities for new planting and natural species colonisation by the roadside and on the re-profiled slopes;

- Maintain and where possible, enhance ecological and landscape connectivity and minimize fragmentation; and
- Take opportunities to screen existing views of the A9 without obstructing particularly attractive long distance views across the valley. This will offer improvements to the landscape character and visual amenity of the sensitive residual receptors located around the A9.

16. Aim to ensure the enhanced reputation of the A9 as one of the world’s great touring roads through landscapes of national and international importance.

8.8.41. A series of design guide strategies (e.g. lay-bys and viewpoints, rock cuttings, public access and transport etc.) should support such route wide enhancement.

8.8.42. The proposed Scheme has been designed to provide a pleasant environment for the road user, including the retention of an attractive journey with views from the road where possible.

Specific mitigation principles

8.8.43. As noted in the SEA Environmental Report landscape key findings ‘road works will present highly visible effects during and post construction periods...’. A range of screening and landscaping measures to soften the effects have been included in the landscape measures for the proposed Scheme and mitigation of adverse effects through the design process will be ongoing. The SEA landscape key findings also acknowledge that ‘a balance will need to be struck between landscape, opportunity views and other factors, (including safety and biodiversity) through the detailed design phase’ and this approach has been adopted for this proposed Scheme.

8.8.44. Specific landscape mitigation measures include (Refer to Figures 8.14-8.21 in Volume 2 of this ES):

- During construction operations, the site compounds and road diversions will be located where the least environmental impacts will be experienced and will avoid the excessive removal of existing vegetation. Where vegetation is to be removed, it will be replaced with similar species following completion;
- The land take to the east and west of the A9, directly affected by the improvements will be minimised as far as practically possible to reduce both direct and indirect impacts. Typically re-profiled slopes are maintained at 1:3 to allow for planting on the embankments, with sections of 1:2 between Chainages 500-800 on the northbound carriageway where species rich acid grassland and rock cutting is proposed;
- The removal of mature woodland and Ancient Woodland will be avoided as far as practically possible to reduce both direct and indirect impacts. New woodland planting will be provided to compensate for losses of woodland adjacent to the A9 during construction operations and to accommodate the improvements. Species selection and woodland design will be carried out in consultation with SNH and the CNPA. Different woodland types will be established along the A9 to reflect the existing woodland composition and promote integration with existing character;
- The loss of wet woodland will be mitigated by compensatory compensated by mitigatory planting areas (please refer to figure 7.21 of within Volume 2 of this ES) at a minimum ratio of 3:1 (proposed : existing) as identified within Chapter 18.
- In the central part of the study area, where the proposed Scheme is mainly dominated by farmland to the west of Kincaig, a species-rich grassland mix is proposed to reflect the existing landscape and enhance biodiversity value. New woodland planting is proposed on embankments that are potentially visible from residential properties in Kincaig to enhance landscape connectivity , screen views and mitigate visual impacts;

- Soils previously excavated from the working area will be placed on the niches and ledges of naturally formed rock face where they occur within re-profiled embankments. The naturally occurring seed bank within the soils will colonise these rock faces over time as the rock face itself weathers;
- Cuttings will be as natural as possible and graded and shaped to integrate with the adjacent landform. Slopes will be graded to minimise land take;
- Areas requiring re-profiling will be stripped of their existing soils and will be stockpiled for re-use. Existing soils will be re-used on new embankments to retain the seedbank of localised vegetation communities;
- Where side access road closures occur, the old access onto the A9 will be re-profiled and planted to continue the existing theme of the woodland belts adjacent to the road side, or seeded where the access was in a more open location. This will help screen views of the A9 and further integrate the road into the landscape;
- Deer fences will be provided around new woodland areas as required. Planting will be set back from the road verges to reduce the likelihood of deer accessing the carriageway. The need for additional deer fencing along the remainder of the proposed Scheme will be discussed with Landowners, SNH, the CNPA and other relevant stakeholders in due course;
- Drainage elements where they occur will be naturalistic and sensitively integrated into the wider landscape setting;
- Materials for the construction of the accommodation tracks will be selected to integrate with the existing material in the area. In addition, locally sourced materials will aid integration into the landscape and promote sustainability. The NMU route will be hard surfaced e.g. hot rolled asphalt or a similar proprietary thin surface course system; and
- The ongoing maintenance and management of the landscape planting and seeding will be an integral part of the proposed Scheme. Individual requirements to be developed at the detailed design stage in line with DMRB and MCHW specifications.

8.9. Impacts (Design Year 15)

Residual Landscape Character Impacts

- 8.9.1. Direct and indirect residual landscape character impacts are considered in relation to the three detailed LCAs and are summarised below.

Dunachton estate and Broadleaved Woodland (LC1)

Residual Impacts on Landscape Elements/Designations

- 8.9.2. By the Design Year, proposed mitigation planting alongside the road will have established, thereby improving the species diversity of the road corridor and thus resulting in better integration of the proposed Scheme into the wider landscape.
- 8.9.3. In addition, materials used to construct the new access tracks, NMU provision and dualling will have weathered; the re-profiled slopes will have established vegetation and thus a natural appearance and character.
- 8.9.4. The long-term impacts of the loss of areas of semi-natural Ancient Woodlands are difficult to mitigate fully as the replacement woodland will not be of a sufficient age to be classified as either semi-natural or Ancient Woodland. As the Ancient Woodland belts are relatively narrow in this LCA (particularly towards the south), the establishment of new planting and softening of new rock faces will result in the significance of effect being reduced from moderate adverse to slight adverse.

Kincaig Village and Pastoral Farmland (LC2)

Residual Impacts on Landscape Elements/Designations

- 8.9.5. By the Design Year 15 the vegetation on the new/re-profiled embankments on either side of the A9 (as it passes through Kincaig village) will have established and will have a natural appearance and character that is consistent with the pastoral character of the wider LCA. New areas of woodland proposed around Alvie School/Baldow will have established. Thus the impacts of the proposed Scheme on the Kincaig Village and Pastoral Farmland detailed LCA the significance of effect will be reduced from **slight adverse to neutral**.

Alvie Estate and Extensive Coniferous Woodland (LC3)

Residual Impacts on Landscape Elements/Designations

- 8.9.6. Mitigation measures will also reduce impacts on the Alvie Estate and Extensive Coniferous Woodland LCA.
- 8.9.7. The long-term impacts of the loss of areas of semi-natural Ancient Woodlands are difficult to mitigate fully as the replacement woodland will not be of a sufficient age to be classified as either semi-natural or Ancient Woodland. However, as the areas of Ancient Woodland within this LCA (particularly to the south) are quite large and given the new established woodland will contribute to the local distinctiveness of this LCA, the overall impact of the proposed Scheme on the Alvie Estate and Extensive Coniferous Woodland LCA the significance of effect will be reduced from **moderate adverse to slight adverse**.

Table 8.5 Residual Landscape Character Impacts (Design Year 15) – Summary Table

LCA	Sensitivity	Magnitude	Significance of Effect
LC1 Dunacthon Estate and Broadleaved Woodland	High	Low	Slight adverse
LC2 Kincaig Village and Pastoral Farm Land	Medium	Negligible	Neutral
LC3 Alvie Estate & Extensive Coniferous Woodland	High	Low	Slight adverse

Residual Visual Amenity Impacts

- 8.9.8. As with landscape character, the proposed Scheme combined with the mitigation measures will limit the wider visual impacts. Refer to the Landscape Mitigation Figures 8.14-8.21 in Volume 2 of this ES, for landscape mitigation proposals.
- 8.9.9. Existing intervening topography, built form and vegetation that screens views of the proposed Scheme at Year 1 will continue to screen views for the following visual amenity receptors at Design Year 15: Cairngorms Christian Centre (visual amenity receptor E4), No. 2 Suide Crescent (visual amenity receptor E8), No. 11 & 12 Suide Crescent (visual amenity receptor E9) and Loch Cottage (visual amenity receptor W4). Visual amenity effects for these receptors will remain **neutral**.

- 8.9.10. By Design Year 15 the reinstated vegetation on the new/re-profiled embankments will have established which will result in better visual integration of the dual carriageway into the wider landscape. This will affect the following visual amenity receptors; Craigmont (Visual amenity receptor E1), Suie Hotel (visual amenity receptor E2), Birchfield Cottage & House (visual amenity receptor E3), Manse (visual amenity receptor E5), Telephone Exchange (visual amenity receptor E6), Properties No. 1-6 The Knoll (visual amenity receptor E7), No.14 and 15 Suidhe Crescent (visual amenity receptors No.E10), No. 1,2 &3 Baldow Park (visual amenity receptors E11), No. 4-7 Baldow Park (visual amenity receptors E12), No. 25-28 Baldow Park (visual amenity receptors E13), Alvie School (visual amenity receptor E14), Easter/Wester Dalraddy Cottage (visual amenity receptor E15) and along the B9152 (visual amenity receptor E16). Views will continue to be obtained of vehicles travelling on the A9 from some of these receptors; however by Design Year 15 they will be less of a prominent feature and restored to their original level of intrusion. Visual amenity effects will be restored to **neutral**.
- 8.9.11. To the west, views of the proposed Scheme will be fully mitigated by established reinstated vegetation for General Wades Military Road (at Dunachton Lodge) (visual amenity receptor W1), Leault Farm (visual amenity receptor W2) and Kinraig House (visual amenity receptor W3), Kinraig Farm (visual amenity receptor W5), Mid Delfour (visual amenity receptor W6), Ring Carn (visual amenity receptor W7), New East Delfour (visual amenity receptor W8) and East Delfour Farm (visual amenity receptor W9) Visual amenity effects will be restored to **neutral**. Views of vehicles travelling on A9 prior to the improvements and following their implementation will be restored to their original level of intrusion.

8.10. Conclusions

- 8.10.1. The study area lies within the Cairngorms National Park and consists of a broad open strath flanked by gently undulating hills leading to the Monadhliaths in the west and the Cairngorms massif in the east. The area contains Loch Insh and Loch Alvie and comprises improved pastures enclosed by small scale coniferous plantations, mixed and broadleaved woodlands and stands of native pinewoods.
- 8.10.2. Three detailed LCAs have been identified within the study area. The Dunachton Estate and Broadleaved Woodland LCA and the Alvie Estate & Extensive Coniferous Woodland LCA have a very attractive quality and high sensitivity to change due to their attractive constituent components. The Kinraig Village and Pastoral Farmland LCA has attractive 'parkland' views to the west, is more residential in nature and has a good landscape quality and medium sensitivity to change.
- 8.10.3. The existing A9 runs through the centre of the study area and already impacts on the area's landscape character. The influence of the A9 and its associated negative impacts have been limited and restricted by the surrounding topography and abundance of existing woodland.
- 8.10.4. The key issues relating to the proposed Scheme, from a landscape and visual amenity perspective have been listed in Section 8.3. In terms of landscape character impacts, the proposed Scheme does not deviate significantly from the existing alignment and therefore impacts are contained and restricted within the immediate vicinity of the road corridor. The improvement works will require re-profiling of existing slopes, formation of new embankments on both sides of the existing road corridor and creation of new underpasses. This will result in the permanent removal of some existing woodland and Ancient Woodland.
- 8.10.5. The proposed Scheme has been developed to avoid, retain and protect existing landscape features and elements. Mitigation measures will include the reinstatement of roadside meadow and acid grassland areas, planting of native species woodland and scrub mixes to mitigate for losses of woodland and earth works adjacent to the road. The proposed mitigation measures will compliment the character of the overall area and reduce the wider direct and indirect landscape effects of the proposed Scheme.

- 8.10.6. The proposed Scheme incorporating the implementation of mitigation measures will cause slight adverse impacts on the Kincaig Village & Pastoral Farmland LCA at Opening Year. However, mitigation measures will reduce impacts to neutral by Design Year 15.
- 8.10.7. Moderate adverse impacts caused to the Alvie Estate & Extensive Coniferous Woodland LCA and Dunachtonmore Estate and Extensive Broadleaved Woodland LCA at Opening Year will be reduced to slight adverse by Design Year 15. It will not be possible to fully mitigate direct impacts associated with the loss of areas of Ancient Woodland by this time. Visual amenity receptors consist of a number of properties located in close proximity to the west of the A9 at Kincaig such Alvie School. In addition a number of isolated rural cottages are scattered among pastoral grassland areas to the east and west of the A9 and properties within the Alvie Estate. Receptors within the study area include historic and listed properties. The existing landform and woodland vegetation limits and screens views of the A9 from a number of these receptors.
- 8.10.8. By Design Year 15, adverse visual amenity impacts will be reduced to neutral for all of the visual amenity receptors.

9. Land Use

- 9.1. Introduction
- 9.2. Relationship to Current A9 Work
- 9.3. Methodology
- 9.4. Baseline Conditions
- 9.5. Consultation
- 9.6. Impacts (Opening Year) Without Mitigation
- 9.7. Mitigation Measures
- 9.8. Impacts (Design Year 15)
- 9.9. Conclusions



9. Land Use

9.1. Introduction

- 9.1.1. This Stage 3 assessment follows the DMRB guidelines contained in Volume 11, Section 3, Part 6 and considers the impacts of the proposed Scheme for the operational phase following the construction of the final scheme. This Chapter does not consider the construction impacts associated with the proposed Scheme. These can be found in Chapter 6 Disruption due to Construction. The effects associated with the proposed Scheme are assessed, with and without, recommended mitigation measures being implemented. As the DMRB guidelines for assessment of Land Use do not contain a defined scale for reporting impacts, the terminology used by STAG has been applied.
- 9.1.2. The study area for this assessment is a rectangle of approximately 1 kilometre by 8 kilometres, bisected by the A9. The study area extends 500 metres on either side of the A9, to the east and west but also considers the wider land use associated with Dunachton Estate and Alvie and Dalraddy Estates.
- 9.1.3. The land on either side of the A9 is owned by the Dunachton Estate south west of Baldow Smiddy and Alvie and Dalraddy Estates to the northeast. Refer to Figure 9.1 Landownership and proposed Scheme features in Volume 2 of this ES. Land within the existing road boundary is owned by Scottish Ministers.
- 9.1.4. 3.1 hectares of land were purchased by Scottish Ministers in 2009 for the previous WS2+1 scheme. The proposed Scheme will require a further 13.4 hectares of land to be acquired. However, as the land purchased by the Scottish Ministers in 2009 is still in use by the original landowners, for the purposes of this assessment the total land (16.5 hectares) out with the existing road boundary is considered to be affected by the proposed Scheme.
- 9.1.5. Land use immediately adjacent to the route corridor consists of pasture, commercial forestry, and woodland.
- 9.1.6. Alvie and Dalraddy Estates also have land uses which include equestrian stables, trout fisheries, fish hatchery, garden nursery, field sports, quad biking, holiday accommodation/caravan park and quarries that are accessed from the A9 and the B9152 side road via existing underpasses and direct trunk road accesses.
- 9.1.7. Dunachton Estate has land uses including farms, traditional field sports and holiday accommodation. Meadowside Quarry and Highland Wildlife Park are also located within Dunachton Estate and are accessed via the B9152 and underpass immediately to the south of the proposed Scheme.

9.2. Relationship to Current A9 Work

A9 Dualling Strategic Environmental Assessment

- 9.2.1. The SEA Environmental Report for the A9 dualling published in June 2013 provides a Policies, Plans and Strategies (PPS) Review. This recognises that A9 dualling effects must be carefully and sensitively managed through the construction phases and the following assessment takes cognisance of the wider A9 SEA. Additionally this Chapter has taken into consideration the responses from the relevant consultees and affected landowners. It is noted that there is little guidance in relation to Land Use identified within the SEA Environmental Report.

Key Issues

- 9.2.2. The Scottish Government's current policy on the protection of prime agricultural land is set out in Scottish Planning Policy. This identifies that development on prime agricultural land should not be permitted unless it is an essential component of the settlement strategy or is necessary to meet an established need, for example for major infrastructure development, where no other suitable site is available. Around Kincaig and in the immediate area surrounding the proposed Scheme, there is no prime agricultural land therefore the above guidelines for its protection are not applicable in this assessment.
- 9.2.3. The main commercial land use issues relate to the impact of the proposed Scheme on the management of the traditional highland estates bordering the A9, particularly with regard to land take and access for all businesses and commercial interests located within the working estates.
- 9.2.4. Other land use interests relate to the River Spey Insh Marshes SSSI and woodlands included within the Ancient Woodlands Inventory (AWI). Impacts on these are reported in Chapter 7, Ecology and Nature Conservation and Chapter 8 Landscape and Visual Effects.

9.3. Methodology

9.3.1. With relevance to the assessment of the proposed Scheme, DMRB considers:

- Demolition of Private Property;
- Loss of Land used by the Community;
- Effects on Development Land; and
- Effects on Agricultural Land.

9.3.2. This assessment is based on several site visits made in the latter part of 2012 to examine land uses and management issues as well as consultation with the owners/managers of Dunachton Estate, and Alvie and Dalraddy Estates since 2004 and more recently in 2012/13.

9.3.3. The DMRB does not have a defined scale of impacts on land use and therefore the STAG terminology has been adopted for this assessment outlined in Table 9.1 below, specifically in relation to the Dunachton Estate and Alvie and Dalraddy Estates.

Table 9.1 Scale of Impacts

Neutral	The estate will experience only very minor disruption, or a decrease in land area and/or potential profitability of less than 1%. Simple adjustments to the management regime will normally restore income levels.
Negative minor	Land loss or disruption to the estate will affect the land area and/or the potential profitability of the holding by 1% - 5%.
Negative moderate	Land loss or disruption to the estate will affect the land area and/or potential profitability of the holding by 5 -10%.
Negative major	There will be severe disruption to agricultural and sporting interests and the way the estate is managed. Land area and/or profitability will be reduced by more than 10%.

9.3.4. As suggested in the DMRB, reference was made to the Macaulay Land Use Research Institutes' classification of Land Capability for Agriculture (LCA) land classification system, which is now administered by the James Hutton Institution. The LCA is a seven class system with four of the classes further sub-divided into divisions. Class 1 represents land that has the highest potential flexibility of use whereas Class 7 land is of very limited agricultural value.

9.3.5. SNH and Landmark Information Group's Envirocheck Report⁹⁰ provided information on designated sites. The Highland Structure Plan (2001) and Cairngorms National Park Local Plan (2010) were used to identify existing and proposed land use.

9.3.6. The Kincaig and Insh section of the Cairngorms National Park Local Plan shows that most of the study area is covered by General Policy 2, which aims to promote sustainable use of natural, social and cultural resources in the context of a thriving local economy. Land around Kincaig, south of the A9, is designated under Environmental Policy 2, aimed at creating a buffer zone around planned new housing.

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http://www.envirocheck.co.uk/images/uploads/Envirocheck_User_Guide-ONLINE.PDF

9.4. Baseline Conditions

Commercial Land Use

- 9.4.1. Dunachton Estate is a large highland rural enterprise lying on both sides of the A9, having a mixture of forestry, agricultural, holiday accommodation and field sport interests. Land alongside the A9 is a mixture of coniferous and deciduous woodland to the west of Cardingmill Cottages and improved pasture to the east. The pasture is part of Leault Farm, which is tenanted. The Estate is served by direct access from the existing trunk road and by underpasses at Dunachton Burn and Baldow Smiddy, which connect with the B9152. The existing Baldow Smiddy Underpass is small in relation to the needs of modern estate traffic.
- 9.4.2. Alvie and Dalraddy Estates also have land on both sides of the A9 and are managed as one unit. It is a diversified enterprise with pasture, commercial forestry, quarrying, equestrian stables, garden nursery, holiday accommodation and field sports. Alvie House also operates as a fully catered events venue for groups with sleeping accommodations for paying visitors/parties. The Estate is served by direct access from the existing trunk road and via an underpass at Lower Milehead from the B9152. This underpass is small in relation to the vehicular needs of modern estate traffic.
- 9.4.3. The vegetation cover of these estates is described in more detail in Chapters 7 and 8 of this ES.

Soils and Land Classification

- 9.4.4. DMRB notes that there are four main areas, which need to be covered in any assessment of effects on agricultural land. These are as follows:
- land-take;
 - type of husbandry;
 - severance; and
 - major accommodation works for access, water supply and drainage.
- 9.4.5. DMRB also notes that any impacts on farmers as residents or business people additional to those listed above should be assessed following the methods used to assess effects on other residents or businesses affected by a scheme.
- 9.4.6. Soils within the study area are developed in hummocky fluvio-glacial deposits of sand and gravel with some peat. Most soils are thin and very stony, but deeper soils between Cardingmill Cottages and Baldow Smiddy and around Dalraddy have been improved to permanent pasture.
- 9.4.7. As part of the SEA commission, information has been provided by the James Hutton Institute on Land Capability for Agriculture (LCA). Most of the land associated with both Dunachton Estate and Alvie and Dalraddy Estates is Grade 6 (land capable of use as rough grazing). Such land within the study area is mostly under forestry and woodland. There are also some areas in the wider estates of Grade 5.1 to 5.3 (improved grassland) between Baldow Smiddy and Alvie House.
- 9.4.8. Within the study area, associated with Dunachton Estate, the improved pasture between Dunachton Lodge and Baldow Smiddy is Grade 4 (land capable of producing a narrow range of crops).
- 9.4.9. Within the study area and associated with Alvie and Dalraddy Estates, the land around Dalraddy Steading is Grade 3.2 (land capable of producing a moderate range of crops including barley, oats and forage crops). Through the remainder of the study area within these estates, the land immediately adjacent to the A9 is predominantly forestry or woodland within Grade 3.1 to 4.2 (mixed agriculture) land.

- 9.4.10. No land in the study area is classified as prime agricultural land (Grade 1 to 3.1).
- 9.4.11. Dunachton Estate, including Dunachton farm, accommodates livestock including sheep, cattle and horses. A sheepdogs trials and demonstration business is located at Leault Farm within Dunachton Estate. The total area of land covered by this estate is in excess of 4050 hectares.
- 9.4.12. Both Dunachton Estate and Alvie and Dalraddy Estates are severed by the existing A9 trunk road. The existing accesses onto and across the A9 are a legacy of this. The estates are currently served by a network of access tracks and roads connecting to existing underpass locations and at grade accesses. The total area of land covered by these estates is approximately 5260 hectares.

Designated Sites

- 9.4.13. Designated sites form a significant part of the land use within the route corridor and impacts to these are covered in more detail in Chapters 7 and 8 of this ES. No agricultural Environmentally Sensitive Areas have been identified in the study area.
- 9.4.14. The River Spey Insh Marshes SSSI, which is also a SAC, SPA and Ramsar site, is 500 metres from the proposed works and is not directly impacted by the proposed Scheme extents. The risk of potential contaminants entering burns and channels discharging into this site is addressed in Chapters 7 and 8 of this ES.
- 9.4.15. The A9 runs through or adjacent to areas of woodland that appear in the AWI as semi-natural woodland. There will be some loss of this habitat to the proposed Scheme, as described in Chapter 7 and Chapter 8.

Effects on Development Land

- 9.4.16. From a search of The Highland Council website, there are no relevant planning applications that would be directly affected by the proposed Scheme. Any current applications are outwith the proposed Scheme extents and immediate surroundings and are therefore not considered applicable.
- 9.4.17. The proposed Allt Duine windfarm is awaiting planning consent, as noted in Chapter 3 and therefore does not form part of this assessment.

9.5.

Consultation

- 9.5.1. Meetings were held at Kincaig Community Hall with the Kincaig and Vicinity Community Council and affected landowners on the 8th August 2012, 6th November 2012 and 6th September 2013 to discuss the proposed Scheme. Those in attendance included a representative of the Community Council, representatives from both Alvie and Dalraddy and Dunachton Estates, as well as representatives from Atkins and Transport Scotland.
- 9.5.2. In addition to public exhibitions held along the A9 route in December 2012 and June 2013, a public meeting arranged through the Kincaig and Vicinity Community Council was held in Kincaig Hall on 2nd September 2013.

9.6.

Impacts (Opening Year) Without Mitigation

- 9.6.1. The proposed Scheme involves on-line widening of the corridor of the existing A9. No private properties will be demolished, there will be no loss of land used by the community and no loss of development land as a result of the proposed Scheme.
- 9.6.2. Land take for the proposed Scheme may disrupt field drainage systems and these will be restored and/or intercepted as necessary to mitigate any impacts. Without mitigation the impacts would be negative major.
- 9.6.3. The main impacts of the proposed Scheme relate to access to both estates as some existing direct accesses to the A9 will be closed. Without mitigation in the form of rationalised access, upgraded accommodation works tracks and new upgraded underpasses, in the longer term, the impact on both estates would be negative major. The severance already caused by the existing A9 would be significantly increased by unmitigated loss of direct access to the trunk road, predominantly as a result of the restricted headroom of existing underpasses.
- 9.6.4. Existing stockproof and deer fencing will also be removed by the proposed Scheme. Removal of existing road boundary fencing, without immediate replacement, would allow livestock to stray onto the A9, resulting in a negative major impact on agricultural operations.
- 9.6.5. The proposed Scheme will require land take outwith the existing road boundary, principally for the widening of the route corridor as well as the provision of alternative accesses. Dunachton Estate will lose use of 5.6 hectares and Alvie and Dalraddy Estates will lose 10.9 hectares; for the proposed Scheme as a whole. The above figures include those areas of land that were vested for the WS2+1 scheme by Scottish Ministers in 2009, but to date not used by Scottish Ministers and continue to be operated by the Estates. The following total areas of land will be lost as a result of the proposed Scheme:
- Grade 3.2 to 4.2 Mixed Agriculture – 10.5 hectares
 - Grade 5.1 to 5.3 Improved Grassland – 4.2 hectares
 - Grade 6.1 to 7 Rough Grazing – 1.8 hectares
- 9.6.6. Overall the loss of land will have a negative minor impact.
- 9.6.7. Commercial timber trees will be taken from Alvie and Dalraddy Estates, which will have a minor negative impact on the forestry enterprise.
- 9.6.8. The area at Leault Farm currently used for Sheep dog trials will be unaffected by the proposed Scheme, however direct access from the A9 will be altered. Unmitigated the impacts specifically for this business would be negative major.

9.7. Mitigation Measures

- 9.7.1. The construction contract will ensure that accommodation works and new, upgraded or temporary access is programmed to minimise the impacts on vehicle movements associated with Estate operations. A minor negative impact will be mitigated through appropriate consultation.
- 9.7.2. New and upgraded access arrangements are proposed to provide adequate alternatives to existing accesses that will be closed by the proposed Scheme. It is proposed that the existing network of estate access tracks will be improved as part of the proposed Scheme, through agreement with the affected landowners, as accommodation works and include:
- Left in / left out access at Leault Farm (Northbound);
 - Enlarging Dunachton Burn Underpass with localised realignment works to the associated access track;
 - Enlarging Baldow Smiddy Underpass with minor realignment works to the access track;
 - Upgrading and improving accesses connecting underpass and access locations within Dunachton Estate;
 - Enlarging the Lower Milehead underpass with localised realignment works to the associated access track;
 - Left in / left out access at Delfour (Northbound); Enlarging Allt An Fhearna Underpass with localised realignment works to the associated access track; and
 - Upgrading and improving accesses connecting underpass and access locations within Alvie and Dalraddy estates.
- 9.7.3. The details for upgrading or new connecting accesses are to be agreed with landowners as a compensation / accommodation works package.
- 9.7.4. Damage to field drains will be made good, with diversion where necessary. The proposed roadside drainage systems will prevent run-off onto adjacent estate land.
- 9.7.5. Stockproof and deer fencing will be provided where required by landowners and in consultation with SNH and the CNPA on the new road boundary, before the existing fencing is removed.
- 9.7.6. The impact of land take cannot be mitigated, as there is no compensatory land within the existing road boundary to return to agriculture or forestry use. However, in the context of the large size of the two affected estates, the land take for Dunachton Estate is 0.14% of the total estate area and land take for Alvie and Dalraddy Estates is 0.21% of the total estates area. Appropriate compensation for the loss of timber trees will also be agreed.

9.8. Impacts (Design Year 15)

9.8.1. New access arrangements, repairs to field drains and the replacement of the stockproof and deer fencing along the highway boundary mean that the impact of the proposed Scheme in Design Year 15 will be neutral. The impacts and mitigation are summarised in Table 9.2 below.

Table 9.2 Main Impacts and Mitigation Measures for the Preferred Option

Nature of Impact	Impact without mitigation	Proposed mitigation	Impact with mitigation
Disruption of access to estates	Negative major	Provision of alternative accesses	Negative Minor
Removal of stock and deer proof highway boundary fencing	Negative major	Provision of fencing along new boundary before existing fencing removed	Neutral
Damage to field drains	Negative minor	Repair or divert	Neutral
Loss of timber trees	Negative minor	Compensation	Neutral
Loss of land	Negative minor	Compensation	Negative Minor (Dunachton Estate) Neutral (Alvie and Dalraddy Estates)

9.9. Conclusions

9.9.1 The proposed Scheme does not involve the loss of any prime land and total land take, including that acquired in 2009, is very small in relation to the overall size of the two affected estates. With mitigation the impacts will be neutral both in opening year and in Design Year 15.



10. Traffic noise and Vibration

- 10.1. Introduction
- 10.2. A9 Dualling Strategic Environmental Assessment
- 10.3. Key Issues
- 10.4. Methodology
- 10.5. Baseline Conditions
- 10.6. Consultation
- 10.7. Impacts (Opening Year 1) Without Mitigation
- 10.8. Impacts (Design Year 15)
- 10.9. Mitigation Measures
- 10.10. Noise Nuisance Calculations
- 10.11. Conclusions



10. Traffic noise and Vibration

10.1. Introduction

- 10.1.1. This Chapter presents the results of the Stage 3 assessment of road traffic noise and vibration and describes the mitigation measures that have been proposed to avoid or reduce the impacts of the proposed Scheme.
- 10.1.2. Assessments of temporary noise and vibration impacts due to construction are summarised in Chapter 6 Disruption Due to Construction based on assessments reported in Appendix 13 in Volume 3 of this ES.
- 10.1.3. The assessment has been carried out in accordance with the detailed assessment methodology set out within the DMRB Volume 11, Section 3, Part 7 Noise and Vibration (HD213/11)⁹¹.
- 10.1.4. The objective of the assessment is to gain an appreciation of the noise and vibration climate with the proposed Scheme (Do-Something) and without the proposed Scheme (Do-Minimum) in the baseline (2017) and a future assessment year (2032), 15 years after opening. Noise level predictions have been produced based upon road alignment drawings and detailed traffic modelling for each of these scenarios

10.2. A9 Dualling Strategic Environmental Assessment

- 10.2.1. The proposed Scheme is subject to Strategic Environmental Assessment (SEA). In relation to noise and vibration, the SEA Scoping Report⁹² set out that the SEA assessment will need to assess whether the proposed option will significantly increase transport related noise and vibration effects when compared with the 'business as usual' (BAU) case. This is identical to the DMRB methodology, which assesses the significance of noise changes with the proposed Scheme and those that would result from the Do-Minimum situation and hence the assessment presented here meets the emerging requirements of the SEA. Within the published A9 Dualling SEA Environmental Report (June 2013), this approach has now been accepted, with the section on 'Population and Human Health' recognising noise as an important issue requiring more detailed assessments at the local level.
- 10.2.2. Definitions of acoustic terminology used in this chapter can be found in Appendix 12 of Volume 3 of this ES.

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Design Manual for Roads and Bridges Volume 11, Section 3, Part 7 (HD213/11), November 2011.
Halcrow. (2013). A9 Dualling Programme. Strategic Environmental Assessment (SEA) Scoping Report.

10.3. Key Issues

Noise

- 10.3.1. Traffic noise is a major source of noise affecting people in many situations; including in their homes, both during the daytime and during the night-time. There is a growing body of evidence to link health effects with prolonged exposure to high noise levels; although further research is required in this area^{93, 94}.
- 10.3.2. Noise changes may result from changes in:
- Road alignment (vertical and horizontal);
 - Sound generation (traffic flow, speed, composition and road surface type); and
 - Sound propagation (distance, ground topography, ground absorption, screening and reflection).
- 10.3.3. The index adopted in the UK for assessing road traffic noise during the daytime is the dB L_{A10,18h} level, defined as the arithmetic mean of the dB(A) noise levels exceeded for 10% of the time in each of the 18, one-hour periods between 6 a.m. and midnight on a typical weekday.
- 10.3.4. The magnitude of a noise change is perceived differently dependent on whether it is a sudden change, or a change over a longer period of time. In the short term (e.g. on scheme opening – Year 1) a change in road traffic noise of 1dB L_{A10,18h} is the smallest that is considered perceptible. In the long term (typically 15 years after project opening), a 3 dB L_{A10,18h} change is considered perceptible. The classification of magnitude of impacts to be used for traffic noise is shown in Tables 3.1 and 3.2 of DMRB 11:3:7 and is reproduced in Table 10.1 (short term) and Table 10.2 (long term) below.

Table 10.1 Classification of Magnitude of Noise Impacts in the Short Term

Noise Change dB _{LA10,18h}	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 - 2.9	Minor
3 – 4.9	Moderate
5+	Major

DMRB 11:3:7 Table 3.1

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World Health Organisation (2000). Guidelines for Community Noise.
World Health Organisation (2009). Night Noise Guidelines for Europe.

Table 10.2 Classification of Magnitude of Noise Impacts in the Long Term

Noise Change dB _{LA10,18h}	Magnitude of Impact
0	No change
0.1 – 2.9	Negligible
3 - 4.9	Minor
5 – 9.9	Moderate
10+	Major

DMRB 11:3:7 Table 3.2

Night Noise

10.3.5

The World Health Organisation's (WHO) Night Noise Guidelines for Europe published in 2009 sets out a recommended Night Noise Guideline (NNG) to protect the public, including most vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise. It also provides an Interim Target (IT) for situations where the achievement of the NNG is not feasible in the short term. The two target noise levels are set out below in Table 10.3.

Table 10.3 WHO recommended night noise guidelines values

Target	L _{night,outside} dB ¹
Interim Target (IT)	55
Night Noise Guideline (NNG)	40

1) The A-weighted long-term average free-field sound level as defined in ISO 1996-2:1987, determined over all the night periods of a year; in which: the night is eight hours (usually 23:00 – 07:00 hours).

Vibration

10.3.6.

Traffic vibration can either be ground-borne or airborne. Ground-borne vibration arising from the interaction between vehicles' wheels and the road surface can be perceptible in nearby buildings if heavy vehicles pass over irregularities in the road. Extensive research on a wide range of buildings of various ages and types has found no evidence to indicate that traffic induced vibrations are a source of significant damage to buildings⁹⁵. As significant ground-borne vibrations are only likely to be generated where there are irregularities in the road surface, this is not generally an important consideration for new roads.

10.3.7.

Airborne vibration can be produced by low frequency sound emitted by vehicle engines and exhausts and can occur to some extent along any type of road. Airborne vibration may result in detectable vibrations in building elements (e.g. windows and doors). The disturbance produced by airborne vibration is closely linked to traffic noise levels and can therefore be assessed based on noise predictions.

Key Legislation

- 10.3.8. A key piece of legislation relating noise and the operation of new or improved roads in Scotland is the Noise Insulation (Scotland) Regulations⁹⁶ (the Regulations). A summary of the Regulations is presented below.
- 10.3.9. Under the circumstances specified in The Noise Insulation (Scotland) Regulations 1975 and the Memorandum of Advice and Instruction (Noise Insulation (Scotland) Regulations 1975), the relevant authority (highway authority) has a duty under the Regulations to offer insulation for residential properties with respect to a new road, or a road for which a new carriageway is proposed; and discretionary powers in relation to otherwise altered roads, where the following conditions are met:
- The use of any road causes, or is expected to cause, noise at a level not less than 68 dB $L_{A10,18h}$ at a position 1 metre in front of a qualifying facade; and
 - If the $L_{A10,18h}$ noise level resulting from the use of a new or altered road, calculated in accordance with the method given in the Memorandum of Advice and Instruction, is greater than the pre-construction noise level by at least 1 dB(A).
- 10.3.10. The authority also has discretionary power to offer insulation against construction noise.
- 10.3.11. Some residential buildings are not eligible under the Regulations. These include any buildings liable to be acquired compulsorily or subject to a demolition order under various of the Housing (Scotland) Acts⁹⁷, and buildings first occupied after the "relevant date", this being the date a new road was first opened to public traffic or an altered road was opened following completion of the alteration. The Regulations apply to habitable rooms and so exclude bathrooms, toilets, halls and smaller kitchens that do not include dining areas. Furthermore, the following conditions are set out within the Memorandum of Advice and Instruction for testing the eligibility of a building, which shall not be:
- More than 300 metres from the nearest point on the carriageway of the new or altered road; or
 - Positioned such that there is no point on it from which a straight line can be drawn to a point on the new or altered road without passing through another building; or
 - Positioned such that it lies outside the triangular area at the terminal point of a new or altered road, the apexes of which are 50 metres along the centre line of the existing road from the terminal points and the bases of which extend from points 300 metres on either side of the road to the nearest point on the carriageway at right angles to the centre line of the carriageway.

10.4. Methodology

- 10.4.1. DMRB 11:3:7 sets out threshold criteria, which where it is possible that they will be met or exceeded, trigger the requirement for a detailed traffic noise assessment. The threshold criteria are as follows:
- Change in daytime traffic noise impacts in the short term of 1 dB $L_{A10,18h}$ (Opening Year 1);
 - Change in daytime traffic noise impacts in the long term of 3 dB $L_{A10,18h}$ (typically 15 years after project opening); and
 - Change in night-time traffic noise impacts of 3 dB $L_{night,outside}$ in the long term where the $L_{night,outside}$ is predicted to be greater than 55 dB $L_{night,outside}$ in any scenario.

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Statutory Instrument, 1975, No. 460 (S.60). The Noise Insulation (Scotland) Regulations 1975.
http://www.legislation.gov.uk/ssi/2013/7/pdfs/ssi_20130007_en.pdf

- 10.4.2. The addition of a new carriageway on the existing A9 together with increased traffic speeds has the potential to give rise to increases in noise above the threshold criteria and therefore a detailed level assessment has been undertaken.

Study Area

- 10.4.3. DMRB 11:3:7 defines the total study area as being that which is within 1 kilometre of any new, improved, or any existing routes which are being bypassed between the start and end points of the physical works relating to the proposed Scheme. Within this 1 kilometre boundary, noise predictions are required within 600 metres of the carriageway edges of the identified routes and within 600 metres of any other affected routes within the 1 kilometre boundary (this is termed 'the calculation area'). An affected route is one where the threshold criteria are likely to be exceeded. Any routes outside of the 1 kilometre boundary that are likely to experience increases above the threshold criteria also need to be identified and a 50 metre boundary from the carriageway edge defined for these routes.
- 10.4.4. An examination of the traffic data produced for the traffic assessment showed that no routes beyond the proposed Scheme extents were likely to experience noise changes in excess of the threshold criteria and therefore the calculation area has been defined as that within 600 metres of the proposed Scheme carriageway edges.
- 10.4.5. A qualitative assessment of any possible noise impacts is required for sensitive receptors that are within 1 kilometre of the proposed Scheme but not within 600 metres of an affected route. For the purposes of this assessment, indicative noise predictions have been made for a selection of sensitive receptors that fall in this category.

Detailed Assessment Methodology

- 10.4.6. In terms of road traffic noise, a methodology has not yet been developed to assign a significance according to both the value of a resource and the magnitude of an impact; however, DMRB states that the magnitude of traffic noise impact should be classified into the levels of impact as set out in Tables 10.1 and 10.2 in Section 10.3.
- 10.4.7. DMRB requires that noise predictions are made for all identified sensitive receptors within the calculation area for the following scenarios:
- Do-Minimum scenario in the baseline year;
 - Do-Minimum scenario in the future assessment (15th) year;
 - Do-Something scenario in the baseline year (Opening Year 1); and
 - Do-Something scenario in the future assessment year (Design Year 15).
- 10.4.8. The terms Do-Minimum and Do-Something refer to the situation without the proposed Scheme in operation and with the proposed Scheme in operation respectively.
- 10.4.9. Comparisons between these scenarios should be made as follows:
- v. Do-Minimum scenario in the baseline year against Do-Minimum scenario in the future assessment year (long term Do-Minimum);
 - vi. Do-Minimum scenario in the baseline year against Do-Something scenario in the baseline year (short term scheme impacts); and
 - vii. Do-Minimum scenario in the baseline year against Do-Something scenario in the future assessment year (long term scheme impacts).
- 10.4.10. A comparison for long term night-time noise impacts should also be made where the threshold criteria are met.

- 10.4.11. The least beneficial change (i.e. smallest decrease or largest increase) should be reported for each sensitive receptor.
- 10.4.12. The results of the assessment at the sensitive receptors should be classified into noise change categories following the impact magnitude scales as presented in Table 10.1 and Table 10.2 for short term and long term impacts respectively. The resulting changes in noise level in the short term and the long term should also be represented graphically for all sensitive receptors in the study area.
- 10.4.13. A noise nuisance impact assessment should be undertaken for all dwellings in the study area taking into account the guidance in Annex 6 of DMRB 11:3:7. The increases or decreases in the number of people bothered by noise should be tabulated in <10 percentage points, 10<20 percentage points, 20<30 percentage points, 30<40 percentage points, or >40 percentage points. All calculations should be based on the highest nuisance levels expected during the first 15 years after opening. When the proposed Scheme will cause noise increases, this will normally be the nuisance level experienced soon after opening. For noise decreases and the Do-minimum situation, the highest nuisance experienced during the first 15 years after opening will normally be that in the 15th year.
- 10.4.14. Where there are unscreened buildings within 40 metres of an existing or proposed route option, an estimation of the degree of traffic induced airborne vibration should also be made. In the rare circumstances where ground-borne vibration on existing routes is likely to be a problem, this should also be assessed.
- 10.4.15. For sensitive receptors that are within 1 kilometre of the proposed Scheme but not within 600 metres of an affected route, a qualitative assessment of any possible noise impacts should be undertaken

Calculation of Road Traffic Noise

- 10.4.16. Road traffic noise levels have been predicted using the method detailed in the DOT/Welsh Office memorandum Calculation of Road Traffic Noise 1988 (CRTN)⁹⁸. The predictive algorithms contained in CRTN were developed from extensive measurement data, validated out to distances of about 300 metres (DMRB Annex 4 approves the use of the CRTN calculation procedure for distances up to 600 metres from the road).
- 10.4.17. The CRTN method of predicting noise from a road consists of five main stages:
- Division of the road scheme into a number of segments;
 - Calculation of the basic noise level (BNL), at a reference distance of 10 metres away from the nearside carriageway edge, for each road segment;
 - Assessment, for each segment, of the noise level at the reception point taking into account distance, ground attenuation and screening;
 - Correction of the noise level at the reception point to take into account site layout features including reflections from buildings and facades, and the size of the source segments; and
 - Combination of the contributions from all segments within view to give the predicted noise levels at the reception point for all roads.
- 10.4.18. The calculation procedure of CRTN has been implemented for this assessment by the use of Noisemap Five Environmental noise modelling software, which calculates fully in accordance with the methodology of CRTN.

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Department of Transport and Welsh Office (1988). Calculation of Road Traffic Noise. HMSO.

10.4.19

The software builds a three dimensional model of features which may affect the generation and propagation of noise. These features have been captured from the following data sources:

- Ordnance Survey Mastermap® data to define the alignments of existing roads and locations of houses and other structures; and
- Three-dimensional topographical survey data provided by Atkins Highways and Transportation for details of cuttings, embankments and existing and proposed road heights.

10.4.20.

Other inputs into the programme also include:

- Type of intervening ground between each road segment and each receiver;
- 18 hour annual average weekday traffic flow (AAWT);
- Percentage of heavy duty vehicles (HDV);
- Annual average speed; and
- Nature of the road surface.

10.4.21

Traffic data was supplied by Atkins Highways and Transportation (as shown in Appendix 2 of Volume 3 of this ES) and is summarised in Table 10.4 for the A9 and Table 10.5 for other affected routes. The HGV percentage for the A9 is approximately 25% with and without the proposed Scheme and approximately 7% on the B9152. The traffic flows are referenced to the road link numbers taken from Network Evaluation from Survey and Assignment (NESA) computer model used for the traffic assessment.

Table 10.4 Noise Assessment Traffic Data – A9

NESA link no	Opening Year Do Min		Design Year Do-Min		NESA link no	Opening Year Do-Some		Design Year Do-Some	
	Traffic Flow 18h AAWT	Average Speed km/h	Traffic Flow 18h AAWT	Average Speed km/h		Do-Some	Traffic Flow 18h AAWT	Average Speed km/h	Traffic Flow 18h AAWT
216-218	12234	84	14358	84	216-300	12187	84	14299	84
218-222	12187	78	14302	78	300-218	12187	90	14299	90
222-226	12561	84	14730	84	218-226	12184	90	14299	90
226-228	12561	84	14730	84	226-301	12184	90	14299	90
228-230	12561	78	14730	78	301-230	12184	75	14299	75

Table 10.5 Noise Assessment Traffic Data - Other Roads

NESA link no	Road	Opening Year Do-Min		Design Year Do-Min		Opening Year Do-Some		Design Year Do-Some	
		Traffic Flow 18h AAWT	Average Speed km/h	Traffic Flow 18h AAWT	Average Speed km/h	Traffic Flow 18h AAWT	Average Speed km/h	Traffic Flow 18h AAWT	Average Speed km/h
254 – 255	B9152	56	56	69	56	47	56	59	56
255 – 257	The Brae B9152 to B970	3210	47	3678	46	3210	47	3678	46
255 – 256	B9152	3154	54	3607	54	3164	54	3616	54
225 – 258	B9152	2780	54	3179	54	3157	54	3610	54
258 – 266	B9152	2780	74	3179	74	3157	74	3610	74

- 10.4.22. Road surfacing information for the existing situation was obtained by interrogating the Transport Scotland Pavement Management System (PMS). The majority of the existing route appears to have been resurfaced with a Thin Surface Course (TSC) between 2006 and 2010 although there are some areas of pavement, which are un-identified. A TSC is often termed a “low noise surface” and can be expected to produce lower noise levels than a concrete or traditional Hot Rolled Asphalt (HRA) road surface.
- 10.4.23. Guidance is given within Annex 4 of DMRB on the corrections to apply for TSC surfaces depending on the level of detail available. For this assessment, the maximum allowable correction of -3.5 dB(A) has been applied for speeds greater than 75 km/h. Below 75 km/h a standard -1 dB(A) correction has been applied.
- 10.4.24. The proposed Scheme road surface is also expected to be a TSC and the same noise reduction has been assumed in the absence of better information at the present time. In the situation where the existing surface currently performs less well than assumed; due to wear and tear or areas which are not TSC, this approach provides a moderate worst case for the scheme effects (i.e. the provision of a new TSC surface with the proposed Scheme would otherwise appear to have greater benefits when compared with the baseline situation).

10.5. Baseline Conditions

- 10.5.1. In accordance with DMRB 11:3:7, the baseline has been defined as the situation expected to exist just before the proposed Scheme opens. This is in the absence of any noise from construction operations and is currently assumed to be in 2017. The baseline conditions have been predicted based on detailed computer modelling as described in the previous section.
- 10.5.2. A noise assessment survey has also been undertaken to gather further information about the existing noise sources and levels in the area and to provide a comparison with predicted noise levels when taking into account current traffic flows. A noise survey is useful to pick up the non-road related noise sources, which are not taken into account in the noise modelling; such as aircraft, industrial/commercial and other human activities.
- 10.5.3. The study area is rural in nature with some small settlements and some isolated dwellings. In this case the impacts of potential noise changes are likely to be felt at larger distances than would be the case for an urban setting. This is due to there being less screening of distant properties from the road and fewer extraneous noise sources (i.e. other roads/industrial operations etc.) masking the noise from the main road.
- 10.5.4. Only one non-residential location, Alvie School, has been identified as being particularly sensitive to noise or vibration. The entire area is within the Cairngorms National Park and is considered as a sensitive receptor under the terms of DMRB. Parts of the River Spey and Insh Marshes SSSI, SAC and SPA are within 600 metres of the proposed Scheme.

Noise Survey

- 10.5.5. A noise survey was undertaken at a number of noise sensitive receptors in the study area between 25th March 2013 and 27th March 2013. Full details of the survey including weather conditions and instrumentation is shown in Appendix 14 of Volume 3 of this ES.
- 10.5.6. At one position close to the A9 in an unobstructed position, a noise logger was set up to log noise levels continuously throughout the period in 15 minute intervals. At 12 satellite locations, two 15 minute non-consecutive measurements were undertaken concurrently with the logger intervals. The average difference was then found between the satellite measured noise levels and the logger measurements for each position. This difference was then applied to the measured noise levels for the daytime construction hours (08:00 – 19:00; see Chapter 6 for more detail) and the CRTN daytime period (06:00 – 24:00). The resulting comparative L_{Aeq} and L_{A10} noise levels are shown below, as appropriate for each period, together with the short-term measured average L_{A90} and L_{Amax} noise levels at each measurement location.
- 10.5.7. The modelled receptor identification (ID) number is shown in brackets to enable the survey positions to be determined from Figure 10.1 (in Volume 2 of this ES).

Table 10.6 Summary of Measured Baseline Noise Levels

Location (Modelled Receptor ID shown in brackets)	Distance to A9 (m)	Noise Level dB(A)			
		$L_{Aeq,1}$ (08:00-19:00)	$L_{A10,18hr}^2$	Average $L_{A90,15min}^3$	Maximum L_{Amax}^4
1. Alvie School (68)	50	56.2	60.4	45.3	67.5
2. Hillview Cottage (49)	70	56.0	60.4	43.0	67.0
3. Loch Insh (179)	170	71.6	55.4	40.2	98.8
4. Highlands Wildlife Park (180)	200	46.4	47.7	35.9	67.9
5. Dunachton Lodge (137)	115	53.5	58.2	41.0	62.7
6. Upper Milehead (53)	75	55.0	59.4	42.6	74.6
7. Kincaig House (67)	400	50.7	55.2	38.9	60.6
8. Alvie House (58)	265	44.1	47.2	37.1	58.5
9. Wester Dalraddy Cottage (56)	245	47.3	50.3	41.5	70.0
10. Craigmount (1)	120	55.0	57.5	36.6	74.3
11. No. 1 MacBean Road (115)	190	57.9	62.7	42.8	75.0
12. Braeriach Road (146)	530	37.2	40.4	32.4	57.4

Notes: 1) Construction period daytime ambient derived from logger comparison; 2) CRTN 18hr noise level derived from logger comparison; 3) Average of short term measured LA90 noise levels; 4) Maximum of short term measured LAmax noise levels.

10.5.8. The survey position at Loch Insh was very close to the railway line and the ambient L_{Aeq} noise measurements were highly affected by train pass-bys. For most positions at Loch Insh, noise levels would be significantly lower than this.

10.6. Consultation

10.6.1. Consultation was undertaken with The Highland Council Environmental Health Officer in February and March 2013 to identify any noise issues or particular constraints within the study area. A copy of the written correspondence is in Appendix 1 of Volume 3 of this ES.

10.7. Impacts (Opening Year 1) Without Mitigation

- 10.7.1. Construction noise impacts are considered in Chapter 6 of this ES.
- 10.7.2. Predictions have been carried out for a total of 181 sensitive receptors within 600 metres of the proposed Scheme. Of these, 170 have been assumed to be residential and 11 have been assumed to be non-residential including two open areas; however, it is possible that some properties identified as residential are holiday lets or other commercial properties. Only one prediction point, at the closest location to the A9, has been used to represent Dalraddy Holiday Park.
- 10.7.4. A representative selection of the modelling results is presented in Table 10.7. The locations of these properties are shown in Figure 10.1 (Volume 2 of this ES). Results for all modelled receivers are shown in Appendix 15 (Volume 3 of this ES) and the results are shown graphically in Figures 10.2 to 10.4 in Volume 2 of this ES.
- 10.7.5. The noise levels presented are the predicted levels at the first floor façade (4 metres above ground level) for each property or at 1.5 metres above ground level for open spaces. For single storey properties it would be expected that noise levels would be lower than predicted due to greater ground absorption effects and increased screening in some instances. All comparisons take a 'worst case scenario' i.e. the highest adverse or least beneficial change has been reported.

Table 10.7 Opening Year Predicted Noise Impacts

Receiver Model ID	Location	Do-Minimum Opening Year Noise Level dB LA10,18h	Do-Something Opening Year Noise Level dB LA10,18h	Noise Change dB LA10,18h	Impact Magnitude
177	Lodge (nr Loch Insh)	56.5	55.5	-0.9	Negligible
176	Highlands Wildlife Park	52.7	52.5	-0.2	Negligible
137	Dunachton Lodge	57.2	57.4	0.2	Negligible
97	Manse, Alvie	48.6	48.2	-0.4	Negligible
16	Sealodh Beann	50.9	51.4	0.5	Negligible
27	Rigo	60.7	60.8	0.1	Negligible
29	Birchfield Cottage	57.2	57.9	0.7	Negligible
133	The Knoll	67.4	67.5	0.1	Negligible
115	Macbean Road	62.0	62.3	0.3	Negligible
39	No 16 & 17 Suidhe Crescent	57.1	57.5	0.4	Negligible
82	February Cottage	47.5	47.9	0.4	Negligible
49	Hillview	58.4	60.4	2.0	Minor Adverse
68	Alvie School	61.9	62.9	1.0	Minor Adverse
58	Alvie House	53.8	53.9	0.1	Negligible
53	Upper Milehead	58.1	59.8	1.7	Minor Adverse
54	Lower Milehead	59.9	60.9	1.0	Minor Adverse
67	Kincaig House	51.6	51.9	0.3	Negligible
55	Alvie Gate Lodge	58.2	58.6	0.4	Negligible
93	Dalraddy Holiday Park	47.6	47.7	0.1	Negligible
56	Wester Dalraddy Cottage	51.7	52.3	0.6	Negligible

10.7.5 Table 10.8 below shows the noise changes categorized into the noise change bands following the magnitude impact ratings as required by DMRB.

Table 10.8 Short-term Traffic Noise Reporting Table

Change in noise level		Number of dwellings	Number of other sensitive receptors
Increase in noise level, $L_{A10,18h}$	0.1 - 0.9	154	4
	1 - 2.9	5	1
	3 - 4.9	0	0
	≥ 5	0	0
No Change	= 0	8	2
Decrease in noise level, $L_{A10,18h}$	0.1 - 0.9	3	4
	1 - 2.9	0	0
	3 - 4.9	0	0
	≥ 5	0	0

10.7.6. Table 10.8 shows that there are 175 modelled receptors within the calculation area, which will experience a negligible change or no change on scheme opening. Six receptors are predicted to experience a minor short term increase in noise. These receptors are:

- Alvie School;
- Upper Milehead;
- Lower Milehead;
- Montcoffer;
- Baldow Smiddy; and
- Hillview.

10.7.7. The construction of a new carriageway next to the existing carriageway will move a proportion of the noise source closer to, or further from, sensitive receptors by approximately 12 metres. The degree of noise change resulting from this is more pronounced for receptors, which are closer to the noise source to start with. Slight noise changes (< 1 dB) also result from minor changes in traffic flow and increases of traffic speed with the proposed Scheme.

10.7.8. There are no significant sources of environmental noise, other than the A9, in or around the study area and therefore noise from the A9 is likely to be audible at some distance from the road. The noise changes due to the proposed Scheme in the opening year are, however, predicted to be negligible at all properties beyond around 120 metres from the carriageway edge.

10.7.9. Thirteen sensitive receptors outside of the 600 metres area but within 1 kilometre of the scheme have been modelled which illustrate this. The results for these receptors are included in the results tables in Appendix 15 of Volume 3 of this ES.

10.8. Impacts (Design Year 15)

10.8.1.

For the design year noise impacts, a comparison is made between the noise levels with the scheme in Year 15 and the noise levels without the scheme in the baseline year. A parallel comparison is also made for the Do-Minimum situation assuming that the scheme did not go ahead (i.e. noise change between Do-Minimum 2017 and Do-Minimum 2032). These comparisons are presented in Tables 10.9 and 10.10 below for selected receptors.

Table 10.9 Design Year 'With Scheme' Noise Impacts

Receiver Model ID	Location	Do-Minimum Opening Year Noise Level dB LA10,18h	Do-Something Design Year Noise Level dB LA10,18h	Noise Change dB LA10,18h	Impact Magnitude
177	Lodge (nr Loch Insh)	56.4	56.2	-0.2	Negligible
176	Highlands Wildlife Park	52.7	53.2	0.5	Negligible
137	Dunachton Lodge	57.2	58.1	0.9	Negligible
97	Manse, Alvie	48.6	48.9	0.3	Negligible
16	Sealodh Beann	50.9	52.1	1.2	Negligible
27	Rigo	60.7	61.4	0.7	Negligible
29	Birchfield Cottage	57.2	58.7	1.5	Negligible
133	The Knoll	67.4	68.2	0.8	Negligible
115	Macbean Road	62.0	62.9	0.9	Negligible
39	No 16 & 17 Suidhe Crescent	57.1	58.1	1.0	Negligible
82	February Cottage	47.5	48.6	1.1	Negligible
49	Hillview	58.4	61.1	2.7	Negligible
68	Alvie School	61.9	63.6	1.7	Negligible
58	Alvie House	53.8	54.6	0.8	Negligible
53	Upper Milehead	58.1	60.5	2.4	Negligible
54	Lower Milehead	59.9	61.6	1.7	Negligible
67	Kincaig House	51.6	52.6	1.0	Negligible
55	Alvie Gate Lodge	58.2	59.3	1.1	Negligible
93	Dalraddy Holiday Park	47.6	48.3	0.7	Negligible
56	Wester Dalraddy Cottage	51.7	53.0	1.3	Negligible

Table 10.10 Design Year 'Without Scheme' Noise Impacts

Receiver Model ID	Location	Do-Minimum Opening Year Noise Level dB LA10,18h	Do-Something Design Year Noise Level dB LA10,18h	Noise Change dB LA10,18h	Impact Magnitude
177	Lodge	56.4	57.1	0.7	Negligible
176	Highlands Wildlife Park	52.7	53.4	0.7	Negligible
137	Dunachton Lodge	57.2	57.9	0.7	Negligible
97	Manse, Alvie	48.6	49.3	0.7	Negligible
16	Seallodh Beann Wst	50.9	51.6	0.7	Negligible
27	Rigo	60.7	61.3	0.6	Negligible
29	Birchfield Cottage	57.2	58.0	0.8	Negligible
133	1 - 10 The Knoll	67.4	68.1	0.7	Negligible
115	Macbean Road	62.0	62.6	0.6	Negligible
39	No 16 & 17 Suidhe Cres	57.1	57.8	0.7	Negligible
82	February Cottage	47.5	48.1	0.6	Negligible
49	Hillview	58.4	59.1	0.7	Negligible
68	Alvie School	61.9	62.6	0.7	Negligible
58	Alvie Lodge Sth	53.8	54.5	0.7	Negligible
53	Upper Milehead	58.1	58.8	0.7	Negligible
54	Lower Milehead	59.9	60.6	0.7	Negligible
67	Kincraig House	51.6	52.3	0.7	Negligible
55	Alvie Gate Lodge	58.2	58.9	0.7	Negligible
93	Dalraddy Holiday Park	47.6	48.3	0.7	Negligible
56	Wester Dalraddy Cottage	51.7	52.4	0.7	Negligible

10.8.2. The highest noise increases with the proposed Scheme are predicted at properties in the area around Alvie School with the highest predicted increase being at Hillview.

10.8.3 Table 10.11 and Table 10.12 present the noise levels at all sensitive receptors categorized in terms of the DMRB long term noise change magnitude levels for daytime and night-time respectively. Night-time noise levels have been calculated in the Noisemap software from the 18 hour traffic flows based on Method 3 of the 2006 Defra/TRL report⁹⁹. Night-time impacts are only reported where the predicted noise level is greater than 55 dB $L_{\text{night, outside}}$ in any scenario.

99 Defra/TRL/Casella Stanger (2006). Method for Converting the UK Road Traffic Noise Index LA10,18h to the EU Noise Indices for Road Noise Mapping".

Table 10.11 Long-term Traffic Noise Reporting Table (Daytime)

Change in noise level		Number of dwellings	Number of other sensitive receptors
Increase in noise level, LA10, 18h	0.1 - 2.9	169	10
	3 - 4.9	0	0
	5 - 9.9	0	0
	>=10	0	0
No Change	= 0	0	0
Decrease in noise level, LA10, 18h	0.1 - 2.9	1	1
	3 - 4.9	0	0
	5 - 9.9	0	0
	>=10	0	0

Table 10.12 Long-term Traffic Noise Reporting Table (Night-time)

Change in noise level		Number of dwellings	Number of other sensitive receptors
Increase in noise level, LA10, 18h	0.1 - 2.9	12	0
	3 - 4.9	0	0
	5 - 9.9	0	0
	>=10	0	0
No Change	= 0	0	0
Decrease in noise level, LA10, 18h	0.1 - 2.9	0	0
	3 - 4.9	0	0
	5 - 9.9	0	0
	>=10	0	0

10.8.4

Table 10.11 and Table 10.12 show that noise changes as a result of the proposed Scheme in the long term are predicted to be negligible.

10.8.5

These predictions assume the same correction for a low noise surface for the Do-Minimum and Do-Something scenarios. If the new surface with the proposed Scheme were to perform less well than the existing road surface in terms of noise reduction, then there is the potential for a small number of properties to move into the minor noise increase category. Any such differences in noise reduction performance are likely to be limited to around 1 dB and hence minor adverse noise impacts would be predicted to affect around 5 properties.

- 10.8.6 Any inaccuracy in the modelling assumptions about the existing noise surface (i.e. if the actual noise reduction properties are less than assumed) would be unlikely to change the overall impact summary as differences in the reduction in noise between the Do-Minimum and Do-Something scenarios would be limited to around 1 dB and hence no properties would be likely to move into the minor decrease in noise band.
- 10.8.7 There are no properties within 40 metres of the existing A9 and no significant change in traffic flows are predicted for the B9152 or other local roads and therefore no vibration assessment has been reported.

10.9. Mitigation Measures

- 10.9.1. Minor short term impacts are predicted in the opening year at six receptors. In the longer term all impacts are predicted to be negligible with the proposed Scheme. These predictions already take into account the provision of a low noise road surface (TSC) both with and without the proposed Scheme. The use of other mitigation measures, such as noise barriers, is not considered proportionate to the predicted impacts; taking into account the likely conflicts with other factors such as visual intrusion.
- 10.9.2. This assessment is not suitable for assessing entitlement under the Noise Insulation (Scotland) Regulations 1975 due to the differences in the required calculation procedure.

10.10. Noise Nuisance Calculations

10.10.1

Residential receptor locations have been categorised into the noise nuisance change bands as described in section 10.3. The highest nuisance level whether in the short-term or long term has been used.

Table 10.13 Traffic Noise Nuisance Reporting Table (DMRB A1.3)

Change in nuisance level (% people bothered by noise)		Do-Minimum	Do-Something
		Number of dwellings	Number of dwellings
Increase in nuisance level	>0 - <10 %	170	37
	10 - <20 %	0	125
	20 - <30 %	0	7
	30 - <40 %	0	0
	>=40 %	0	0
No Change	=0 %	0	0
Decrease in nuisance level	>0 - <10 %	0	1
	10 - <20 %	0	0
	20 - <30 %	0	0
	30 - <40 %	0	0
	>=40 %	0	0

10.10.2

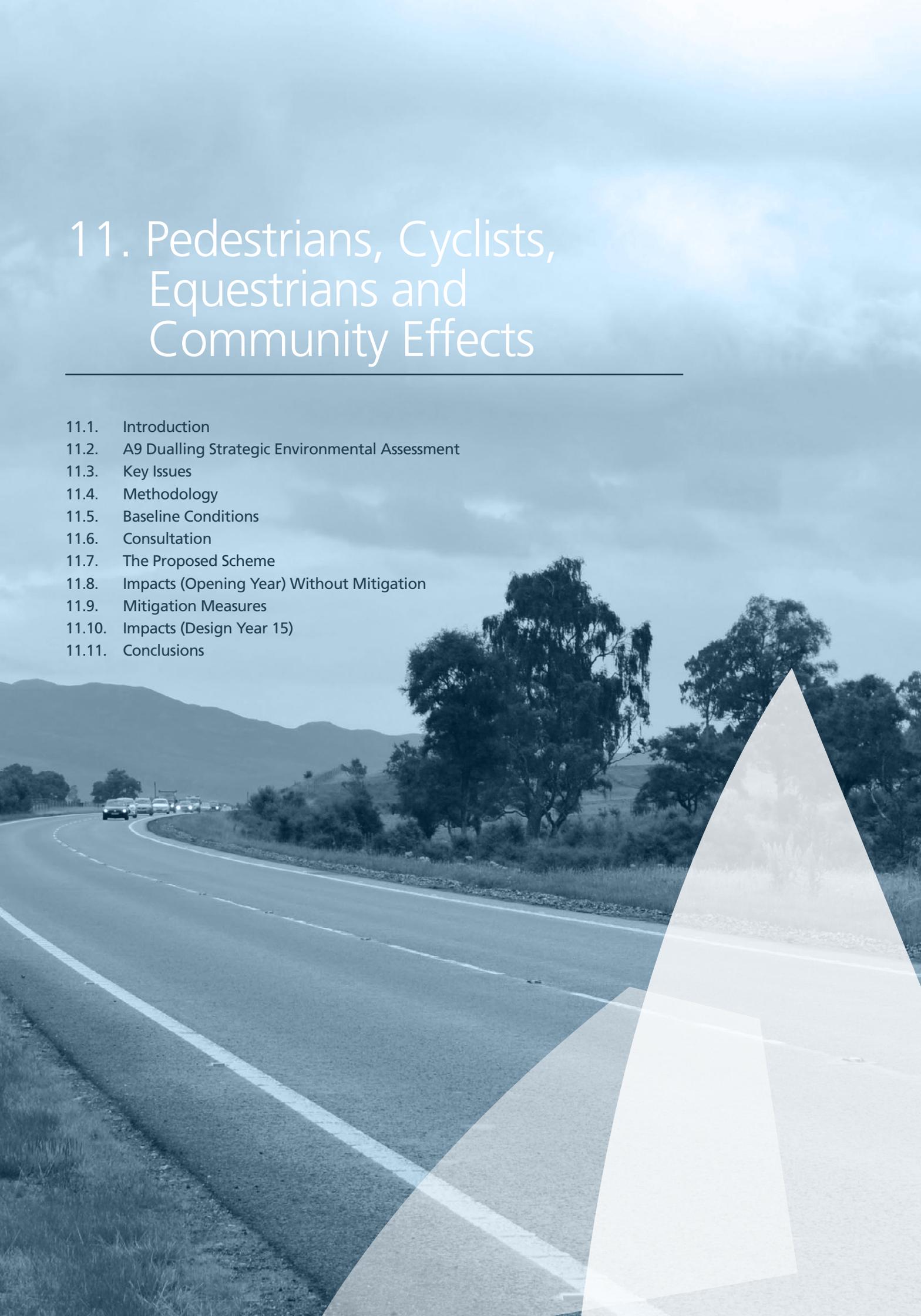
Table 10.13 shows that 125 dwelling locations are predicted to fall in the 10 - 20% people bothered by noise increase band and 7 dwelling locations are predicted to fall in the 20 – 30% increase band. These predicted increases are as a result of the on opening short term noise changes.

10.11. Conclusions

- 10.11.1. A DMRB Stage 3 traffic noise and vibration assessment has been undertaken for the proposed Scheme. The construction of a new carriageway next to the existing carriageway will move a proportion of the noise source closer to sensitive receptors by around 12 metres. In the south of the proposed Scheme, for the first 1.8 kilometres, this movement is to the west of the existing carriageway; changing over to the east just south of Kincaig.
- 10.11.2. No significant change in traffic flow is predicted and average speeds are predicted to increase from 78 – 84 km/h (range) in the Do-Minimum scenario to 90 km/h in the Do-Something scenario for the A9 dualled section. Heavy vehicle composition is not predicted to change as a result of the proposed Scheme.
- 10.11.3. As a result of these changes, noise levels would be expected to increase by up to 2 dB(A) on opening at the nearest properties to the proposed Scheme resulting in a minor short term noise impact.
- 10.11.4. During Design Year 15 the maximum noise increase when compared with the opening year Do-Minimum is predicted to be under 3 dB(A) and all long term noise impacts are predicted to be negligible.
- 10.11.5. The Do-Minimum situation in Design Year 15 would similarly result in negligible noise impacts.
- 10.11.6. No specific mitigation has been recommended, however, a low noise surface will be implemented as part of the proposed Scheme.
- 10.11.7. This assessment is not suitable for assessing entitlement under the Noise Insulation (Scotland) Regulations 1975 due to the differences in the required calculation procedure.

11. Pedestrians, Cyclists, Equestrians and Community Effects

- 11.1. Introduction
- 11.2. A9 Dualling Strategic Environmental Assessment
- 11.3. Key Issues
- 11.4. Methodology
- 11.5. Baseline Conditions
- 11.6. Consultation
- 11.7. The Proposed Scheme
- 11.8. Impacts (Opening Year) Without Mitigation
- 11.9. Mitigation Measures
- 11.10. Impacts (Design Year 15)
- 11.11. Conclusions



11. Pedestrians, Cyclists, Equestrians and Community Effects

11.1. Introduction

11.1.1.

This Chapter provides an assessment of the impact of the proposed Scheme on journeys made in its locality by pedestrians, cyclists and equestrians as well as any associated community effects. For ease of reference, the term Non-Motorised Users (NMUs) is used to describe this group.

11.1.2.

In accordance with the DMRB Volume 11, Section 3, Part 8 Pedestrians, Cyclists, Equestrians and Community Effects¹⁰⁰, the assessment of impacts on NMUs focuses on three key aspects of peoples' journeys:

- Key journey parameters - changes in journey lengths and times resulting from any diversions or closures of footpaths, tracks, public rights of way or roads;
- Amenity value - the effect on the amenity value of journeys, where amenity is defined as the relative pleasantness of a journey; and
- Community severance - changes in community severance, where community severance is defined as the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows.

11.2. A9 Dualling Strategic Environmental Assessment

- 11.2.1. The SEA Environmental Report for the A9 Dualling Programme was published in June 2013. This includes a PPS review to inform the development of a set of strategic environmental principles for the A9 between Perth and Inverness.
- 11.2.2. The SEA Environmental Report highlights the key considerations, which may form the basis of strategic environmental principles in relation to Population and Human Health (Access) to support further discussion with the statutory consultation bodies. The key considerations identified through the SEA in relation to Population and Human Health (Access) are:
- Continue to facilitate opportunities to access visitor attractions and recreational opportunities throughout the route;
 - Retain, and where possible enhance, overall connectivity between non-motorised user routes along and across the A9 corridor;
 - Incorporate effective rationalisation between non-motorised user routes, safe crossing points and provisions for access to public transport;
 - Ensure any rationalisation between non-motorised user routes and safe crossing points is carefully considered to minimise the distance between crossings where possible;
 - Design any permanent diversion in NMU routes to provide the same, or improved, standard of pathway;
 - Employ a preference for underpass crossings, where feasible, to minimise landscape and visual impacts;
 - Ensure compliance with DDA guidance in the design of crossings, lay-bys and links to path networks;
 - Consider the safety and quality of experience for non-motorised users of local roads when vehicle access to the A9 is being rationalised (e.g. the potential for traffic increases in the cycle network);
 - Establish community liaison group(s), throughout the construction period, in order to maintain good community relations and ensure that local populations are aware of progress as regards construction; and
 - Schedule and control the timing of construction activities to minimise noise impacts on sensitive receptors; and
 - Adopts construction and traffic management methods, which, as far as possible, maintain access for road users, cyclists, pedestrians and equestrians, and access to the Cairngorms National Park during construction periods.
- 11.2.3. The proposed Scheme has been developed in line with the above general principles where appropriate. Furthermore, the assessment of existing conditions, proposals and impacts references the above where relevant to do so.

- 11.2.4. The following features have been identified within the wider area surrounding the proposed Scheme with respect to the wider network for non-motorised users, including:
- Extensive Core Path Network in the National Park including Tombaraidh Path, The Badenoch Way, the Blue Route, the Green Route and the Orange Route;
 - National Cycle Network route number 7 (NCN7) passes through Study Area 5; and
 - The British Horse Society identified all existing crossing points of the existing A9 within the study area, but acknowledged that these may not all require to be retained where they can be reasonably rationalised to safe underpass locations.

11.3. Key Issues

- 11.3.1. Pedestrians wishing to cross the existing A9 safely make use of a number of existing underpasses located at Dunachton Burn, Baldow Smiddy, Lower Milehead and Allt an Fhearna.
- 11.3.2. National Cycle Network (NCN) 7 is the main cycle route in the area, located approximately 2 kilometres east of the A9 and therefore unaffected by the proposed Scheme.
- 11.3.3. Alvie Primary School is located approximately 72 metres from the existing and proposed Scheme alignment.
- 11.3.4. The B9152 local road runs parallel to the existing A9. There is a footway along the B9152 within the village of Kinraig extending as far as Alvie Primary School access.
- 11.3.5. The Core Path Network, designated footways under the Land Reform (Scotland) Act is unaffected by the proposed Scheme.

11.4. Methodology

- 11.4.1. For the purposes of this assessment, the study area was defined as a corridor 500 metres to each side of the centre of the proposed Scheme, extended as necessary to include features or facilities of particular importance or where potential impacts were identified outside this corridor.
- 11.4.2. The approach adopted for this assessment is through:
- Identification of the key community facilities used within the study area;
 - Identification of routes used by NMUs;
 - Estimation of the numbers of NMUs using particular routes; and
 - Assessment of any likely changes in the key journey aspects resulting from the proposed Scheme.
- 11.4.3. As existing travel patterns within the locality will be broadly unaffected by the proposed Scheme, this Chapter focuses on any identifiable changes in journey length or amenity experienced by pedestrians and others

11.5. Baseline Conditions

- 11.5.1. Baseline conditions for pedestrians, cyclists, equestrians and community effects were reviewed through consultations with the Kincaig and Vicinity Community Council, Landowners and the CNPA including reference to the Cairngorms National Park Plan 2012 and the consultative draft of the Cairngorms National Park Plan 2012-2017. Figures 11.1 and 11.2 (in Volume 2 of this ES) indicate existing non-motorised user routes, including Core Paths, in the vicinity of the proposed Scheme.
- 11.5.2. Local tourist attractions including Alvie Estate, Loch Insh Watersports, Leault Farm Sheepdog Demonstrations, Inshriach Nursery Cakeshop and Highland Wildlife Park are all signed from the B9152 side road and the formal junctions at Kingussie to the South and Aviemore from the North.
- 11.5.3. Landowners and the Community Council have indicated that pedestrian, equestrian and cyclist movements within the study area are low, and indeed the pattern of existing development within the study corridor supports this. As travel patterns will be broadly unaffected, detailed origin and destination surveys have not been carried out. Instead an assessment has been carried out based on consultation as described in Section 11.6, below. Consultation has not identified any groups of vulnerable users affected by the existing A9 at this location.
- 11.5.4. With the exception of NCN7, there are no formal public rights of way within the study area. NCN7 is located approximately 2 kilometres to the east of the A9 and is not affected by the proposed Scheme. Cyclists Cycleway mapping, available online, and cycleway signage encourages cyclists to use NCN7 which follows the route of the B970 rather than the A9 trunk road. The B970 is located east of Kincaig following an alignment approximately parallel to the A9. No formal provision for cyclists currently exists on the B9152. Sustrans does not recommend use of the A9 by cyclists.
- 11.5.5. The catchment area for Alvie Primary School covers the village of Kincaig and immediate surrounding area. With the exception of residents of Dunachton, Alvie and Dalraddy Estates, this catchment is predominantly to the west of the existing A9.
- 11.5.6. In the vicinity of the proposed Scheme, the A9 trunk road is single carriageway and has a cross section width of approximately 14.5 metres, including 3-4 metre verges, 7.3 metre carriageways and 0.6 – 0.7 metre hard strips.

- 11.5.7. Pedestrians and other users wishing to cross the existing A9 generally do so at one of the existing underpasses at Dunachton Burn, Baldow Smiddy, Lower Milehead, or Allt an Fhearna, however these tend to be used in the main by the adjacent landowners, their tenants and staff. There are a total of 16 private accesses onto the existing A9. Frequency of pedestrian and other users has not been confirmed by landowners or the CNPA. It should be noted that the equestrian centre located at Easter Delfour makes use of the accesses across the A9 in the vicinity. With the exception of Dunachton and Alvie and Dalraddy Estates, the existing trunk road does not sever the Kincaig community.
- 11.5.8. Known route mapping was provided by both the CNPA and the British Horse Society (BHS). The mapping identified a number of locations within the study area where at grade crossings of the carriageway by NMU's are understood to take place. These are shown on Figures 11.1 and 11.2 of Volume 2 of this ES. Information on numbers of users for these crossings was not provided.
- 11.5.9. Alvie Primary School is located to the east of the A9, west of Alvie Lodge and is accessed from the B9152, which provides a link between the settlements of Kincaig and Aviemore. There is an existing footpath between the Village of Kincaig and the Primary School. Within the village of Kincaig there is a community hall, shop with post office facilities and two hotels. Key Community Facilities are identified on Figure 9.1 in Volume 2 of this ES.
- 11.5.10. Two tourist destinations lie within the study corridor. Located immediately south of the proposed Scheme is the Highland Wildlife Park. The Park is accessed from the B9152 and will not be affected by the proposed Scheme. The Leault Working Sheepdog Trials are located at Leault farm, west of Kincaig. The farm is currently signposted from the B9152, with the advertised route including an at grade crossing of the A9. No established active travel routes are evident between Kincaig and Leault Farm.

11.6. Consultation

- 11.6.1. Consultation was carried out with The Highland Council, the CNPA and the British Horse Society (BHS) who also consulted their local members. This identified accesses of the existing A9, which were understood by the consultees to be used by NMUs. The location of these are indicated on Figures 11.1 and 11.2 in Volume 2 of this ES.
- 11.6.2. The Local Plan does not highlight any proposals for new pedestrian, cycle or equestrian facilities within the corridor study area. Kincaig and Vicinity Community Council were also consulted as part of the wider A9 dualling and proposed Scheme consultation.
- 11.6.3. Consultation with the CNPA identified the need for a non-motorised user route adjacent and parallel to the A9 in order to facilitate active travel in the corridor and connect communities such as Kingussie, Kincaig and Aviemore through active travel.
- 11.6.4. The Highland Council has identified that there are no easy means of active travel access between Leault Farm sheepdog demonstrations and the B9152 as a result of the proposed Scheme and that disrupting the farm's established linkage to the Kincaig community, would not accord with Highland Structure Plan Policy G2. However, there are no formal public means of access in the existing situation. Safe accessibility to individual visitors travelling on foot, by cycle or service buses (which use the B9152) to the sheepdog trials area will be provided by the upgraded underpass at Baldow Smiddy and the proposed new NMU route.

11.7. The Proposed Scheme

- 11.7.1. The Cycling Action Plan for Scotland (CAPS) 2013 includes for Considering Cyclists in the A9 Dualling Project and supports the provision of segregated off-road cycleway facilities (where practical) as well as safe crossing facilities and enhancement of parallel routes (where possible).
- 11.7.2. With reference to both CAPS 2013 and the response provided by CNPA, the proposed Scheme therefore includes for a NMU route adjacent and parallel to the proposed northbound carriageway. This route connects with the existing access at the Highland Wildlife Park, the upgraded access at Baldow Smiddy Underpass and locally to existing private access tracks in the vicinity of Dalraddy. This route is shown on Figures 11.1 and 11.2 in Volume 2 of this ES.
- 11.7.3. Provision of this facility is also promoted as part of the wider A9 dualling programme, which will seek to enhance NMU connectivity and accessibility between communities such as those at Kingussie, Kincaig and Aviemore.
- 11.7.4. All underpasses to be upgraded as part of the proposed Scheme will include for a new footway, segregated by kerbs from the access to provide safe refuge within the structure for NMUs.

11.8. Impacts (Opening Year) Without Mitigation

- 11.8.1. The NCN Route 7 will be unaffected.
- 11.8.2. While there are no existing dedicated pedestrian facilities affected, access will be made safer and enhanced by the proposed Scheme through stopping up surface crossings of the trunk road, upgrading existing underpass facilities and connecting and upgrading estate access tracks.
- 11.8.3. The existing at-grade private crossings of the existing A9 will be closed, with accommodation works access diversion routes available through the upgraded underpasses with dedicated NMU provision within these. Through the wider network of accommodation works, accesses are shown on Figures 11.3 to 11.6 in Volume 2 of this ES. There is no increase in journey times for NMU's or vulnerable users. The details of accommodation accesses are still to be confirmed with affected landowners, but it is likely that these will be improved.
- 11.8.4. As all tourist and visitor facilities are currently signed at formal junctions remote from the proposed Scheme (all key community facilities are currently accessed from the B9152 and local road network), an increase in traffic on the B9152 limited to vehicle movements associated with the affected estates is likely as a result of closing the direct private accesses to the A9. It is noted that there may be an increase in quarry traffic using the B9152 as a result of the proposed Scheme however, a condition of the planning permission for the quarries within Alvie and Dalraddy Estates is that all traffic cross the A9 and use the B9152. Provision of the upgraded Allt an Fhearna underpass by the proposed Scheme will continue to facilitate this movement.
- 11.8.5. The proposed Scheme is assessed as having a neutral impact in the opening year in terms of pedestrian, equestrian and cycle movements and community severance.

11.9. Mitigation Measures

- 11.9.1. At-grade pedestrian crossing facilities will not be provided as part of the proposed Scheme, this is in line with the emerging strategy for the A9 identified within the Preliminary Engineering Services commission being carried out by others. Safe, segregated NMU provision will be provided at all underpass locations.
- 11.9.2. All mitigation measures included in the proposed Scheme extent will be operational in the opening year of 2017 and mitigation measures out with the proposed Scheme, in the form of landowner accommodation works accesses, will require to be operational in advance of completion of construction, subject to final agreement of accommodation works with landowners.

11.10. Impacts (Design Year 15)

- 11.10.1. The proposal is assessed as having a slight beneficial impact in the design year in terms of pedestrian, equestrian and cycle movements and community severance. This is largely as a result of the NMU facility provided parallel to the A9 which will provide connectivity between Kincaig, Kingussie and Aviemore under current commitments to dual the A9 by 2025.

11.11. Conclusions

- 11.11.1. Through upgrading existing underpasses and the network of private access tracks within the affected estates, existing travel patterns for pedestrians, cyclists and equestrians should be unaffected by the proposed Scheme. Alvie Primary School is located in the corridor study area and safe access from the B9152 will remain unchanged by the scheme.
- 11.11.2. The provision of a new NMU facility parallel to the A9 will facilitate active travel and provide improved accessibility from the estates to the west of the A9 with the village of Kincaig and associated key community facilities such as the primary school.

12. Vehicle Travellers

- 12.1. Introduction
- 12.2. Relationship to Current A9 Work
- 12.3. Key Issues
- 12.4. Methodology
- 12.5. Baseline Conditions
- 12.6. Consultation
- 12.7. Impacts (Opening Year) Without Mitigation
- 12.8. Mitigation Measures
- 12.9. Impacts (Design Year 15) with mitigation
- 12.10. Conclusions



12. Vehicle Travellers

12.1. Introduction

- 12.1.1. In accordance with the DMRB Volume 11, Section 3, Part 9 Vehicle Travellers, this section addresses impacts on vehicle travellers in terms of views gained of the surrounding landscape from the road and driver stress levels. Impacts on local journeys for non-vehicle travellers are discussed in Chapter 11.
- 12.1.2. 'View from the road' is defined as the extent to which travellers (including drivers) are exposed to different types of scenery through which a route passes. The assessment considers landscape character and quality and potential views, good or bad, along the route.
- 12.1.3. 'Driver stress' is defined for the purposes of environmental assessment as 'the adverse mental and physiological effects experienced by a driver traversing a road network'. Factors influencing the level of driver stress include road layout and geometry, surface riding characteristics, junction frequency and vehicle speed and flow per lane. The level of stress felt by individual drivers will also depend on the skill, experience, temperament, knowledge of the route and state of health of the driver at that particular time.
- 12.1.4. Driver stress has three main components; namely frustration, fear of potential accidents and uncertainty relating to the route.
- 12.1.5. Frustration is caused by a driver's inability to drive at a speed consistent with his or her desire. The level of frustration increases as speed falls in relation to expectation. High traffic flow levels, intersections, road works, or difficulties in overtaking slower-moving traffic may cause this.
- 12.1.6. Congestion can lead to frustration by creating a situation in which the driver does not feel in control, especially when he or she wishes to arrive at a destination by a particular time, but is held up by traffic congestion of an unpredictable duration.
- 12.1.7. Driver fear is caused by the imposing presence of other vehicles, inadequate sight distances, the likelihood of pedestrians, cyclist and animals entering onto the carriageway and poor road surfacing. Fear is highest when speeds, traffic flows and the proportion of HGVs are all high, and these factors become more important in adverse weather conditions. Improvements to existing roads may increase driver fear to some extent if the improvements result in increased traffic speeds and higher volumes of traffic (due, for example, to traffic diverting from alternative routes). This increased perception of danger is likely to be more than offset in most cases by the superior design standards to which a new scheme is built (for example, longer sight distances, footbridges for pedestrians, good lighting, and a new road surface).
- 12.1.8. Route uncertainty is caused primarily by inadequate signage for the individual's purposes and poor lighting. Good design and layout together with adequate signage and lighting should help eliminate this cause of stress for drivers.

12.2. Relationship to Current A9 Work

A9 Dualling Strategic Environmental Assessment

- 12.2.1. The SEA Environmental Report for the A9 Dualling Programme has been prepared by Halcrow (June 2013). This report highlights that the route passes through areas of outstanding landscape, in particular in relation to the Cairngorms National Park and identifies some overarching principles with respect to landscape and vehicle travellers. The report identifies that previous Strategic Transport Projects Review (STPR) work should be reviewed at project level environmental assessment to assist in consistency of design on aspects such as form of junctions, landscape, route alignment, earthworks and drainage. This has been undertaken for the proposed Scheme.
- 12.2.2. The SEA Environmental Report includes a set of preliminary environmental principles (SEA Table 2.2) and one of the Landscape and Historic Environment principles is 'to enhance the view from the road/ driver/ touring experience' and this has been taken into account in the assessment for the proposed scheme and development of the indicative landscape mitigation.
- 12.2.3. One of the key findings presented by the SEA Environmental Report is:

SEA considers that, with respect to Landscape (View from the Road), the early incorporation of opportunity views, supported with design guidance on the potential for enhanced lay-bys, is a key enhancement measure for A9 dualling. This is likely to present locally minor benefits aggregating to a cumulatively moderate benefit at the route wide scale.

Within the extents of the proposed Scheme SEA identifies the following location where opportunity views may be enhanced: Dalraddy – View over strath Spey to the Cairngorms

- 12.2.4. Due to the proximity to end tapers associated with the proposed Scheme, it is not possible to provide a lay-by or enhanced lay-by at the location identified by the SEA without introducing a departure from design Standards. However, this is something that could be incorporated under the wider dualling programme when dualling immediately to the north of the proposed Scheme is provided. Detailed assessment for this will be required for the proposed dualling scheme immediately north of the proposed Scheme. This has not been considered further in the Assessment.

12.3. Key Issues

- 12.3.1. The pattern of traffic using this section of the A9 can result in platoons of vehicles building up over the day.
- 12.3.2. There are no major junctions located on the section of the A9, which would form the proposed Scheme.

12.4. Methodology

View from the Road

12.4.1. The 'view from the road' is defined as the extent to which travellers, including drivers are exposed to the different types of scenery through which a route passes. Aspects, which are considered are:

- The landscape character types of the areas through which the road passes;
- The extent to which travellers can view the scene;
- The quality of the landscape through which the route passes; and
- Features of particular interest or prominence in the view.

12.4.2. The four categories recommended in the DMRB to be used in the assessment of the traveller's ability to see the surrounding landscape are as follows:

- No view – road in deep cutting or contained by earth bunds, environmental barriers or adjacent structures;
- Restricted view – frequent cuttings or structures blocking the view;
- Intermittent view – road generally at ground level but with shallow cuttings or barriers at intervals; and
- Open view – view extending over many miles, or only restricted by existing landscape features.

12.4.3. The assessment should note where views will be restricted, making allowance for the growth of trees and shrubs included in any landscaping work.

12.4.4. The quality and character of the landscape have been assessed as part of Chapter 8 of this ES.

Driver stress

12.4.5. DMRB notes that reliable correlations have not been established between physical factors and driver stress levels. However, it gives guidance on the appropriate category of stress for use in environmental assessments and driver stress has been evaluated in accordance with the DMRB suggested use of a three point scale; Low, Moderate and High, to assess drivers stress based on traffic volume and traffic speed.

12.4.6. The assessment has been carried out for the existing traffic conditions and for the design year (2032). The DMRB offers guidance on assessing driver stress by using average peak hourly flows and average journey speeds for single carriageway roads as shown in Table 12.1 and Table 12.2. The categories apply only to those sections of road where traffic flows and speeds are known for over 1 kilometre of the route.

12.4.7.

For reference, a car or light van equals one flow unit, and a commercial vehicle over 1.5 tonnes or a public service vehicle equals three flow units.

Table 12.1 Relationship between driver stress and traffic flows for single carriageways¹⁰¹

Average peak hourly flow per lane, in flow Units/ hour	Average Journey Speed Km/hr		
	Under 50	50-70	Over 70
Under 600	High	Moderate	Low
600 – 800	High	Moderate	Moderate
Over 800	High	High	High

Table 12.2 Relationship between driver stress and traffic flows for Dual carriageways¹⁰²

Average peak hourly flow per lane, in flow Units/ hour	Average Journey Speed Km/hr		
	Under 60	60-80	Over 80
Under 1200	High	Moderate	Low
1200-1600	High	Moderate	Moderate
Over 1600	High	High	High

12.5. Baseline Conditions

View from the road

12.5.1.

The A9 is located within the Cairngorms National Park and an area designated as a National Scenic Area (NSA) runs parallel to the east of the A9.

12.5.2.

The A9 is defined by SNH as being located within the Straths landscape type. This landscape contains a diverse mixture of farmland, woodland, forests and settlements and has been strongly shaped by man through a history of cultivation.

12.5.3.

The A9 is situated on the valley floor and bordered to the east and west by the Cairngorms and Monadhliath Mountains respectively, which form part of the dramatic landscape experienced by the motorist.

12.5.4.

A digital terrain model (bare earth) and digital surface model (with vegetation and buildings) have been computer generated to identify the extent of theoretical views from the proposed Scheme. A view height of 2 metres above carriageway has been assumed. These are illustrated in Figure 12.6 in Volume 2 of this ES. This has helped identify key views, which will be analysed further at detailed design.

¹⁰¹
¹⁰²

Table taken from DMRB Volume 11, Section 3, Part 9 Vehicle Travellers (Table 3)
Table taken from DMRB Volume 11, Section 3, Part 9 Vehicle Travellers (Table 2)

- 12.5.5. Oblique views experienced by road users vary from south to north as the road passes through three local Landscape Character Areas (LCA):
- Dunachton Estate and Extensive Broadleaved Woodland LCA - landscape quality is considered to be very attractive;
 - Kincaig Village LCA - landscape quality is considered to be good; and
 - Alvie Estate and Extensive Coniferous Woodland LCA – landscape quality is considered to be very attractive.
- 12.5.6. Typical vehicular traveller views from within each of these Landscape Character Areas are illustrated on Figures 12.1-12.5 in Volume 2 of this ES.
- 12.5.7. In the southern section of the Scheme in the Dunachton Estate and Extensive Broadleaved Woodland LCA, views are generally enclosed as the road goes through frequent cuttings and is flanked by dense areas of woodland on either side which restricts long-distance views (View A).
- 12.5.8. In the central section of the Scheme, as the road approaches Kincaig village, views are more open and expansive as the road emerges from cuttings. Distant views are available of the Monadhliath Mountains in the west and the Cairngorms to the east (Views B and C). There are intermittent views to Kincaig to the east and open views to the pastoral fields and parkland landscape to the west. Views are more intermittent approaching Alvie Primary School as long-distance views are, screened by areas of woodland along the road (View D).
- 12.5.9. In the northern section of the Scheme, through the Alvie Estate and Extensive Coniferous Woodland LCA, views are once again contained by dense areas of woodland planting on either side of the road giving a strong sense of enclosure (View E). The road is largely in cutting towards the east, which also blocks long distance views. Views open up for a short section between East Delfour and Dalraddy where the mature woodland ends and there are views to open fields and hills beyond; however views close in again as the road approaches mature woodland to the far north of the Scheme.
- 12.5.10. Traveller views from the road vary along this stretch of the existing A9 ranging from 'no view' in the sections with dense woodland or the road is in cutting; 'restricted and intermittent views' through breaks in the roadside vegetation and landform; and 'open views' to the landscape close to the road corridor and to the hills and mountains beyond.

Existing driver stress

- 12.5.11. There are no major junctions located on the section of the A9 being upgraded by the proposed Scheme. The road alignment is generally straight with standard geometry and overall good visibility. There are a total of sixteen direct private accesses onto the existing A9. These accesses form direct crossings of the A9 and while there are no formal pedestrian crossings on this section of the A9, consultation with landowners has confirmed use by pedestrians and equestrians. This leads to an increase in driver stress due to the unpredictability of driver and non-motorised user manoeuvres both on and off the trunk road.
- 12.5.12. The section of the existing A9 between Kincaig and Dalraddy is mainly in cutting on both sides of the carriageway and is a single carriageway road approximately 7.3 metres wide with 0.6 to 0.7 metre wide hardstrips. Grass verges exist on both sides of the road and are approximately 3 metres to 4 metres wide.
- 12.5.13. The AAHT traffic flow of 367 was calculated for 2011 for this section of the A9 using data from an automatic traffic counter. Although the average peak hourly flow will be higher than that of the AAHT, it can be assumed to fall into the 'under 600' category within Table 12.1 given that the AADT is 11,493, with approximately 25% of the traffic being Heavy Goods Vehicles (HGV's).
- 12.5.14. If considered in isolation, the traffic flows for the existing situation suggest that driver stress is low. However, with respect to the number of HGVs on the route, the pattern of traffic using this section of the A9 can result in platoons of vehicles building up over the day and combined with the level of direct private access on to the A9, the existing driver stress is assessed as moderate.

Average Journey Speeds and Times

The traffic data gathered on this section of the A9 shows that the average speed is 84 kilometres per hour with average journey times of approximately 5 minutes and 24 seconds for the length of the section of A9 being considered.

12.6. Consultation

- 12.6.1. No specific consultation was carried out for this assessment. However, wider route principles consultations with the CNPA with respect to Landscaping and key views from the road has been undertaken and taken into account in this assessment.

12.7. Impacts (Opening Year) Without Mitigation

View from the road

- 12.7.1. The views from the road vary from south to north as the road passes through different Landscape Character Areas (LCA).
- 12.7.2. Generally there are no views to the wider landscape and views will remain largely unchanged from within the Dunachton Estate and Extensive Broadleaved Woodland LCA at Opening Year; although fringes of existing vegetation will need to be removed to accommodate the Scheme, the majority of the woodland will be unaffected by the improvements. Short-distance views of new cutting and embankment slopes in their un-vegetated state will be visually prominent for travellers.
- 12.7.3. In the central section of the proposed Scheme, as the road passes through the Kincaig Village LCA views will remain largely unchanged at Opening Year ranging from open to intermittent depending upon vegetation and landform.
- 12.7.4. Views from the northern section of the proposed Scheme, through the Alvie Estate and Extensive Coniferous Woodland LCA, will remain largely unchanged with no views to the wider landscape where the A9 is enclosed by extensive woodland at Opening Year. Removal of woodland fringes will result in un-vegetated and exposed embankments forming a prominent feature along this section of the road for travellers.
- 12.7.5. Overall, views from the road to the wider landscape at Opening Year without mitigation are likely to remain largely unchanged. Traveller views on the A9 will be affected by the proposed wider road corridor, introduction of new and in some places higher embankments and cuttings and removal of woodland fringes. The new road elements will be visually prominent and there will be a visual contrast between the new materials used to construct the carriageway, NMU provision, access tracks, structures etc. and existing weathered site materials.

Driver Stress

- 12.7.6. The AAHT flow in 2017 is expected to be 391. Although the average peak hourly flow will be higher than that of the AAHT, it can be assumed to fall into the 'under 1200' category within Table 12.2 given that the AADT is 12,184. The average weekday vehicle speed is estimated as 90 kilometres per hour
- 12.7.7. Based on Table 12.2, driver stress is estimated as low.

Average journey times

- 12.7.8. Average journey times would be expected to fall in the opening year as overtaking opportunities and speed limits increase.

12.8. Mitigation Measures

12.8.1. Mitigation measures aim to minimise the cumulative impacts of the carriageway widening scheme and maximise opportunities to enhance the landscape character and visual amenity of the area. Mitigation measures included and agreed through consultation are:

- Key views from the road will be retained e.g. acid grassland and no new planting to maintain open views to reflect the original landscape design associated with Kincaig House; and woodland block planting to allow views across the strath to the Duke of Gordons monument at Dalraddy;
- Creating an enclosed corridor through this section has been avoided by only proposing new woodland where it is required for screening or habitat connectivity. Wildflower grassland has been proposed on new/re-profiled embankments where appropriate in order to retain/enhance key views and create a pleasant and varied environment for the road-user. Key views will be considered further in refining the detailed planting/landscape design and in consultation at the detailed design;
- The planting of woodland adjacent to the A9 to replace areas of woodland and Ancient Woodland removed during construction operations and to accommodate the improvements. Species selection and woodland design will be carried out in consultation with the National Park and local planning authorities;
- Where side access road closures occur, the old access on to the A9 will be re-profiled and planted to continue the existing theme of the woodland belts adjacent to the road side;
- Cuttings will be as natural as possible and graded and shaped to integrate with the adjacent landform;
- The higher standard of the route and guaranteed overtaking opportunities through the length of the proposed Scheme will reduce driver stress, particularly with respect to relieving platoons of vehicles that will form over lengths of adjacent single carriageway ;and
- The removal of fourteen direct accesses and all right turning manoeuvres from the A9 by the proposed Scheme will reduce driver stress.

12.9. Impacts (Design Year 15) with mitigation

View from the road

12.9.1. By the design year, new planting/seeding on embankments will have established and will compensate for the vegetation removed, and together with the retained existing woodland will provide a setting for the A9. There will generally be no views from the road from within the woodland areas as is the case for the existing A9. Key views will remain open in the central section near Kincaig and towards the northern extents at Dalraddy. The development of view management plans and the potential to open up new views by thinning trees in consultation and agreement with adjacent landowners or establishing view cones through proposed planting will be explored at the detailed design stage. In addition the materials used to construct the new access tracks and road widening will have weathered, softened and integrated into the local landscape resulting in the road corridor being less visually prominent.

Driver stress

12.9.2. The AAHT flow in 2032 is forecast to be 458. Although the average peak hourly flow will be higher than that of the AAHT it can be assumed to fall into the 'under 1200' category, within Table 12.2, given that the AADT is forecast to be 14,299. The average weekday vehicle speed is estimated as 90 kilometres per hour with the proposed Scheme in place.

12.9.3. Based on Table 12.2, driver stress is estimated as low.

12.10. Conclusions

View from the road

- 12.10.1. Following completion of the proposed Scheme the view from the road will remain largely unchanged. The wider road corridor and associated infrastructure will be prominent in views for travellers.
- 12.10.2. By the design year, implementation of the proposed mitigation measures will not have changed the overall view from the road, which will vary from 'no view' where the A9 is enclosed by dense woodland or earthworks to open views to the wider landscape. Along the A9 corridor the road materials will have weathered to be less visually prominent and landscape planting and seeding will have established.

Driver Stress

- 12.10.3. After the introduction of the proposed Scheme, driver stress is expected to be low.
- 12.10.4. By the design year, 2032, applying traffic growth factors and following guidance in Volume 11 of the Design Manual for Roads and Bridges, driver stress will remain low.

Average journey times

- 12.10.5. Following completion of the proposed Scheme the average journey time is expected to decrease as overtaking opportunities and speed limits increase.

13. Road Drainage & the Water Environment

- 13.1. Introduction
- 13.2. A9 Dualling Strategic Environmental Assessment
- 13.3. Strategic Flood Risk Assessment
- 13.4. Key Issues
- 13.5. Methodology
- 13.6. Baseline Conditions
- 13.7. Impacts (Opening Year 1) Without Mitigation
- 13.8. Mitigation Measures
- 13.9. Impacts (Design Year 15)
- 13.10. Conclusions



13. Road Drainage and the Water Environment

13.1. Introduction

- 13.1.1. This chapter outlines the assessment undertaken to determine potential impacts of the proposed Scheme on the existing water environment. It details the desk study approach, consultation process, the baseline assessment and identifies the impacts for the proposed Scheme and the related mitigation measures. This section follows the guidance in DMRB HD 45/09¹⁰³.
- 13.1.2. The length of road to be dualled runs parallel with the River Spey on its northern side. The proposed Scheme is approximately 7.45 kilometres in length, coming within approximately 250 metres of the north bank of the River Spey at its closest point opposite Meadowside Quarry, near the southern end of the route. There is a potential impact from the road on the water quality of the watercourses crossed by the proposed Scheme. The existing A9 in this location crosses six watercourses, four of which are tributaries to the River Spey. These six watercourses have been assessed in this Chapter along with details of the River Spey, the Insh Marshes, Loch Alvie and Loch Insh.
- 13.1.3. This Chapter considers the potential impact of the proposed Scheme from surface water, groundwater, accidental spillages and flood risk. A separate Flood Risk Assessment (FRA) has been included in Appendix 17 of this ES. The results of the assessment for fisheries and aquatic habitat area are reported in Chapter 7 Ecology and Nature Conservation.
- 13.1.4. Chapter 16 (Policies and Plans) sets out how the proposed Scheme has been assessed in terms of the wider context of national, regional, strategic and local planning policies.
- 13.1.5. The EU Water Framework Directive (WFD) came into force on 22 December 2000. This resulted in the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act) becoming law in Scotland. The WEWS Act gave Scottish Ministers powers to introduce regulatory controls over water activities in order to protect, improve and promote sustainable use of Scotland's water environment. This includes wetlands, rivers, lochs, estuaries, coastal waters and groundwater.
- 13.1.6. The WFD established a river basin management planning system. The directive specified three principal environmental objectives for surface water bodies and bodies of groundwater, which were to:
- Prevent deterioration in status;
 - Restore to good status by 2015; and
 - Protect and restore, where applicable, to achieve the objectives for Protected Areas established under Community legislation.
- 13.1.7. The classification scheme for surface waters describes the water bodies' ecological status and its chemical status. The overall status of the surface water body will be determined by whichever of these is the poorest. The status classifications for surface waters are outlined in Table 13.1: Status Classification for Surface Waters on Page 294.

Table 13.1: Status Classification for Surface Waters

Ecological Status	Change from natural condition
High	No or minimal
Good	Slight
Moderate	Moderate
Poor	Major
Bad	Severe

13.1.8. SEPA have published River Basin Management Plan (RBMP) water body information sheets, which give the Ecological Status and the Overall Status of the water body using the WFD classifications. These are available for the River Spey at Loch Insh and the Allt an Fhearna upstream of Loch Alvie. The smaller watercourses do not have a water body information sheet. The classifications for the River Spey at Loch Insh and the Allt an Fhearna upstream of Loch Alvie are listed below in Section 13.4.

13.1.9. In addition to the WEWS Act, the Water Environment (Controlled Activity) Regulations (Scotland) 2005 (CAR) control all engineering activity in or near watercourses, enforcing the requirements of the WFD. There are three different types of authorisation under CAR: General Binding Rules (GBR); Registration; and Licence (both simple and complex). The CAR application for the proposed Scheme is likely to include licences required for outfalls (draining over 1 kilometre of road length), and culverting. The applications will require baseline environmental information of the watercourse, details of the proposed design, a construction method statement and details of the proposed mitigations. These will be developed prior to construction and will require approval from SEPA before construction starts.

13.2. A9 Dualling Strategic Environmental Assessment

13.2.1. A Strategic Environmental Assessment (SEA) Environmental Report for the A9 Dualling Programme has been prepared by Halcrow (2013)¹⁰⁴. This provided a Policies, Plans and Strategies (PPS) Review. For the water environment, the report recommended that the WFD and the Flood Risk Management (Scotland) Act 2009 were consulted. These have been referred to when completing this chapter of the ES. The SEA Environmental Report also outlined how these policies will affect the Environmental Assessment of the proposed Scheme and, alongside the FRA, this Chapter has covered the following:

- Detailed project level considerations of impacts on the water environment required, including works adjacent to water bodies and impact on groundwater to assist in meeting WFD targets;
- Close consultation with SEPA to identify and avoid high flood-risk areas and consider flood risk mitigation options where unavoidable; and
- Promote sustainable water use and discharge and promote flood resilience.

13.2.2. Additionally, this Chapter has taken into consideration the responses from the relevant consultees and the information outlined for Study Area 5 within the SEA Environmental Report. Identified within the 'Key Feature/ Constraints in Study Area 5' table, a number of features are identified, including two river water bodies, three groundwater bodies and one loch. The table states that the constraints for such features are 'Increased precipitation as a result of climate change, leading to increased flooding risk from rivers, especially around Kingussie and the Insh Marshes'.

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Halcrow, A9 Dualling Programme, Strategic Environmental Assessment Environmental Report, Document No. TSSEA9/SR/01 Version 1.1, June 2013

13.3. Strategic Flood Risk Assessment

- 13.3.1. A Strategic Flood Risk Assessment (SFRA) for the A9 Dualling programme has been prepared by Halcrow (2013)¹⁰⁵. The SFRA provides information on the most likely sources of flooding along the A9 Perth-Inverness route. The SFRA serves to support more detail assessment such as the proposed Scheme's FRA. The findings and recommendations of the SFRA are also intended to inform strategic design principles being collated in the A9 Dualling SEA.
- 13.3.2. The key aims of the SFRA were:
- High level identification of areas sensitive to flood along the A9 corridor;
 - High level assessment of potential constraints due to the proposed works; and
 - Development of overarching principles and design guidance for A9 dualling site-specific FRA.
- 13.3.3. Potentially vulnerable areas (PVAs) were identified by SEPA as part of the National Flood Risk Assessment. The SFRA identified those, which lie within the A9 corridor route. Those of particular relevance to the A9 Dualling: Kinraig to Dalraddy were:
- The identification of the two main sources of flooding. These were river and surface water, where both sources were noted to be equivalently dominant in most locations;
 - Sections C and E (which includes the Kinraig to Dalraddy route) were identified as having a higher percentage of surface water flooding, particularly at Newtonmore and Aviemore where the route corridor is surrounded by steep hillsides.
- 13.3.4. The overarching principle for flood risk management on the A9 dualling programme was to:
- 'Avoid increasing overall flood risk in the dualling corridor and on sensitive receptors that are 'hydrologically influenced' by the A9 dualling.'*
- 13.3.5. The following strategic principles support the overarching principle:
- 1. Demonstrate that the A9 dualling will not increase overall flood risk;
 - 2. Route alignment to avoid functional floodplain, where possible;
 - 3. Where the route alignment cannot avoid the functional floodplain, it must be designed and constructed to:
 - Remain operational and safe for users in times of flood;
 - Result in no loss of floodplain storage;
 - Not impede water flows; and
 - Not increase flood risk elsewhere.
- 13.3.6. The SFRA is discussed further in the proposed Scheme's FRA, which can be found in Appendix 17 of Volume 3 of this ES.

13.4.

Key Issues

13.4.1.

The key issues for water quality, flood risk and drainage for the proposed Scheme are:

- The potential for water pollution, flooding and drainage problems during construction and operation;
- The River Spey and its tributaries are an important and sensitive fishery and wildlife habitat with SAC and SSSI status;
- The water quality classification of the River Spey is A1 (excellent);
- Overall status of the River Spey at the Insh Marshes is High and the overall ecological status is High; and
- Overall status for the Allt an Fhearna upstream of Loch Alvie is Poor and the overall ecological status is Poor.

13.4.2.

Water features of significance to the proposed Scheme are shown in Figure 13.1 in Volume 2 of this ES. The watercourses that cross under the existing A9 Kincaig to Dalraddy route are directly at risk from the proposed Scheme. These are Dunachton Burn, Leault Burn, Baldow Smiddy, Allt an Fhearna and an unnamed watercourse crossing under the road at 285220, 808890 (referred to as unnamed watercourse at Dalraddy). There is another unnamed watercourse crossing under the existing A9 at 281130, 803720 (referred to as unnamed watercourse at Meadowside). This is outwith the proposed Scheme but has been included in the assessment, as runoff from the proposed Scheme will drain into this watercourse. Loch Insh, Loch Alvie and the River Spey may be indirectly impacted by the proposed Scheme as the watercourses named above flow into these water bodies.

Ecology and Nature Conservation

13.4.3.

Chapter 7 Ecology and Nature Conservation has identified fish habitat for the two major watercourses; the Dunachton Burn and the Allt an Fhearna. Fry, parr, and mixed juvenile fish were identified on the Dunachton and the Allt an Fhearna. This is shown in the River Habitat Survey maps Figures 7.12 and 7.13 in Volume 2 of this ES. There is an existing fish pass on the Dunachton Burn at the A9 crossing. A conversation with Spey Fishery Board on 23rd April 2013 confirmed that the fish pass was constructed to allow fish migration during low flow conditions. It was designed to allow charr, salmon and trout to use the river upstream. The Spey Fishery Board confirmed in their email dated 7th February 2013 that they would be keen to see appropriate fish pass provision on all watercourses. SEPA confirmed in their letter of 29th May 2013 that fish migration should be maintained or improved.

13.4.4.

The River Habitat Survey confirmed that the Dunachton Burn and Allt an Fhearna were the only watercourses likely to support fish habitat. Both crossings are proposed to be replaced with upgraded structures. An assessment of fish passage on the proposed Scheme will be undertaken on the Dunachton and Allt an Fhearna, and where necessary concept design of a proposed solution will be presented. This assessment has been carried out separately.

Water Quality

13.4.5.

Impacts on the quality of surface water and groundwater can occur during construction due to the pollution from accidental spills or from contamination of site runoff. Water quality is also potentially affected by pollutants from runoff and spray on the highway including heavy metals (such as zinc and copper), suspended solids, chloride ions, organics and hydrocarbons. These pollutants are derived from road surface and vehicle wear, exhaust emissions, oil, de-icing salts and litter. Pollutants can affect surface waters and also groundwater, potentially causing longer-term problems. This could impact on existing uses of the water for amenity, water abstraction and habitats. A key environmental constraint to this proposed Scheme is the requirement to satisfy SEPA and SNH that the proposed design provides sufficient protection to the excellent water quality of the River Spey and to the associated protected habitats and species.

Surface Water Hydrology

- 13.4.6. The hydrology of watercourses receiving road drainage can be affected by the presence of a new impermeable surface. Dualling the carriageway will increase the volume of runoff generated and may increase the volume of runoff that reaches the receiving watercourse and also reduce the time it takes to get there. This can have implications for channel stability, aquatic habitats and flooding.
- 13.4.7. The proposed Scheme presents an opportunity to improve the drainage arrangements of the existing road, as the present drainage outfalls discharge directly with little or no attenuation or treatment to land or to the small watercourses that ultimately flow into the River Spey.

Flood Risk

- 13.4.8. The construction of a road can have a significant effect on flood risk. The FRA will recognise, consider and address flooding from all potential sources. The key issue for the proposed Scheme is the loss of functional flood plain as the embankments encroach onto the 0.5% Annual Exceedance Probability (AEP), or the 1 in 200 year flood outline. Improvements to structures can also affect flood risk by increasing river levels downstream as well as causing a localised increase in water levels at the water crossing location.
- 13.4.9. Surface water flooding is also a key issue within the proposed Scheme. Without efficient road drainage high rainfall will pond in local depressions in impermeable surfaces.
- 13.4.10. Flood risk is a key issue at the construction phase. Temporary works may increase the risk of flooding if they are placed within the functional flood plain. Temporary paved surfaces may increase the rate of runoff.

13.5. Methodology

- 13.5.1. The baseline conditions assessment identified key issues and constraints the water environment might pose. Information was obtained on the following:
- Location of watercourse;
 - Hydrological characteristics of the watercourse;
 - Water quality classification; and
 - International and national designations for habitats and conservation status, such as EC freshwater fisheries and the Surface Water (Fishlife) (Classifications) (Scotland) Regulations 1997¹⁰⁶.
- 13.5.2. The existing nature of the water environment within the study area was identified through information received from SEPA, SNH, and the Spey Fisheries Board. Flow information on the watercourses was obtained from the Flood Estimation Handbook (FEH) CD ROM (version 3).
- 13.5.3. HD 45/09¹⁰⁷ sets out a framework through which the assessment considers the attributes of the existing water environment and their importance, along with the potential impacts of the proposed road improvement scheme and their magnitude and significance. The Standard considers four principal areas:
- Effects of Routine Runoff on Surface Waters;
 - Effects of Routine Runoff on Groundwater;
 - Pollution Impacts from Spillages; and
 - Assessing Flood Impacts.

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<http://www.scotland.gov.uk/resource/doc/1057/0053385.pdf>
<http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/hd4509.pdf>

13.5.4.

Examples of the criteria for estimating the importance of a water environment attribute are given in Table 13.2 below. Criteria for estimating the magnitude of an impact on an attribute are given in Table 13.3.

Table 13.2 Estimating the Importance of Water Environment Attributes (from HD45/09¹⁰⁸, Table A4.3)

Importance	Criteria	Typical Examples
Very High	Attribute has a high quality and rarity on regional or national scale	Surface Water: EC Designated Salmonid/Cyprinid fishery WFD* Class 'High'
		Site protected/designated under EC or UK habitat legislation (SAC, SPA, SSSI, WPZ, Ramsar site, salmonid water)/Species protected by EC legislation.
		Groundwater: Principal aquifer providing a regionally important resource or supporting site protected under EC and UK habitat legislation SPZ1.
High	Attribute has a high quality and rarity on local scale	Flood Risk: Floodplain or defence protecting more than 100 residential properties from flooding.
		Surface Water: WFD Class 'Good'
		Major Cyprinid Fishery
Medium	Attribute has a medium quality and rarity on local scale	Species protected under EC or UK habitat legislation
		Groundwater: Principal aquifer providing locally important resource or supporting river ecosystem
		SPZ2
Low	Attribute has a low quality and rarity on local scale	Flood Risk: Floodplain or defence protecting between 1 and 100 residential properties or industrial premises from flooding.
		Surface Water: WFD Class 'Moderate'
		Groundwater: Aquifer providing water for agricultural or industrial use with limited connection to surface water
		SPZ3
		Flood Risk: Floodplain or defence protecting 10 or fewer industrial properties from flooding.
		Surface Water: WFD Class 'Poor'
		Groundwater: Unproductive strata
		Flood Risk: Floodplain with limited constraints and a low probability of flooding of residential and industrial properties

*Water Framework Directive (WFD)

Table 13.3 Estimating Magnitude of an Impact on an Attribute (from HD45/09, Table A4.4)

Magnitude	Criteria	Typical Examples
Major Adverse	Results in loss of attribute and/ or quality and integrity of the attribute	Surface Water: Failure of both soluble and sediment-bound pollutants in HAWRAT (Method A, Annex I) and compliance failure with EQS values (Method B). Calculated risk of pollution from a spillage >2% annually (Spillage Risk Assessment, Method D, Annex I). Loss or extensive change to a fishery. Loss or extensive change to a designated Nature Conservation Site.
		Groundwater: Loss of, or extensive change to, an aquifer. Potential high risk of pollution to groundwater from routine runoff – risk score >250 (Groundwater Assessment, Method C, Annex I). Calculated risk of pollution from spillages >2% annually (Spillage Risk Assessment, Method D, Annex I)
		Flood Risk: Increase in peak flood level (1% annual probability) >100 mm (Hydrological Assessment of Design Floods and Hydraulic Assessment, Methods E and F, Annex I)
Moderate Adverse	Results in effect on integrity of attribute, or loss of part of attribute	Surface Water: Failure of both soluble and sediment-bound pollutants in HAWRAT (Method A, Annex I) but compliance with EQS values (Method B) Calculated risk of pollution from spillages >1% annually and <2% annually Partial loss in productivity of a fishery
		Groundwater: Partial loss or change to an aquifer. Potential medium risk of pollution to groundwater from routine runoff – risk score 150-250 Calculated risk of pollution from spillages >1% annually and <2% annually. Partial loss of the integrity of groundwater supported designated wetlands
		Flood Risk: Increase in peak flood level (1% annual probability) >50 mm
Minor Adverse	Results in some measurable change in attributes quality or vulnerability	Surface Water: Failure of either soluble or sediment-bound pollutants in HAWRAT. Calculated risk of pollution from spillages >0.5% annually and <1% annually
		Groundwater: Potential low risk of pollution to groundwater from routine runoff – risk score <150. Calculated risk of pollution from spillages >0.5% annually and <1% annually Minor effects on groundwater supported wetlands
		Flood Risk: Increase in peak flood level (1% annual probability) >10mm

Negligible	Results in effect on attribute but of insufficient magnitude to affect the use or integrity	The proposed scheme is unlikely to affect the integrity of the water environment
		Surface Water: no risk identified by HAWRAT (Pass both soluble and sediment-bound pollutants) Risk of pollution from spillages <0.5%
		Groundwater: No measurable impact upon an aquifer and risk of pollution from spillages <0.5%
		Flood Risk: negligible change in peak flood level (1% annual probability) <+/- 10mm
Minor Beneficial	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring	Surface Water: HAWRAT assessment of either soluble or sediment-bound pollutants becomes Pass from an existing site where the baseline was a Fail condition. Calculated reduction in existing spillage risk by 50% or more (when existing spillage risk is ,1% annually)
		Groundwater: Calculated reduction in existing spillage risk by 50% or more to an aquifer (when existing spillage risk <1% annually)
		Flood Risk: Reduction in peak flood level (1% annual probability) >10mm
Moderate Beneficial	Results in moderate improvement of attribute quality	Surface Water: HAWRAT assessment of both soluble and sediment-bound pollutants becomes Pass from an existing site where the baseline was a Fail condition. Calculated reduction in existing spillage by 50% or more (when existing spillage risk > 1% annually)
		Groundwater: Calculated reduction in existing spillage risk by 50% or more (when existing spillage risk is >1% annually)
		Flood Risk: Reduction in peak flood level (1% annual probability) >50mm
Major Beneficial	Results in major improvement of attribute quality	Surface Water: Removal of existing polluting discharge, or removing the likelihood of polluting discharges occurring to a watercourse
		Groundwater: Removal of existing polluting discharge to an aquifer or removing the likelihood of polluting discharges occurring
		Recharge of an aquifer
		Flood Risk: Reduction in peak flood level (1% annual probability) >100mm

- 13.5.5. The significance of the potential effects is estimated by considering both the importance of the attribute and the predicted impact magnitude, i.e. the predicted impact of the road on the baseline environment is considered. The matrix in table 13.4 shows the method for estimating the significance of effects.

Table 13.4 Estimating the Significance of Potential Effects (from HD45/09, Table A4.5)

IMPORTANCE OF ATTRIBUTE	Very High	Neutral	Moderate/Large	Large/Very Large	Very large
	High	Neutral	Slight/Moderate	Moderate/Large	Large/Very Large
	Medium	Neutral	Slight	Moderate	Large
	Low	Neutral	Neutral	Slight	Slight/Moderate
		Negligible	Minor	Moderate	Major
MAGNITUDE OF IMPACT					

- 13.5.6. A brief description of the tasks involved is outlined below.

Effects of Routine Runoff on Surface Waters

- 13.5.7. Routine runoff is assessed using the Highway Agency Water Risk Assessment Tool (HAWRAT). This has been developed to investigate the effects of routine road runoff on receiving waters and their ecology. It assesses the impacts from soluble pollutants associated with acute pollution impacts, expressed as Even Mean Concentrations (EMCs) for dissolved copper and zinc and sediment-bound pollutants associated with chronic pollution impacts, expressed as Event Mean Sediment Concentrations (EMSCs) for total copper, zinc, cadmium, pyrene, fluoranthene, anthracene, phenanthrene and total polycyclic aromatic hydrocarbons (PAH).

- 13.5.8. To assess the effects of routine runoff the following information was required:

- The design traffic flow of the road (two-way Annual Average Daily Traffic) (AADT);
- The climatic region of the site;
- The nearest rainfall site within that climatic region;
- The annual 95%ile river flow (m^3/s);
- Base Flow Index (BFI);
- The impermeable road area which drains to the outfall (ha);
- Any permeable (non-road surface) area which also drains to the outfall (ha);
- The hardness of the receiving water ($\text{mg CaCO}_3/\text{l}$);
- Whether there is a downstream structure, lake or pond that reduces the river velocity near the point of discharge;
- An estimate of the river width; and
- Measurements of bed width, side slope, long slope and Manning's n.

- 13.5.9. In addition to this, assessments can be made of the effectiveness of existing and proposed treatment systems using additional information of flow attenuation and % reduction of pollutant concentrate through treatment.

Effects of Routine Runoff on Groundwater

- 13.5.10. The effect of routine runoff on groundwater involves identifying and assessing the individual components of the overall risk to groundwater quality posed by the disposal of road runoff to the ground. The assessment is based on an examination of the 'Source-Pathway-Receptor protocol' (S-P-R). The principle that is applied in this assessment is that all elements of the S-P-R linkage have to be present to create a pollutant linkage. The presence of the pollutant in itself does not pose a risk to groundwater if there is no identifiable pathway.
- 13.5.11. Each component is identified and given a weighting factor. This is to recognise that individual components may have a greater or lesser influence on the magnitude of the risk to groundwater. Each component is given a risk score (low, medium or high) and multiplied by the weighing factor. The overall cumulative assessment of risk score is obtained and classed using suggested classes from HD45/09¹⁰⁹:
- Overall risk score <150 Low Risk of Impact
 - Overall risk score 150-250 Medium Risk Impact
 - Overall risk score >250 High Risk Impact

- 13.5.12. As there is no routine discharges into groundwater. This assessment has not been required for the proposed Scheme.

Pollution Impacts from Spillages

- 13.5.13. Spillages caused by accident or other causes can occur anywhere on the road network. Although the effect of many road projects will be to reduce the overall risks of collisions, it is important to assess the risks of an acute pollution impact. Assessment will allow routes to be chosen to minimise the environmental risks and to target mitigation measures at the highest risk areas. HAWRAT includes a facility to assess spillage risk. The method initially estimates the risk that there will be a collision involving the spillage of a potentially polluting substance somewhere on the length of road being assessed. It then calculates the risk, assuming a spillage has occurred, that the pollutant will reach and impact on the receiving watercourse. These risks can be expressed as annual probabilities of such an event occurring.
- 13.5.14. To determine the risk, the following information is required:
- The length of road in each category (motorways, rural trunk roads, urban trunk roads);
 - The AADT two way flow for each category; and
 - The percentage of AADT flow that comprises of Heavy Good Vehicles (HGVs).

Assessing Flood Impacts

- 13.5.15. Assessing flood impacts involves highlighting important issues in the planning stages. These are:
- To ensure that any route options which avoid floodplains are fully investigated;
 - Outline bridge designs may require alteration to achieve the no net afflux target. The cost effectiveness of achieving this should be compared to other options such as providing separate flood relief culverts; and
 - Costs and benefits should be assessed when considering the need for compensatory flood storage, alternative measures to reduce floodwater levels or the protection of areas where the flood risk would otherwise be increased.

13.5.16. Other factors which may require more detailed assessment at the design stage are:

- The hydraulic performance of bridge structures and culverts;
- The effect of any works affecting rivers both upstream and downstream;
- The impact of road runoff on river flows;
- The effect of road construction on hydrological regimes and catchments; and
- Consequential impacts on aquatic and other environments.

13.5.17. The DMRB methodology for flood risk states that the risk should be assessed to the 1% AEP flood event (1 in 100 years), plus an allowance for climate change. However, the Scottish Planning Policy (SPP)¹¹⁰ flood risk framework expects assessment to the 0.5% AEP. The SPP flood risk framework is shown in the table below.

Table 13.5 Scottish Planning Policy flood risk framework

Risk Framework
<p>Little or No Risk – annual probability of watercourse, tidal or coastal flooding is less than 0.1% (1:1000) No constraint due to watercourse, tidal or coastal flooding.</p>
<p>Low to medium Risk Area – annual probability of watercourse, tidal or coastal flooding in the range 0.1% - 0.5% (1:1000 – 1:200) These areas will be suitable for most development. A flood risk assessment may be required at the upper end of the probability range (i.e. close to 0.5%) or where the nature of the development, or local circumstances, indicate heightened risk. Water resistant materials and construction may be required depending on the flood risk assessment. Subject to operational requirements, including response times, these areas are generally not suitable for essential civil infrastructure such as hospitals, fire stations, emergency depots etc. Where such infrastructure must be located in these areas, or is being substantially extended, it should be capable of remaining operational and accessible during extreme flooding events.</p>
<p>Medium to High Risk – annual probability of watercourse, tidal or coastal flooding greater than 0.5% (1:200) Generally not suitable for essential civil infrastructure such as hospitals, fire stations, emergency depots etc., schools, care homes, ground-based electrical and telecommunications equipments unless subject to an appropriate long term flood risk management strategy. The policy for development on functional flood plains applies. Land raising may be acceptable. If build development is permitted, appropriate measures to manage flood risk will be required and the loss of flood storage capacity mitigated to produce a neutral or better outcome. Within built up areas, medium to high risk areas may be suitable for residential, institutional, commercial and industrial development provided flood prevention measures to the appropriate standard already exist, are under constructions or are planned as part of the long term strategy. In allocating sites, preference should be given to those areas already defended to required standards. Water resistant materials and construction should be used where appropriate. In undeveloped and sparsely developed areas, medium to high risk areas are generally not suitable for additional development. Exceptions may arise if a location is essential for operational reason, e.g. for navigation and water based recreation uses, agriculture, transport or some utilities infrastructure and an alternative lower risk location is not achievable. Such infrastructure should be designed and constructed to remain operational during floods. These areas may also be suitable for some recreation, sport, amenity and nature conservation uses provided adequate evacuation procedures are in place. Job related accommodation (e.g. caretakers and operational staff) may be acceptable. New caravan and camping sites should not be located in these areas. If built development is permitted, measures to manage flood risk are likely to be required and the loss of flood storage capacity minimised. Water resistant materials and construction should be used where appropriate.</p>

- 13.5.18. The proposed Scheme's FRA follows the SPP flood risk framework and the methodology from SEPA's Technical Flood Risk Guidance for Stakeholders, version 4¹¹¹. Therefore Table 13.5, for flood risk should be read using 0.5% AEP instead of 1% AEP. For example a negligible impact to flood risk would be quantified as 'negligible change in peak flood level (1% annual probability) <+/- 10mm'.
- 13.5.19. Methodology to assess fluvial flood risk is described in more detail in the technical appendices of the FRA. Hydrological and hydraulic modelling was carried out to inform flood risk analysis. The hydrological models were built in accordance with UK industry procedures set out in the Flood Estimation Handbook and subsequent related research. The hydraulic models were built using InfoWorks RS 1D and 2 D hydraulic modelling software. Although the methodology to assess flood risk for the ES and FRA are the same, the effects on flood risk are reported differently. This ES will report the significance of the effects using Table 13.2, Table 13.3 and, Table 13.4 i.e. it will quantify the effects of flood risk in terms of Major Adverse, Negligible or Major Beneficial. The FRA will assess flood risk in terms of Little or No Risk, Low to Medium Risk, and Medium to High Risk in line with the SPP risk framework.

13.6. Baseline Conditions

Water Resources

- 13.6.1. Baseline conditions of the significant water features to this proposed Scheme have been described below. Impacts of the proposed Scheme to the River Spey and the Insh Marshes have not been assessed in the subsequent sections. The proposed Scheme will not affect the River Spey and Insh Marshes directly; any impact to these water features would be through the unnamed watercourse at Meadowside, Dunachton Burn, Baldow Smiddy, Leault Burn, unnamed watercourse at Dalraddy and the Allt an Fhearna. These have been assessed and mitigation measures have been recommended to ensure no impact occurs to the River Spey or the Insh Marshes.

River Spey

- 13.6.2. The River Spey is one of the largest rivers in Scotland and one of the least polluted in the UK. The river, its main tributaries and many similar tributaries are designated as a SAC and a SSSI. It is a major feature of the Highland landscape providing valuable recreational amenities, such as at Loch Insh.
- 13.6.3. The upper catchment of the river is relatively steep, as is the lower river downstream from Grantown-on-Spey. However, the middle reach, which includes the study area, is characterised by a broad meandering channel, wide floodplain and are relatively slow flowing due to the low gradient. In this part of the river, which includes the Insh Marshes south east of Loch Insh, the river is more similar to a lowland river in form.

Insh Marshes

- 13.6.4. The Insh Marshes are an important feature of the River Spey catchment and are significant in terms of geology, wildlife and plant life. The site has been given SAC, SPA, SSSI and Ramsar status for its important populations of breeding and wintering wetland birds, nationally scarce mammals, plants and invertebrates and its transition mires and quaking bogs.

Unnamed Watercourse at Meadowside

- 13.6.5. The unnamed watercourse at Meadowside lies approximately 1.6km south of the Dunachton Burn. It has a catchment area of 1.36km² (FEH CD ROM, version 3). It has a rural catchment and flows under the existing A9 at 281130, 803720. It then flows into the Insh Marshes.

Dunachton Burn

- 13.6.6. The Dunachton Burn is a tributary to the River Spey and has a catchment area of 11.92 km² (FEH CD ROM, version 3). The Allt na Baranachd source is to the west of the Loch Insh, from Meali a' Chaochairn Duibh (604 metres in altitude), various tributaries join this mountainous stream which become the Dunachton Burn. The Dunachton Burn flows under the existing A9 at NGR 282370, 804850, then railway line and outflows into Loch Insh.

Leault Burn

- 13.6.7. The Leault Burn is also a tributary to the River Spey and has a catchment of 2.74 km² (FEH CD ROM, version 3). It has a predominantly rural catchment and flows under the A9 at NGR 283090, 806040. It then flows under the B9152, then the railway line and joins with the Baldow Smiddy before flowing into the River Spey.

Baldow Smiddy

- 13.6.7. The Baldow Smiddy is a small tributary to the Leault Burn and has a catchment of 0.91 km² (FEH CD ROM, version 3). It flows under the existing A9 at NGR 283298, 806470, then under the B9152 and then the railway line before joining with the Leault Burn and outflowing into the River Spey.

Unnamed Watercourse at Dalraddy

- 13.6.8. The unnamed watercourse at Dalraddy crosses the existing A9 through a pipe at 285250, 808890. It has a catchment of 1.78km². The watercourse flows east towards the properties at Dalraddy and then flows into Loch Beag.

Allt an Fhearna

- 13.6.9. The Allt an Fhearna has a catchment area of 20.08 km². It is a product of a number of larger tributaries, including the Allt na Cornlaraiche, Allt Each and Allt Coire Chleich. It has a predominantly rural catchment and flows under the existing A9 at NGR 285390, 809130. It then outflows into Loch Alvie.

Hydrometric Data

- 13.6.10. River flow data for the Spey catchment is monitored by SEPA as part of its hydrometric network. The resulting river flow data is available from the National River Flow Archive. There is a gauging station on the Spey at Ruthven Bridge (NH 759 996), upstream of the scheme. A tributary, the River Tromie is gauged at Tromie Bridge (NN 789 995), also upstream of the proposed Scheme. The River Feshie is gauged at Feshie Bridge (NH 849 047) upstream of its confluence with the Spey. The River Spey is also gauged at Kinrara (NH 881 082), downstream of the scheme. Gauged flows are shown in Table 13.6 below.

Table 13.6 Hydrometric data for the River Spey and its tributaries in the study area

STATION	RIVER	CATCHMENT (km ²)	MEAN FLOW (m ³ /s)	Q95%ile (m ³ /s)	Q10%ile (m ³ /s)	MEAN RAIN 1961-1990 (mm)
Ruthven Bridge	Spey	533.8	9.36	2.72	18.23	1375
Tromie Bridge	Tromie	130.3	2.5	1.2	3.76	1437
Feshie Bridge	Feshie	231	7.73	1.85	15.58	1286
Kinrara	Spey	1011.7	22.67	6	45.03	1317

- 13.6.11. The River Spey catchment is widely used in the generation of hydro-power. Scottish and Southern Energy plc diverts water from the upper catchments of the River Tromie and the River Truim to Loch Erich. Data has not been made available on the volumes of water diverted by the hydro-power scheme. The gauged flows in Table 13.6 above are downstream of this diversion.
- 13.6.12. The Dunachton Burn, Leault Burn, Baldow Smiddy, unnamed watercourses and the Allt an Fhearna are not currently part of the hydrometric network. Flow estimates can be obtained from FEH and subsequent relevant research. This has been undertaken as part of the FRA for the proposed Scheme. The FEH CD ROM (version 3) was used to obtain the hydrological characteristics of these catchments. The Q₉₅ low flow for each of the watercourses was estimated using methodology set out in the Institute of Hydrology, Report 101, Low Flow Estimation in Scotland, 1987¹¹²
- 13.6.13. The hydrological characteristics, including the estimated Q_{95r}, are listed in Table 13.7.

Table 13.7 Hydrological Characteristics of Watercourses

Watercourse	Catchment (km ²)	SAAR (mm)	Baseflow (m ³ /s)	Q95 (m ³ /s)
Unnamed Watercourse at Meadowside	1.36	877	0.619	0.01
Dunachton Burn	11.92	1015	0.494	0.071
Leault Burn	2.74	912	0.583	0.020
Baldow Smiddy	0.91	851	0.687	0.007
Unnamed Watercourse at Dalraddy	1.78	850	0.816	0.03
Allt an Fhearna	20.08	1075	0.436	0.110

Water Quality

- 13.6.14. A key issue of concern for the River Spey at a catchment scale is the continued improvement of fisheries and breeding grounds for both mammals and birds, and the effect that an adverse impact on water quality could have on these. Issues with water quality can also affect recreational users, water abstractions and the dilution of waste materials.
- 13.6.15. The quality of all controlled waters in Scotland is classified by SEPA using data gathered from routine chemical and biological monitoring programmes and from an assessment of the aesthetic quality of the watercourse and the bankside environment. River quality is scored on a five point scale shown in Table .

Table 13.8 River Water Quality Classification Scheme

Classification	Description
A1	Excellent
A2	Good
B	Fair
C	Poor
D	Seriously Polluted

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The Groundwater Vulnerability Map of Scotland. 1995

13.6.16. The River Spey is a very important watercourse for migratory fish. The 2011 water quality classification of the River Spey was A1 – Excellent (See Table 13.8). The Allt an Fhearna water quality classification was C – Poor.

13.6.17. The five other watercourses crossed by the existing A9 over the length of the proposed Scheme are not currently monitored by SEPA.

Drainage

13.6.18. At present runoff from the road along the length of the proposed Scheme is collected via gullypots, which discharge to carrier drains that run along the verges adjacent to the A9 carriageway. The gullies switch between the north and south side of the existing A9 depending on the crossfall at each section. These carrier drains are laid in filter trenches which also provide drainage for the road's sub-surface layers and to pick up any additional overland flow from the verges and adjacent embankments. There are also a number of open ditches running parallel to the road that provide both field drainage and convey some of the road drainage to specific discharge points. The present drainage outfalls discharge directly with little or no attenuation or treatment to land or to the small watercourses that ultimately flow into the River Spey. Along the length of the proposed Scheme there are several discharge points. Existing drainage information received only covers a 4.5 kilometre stretch of the proposed Scheme.

13.6.19. Existing drainage information for the entire proposed Scheme is currently unavailable pending design development. Road drainage outfalls will be required for six drainage networks. The location of the drainage outfalls and networks are shown in Figure 13.2 of Volume 2 of this ES.

13.6.20. The approximate drainage areas for each watercourse for the existing and proposed networks are shown in Table 13.9 below.

Table 13.9 Approximate drainage areas for Existing and Proposed Networks

Network	Chainage	Watercourse	Approximate Drainage Area – Existing (ha)	Approximate Drainage Area - Proposed (ha)
1	0 - 1060	Unnamed Watercourse at Meadowside	1.7	3.39
2A and 2B	2A: 1060 – 1750 2B: 1750 - 2800	Dunachton Burn	TOTAL = 2.1 2A – 0.9 2B – 1.2	TOTAL = 4.54 2A – 1.78 2B – 2.76
3	2800 - 3500	Leault Burn	1.0	2.72
4	3500 - 4550	Baldow Smiddy	1.3	2.82
5	4550 - 6950	Unnamed Watercourse at Dalraddy	3.0	8.1
6	6950 - 7350	Allt an Fhearna	0.3	0.72

Baseline Pollution from Surface Water Runoff

- 13.6.21. The DMRB methodology assesses the impact of the main metallic pollutants copper and zinc. Existing pollution from surface water runoff has been assessed using the HAWRAT tool described in the methodology section (section 13.5). Data for the annual 95%ile river flow (Q_{95}) was estimated using methodology set out in the Institute of Hydrology, Report 101, Low Flow Estimation in Scotland, 1987¹¹³. Q_{95} estimates for the unnamed watercourse at Meadowside, Dunachton Burn, Leault Burn, Baldow Smiddy, unnamed watercourse at Dalraddy and Allt an Fhearna are displayed in Table 13.7.
- 13.6.22. Baseflow was obtained using the catchment descriptors from the Flood Estimation Handbook¹¹⁴ (FEH CD ROM) and are also shown in Table 13.7.
- 13.6.23. Mean hardness (CaCO_3 concentration) was not available for the six watercourses. In the ES for the previous WS2+1 carriageway widening scheme¹¹⁵, a mean hardness was provided by SEPA for 2003, for the River Spey at Kingussie as 19.4 mg/l. In HAWRAT the mean hardness value is entered as either low, which is less than 50 mg/l, medium, which is between 50 – 100 mg/l and high, which is greater than 200 mg/l. It has been assumed that the mean hardness for the River Spey tributaries is similar to the River Spey and therefore the water hardness was marked as low.
- 13.6.24. The estimate for the average annual concentrations of copper and zinc were calculated using the information from the hydrological characteristics (Table 13.7) and the existing drainage areas (Table 13.9). The results are displayed in Table 13.10. These are compared with the Environmental Quality Standard for dissolved Copper and Zinc. The HAWRAT results sheets are available in Appendix 16 of Volume 3 of this ES.

Table 13.10 Baseline Estimates of Average Annual Concentration of Copper and Zinc

Watercourse	Approximate Drainage Areas (ha)	Average annual concentration copper ($\mu\text{g/l}$)	EQS for dissolved copper ($\mu\text{g/l}$)	Average annual concentration zinc ($\mu\text{g/l}$)	EQS for dissolved zinc ($\mu\text{g/l}$)
Unnamed Watercourse at Meadowside	1.7	0.15	1	0.53	7.8
Dunachton Burn	2.1	0.03	1	0.12	7.8
Leault Burn	1.0	0.05	1	0.19	7.8
Baldow Smiddy	1.3	0.18	1	0.64	7.8
Unnamed Watercourse at Dalraddy	3.0	0.1	1	0.35	7.8
Allt an Fhearna	0.3	0.00	1	0.01	7.8

- 13.6.25. The results show that the existing estimated values for the average annual concentration of copper and zinc are lower than Environmental Quality Standard.

Baseline Pollution Impacts from Spillages

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Scottish Planning Policy, SPP, 2010.
<http://www.ceh.ac.uk/feh2/fehintro.htm>
Atkins. A9 Kincaig to Dalraddy Carriageway Widening Environmental Statement, 2006.

13.6.26. A baseline estimate of the risk of pollution from spillages was assessed using the methodology described in HD45/09.

13.6.27. The risk is defined as the probability that there will be a spillage of pollutant and that the pollutant will reach and impact the water body to such an extent that a serious pollution incident occurs. The probability is the product of two separate risks:

- The probability that there will be a spillage with the potential to cause a serious incident; and
- The probability, assuming such a spillage occurred that the pollutant will cause a serious pollution incident.

13.6.28. The probability that there will be a spillage with the potential to cause a serious pollution impact was calculated using the following formula:

$$P_{SPL} = RL \times SS \times (AADT \times 365 \times 10^{-9}) \times (\% \text{ HGV} / 100)$$

Where:

P_{SPL} = annual probability of spillage with the potential to cause a serious pollution incident

RL = road length in kilometres

SS = spillage rate (from Table D1.1 from HD45/09).

AADT = annual average daily traffic (use design year for new road)

%HGV = percentage of heavy goods vehicles

This was calculated for the proposed design, which gave the PSPL as 0.0036%.

13.6.29. The probability, assuming such a spillage has occurred; that the pollutant will cause a serious pollution incident was calculated using the following formula:

$$P_{INC} = P_{SPL} \times P_{POL}$$

Where:

P_{INC} = the probability of a spillage with an associated risk of a serious pollution incident occurring.

P_{POL} = the probability, given a spillage, that a serious pollution incident will result (based on the sensitivity of the watercourse and how soon it can be reached by the emergency services).

13.6.30. The HAWRAT tool was used to assess the baseline risk of spillage to surface runoff and groundwater. The summary sheets are included in Appendix 16 in Volume 3 of this ES. A summary of the results are in Table 13.11 below. The risk to surface water and groundwater was calculated separately however, both gave the same result.

Table 13.11 Baseline Risk of a Spillage to Surface Water and Groundwater

Network	PINCSurface Water (%) and Groundwater
1	0.00047
2	0.00077
3	0.00031
4	0.00046
5	0.00106
6	0.00018

13.6.31. Within areas which are in close proximity to (i.e. within 1km) a natural wetland or designated wetlands such as SSSIs SACs, SPAs, WPZs, Ramsar sites and salmonid waters a high standard of protection is required. The risk of a serious pollution incident should be less than 0.5%. The calculated risk for surface water and groundwater for the baseline conditions are significantly lower than 0.5%.

Flood Risk

13.6.32. The flood risk for the existing A9 has been assessed in the A9 Dualling: Kincaig to Dalraddy Flood Risk Assessment (Appendix 17 in Volume 3 of this ES). Flood risk from all sources was assessed however, risk of surface water flooding and fluvial flooding were found to be the most significant sources for this proposed Scheme.

Surface Runoff

13.6.33. Existing flooding from surface runoff was assessed using the Wallingford Modified Rational Method¹¹⁶. The runoff calculations are described in detail in the FRA (Appendix 17). The results for the existing road runoff volumes are in Table 13.12. These are for the 200 year event and 5 minute point intensity.

Table 13.12 Existing Road Runoff Volumes

Network	Area (ha)	Flow (m3/sec)	Flow (litres/sec)
1	1.7	0.59	587.41
2A	0.9	0.30	297.02
2B	1.2	0.41	411.99
3	1.0	0.36	360.62
4	1.3	0.45	445.19
5	3.0	1.05	1053.21
6	0.3	0.1	120.21

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Wallingford(1983) Design and analysis of urban storm drainage. The Wallingford Procedure.

Fluvial Flooding

- 13.6.34. A review of SEPA's Indicative River and Coastal Flood Map (Scotland) 200 year flood outline (i.e. the flood with a 0.5% chance of occurring in any single year) showed that there was a risk of flooding. The indicative flood outlines showed that the Dunachton Burn and the Allt an Fhearna flooded at the existing A9 crossings. During a consultation with SEPA (dated 19.12.12), concern was expressed that the proposed embankments associated with the A9 dualling may impinge on the functional floodplain for the Allt an Fhearna and Loch Alvie. The SEPA Indicative Flood Map does not represent watercourses with a catchment area less than 3 kilometres, therefore the Leault Burn, Baldow Smiddy and the unnamed watercourses at Meadowside and Dalraddy are not shown.
- 13.6.35. Hydrological and hydraulic modelling was carried out to inform flood risk analysis. The hydraulic models showed that the existing A9 development is not at risk of flooding from fluvial sources as it is built above the flood level. There is however, flooding at the Dunachton Burn and Allt an Fhearna under the existing A9 crossing.
- 13.6.36. The hydraulic model for the Dunachton Burn indicates that the river channel under the culvert floods the access track but does not extend onto the flood plains. There is also out of bank flow at the downstream extent of the model where the railway crosses the Dunachton Burn.
- 13.6.37. The results for the Allt an Fhearna model showed that the river floods directly upstream and directly downstream of the existing structure. There is further flooding to the east of the existing A9, in agricultural fields. This is from Loch Alvie and Loch Beag, although there is a low-lying area of land on the right bank of the Allt an Fhearna that allows flood water to flow into this flood plain.
- 13.6.37. Flood outlines for the 0.5% AEP (with 20% increase in flow as allowance for climate change) for the Dunachon Burn and the Allt an Fhearna are in Figures 13.4 and 13.5 in Volume 2 of this ES.
- 13.6.38. The hydraulic model for the unnamed watercourse at Meadowside found that the river did not flow out of bank at the 0.5% AEP (with 20% increase in flow as allowance for climate change). There is some ponding downstream of the A9 crossing, where the water flows into the B9152 culvert. This has been mapped on Figure 13.6 in Volume 2 of this ES.
- 13.6.39. The hydraulic models of the Baldow Smiddy, the unnamed watercourse at Dalraddy and the Leault Burn showed a minimal amount of out of bank flow, however no flood risk to receptors such as farm land, access tracks or properties.

Groundwater

- 13.6.40. The Spey catchment is characterised by steep sided mountain valleys interspersed with broad floodplains. The proposed works are within the extent of the alluvial deposits along the valley floor. The Groundwater Vulnerability Map of Scotland¹¹⁷ shows the solid geology in the study area to be moderately permeable. The Macaulay Land Use Research Institute¹¹⁸ provisional groundwater vulnerability maps show the area to be of low vulnerability.
- 13.6.41. At the time of writing this Chapter, a detailed Ground Investigation (GI) relevant to the proposed Scheme has still to be completed, with work anticipated to start in March 2014. Accordingly, the baseline assessment of groundwater within this chapter and subsequent assessment is based upon information available at the time of writing and the SEA Environmental Report¹¹⁹.

117 NERC (2005) The Groundwater Vulnerability Map of Scotland. <http://publicdata.eu/dataset/groundwater-vulnerability-map-of-scotland>

118 www.macaulay.ac.uk

119 Halcrow, A9 Dualling Programme, Strategic Environmental Assessment Environmental Report, Document No. TSSEA9/SR/01 Version 1.1, June 2013

13.6.42.

A search was conducted on the BGS GeolIndex¹²⁰ service for relevant historical borehole and site investigation reports. The search indicated there to be sixty six (66 No.) relevant historical boreholes, typically associated with the existing A9 construction. Additionally a GI was carried out by Norwest Holst, in 2006 across 4.5 kilometre of the proposed route in support of the proposed A9 Kincaig to Dalraddy Carriageway WS2 +1 Scheme¹²¹. Results from the relevant exploratory holes from the Norwest Holst GI and the historical boreholes are summarised in Table 13.13.

Table 13.13 Summary of Groundwater Strikes

Exploratory hole ID	Investigation	Date	Depth of inflow (m)	Reduced Level (m AOD)	Rate of inflow	Level after 20 mins (m)	Type of stratum
R01	A9 Kincaig to Dalraddy Widening. Norwest Holst	08/09/2005	8.7	228.9	NR	NR	Sand and Gravel
R02	A9 Kincaig to Dalraddy Widening. Norwest Holst	06/09/2005	11.5	229.25	NR	NR	Sand and Gravel
TP17	A9 Kincaig to Dalraddy Widening. Norwest Holst	08/09/2005	1.0	233.55	Moderate	0.8m	Sand
TP18	A9 Kincaig to Dalraddy Widening. Norwest Holst	08/09/2005	0.4	233.35	NR	NR	Made Ground
8058A	BGS	13/04/1978	0.7	219.7	Fast	NR	Sand
8035	BGS	04/04/1978	GL	223.5	NR	NR	Sand and Gravel
8035	BGS	04/04/1978	3.0	220.5	NR	NR	Sand and Gravel
8043	BGS	23/03/1978	4.9	237.6	NR	NR	Sand and Gravel
8044	BGS	22/03/1978	GL	236.7	Seepage	NR	Peat
8045	BGS	22/03/1978	GL	237.6	NR	NR	Peat
8046	BGS	21/03/1978	3.9	238.1	NR	NR	Sand and Gravel
8047	BGS	21/03/1978	0.55	237.65	Fast	NR	Sand and Gravel
8047	BGS	21/03/1978	1.6	236.6	NR	NR	Sand and Gravel

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British Geological Survey, Onshore Geolindex available at <http://www.bgs.ac.uk/GeolIndex/>, accessed November 2012
Atkins (2006) A9 Kincaig to dalraddy Carriageway Widening. Geotechnical Interpretative Report. Issue 03.

Exploratory hole ID	Investigation	Date	Depth of inflow (m)	Reduced Level (m AOD)	Rate of inflow	Level after 20 mins (m)	Type of stratum
8048	BGS	20/03/1978	2.4	233.8	NR	NR	Sand and Gravel
8049	BGS	20/03/1978	1.8	236.2	NR	NR	Sand and Gravel
8053	BGS	10/03/1978	3.8	233.8	NR	NR	Sand and Gravel
8054	BGS	11/03/1978	GL	225.1	NR	NR	Peat
8055	BGS	10/03/1978	2.3	224.7	NR	NR	Sand and Gravel
8056	BGS	09/03/1978	3.55	223.55	NR	NR	Sand and Gravel
8057	BGS	08/03/1978	10.1	220.4	NR	NR	Sand and Gravel
8059	BGS	07/03/1978	1.5	219.1	NR	NR	Sand and Gravel
8060	BGS	07/03/1978	1.0	216.6	NR	NR	Sand and Gravel
8064	BGS	02/03/1978	0.5	215.9	Fast	NR	Sand and Gravel
8026A	BGS	08/05/1978	3.25	222.08	NR	NR	Sand and Gravel
8026C	BGS	25/04/1978	1.05	224.35	NR	NR	Sand and Gravel
8026D	BGS	06/05/1978	4.8	219.8	NR	NR	Sand and Gravel
8037A	BGS	12/06/1978	GL	226.1	NR	NR	Peat
8037B	BGS	01/06/1978	GL	226.5	NR	NR	Peat
8037C	BGS	24/05/1978	0.55	226.45	NR	NR	Peat
8037D	BGS	16/06/1978	0.17	225.96	NR	NR	Peat
8044A	BGS	05/06/1978	1.5	235.5	NR	NR	Peat
8047A	BGS	07/06/1978	0.55	235.75	NR	NR	Sand and Gravel
8052A	BGS	13/03/1978	3.9	233.6	NR	NR	Sand and Gravel
8052B	BGS	13/03/1978	2.9	230.8	Fast	NR	Sand and Gravel
8059A	BGS	14/06/1978	1.2	218.4	NR	NR	Sand and Gravel
8061A	BGS	20/05/1978	1.0	217.2	NR	NR	Sand and Gravel

Exploratory hole ID	Investigation	Date	Depth of inflow (m)	Reduced Level (m AOD)	Rate of inflow	Level after 20 mins (m)	Type of stratum
8061B	BGS	16/05/1978	0.9	217.2	NR	NR	Sand and Gravel
8061C	BGS	11/05/1978	1.0	216.8	NR	NR	Sand and Gravel
8061D	BGS	09/05/1978	1.0	217.2	NR	NR	Sand and Gravel
8061E	BGS	24/05/1978	1.0	217.2	NR	NR	Sand and Gravel
8063A	BGS	03/03/1978	1.7	223.9	NR	NR	Sand and Gravel
8063B	BGS	03/03/1978	1.3	223.3	Seepage	NR	Sand and Gravel
8063D	BGS	20/06/1978	1.5	220.8	NR	NR	Sand and Gravel
8063E	BGS	16/06/1978	1.5	223.5	NR	NR	Sand and Gravel
8065A	BGS	01/03/1978	2.2	234.9	NR	NR	Sand and Gravel

- 13.6.43. It should however be noted that the historical boreholes were carried out prior to the existing A9 alignment construction. Accordingly, reported groundwater conditions may not be representative of current conditions. Furthermore, it should be noted that the groundwater is subject to seasonal variations and levels higher or lower than those recorded to date may exist. A full assessment of the potential impact to the groundwater will be undertaken following completion of the proposed GI, which shall include long term monitoring and sampling of groundwater across the site. However, it is noted that the proposed works for the A9 dualling principally comprise the extension / regrading of existing earthworks. It is therefore anticipated that the proposed Scheme will have a minimal effect on the current water table.
- 13.6.44. Section 13.8 lists mitigation measures and best practise guides, which will reduce the impact to groundwater through construction and operation. Where there is a possibility of cross contamination groundwater occurring through the road drainage, filter drain, swales and Sustainable Urban Drainage System (SuDS) ponds should be lined.
- 13.6.45. The Highland Council confirmed locations of private water suppliers in the vicinity of the site. These have been mapped in Figure 13.3 in Volume 2 of this ES. The figure shows that there is a groundwater abstraction point at Dunachton Lodge which may be impacted by the proposed Scheme.
- 13.6.46. In the letter dated 6th March 2012, SEPA recommended that the radius of the risk assessment for groundwater abstractions was taken from Table 1 of the regulatory methods statement WAT-RM-11 Licensing Groundwater Abstractions and Dewatering¹²². Figure 13.3 has mapped the groundwater abstractions; those marked in red are located within a 1200 metre radius of the site.

Fisheries

- 13.6.47. The River Spey is a designated Salmonid Water under the Fisheries Directive (78/659/EEC)¹²³ and it is a SAC because of its Atlantic salmon, sea lamprey, otter and freshwater pearl habitats and populations (SNH, 2008).
- 13.6.48. Overall, there are several important species and habitats supported by the River Spey and its tributaries. These are:
- Atlantic salmon;
 - Brown (sea) trout;
 - Arctic charr;
 - Eels;
 - Freshwater pearl mussels Sea lampreys known to spawn in the River Spey;
 - Otters; and
 - Ospreys.
- 13.6.49. The list above was confirmed by the Spey Fishery Board (consulted on 31.01.13) and SNH (consulted on 18.01.13).
- 13.6.50. Loch Alvie and Loch Beag are known to support non-native fish species. The Insh Marshes also support populations of important aquatic invertebrate species and aquatic mammals such as otter and rare species of plant.

13.7. Impacts (Opening Year 1) Without Mitigation

- 13.7.1. Roads have the potential to affect the water environment due to the increase in runoff from the impermeable surfaces, which will increase in proportion to the increase in surface area of the road. Runoff from the road surface transports a range of contaminant from the road surface into drainage channels and receiving watercourses or groundwater. Structures within the floodplains and on or over watercourses may also alter the hydrological regime of the area.
- 13.7.2. There are a number of potential effects that could occur both during construction of the scheme and after completion. These include:
- Pollution from surface water runoff;
 - Pollution from accidental spills; and
 - Increased risk of flooding.

Pollution from Surface Water Runoff

13.7.3.

The average annual concentrations of copper and zinc were estimated using the HAWRAT tool. This was estimated for each watercourse, using the information from the hydrological characteristics in Table 13.7 and the approximate drainage areas in Table 13.9. The results are displayed in the Table 13.14 and Table 13.15. These are compared with the Environmental Quality Standard for dissolved Copper and Zinc.

Table 13.14 Estimated Average Annual Concentration of Copper

Watercourse	Approximate Drainage Areas (ha)	Average annual concentration copper (µg/l) from existing Scheme	Average annual concentration copper (µg/l) from proposed Scheme	EQS for dissolved copper (µg/l)
Unnamed Watercourse at Meadowside	3.39	0.15	0.29	1
Dunachton Burn	4.54	0.03	0.07	1
Leault Burn	2.72	0.05	0.13	1
Baldow Smiddy	2.82	0.18	0.34	1
Unnamed Watercourse at Dalraddy	8.07	0.1	0.24	1
Allt an Fhearna	0.72	0.00	0.01	1

Table 13.15 Estimated Average Annual Concentration of Zinc

Watercourse	Approximate Drainage Areas (ha)	Average annual concentration zinc (µg/l) for existing scheme	Average annual concentration zinc (µg/l) for proposed scheme	EQS for dissolved zinc (µg/l)
Unnamed Watercourse at Meadowside	3.39	0.53	1.00	7.8
Dunachton Burn	4.54	0.12	0.26	7.8
Leault Burn	2.72	0.19	0.49	7.8
Baldow Smiddy	2.82	0.64	1.19	7.8
Unnamed Watercourse at Dalraddy	8.07	0.35	0.86	7.8
Allt an Fhearna	0.72	0.01	0.03	7.8

- 13.7.4. The results shows that there is an increase in concentrations of copper and zinc as a result of the proposed Scheme, however the proposed estimates are still below the EQS threshold. The impact of surface water can be assessed as negligible as no risk has been identified by the HAWRAT calculations.

Pollution Impacts from Spillages

- 13.7.5. The HAWRAT tool was used to assess the risk of spillage to surface runoff and groundwater for the proposed development. The summary sheets are included in Appendix 16 in Volume 3 of this ES. A summary of the results are in Table 13.16. below.

Table 13.16 Risk of a Spillage to Surface Water and Groundwater

Network	PINCSurface Water and Groundwater (%)
1	0.00051
2	0.00084
3	0.00034
4	0.00051
5	0.00116
6	0.00019

- 13.7.6. Although there is a slight increase in risk from spillage to groundwater and surface water, the calculated estimates are still significantly lower than the required 0.5%. Pollution impact from a spillage with the potential to cause a serious pollution incident is assessed to be negligible as the risk of pollution from spillages is less than <0.5%.

Increased risk of flooding

Surface Water

- 13.7.7. Flooding from surface runoff for the proposed Scheme was assessed using the Wallingford Modified Rational Method¹²⁴. The runoff calculations are described in detail in the FRA (Appendix 16 in Volume 3 of this ES). The results for the existing road runoff volumes are in Table 13.17 below. These are for the 200 year event and 5 minute point intensity (M200-5).

Table 13.17 Proposed Road Runoff Volumes

Network	Proposed Area (ha)	Flow (m3/sec)	Flow (litres/sec)	Increase in flow from Existing A9 (m3/s)
1	3.4	1.18	1184.25	0.60
2A	1.8	0.63	627.94	0.33
2B	2.8	0.96	964.10	0.55
3	2.7	0.95	949.43	0.59
4	2.8	0.99	985.42	0.54
5	8.1	2.82	2818.58	1.77
6	0.7	0.25	252.65	0.13

13.7.8. The results show that there is an increase of surface runoff from the proposed development.

Fluvial Flooding

13.7.9. The impacts of the proposed designs for each watercourse were assessed using the hydraulic models. Details of the hydraulic models and the options assessed are in the FRA (Appendix 17 in Volume 3 of this ES). The hydraulic models showed that with the exception of the Allt an Fhearna, the proposed design had a negligible effect on flood risk i.e. changes in water level were less than 10mm and localised to the upstream face of the structure.

13.7.10. Table 13.18 summarised the results of the hydraulic modelling and the impact of the proposed design on each watercourse.

Table 13.18 Summary of Fluvial Flood Risk (no mitigation)

Watercourse	Impact of proposed design	Magnitude
Unnamed watercourse at Meadowside	There is an existing 800mm pipe which conveys the flow under the A9. The proposed development will span across the watercourse, upstream of the existing pipe. This has resulted in no impact to the water levels or flow.	Negligible
Dunachton Burn	The existing structure will be replaced with a bottomless culvert. The overall span of the structure will increase, however the width of the channel will remain the same. The increase in span reduces the water level for out of bank flow, resulting in an improvement in flood risk to the access track.	Minor Beneficial
Leault Burn	The existing structure will be replaced with a bottomless culvert. There is no increase in water level or flow as a result of this proposal.	Negligible
Baldow Smiddy	The existing structure will be replaced with a box culvert. There is no increase in water level or flow as a result of this proposal.	Negligible
Unnamed watercourse at Dalraddy	The existing 1500mm pipe will be replaced. The proposed pipe length will increase but the pipe will remain as 1500mm. This results in no change to water level or flow.	Negligible
Allt an Fhearna	The existing structure will be replaced with a bottomless culvert. The proposed embankments for the road encroach onto the 0.5% AEP (with 20% increase in flow as allowance for climate change) flood outlines. The flood model found that there was a decrease in water levels and flow in the channel downstream of the crossing. This was a result of the proposed span of the structure increasing.	Moderate Beneficial

13.8. Mitigation Measures

13.8.1. The mitigation measures presented below involve intercepting pollution at the source before it reaches the receptors. Mitigation is required to convey surface water runoff from the proposed dualling to receiving watercourses without a detrimental effect on water quality, water quantity, associated ecosystems and the underlying groundwater. They involve, where possible, solutions, which 'design out' any risk and include measures that should be implemented prior to construction to ensure minimal impact on the receptors from the temporary works.

Best Practice Guidelines

13.8.2. Prior to construction, activities within the water environment associated with the scheme will require a licence application under the CAR regulations (see section 13.1). The application will require the following information:

- The proposed activity, its design and the reasons for the chosen design;
- Details of the potential impacts to the water environment, including baseline environmental information;
- Details of the mitigation included in the design, aimed at reducing the potential impact; and
- A detailed construction methodology.

13.8.3. It is anticipated that CAR licences will be required for all outfalls to the watercourses detailing the discharges and the scour protection. A licence will be required for the structures updated to bottomless culverts. The detailed construction methodology should include details of any temporary works within the watercourse, for example diversions and temporary treatment ponds.

13.8.4. The risk of pollution of both surface and ground water can be significantly reduced by the adoption of good working practises and strict adherence to the appropriate SEPA guidelines. The key guidelines are listed below:

- PPG 1 - General Guide to the Prevention of Water Pollution¹²⁵;
- PPG 5 - Works and Maintenance in or Near Water¹²⁶;
- PPG 6 - Working at Construction and Demolition Sites¹²⁷;
- PPG 21 - Pollution Incident Response Planning¹²⁸; and
- PPG 22 - Incident response – dealing with spills¹²⁹.

13.8.5. Guidance is also available in the CIRIA publications:

- C532 - Control of Water Pollution from Construction Sites¹³⁰; and,
- C648 - Control of Water Pollution from Linear Construction Projects¹³¹.

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Pollution Prevention Guideline 1: General Guide to the Prevention of Water Pollution. 2001

Pollution Prevention Guideline 5: Works and Maintenance in or Near Water. 2000

Pollution Prevention Guideline 6: Working at Construction and Demolition Sites. 2003

Pollution Prevention Guideline 21: Pollution Incident Response Planning. 2004

Pollution Prevention Guideline 22: Dealing with Spilalges on Highways. 2002.

CIRIA. Control of Water Pollution from Construction Sites: Guidance for consultants and contractors - C532. 2001

Control of Water Pollution from Linear Construction Projects - C648. 2006

Mitigation Measures during Construction

- 13.8.6. With any construction work undertaken close to a watercourse there is an inherent risk of surface water and groundwater contamination. Without appropriate mitigation/controls in place, construction works including temporary work at the watercourse may have a detrimental effect on the watercourse, effecting its water quality and ecological status.
- 13.8.7. Replacement structures are proposed for all watercourses except the unnamed watercourse at Meadowside, where an extension to the existing pipe is proposed. Bottomless culverts are proposed for the Dunachton Burn, Leault Burn and the Allt an Fhearna. These are designed to span the watercourse to minimise impacts on watercourse hydrology. A box culvert is proposed for the Baldow Smiddy. All structures are designed to convey the 0.5% AEP (with 20% increase as allowance for climate change) event. Disruption on the watercourses due to construction is discussed further in Chapter 6.
- 13.8.8. The impact of construction will be reduced by following the key guideline stated above. It will include the following measures:
- Minimising the duration and extent of the work around the watercourse and ensure sediment control measures are in place to protect the watercourses;
 - Installation of temporary treatment ponds to treat surface runoff throughout construction;
 - All temporary culverts to be designed to the 0.5% AEP flood event and where appropriate, ensure fish and mammal passage;
 - On-site availability of oil spill cleanup equipment including absorbent material and inflatable booms for use in the even of an oil spill or leak;
 - Use erosion controls such as sediment fencing;
 - Any works close to the watercourse should be timed to avoid any inference with spawning fish or breeding seams for mammals;
 - Large stockpiles to be located away from the watercourse and have silt fences or gravel bags placed around them; and
 - An Ecological Clerk of Works (ECoW) should be on site to ensure appropriate environmental safeguards.

Operation

- 13.8.9. Increased rates of flow to watercourses as a result of altering runoff characteristics by increasing the area of impermeable road surface may need to be controlled by flow balancing to minimise adverse impacts to watercourses. These effects can include bank erosion or increased sediment loading in addition to increased risk of flooding. Road runoff should be attenuated to pre-development rates and reduce the pollution before it outfalls to the watercourses.
- 13.8.10. The outline drainage design includes two treatment methods to treat the road runoff in order to mitigate adverse environmental impacts from contaminated runoff. The following treatment methods have been used in the concept drainage designs.

Filter Drains

- 13.8.11. Filter drains are used along the length of the proposed road. Filter drains consist of a perforated pipe laid in a trench backfilled with gravel. They convey surface runoff to the discharge point and are designed to filter out pollutants including suspended solids, hydrocarbons, iron, copper and zinc. They also provide attenuation of flows. Piped carrier drains are required in some locations to transfer discharge from filter drains to the swales or SuDS ponds. The DMRB indicates copper removal efficiency of 20% and zinc removal efficiency of 75%.

Swales

- 13.8.12. Swales are used to treat surface water from networks 1, 3, 4, 6. This is the secondary treatment for these networks as the surface runoff has been treated once through filter drains. Swales are low-lying vegetated channels that drain water evenly off impermeable areas. Swales provide significant pollution removal benefits as they slow flows, increase attenuation and promote deposition of suspended solids. Swales are reported to remove 70-90% of zinc and 50-70% of copper from road runoff.

Sustainable Urban Drainage System ponds

- 13.8.13. SuDS ponds are the secondary treatment for networks 2 and 5. These provide attenuation and treatment of the road runoff prior to discharge into the watercourse. They are designed to retain water for long periods of time during and after storm events. They provide conditions for settlement of suspended solids and other pollutants. Treatment ponds are reported to remove 65% of zinc and copper from road drainage. Ecological value and diversity can be promoted through micro-wetland areas in the base of the basin.
- 13.8.14. SuDS guidance for drainage design is available through CIRA C521 'Sustainable urban Drainage Systems – best practise manual for England, Scotland, Wales and Northern Ireland'¹³². The incorporation of filter drains, for example, into the drainage design for the proposed Scheme would satisfy the requirement for SuDS and would provide removal of a significant proportion of potential contamination in the scheme runoff. The inclusion of filter drains in the drainage design for the scheme would reduce further the impact on groundwater.

Flood Risk

- 13.8.15. The Swales and SuDS ponds proposed for the proposed Scheme are designed to attenuate the runoff from the road to Greenfield runoff rates. The SuDS ponds and Swales will be located outwith the 0.5% AEP flood outlines and will attenuate flow for the 1 in 30 year event.
- 13.8.16. There is no increase to flooding as a result of the proposed structures, therefore no mitigation is required during operation of the proposed Scheme.

Spillages

- 13.8.17. There is always a level of risk that a serious accidental spillage may occur on the road which could lead to a serious pollution incident in the River Spey, via the small tributaries in the vicinity of the proposed works. The risk of a serious accidental spillage occurring has been calculated as low. Despite this, mitigation would still be recommended to protect the River Spey and its tributaries from pollution due to the importance of its Salmon stock. Pollution Prevention Guidance (PPG) 18 outlines a number of pathways in which spillages will enter the water environment. These are:
- The site's surface water drainage system, either directly or via surface water sewers;
 - Direct run-off into nearby watercourses or onto ground, with potential risk to groundwaters;
 - Via the foul drainage system, with pollutants either passing unaltered through a sewage treatment works or affecting the performance of the works, resulting in further environmental damage; and
 - Through atmospheric deposition, such as vapour plumes.
- 13.8.18. Guidance from the PPGs recommends that an incident response plan is produced. The existing A9 has an incident response plan, however this should be updated to ensure it is appropriate for a dualled road.

Groundwater

- 13.8.19. The GI for the A9 dualling will confirm areas where the proposed dualling may impact groundwater. Where there is a possibility of groundwater contamination occurring through the road drainage, the Swales and SuDS ponds should be lined.
- 13.8.20. Figure 13.3 in Volume 2 of this ES shows that there are private groundwater abstractions in the vicinity of the proposed dualling. Groundwater monitoring prior to construction should be installed to provide further clarity on the potential impact on these abstractions and for mitigation to be developed where appropriate.

13.9. Impacts (Design Year 15)**Pollution from Surface Water Runoff**

- 13.9.1. The impact of the proposed Scheme found that the predicted concentrations of zinc and dissolved copper increased slightly, however they were still low compared with the EQS. As a result of climate change surface water runoff may increase during the design life of the proposed Scheme. The runoff rates calculated in section 13.7 and used to estimate concentrations of zinc and dissolved copper were increased by 20% as an allowance for climate change.
- 13.9.2. The incorporation of filter drains into the road design will reduce the concentrations of zinc and dissolved copper in discharged runoff. This will insure an improved protection of water quality to the watercourses for the traffic increase and increase in surface runoff due to climate change. The impact of the scheme in Design Year 15 is assessed as minor beneficial to the water environment.

Pollution Impacts from Spillages

- 13.9.3. The pollution impacts, without mitigation were assessed as low. The mitigation will further reduce the risk of pollution from Spillages. The incident response plan for the existing A9 should be updated to include the dualled road; this will ensure that the impact of the proposed dualling would have a negligible effect on pollution impacts from spillage.

Pollution Impacts from groundwater

- 13.9.4. The GI will confirm where mitigation measures are required to reduce pollution impacts from groundwater. Implementing mitigation measures will ensure the proposed dualling has a negligible effect on groundwater.

Impact from Flooding**Surface Water**

- 13.9.5. The introduction of SuDS to the A9 surface water drainage system will ensure that there is a negligible effect on flooding from surface water due to the proposed A9 dualling.

Fluvial Flooding

- 13.9.6. The risk of flooding was assessed using a 20% increase in flow as an allowance for climate change. The flood modelling showed that for the Dunachton Burn there was a minor beneficial effect on flood risk and a moderate beneficial effect on flood risk at the Allt an Fhearna.

13.10.

Conclusions

- 13.10.1. This chapter assesses the impact of the proposed Scheme on the water environment. This has been assessed for surface water quality, pollution from spillages and impact of flood risk.
- 13.10.2. With implementation of mitigation measures during construction and operation, the potential impacts to the River Spey and its tributaries for the 15 year assessment remains low.
- 13.10.3. Risk assessments may have to be re-assessed at regular intervals during the construction of the proposed Scheme in order to minimise likely pollution. Given the sensitivity of the River Spey catchment these could be written into the CEMP.
- 13.10.4. Good drainage design, run-off attenuation and pollution control measures incorporated into the design, construction and operation phases will minimise the risk of adverse impact from the proposed Scheme. The proposed Scheme will have a minor beneficial impact on the water features assessed. This will have a moderate/large significance as the water features in this area are of very high importance. This is to be achieved through the incorporation of flow attenuation and pollution removal measures for road surface runoff as there are none currently present.

14. Geology and Soils

- 14.1. Introduction
- 14.2. A9 Dualling Strategic Environmental Assessment
- 14.3. Key Issues
- 14.4. Methodology
- 14.5. Baseline Conditions
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- 14.7. Impacts (Opening Year) Without Mitigation
- 14.8. Mitigation Measures
- 14.9. Impacts (Design Year 15)
- 14.10. Conclusions



14. Geology and Soils

14.1. Introduction

- 14.1.1. This chapter presents the results of the Stage 3 assessment of the potential impacts on geology and soils as a result of the proposed Scheme.
- 14.1.2. The assessment has been carried out in accordance with the detailed assessment methodology set out within the DMRB Volume 11, Section 3, Part 11: Geology and Soils¹³³.
- 14.1.3. Impacts to the hydrogeological conditions (groundwater) associated with the proposed Scheme, together with impacts to surface water and drainage are considered separately in Chapter 13, Road Drainage and the Water Environment.
- 14.1.4. At the time of writing a detailed ground investigation relevant to the proposed Scheme had still to be completed, with work anticipated to start in March 2014. Accordingly, the information within this chapter and subsequent assessment is based upon information available at the time of writing and the SEA Environmental Report¹³⁴. Published information is supplemented by a site inspection undertaken by Atkins geotechnical engineers between 14th and 15th November 2012.

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Highways Agency, Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 11: Geology and Soils, 1993.
Halcrow, A9 Dualling Programme, Strategic Environmental Assessment Environmental Report, Document No. TSSEA9/ER/01Version 1.1, June 2013.

14.2. A9 Dualling Strategic Environmental Assessment

14.2.1. The proposed Scheme is subject to a SEA. In relation to Geology and Soils, the SEA Environmental Report identifies the following Environmental Objectives/Principles:

- Maximise re-use of material resources and use of recycled material;
- Minimise waste generation;
- Avoid and minimise soil losses/ sealing;
- Maintain or improve carbon storage capacity of soils and peat;
- Maintain hydrological integrity of peat/ wetlands; and
- Maintain productive capacity and prevent erosion of soils.

14.2.2. These objectives are expanded to identify the following key principles:

- Minimise overall land-take and soil sealing;
- Minimise the need for rock cuttings;
- Minimise excavation/construction on peat/high carbon soils;
- Maintain or minimise effects on hydrological and ecological integrity of peat/wetland soils;
- Maintain or improve the integrity/ condition of designated geological sites; and
- Maintain or improve access to, and opportunities for interpretation of, geological sites/features of interest.

14.2.3. These principles are broadly similar to the potential impacts discussed in Section 5 of the DMRB Volume 11, Section 3, Part 11 and the impact of the proposed Scheme in relation to the above is discussed in detail in Section 14.7.

14.2.4. In addition, the SEA Environmental Report also noted within Section 5.7.1 and 5.7.2, the following Geological Conservation Review (GCR) sites and Geological Sites of Specific Scientific Interest (SSSI) in the surrounding area. Indicative locations of the noted features are provided in Figure 14.3 of Volume 2 of this ES. However, it should be noted that none of the identified features or sites are within the 250 metre study area of the proposed Scheme.

14.2.5. Geological Conservation Review (GCR) sites:

- An Suidhe;
- Kincaig (Dalradian);
- Loch Etteridge (Quaternary of Scotland); and
- Glen Feshie (Fluvial Geomorphology of Scotland/ Quaternary of Scotland).

14.2.6. Geological Sites of Specific Scientific Interest:

- Loch Etteridge and River Feshie SSSI; and
- Drumochter Hills SSSI (mixed).

14.2.7. The impact of the above is discussed in Section 14.4.4 and 14.7.

14.3. Key Issues

14.3.1. Potential issues resulting from the proposed Scheme include:

- Direct impact on the underlying soils and geology;
- Direct impact on geological or geomorphological features which are of specific interest or importance;
- Direct impact to soils through loss and destruction or agricultural soils; and
- Impact on contaminated land.

14.4. Methodology

14.4.1. The DMRB Volume 11 Section 3, Part 11: Geology and Soils divides the assessment of the potential impact of a scheme into three stages, with the assessment becoming increasingly detailed as the proposed Scheme develops.

14.4.2. A Preliminary Sources Study Report (PSSR)¹³⁵ required as part of the Geotechnical Certification process in accordance with SH4/89 – Geotechnical Certification Procedures¹³⁶ was prepared by Atkins in February 2013 following the format of HD22/08 – Managing Geotechnical Risk¹³⁷. This report broadly met the objectives of the Stage 1 and Stage 2 assessment.

14.4.3. This report presents the results of the Stage 3 assessment and considers an area approximately 250 metres parallel to either side of the existing A9 centreline providing information on the following key features pertinent to the potential impact of the proposed Scheme on the underlying soils and geology:

- Details of the current land use and soil conditions;
- Details on the anticipated underlying geology and ground conditions;
- Locations of any SSSIs and other significant geological sites of importance such as GCR's;
- Details and locations of potential contaminated land sites; and
- Details and locations of historical / current quarrying and mining activities.

14.4.4. The objectives were met through a review of available documentary information relating to the site including: published geological maps, previous site investigation reports, regulatory data and site inspections as outlined in Sections 14.4.10 through 14.4.25.

14.4.5. On the basis of the information obtained from the PSSR and the SEA, potential impacts to the geology and soils as a result of the proposed Scheme have been identified and the magnitude of these impacts qualitatively assessed. To limit the impacts identified, recommendations for mitigation measures have then been made.

14.4.6. DMRB does not have a defined scale of impacts on geology and soils in terms of measuring sensitivity and magnitude. Therefore the STAG system has been adapted to the situation at Kincaig as shown in Table 14.1. All significance of effects range from neutral to adverse.

135 Atkins Limited, A9 Dualling Kincaig to Dalraddy, Preliminary Sources Report, May 2013.

136 Highways Agency, Design Manual for Roads and Bridges (DMRB), Volume 4, Section 1, Part 7 SH4/89: Geotechnical Certification Procedures, 1999.

137 Highways Agency, Design Manual for Roads and Bridges (DMRB), Volume 4, Section 1, Part 2 HD22/08: Managing Geotechnical Risk 2008.

Table 14.1 Scale of Impacts

Significance Level	Impact Effects
Neutral	The geology, hydrogeology, geomorphology and/or agricultural soils will experience only very minor impact with no contamination material encountered or pollutant sources generated.
Slight	Disturbance / erosion of or loss of geology, hydrogeology, geomorphology and/or agricultural soils by 1% - 5%.
Moderate	Disturbance / erosion of or loss of geology, hydrogeology, geomorphology and/or agricultural soils by 5% - 20%. Modification of existing hydrogeological regime.
Adverse	Complete loss or destruction of geology, geomorphology, and/or agricultural soils. Disturbance or generation of pollutant source and generation of pathway with potential to cause harm. Disturbance of geological SSSI.

Land Use and Soil Survey Information

14.4.7. Soil survey information was obtained from the Macaulay Land Use Research Institutes’ classification of Land Capability for Agriculture (LCA) land classification system which is now administered by the James Hutton Institution. and Institute for Soil Research, Institute of Soil Survey of Scotland¹³⁸. This provides information on the land quality and potential agricultural uses across the site. Anticipated conditions were verified and supplemented by a site inspection.

14.4.8. Further information on the land use and potential impacts can be found in Chapter 9 Land Use.

Geology

14.4.9. The recorded geology of the site was determined from the British Geological Survey (BGS) 1:50,000 and 1:10,000 scale series geological maps. The maps considered are listed below:

- BGS Geological Map (Bedrock & Superficial Deposits) Sheet 74W, Tomatin, Scale 1:50,000¹³⁹;
- BGS Geological Map (Solid and Drift Edition) Sheet 74, Granton on Spey, Scale 1:63,360¹⁴⁰;
- BGS Geological Map (Solid Edition) Sheet 74E, Aviemore, Scale 1:50,000¹⁴¹; and
- BGS Geological Map (Solid and Drift Edition) Sheet NH80NW, Kincaig, Scale 1:10,000¹⁴².

14.4.10. Note, that on account of copyright protection, extracts of the geological maps detailed above are not included within this report.

138 Macaulay Institute for Soil Research, Institute of Soil Survey of Scotland Website available at (<http://www.macaulay.ac.uk/policyrelevance/landusestrategy/maps.php>), accessed in November 2012.
 139 British Geological Survey, Scotland Sheet 74W Tomatin, Bedrock & Superficial Deposits, 1:50,000 scale, 2004.
 140 British Geological Survey, Scotland Sheet 74 Granton on Spey, Solid and Drift Edition 1:63,360 scale, 1914.
 141 British Geological Survey, Scotland Sheet 74E Aviemore, Solid Edition, 1:50,000 scale, 1993.
 142 British Geological Survey, Scotland Sheet NH80NW Kincaig, Solid and Drift Edition, 1:10,000 scale, 1998.

Historical Ground Investigations

- 14.4.11. A search was conducted on the BGS GeoIndex¹⁴³ service for relevant historical borehole and site investigation reports. The search indicated there to be sixty-six (66 No.) relevant historical boreholes, typically associated with the existing A9 construction. No reports or laboratory testing information associated with the historical boreholes were available.
- 14.4.12. A GI specified and supervised by Atkins was also undertaken by Norwest Holst (now Vinci Soil Engineering) on behalf of The Scottish Executive in early 2006. The investigation was completed as part of a previous proposed widening scheme of the A9 between Kincaig and Dalraddy (circa Chainage 4,000 metres to 7,500 metres).
- 14.4.13. The investigation comprised of the following:
- Two (2 No.) cable percussive boreholes;
 - Two (2 No.) open hole rotary drilled boreholes;
 - Twenty (20 No.) machine excavated trial pits;
 - Twenty four (24 No.) pavement cores; and
 - Twenty three (23 No.) dynamic probes.
- 14.4.14. Full factual details and testing undertaken for the investigation are included in the Norwest Holst Factual Report¹⁴⁴.
- Approximate exploratory hole locations of the historical and Norwest Holst exploratory holes are presented in Figures 14.1 and 14.2 of Volume 2 of this ES and a summary of the investigations is contained in Atkins PSSR.

Sites of Geological Importance

- 14.4.15. The location of any SSSIs and GCR's were established through review of the Landmark Envirocheck Reports, review of current maps, site inspections and consultation with statutory bodies (e.g. BGS, SEPA, SNH, The Highland Council).

Contaminated Land

- 14.4.16. The location of potential contaminated land sites were established through review of the Landmark Envirocheck Reports, review of current and historical maps, site inspections and consultation with statutory bodies (e.g. SEPA, Highland Council).

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British Geological Survey, Onshore Geoindex available at <http://www.bgs.ac.uk/GeoIndex/>, accessed November 2012
Norwest Holst Soil Engineering, Report on a Ground Investigation for A9 Kincaig to Dalraddy Widening Scheme, 2006

Mining and Quarrying

- 14.4.17. A search of the Coal Authority online gazetteer¹⁴⁵ for locations likely to be influenced by past underground coal mining was undertaken.
- 14.4.18. Further review of the BGS Mining Plan Portal¹⁴⁶ was undertaken to identify areas of non-coal mining activities within vicinity of the site. Review of Ordnance Survey (OS) maps and a site walkover were also undertaken to identify any surface mining features or quarrying activities.
- 14.4.19. A detailed Coal Authority Mining Stability Report has not been obtained for this site.

14.5. Baseline Conditions

Land Use and Soil Survey Information

- 14.5.1. The Land Capability for Agriculture land classification indicates the land to be current woodland. Topsoil organic carbon content is recorded as between 5% and 35% with localised deposits of peat deposits up to 1.0 metre thick recorded.
- 14.5.2. The land is recorded as being either suitable or marginally suitable for agriculture. More details on the soil classification provided by the James Hutton Institute on Land Capability for Agriculture (LCA) are contained in Chapter 9 Land Use.
- 14.5.3. The potential for Radon to be within the soil varies across the site. Primarily the site lies within an area where either <1% or 1-3% of homes will be above the action level. However, north of the site towards Loch Alvie the number of homes above the action level increases to between 10% and 30% evident within the northeast of Scotland.
- 14.5.4. According to the information provided within the Envirocheck report and considering the inorganic contaminants of Arsenic, Chromium, Lead and Nickel it is likely that the soil chemistry have the following concentrations: Arsenic - <15mg/kg average, with occasional concentrations of 15 – 25mg/kg. Chromium – 40 – 80mg/kg occasionally 80 – 90mg/kg in the west of the site. Lead - <150mg/kg. Nickel 15 – 30mg/kg with occurrences exceeding 40 – 80mg/kg towards the north of the site.

145 The Coal Authority, Online Gazetteer, available at (http://coal.decc.gov.uk/en/coal/cms/services/reports/Scotland_Gazet/Scotland_Gazet.aspx) accessed in November 2012.

146 British Geological Survey, Non Coal Mining Plans Portal, available at (http://www.bgs.ac.uk/nocomico/choose_search.htm), accessed in November 2012.

Geological Conditions

Drift Deposits

- 14.5.5. The geological maps indicate that the site is underlain by the following superficial geology with conditions varying along the length of the proposed Scheme:
- **Peat:** 'mainly upland blanket accumulation of wet acidic, partially decomposed vegetation';
 - **Alluvium:** 'mainly sand, sandy gravel, silt and clay';
 - **Lacustrine Deposits:** 'inter-bedded silt and peat';
 - **Glaciofluvial Sheet Deposits:** 'mainly terraced spreads of sand and gravel with lenses of sand';
 - **Glaciofluvial Ice-Contact Deposits:** 'undulating spreads and mounds of sand and gravel, including flat topped mounds'; and,
 - **Glacial Till:** hard to stiff sandy clay with boulders.
- 14.5.6. Glacial Tills were not encountered during historical ground investigation works, but are anticipated to underlie younger superficial deposits.
- 14.5.7. Although not shown on the published geological information, it is also anticipated that areas of Made Ground, associated with the existing A9 construction and surrounding urban development will be present.
- 14.5.8. The approximate chainages where the deposits are shown on the geological maps are summarised in Table 14.2.

Table 14.2 Anticipated Principle Superficial Conditions Underlying the A9 Footprint

Approximate Chainage (m)	Superficial Deposit
0 – 100	Glaciofluvial Sheet Deposits
100 – 150	Alluvium
150 – 450	Glaciofluvial Sheet Deposits
450 – 950	Glaciofluvial Ice Contact Deposits
950 – 1,050	Alluvium
1,050 – 1,400	Glaciofluvial Ice Contact Deposits
1,400 – 1,500	Alluvium
1,500 – 1,650	Glaciofluvial Sheet Deposits
1,650 – 1,800	Alluvium
1,800 – 3,200	Glaciofluvial Sheet Deposits
3,200 – 3,550	Glaciofluvial Ice Contact Deposits
3,550 – 3,700	Glaciofluvial Sheet Deposits
3,700 – 3,800	Peat
3,800 – 3,850	Glaciofluvial Sheet Deposits
3,850 – 3,900	Peat
3,900 – 4,000	Glaciofluvial Ice Contact Deposits
4,000 - 4,010	Devensian Till

Approximate Chainage (m)	Superficial Deposit
4,010 – 4,400	Peat
4,400 – 4,700	Glaciofluvial Ice Contact Deposits
4,700 – 4,720	Glaciofluvial Sheet Deposits
4,720 – 4,900	Glaciofluvial Ice Contact Deposits
4,900 – 5,100	Glaciofluvial Sheet Deposits
5,100 – 5,250	Glaciofluvial Ice Contact Deposits
5,250 – 5,600	Glaciofluvial Sheet Deposits
5,600 – 5,850	Glaciofluvial Ice Contact Deposits
5,850 – 6,000	Peat / Glaciofluvial Ice Contact Deposits
6,000 – 7,500	Glaciofluvial Ice Contact Deposits

- 14.5.9. As indicated in Table 14.2 the majority of the site was shown to be underlain by Glaciofluvial Ice Contact and/or Sheet Deposits. It is considered that all the Glaciofluvial deposits will likely underlie any Peat, Alluvial or Lacustrine deposits (recorded in general proximity). No indication of depth or thickness of the superficial deposits is provided on the geological maps.
- 14.5.10. Although not recorded to be directly underlying the proposed Scheme, Lacustrine deposits are recorded in the general vicinity and may therefore underlie the route. However, it is noted that the Lacustrine deposits are typically associated with Insh Marshes which are located south of the scheme at a lower level than the existing A9.
- 14.5.11. From the available ground investigations Made Ground, comprising slightly sandy gravel with cobbles and boulders was only reported in the recent ground investigation undertaken by Norwest Holst (2006) and not in the BGS historical borehole logs from 1978. Therefore, it is assumed that Made Ground encountered on the site is associated with the construction of the A9 embankments in the late 1970's / early 1980's and any recent development of the area. The greatest depth of Made Ground reported was in BH02 from the 2006 ground investigation, from 0.1 metres to 3.0 metres bgl. However, the exploratory hole was terminated at 3.0 metres within the Made Ground and therefore the thickness of these deposits was not proven.
- 14.5.12. Peat was recorded on the BGS Historical Logs only. It is therefore, considered that the material is likely to have been excavated and replaced during the construction of the existing A9. However, as the proposed works will involve widening embankments and cuttings onto previously undeveloped land, it is possible that Peat may remain in areas below the proposed earthwork footprints. The maximum depth of Peat reported in historical borehole logs was 1.2 metres bgl, though, greater extents and depths may be present elsewhere within the site.
- 14.5.13. Similar to Peat, Alluvial deposits were only identified in the historical investigations. It is considered that any Alluvial deposits below the existing A9 footprint were excavated and replaced during the construction of the A9. It is likely that Alluvium will be present in areas where embankment or cutting widening is required adjacent to watercourses. The maximum depth of Alluvial deposits recorded was between 0.3 metres and 3.6 metres bgl at BH8044.
- 14.5.14. The historical boreholes record Glaciofluvial Deposits to a maximum depth of 11.86 metres bgl in BH8026C. However, all of the available exploratory holes were terminated within the Glaciofluvial Deposits without the base of the deposits being proven.

Solid Deposits

- 14.5.15. The geological maps record the solid geology across the site to vary between the Loch Laggan Psammite Formation, the Glen Banchor Succession, the Kincaig Formation and the Monadhliath Pluton.
- 14.5.16. The Loch Laggan Psammite Formation, which is part of the Precambrian Grampian Group is described as 'bedded Psammite and micaceous psammite with beds of schistose semipelite'.
- 14.5.17. The Glen Banchor Succession of Precambrian Age is described as 'Schistose to gneissose semipelite and interbanded psammite with units of semipelite and calc-silicate rock. The stratigraphical position is described as being uncertain.
- 14.5.18. The Kincaig Formation, which is part of the Precambrian Grampian Group is described as 'Schistose and locally gneissose semipelite inter-layered with psammite silicified calcilicate rock quartzite and meta limestone overlain by striped psammite and semipelite'.
- 14.5.19. The Monadhliath Pluton is described as either 'Porphyritic aplitic microgranite' or 'medium to coarse grained pink biotite granite' of the Caledonian Igneous Suite from the Late Silurian / Early Devonian Age.
- 14.5.20. Five (5 No.) geological faults are shown in the vicinity of the site:
- **Unnamed Fault 1:** Traversing approximately north to south, circa 350 metres northwest of the site at Chainage 150 metres. No downthrown is shown on the geological map. The fault is shown to meet an unnamed fault circa 1,800 metres northwest of the site at Chainage 1,200 metres;
 - **Unnamed Fault 2:** Traversing approximately south by southwest to north by northeast, circa 800 metres northwest of the site at Chainage 2,500 metres. No downthrow direction is shown;
 - **Unnamed Fault 3:** Traversing approximately south by southwest to north by northeast, circa 1,000 metres northwest of the site at Chainage 2,100 metres. No downthrown is shown. The fault is shown to meet unnamed fault 4 circa 1,100 metres northwest of the site at Chainage 2,800 metres;
 - **Unnamed Fault 4:** Traversing approximately southwest to northeast, circa 1,200 metres northwest of the site at Chainage 2,800 metres this fault is shown to downthrown in a northwest direction. The fault meets unnamed faults 1 and 3 as previously described; and
 - **The Ericht Laidon fault:** Traversing approximately southwest to northeast, circa 1,100 metres south east of the site.
- 14.5.21. No typical geological cross section in the vicinity of the site is shown on the geological maps. None of the available historical ground investigations prove solid conditions.
- 14.5.22. During the site walkover a rock outcrop was identified in the cutting slope along the northbound A9 carriageway between approximate Chainages 730 metres and 810 metres with the rock believed to be schist.
- 14.5.23. At approximate Chainage 2,200 metres on the northbound carriageway and at Chainage 2,850 metres on the southbound carriageway hummocky ground and a large number of boulders at ground level were observed, possibly indicating shallow bedrock.

Sites of Geological Importance

- 14.5.24. No sites of special geological interest (SSSI's or GCR's) are present within the 250 metre buffer study area.

Contaminated Land

- 14.5.25. A number of potential sources of contamination identified during the historical and current review of the site have been highlighted below:
- **Imported Fill Material (road and railway construction):** It is possible that during construction that imported fill material of unknown composition and origin was brought onto site. A number of existing cuttings and embankments are present along the length of the existing A9 therefore it is possible that there was an extensive amount of local reuse. Made Ground has been reported in the previous ground investigation to possibly exceed 3.0 metres bgl with compact sand and gravel reported to a depth of 11.8 metres bgl also suggested to be Made Ground. The level of contamination within this Made Ground has not been confirmed to date;
 - **Quarrying (historical and current):** Refer to Section 14.5.29 for further details;
 - **Contaminated soils (Railway):** The current railway line runs along the same route corridor as the road and in parts runs less than 25 metres away (southern section) from each other. It has been noted that the railway line has been operational since before 1872 (earliest occurrence noted within historical maps). It is possible that the continuous use of the railway has resulted in the soils surrounding the line becoming contaminated with hydrocarbons and or other contaminants;
 - **Discharges to Groundwater / Surface Water (Septic tanks and Waste Water Treatment Works(WWTW)):** According to the Envirocheck report there are a number of discharge consents in place along the length of the site. Typically, these discharges are noted to groundwater or surface water and relate to residential septic tank discharges, which are controlled through SEPA. There are two discharge consents noted within the southern section of the site between Chainage 0 metres and 500 metres. There is also a discharge consent relating to the Kincaig wastewater treatment facility which lies approximately 216 metres east of the site within the town of Kincaig;
 - **Agriculture and Commercial Forestry:** The historical review indicated that the site was used extensively for agriculture and commercial forestry. This is still considered the primary land use for much of the surrounding areas;
 - **Urbanisation (Kincaig):** The village of Kincaig was noted to have been initially established between 1874 and 1903 around the railway station with extensive development between 1938 and 1971;
 - **Commercial Fishery (Alvie Hatchery):** The Alvie hatchery and fish rearing unit is located approximately 600 metres east of the site (NGR NH 284130, 808440) and discharges to the Allt an Fheàrna and Loch Alvie; and
 - **Landfill:** A historical landfill, as shown on Figure 14.3 within Volume 2 of this ES is noted within 250 metres of the existing A9, occupying an area of approximately 429 m². No further information is available with regards the nature and integrity of the site. From the current maps available for the site it appears that the landfill site has been landscaped.
- 14.5.26. No elevated levels of inorganic and organic contamination were identified within the nine soil samples analysed during the site investigation completed by Norwest Holst in 2006. Copper and zinc were found to be elevated within the single water sample analysed from BH01. Although these results suggest generally low levels of contamination, they are limited in nature and there may be areas of contamination on the proposed site that have not been identified to date.

Mining and Quarrying

Mining

- 14.5.27. The bedrock at the site belongs to the Precambrian geological period, which predates the Carboniferous period during which all UK coal deposits were laid down. It is therefore, considered unlikely that coal mining will be an issue in the study area. A search was conducted of the Coal Authority website gazetteer for Aviemore, Kincaig and Kingussie which confirmed that a coal mining search is not required.
- 14.5.28. A search on the BGS mining portal does not record any non-coal mining activities in the area. However, it is noted that submission of plans of mines for non-coal minerals was not required up until 1993, and therefore some unrecorded activity may have taken place. No specific shafts or other mining features were noted from the historical mapping check within the study area.

Quarrying

- 14.5.29. Three surface quarries and a disused pit, as shown on Figure 14.3 in Volume 2 of this ES are noted on historical maps in the vicinity of the site and these were identified during the site walkover undertaken in November 2012:
- The Meadowside Quarry at the southern extent of the route (immediately west of the site between approximate Chainages 250 metres and 700 metres) was observed to be a rock quarry, where excavated rock is described as metamorphic in nature;
 - The Alvie Quarry located near to the northern part of the site (circa 300 metres east of the site between Chainages 5000 – 5500 metres) quarries both pink granite and sand and gravel materials;
 - A disused pit (as identified from historical maps) is shown circa OS grid reference NH 824 050 near to Dunachton Mill. The material that was extracted from this pit is unknown; and
 - An unnamed quarry is present which lies approximately 600 metres to the west of the A9 within the northern section of the site near Easter Delfour farm. The material that was extracted from this pit is unknown.

14.6. Consultations

- 14.6.1. Consultations with The Highland Council and SEPA have been undertaken as part of the assessment process to identify any restrictions or sensitive areas.
- 14.6.2. SEPA indicated that they hold no information, which would impact upon the proposed Scheme.
- 14.6.3. The Highland Council advised of the presence of a previously undetermined landfill site within 250 metres of the existing A9 position. The landfill site (NGR 284467 807904) lies approximately 194 metres northwest of the site and occupied an area of approximately 429 m². According to the correspondence with The Highland Council, the site was visible within a 1970 historical map but not visible on the 1986 map. The landfill was not shown on any historical maps provided within the Envirocheck report.

14.7.

Impacts (Opening Year) Without Mitigation

14.7.1.

Immediate impacts, which have been identified as a consequence of the proposed Scheme, taking consideration of the requirements of the SEA Environmental Report Section are summarised in Table 14.3.

Table 14.3 Immediate Impact of proposed Scheme

Impact	Effect of Impact	Reasoning
Disturbance / destruction of special geological interest (SSSI's or GCR's)	Negligible	No SSSI or GCR's within the proposed construction footprint or surrounding area.
Loss of peat and / or high carbon soils due to increased land take.	Slight	Land take represents regrading of existing earthworks and as such not considered significant. Limited extents of peat within proposed construction footprint. Land use will remain the same.
Loss of soil and / or rock due to increased land take.	Slight / moderate adverse	Land take represents regrading of existing earthworks and as such not considered significant. Considerable areas of similar soil and rock type will remain. Land use will remain the same.
Loss of soil due to surface erosion or surface spray	Slight	Any surface discharge or water runoff across earthworks should be mitigated through adequate drainage design and surface vegetation.
Imbalance of site earthworks operations (cutting vs. filling). Excess material generated.	Moderate / adverse	Surplus site won material will require removal and disposal from site reducing sustainability of the scheme.
Modification to existing hydrogeological regime	Slight adverse	Extension of cutting formations may have a localised impact on groundwater flows. However, as identified in Chapter 13 the groundwater is likely to be of a depth such that it will not be affected by the proposed works.
Contaminated Land	Slight / moderate	Limited historical investigations have not indicated significantly elevated contamination levels. There is insufficient data, at present, to confirm the extent of contamination on site and subsequent impacts. However, it is anticipated, given the known historical use of the site and site surrounds that contamination will be limited in nature.

14.8. Mitigation Measures

- 14.8.1. Ideally a scheme attempting to achieve a balance of cut and fill operations would be advantageous from a sustainability perspective. However, under the current proposed Scheme proposals an excess quantity of material is likely to be generated (refer to Chapter 15 for further details).
- 14.8.2. To maximise sustainability, the proposed Scheme design should consider (where feasible), the re-use of material excavated during cutting formation to be used as an engineered fill material in embankment construction, as pavement capping material or as concrete aggregate. Available geotechnical investigation information suggests that the granular Glaciofluvial which are likely to comprise the majority of excavated material will be suitable for reuse. However, the material should be proved chemically suitable for use, and consideration / adherence to SEPA's guidance¹⁴⁷ on the reuse of materials on site should be undertaken. As some soils are of specific types, where possible, the contractor will be encouraged to store and reuse soils as close to their source as practical.
- 14.8.3. To achieve a more sustainable design for the overall A9 Dualling scheme consideration should be given to the programming of general works along the existing A9 carriageway to maximise the re-use of excavated materials. The Contractor will be encouraged to seek local uses for surplus material.
- 14.8.4. It is anticipated that the level of contamination identified on site will be low and will not require substantial remediation works. Possible mitigation measures associated with impacts on contaminated land, once identified, may therefore include limiting work in areas of contaminated land, remediating or sealing areas of contaminated land, excavating and removing areas of contaminated land to suitably licensed landfill or re-used elsewhere in accordance with current guidance and regulations.

14.9. Impacts (Design Year 15)

- 14.9.1. No impacts on the geology and soils within the study area are envisaged in addition to those identified for 'Opening Year 1' as detailed above in Section 14.7.
- 14.9.2. Impacts associated with surplus site materials will generally be restricted to Design Year 1 when surplus material will either be removed from the proposed Scheme area or reused within the proposed Scheme. However, there may also be limited surplus materials related to any future road maintenance, which will need to be removed from site and disposed of in accordance with current regulations and guidance.
- 14.9.3. Impacts on contaminated land will also mainly be restricted to Design Year 1 as the majority of the disturbance to contaminated land will be undertaken in Design Year 1. However, there will be some limited disturbance to contaminated land from any ongoing maintenance required on the site throughout.
- 14.9.4. Mitigation measures required for contaminated land will also generally be restricted to Design Year 1 with contaminated materials either proved suitable for use, remediated or removed off site during the construction phase. It is anticipated that there will be limited contaminated land left on site at Design Year 15.

14.10.

Conclusions

14.10.1.

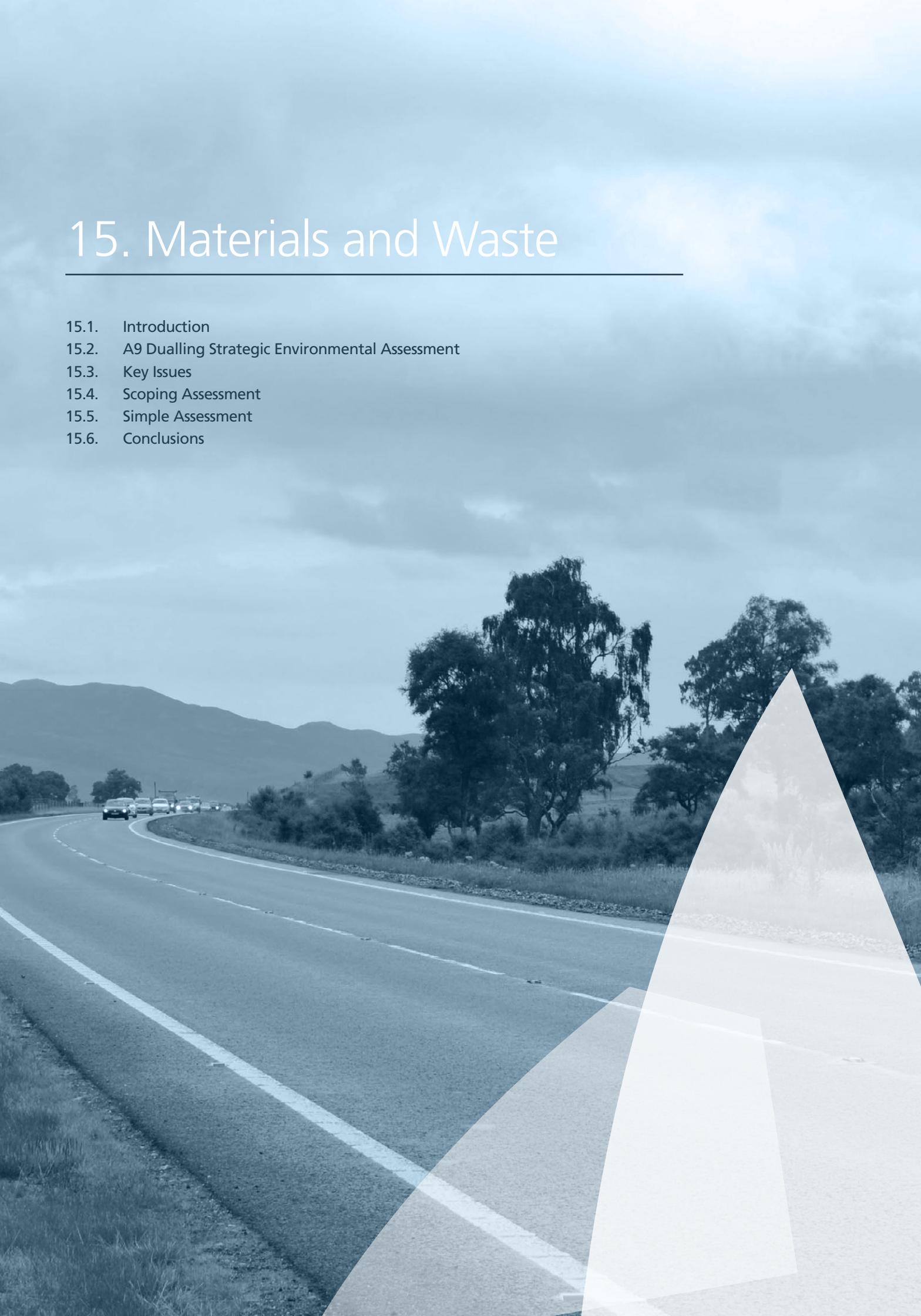
With the exception of the surplus of fill material generated, the impacts on the underlying soils and geology identified as a consequence of the proposed Scheme are likely to be negligible to low and therefore do not require detailed consideration when assessing the acceptability of the scheme.

14.10.2

Further assessment of the potential impact of the route to the underlying geology and soils should be undertaken upon completion of the scheme specific ground investigation. Similarly, a detailed contaminated land assessment combined with a materials classification and reuse assessment should also be undertaken upon receipt of the information.

15. Materials and Waste

- 15.1. Introduction
- 15.2. A9 Dualling Strategic Environmental Assessment
- 15.3. Key Issues
- 15.4. Scoping Assessment
- 15.5. Simple Assessment
- 15.6. Conclusions



15. Materials and Waste

15.1. Introduction

- 15.1.1. This chapter presents the results of the Stage 3 assessment and comprises a review of the potential impacts on materials as a result of the proposed Scheme taking cognisance of the draft guidance provided by the draft DMRB Volume 11, Section 3, Part 6 (HD 212/11)¹⁴⁸.
- 15.1.2. Impacts to hydrogeological conditions (groundwater) including surface water and drainage and the land associated with the proposed Scheme, are considered separately in Chapter 13 Water Quality and Drainage and Chapter 14 Geology and Soils.
- 15.1.3. At the time of writing, a detailed ground investigation relevant to the proposed Scheme and the design of the proposed Scheme was still to be finalised. Accordingly, the information and subsequent assessment presented in the following section is based upon readily available information including the previous ground investigation completed in 2006, available preliminary design details, and a site inspection undertaken by Atkins geotechnical engineers in November 2012.

15.2. A9 Dualling Strategic Environmental Assessment

- 15.2.1. A SEA Environmental Report was published in June 2013 for the A9 Dualling Programme. This provides information regarding the resource efficiency requirements for earthworks, construction materials and waste. Transport Scotland has made a commitment to embed resource efficiency into their construction practices and adopt the next generation of Waste and Resources Action Programme (WRAP).
- 15.2.2. Table 2.2 of the SEA summarises the environmental principles identified from the PPS review. For materials these include:
- Adapt and improve resilience to the effects of climate change;
 - Promote local/ sustainable sourcing of materials;
 - Promote sustainable design and innovation to reduce material consumption;
 - Minimise waste generation;
 - Maximise re-use of material resources and use of recycled materials; Minimise use of scarce/ rare earth resources; and,
 - Minimise energy consumption and encourage use of renewable energy.
- 15.2.3. In addition, the overall environmental principles identified include:
- Maintain and improve the health of people, ecosystems and natural processes;
 - Minimise effects on landscape and historic environment features;
 - Adapt and improve resilience to climate change and extreme weather events; and
 - Actively seek to integrate opportunities for enhancement.
- 15.2.4. This Chapter therefore takes cognisance of these principles in highlighting potential qualities of materials required for the proposed Scheme and identifies potential waste streams in line with the DMRB draft materials chapter.
- 15.2.5. The SEA also identifies key environmental constraints relating to the proposed Scheme. The appropriate use and management of raw materials on site and the re-use of site won materials shall take cognisance of the local water bodies and the environmentally sensitive areas including the SACs, SPA, SSSIs, NNRs, Ancient Woodlands, GCRS, and Geological SSSIs.

15.3.

Key Issues

- 15.3.1. The Draft DMRB guidance states that the chapter is required to consider the environmental impacts associated with two principal areas, namely:
- The use and consumption of material resources from primary and recycled/secondary sources, and manufactured construction products required for the construction, improvement and maintenance of the trunk road network; and
 - The production and management of wastes arising as a result of the construction, improvement and maintenance of the trunk road network.
- 15.3.2. In April 2008 the Site Waste Management Plans Regulations¹⁴⁹ (the Regulations) came into force in England. The Regulations require that a Site Waste Management Plan (SWMP) is produced for all construction projects with a value greater than £300,000 (excluding VAT). For projects valued at greater than £500,000, additional information is required. The SWMP is used to identify the type and quantity of waste that will be produced on a construction site and sets out how waste will be managed so that it is reused, recycled, or disposed of appropriately.
- 15.3.3. These Regulations are not applicable in Scotland, however other initiatives and guidance in Scotland are available that support the implementation of SWMPs in Scotland such as the Scottish Government's Zero Waste Plan¹⁵⁰ and WRAP Scotland's Construction Commitments. Both initiatives look to reducing the amount of waste produced, re-use valuable resources and increase the level of recycling. This Zero Waste Plan also comprises a vision to regard all waste as a potential resource. Therefore, the construction project value threshold as discussed above has been utilised as good practice within this materials assessment.

15.4.

Scoping Assessment

- 15.4.1. The cost for the proposed Scheme is in the range of £30million to £40million, which is greater than the £300,000 threshold utilised for this assessment. Therefore, it is assumed that the potential exists for environmental impacts and effects from the use of materials and the generation of waste.

Proposed Scheme Overview

- 15.4.2. The 7.45 kilometre proposed Scheme comprises the online widening of the existing single carriageway to provide guaranteed overtaking opportunities in each direction by means of a Dual Carriageway (D2AP) cross-section. Full details of the proposed Scheme are provided in Chapter 2.
- 15.4.3. No gantries, speed cameras or lighting are proposed along the length of the road scheme. Approximately 27 No. marker posts and 18 No. traffic signs are proposed for route confirmation, the commencement of dual carriageway, the reduction of a lane, etc. Filter drains are proposed along either one or both sides of the new carriageway and discussions with Scottish and Southern Energy (SSE) are in process regarding the diversion and possible movement underground of an existing overhead power cable.

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<http://www.legislation.gov.uk/uksi/2008/314/contents/made>
The Scottish Government, Zero Waste Plan, 2010.

Materials Resource Use and Waste

- 15.4.4. The proposed Scheme is at the preliminary design stage and ground investigation and other site information is likely to become available April / May 2014. Some information on the material requirement and likely waste generation for the proposed Scheme will therefore not be available until after this ES is published.
- 15.4.5. Material resources are required for construction of the new pavement, signage, foundations, underpass and drainage. Initial cut and fill balance has been calculated to indicate an excess of materials of approximately 170,000m³. The detailed design and Site Waste Management Plan will be required to deliver efficiencies including reducing excess waste / spoil within the cut / fill balance, increasing the recycling potential of materials, and minimising the requirement for raw materials.
- 15.4.6. Where site won materials are found to be unsuitable, resources could potentially be sought from the local area to avoid increased haulage distances. However, there is a possibility of significance quantities of "waste" excess materials requiring movement off site.
- 15.4.7. Information provided within the Preliminary Source Study Report completed by Atkins in 2013, suggests the absence of significant contamination beneath the proposed Scheme. This report is based on publically available published information, initial consultation with The Highland Council and SEPA and a ground investigation for the northern section of the proposed Scheme completed by Vinci Soil Engineering in 2005. However, the existing ground investigation data for the northern section of the scheme does indicate the presence of Made Ground and limited contamination associated with the existing A9. It is therefore, anticipated that areas of Made Ground and possible contamination associated with the existing A9 construction may be present along the whole length of the proposed Scheme, the extent of which should be identified during the forthcoming ground investigation. Potential sources of contamination on site, as identified within Chapter 14 Geology and Soils, may therefore, include:
- Made Ground and possible contamination and imported fill material and the re-use of locally sourced materials associated with the existing road construction;
 - Impacted soil from adjacent railway line; and
 - Septic tank discharges to groundwater.
- 15.4.8. Potential effects from the proposed Scheme from materials requirement and excess materials / waste are therefore likely to be significant and these aspects should be considered in more detail during the detailed design stage. Potential effects may relate directly to material demand, the sourcing of materials, the generation of non-useable materials from the site clearance and demolition, the re-use of soils and materials on site, the pre-treatment of materials prior to re-use on site, the recycling of materials and wastes, and the re-use and / or disposal of materials off site.

Consultation

- 15.4.9. An initial consultation with SEPA in relation to the project as a whole did not reveal any specific concerns, and indicated that they hold little information on the area. SEPA has provided comments during the consultation process of this ES and these relate to the minimisation of soil extraction and waste generation, the maximisation of the re use and recycling of materials on site and the production of a SWMP as part of the CEMP.
- 15.4.10. Further consultation with SEPA will be required at the design stage in relation to the large quantity of excess material proposed and options to stockpile and re-use this material on site and the wider proposed Scheme.

Recommendation

- 15.4.11. Based on the findings at this scoping stage, it is recommended that the proposed Scheme be assessed in the first instance at the Simple Level of assessment in accordance with the draft DMRB chapter¹⁵¹. A detailed assessment may need to be considered once the ground investigation and detailed design has been completed.

15.5. Simple Assessment

Existing A9 (Current Site)

- 15.5.1. The existing A9 does not entail any substantial material demand or generate large quantities of waste during routine maintenance activities of the road. The proposed Scheme includes the improvement of the existing road as outlined in Chapter 2.

Construction Methods and Techniques

- 15.5.2. Construction methods and the need for temporary works have been outlined in Chapter 2 of this ES. Works are anticipated to commence in early 2016, with the construction period expected to be approximately 18 months in duration.
- 15.5.3. Road design and construction practice of the DMRB requires that the cut and fill balance is considered to maximise the re-use of site won materials on-site. The reuse and recycling of aggregate, inert material and reprocessed road planings shall be considered under Paragraph 9 or 19 exemptions within the detailed design. Stripped and stored vegetation could also potentially be used for the restoration of banksides with turfs stored appropriately to minimise pollution run off and maximise vegetation health for restoration. However, it is understood that the phasing and sequencing of work may affect the potential for the re-use of material. In addition, the design / construction team shall consider the use and source of material types such as a lean mix concrete and/or recycled aggregates primarily within the SWMP.

Regulatory and Policy Requirements

- 15.5.4. There are a number of key policies and strategies in Scotland that seek to influence the sustainable use of Material Resources and waste management and these shall be utilised during the detailed design. These include but are not limited to:
- The Scottish Government, Scottish Planning Policy, 2010¹⁵²;
 - The Waste & Resources Action Programme (WRAP) Scotland¹⁵³;
 - The Scottish Government, Zero Waste Plan, 2010¹⁵⁴;
 - The Scottish Government, Zero Waste Regulations, 2011¹⁵⁵;
 - The Waste (Scotland) Regulations, 2012¹⁵⁶;
 - SEPA's Land Remediation and Waste Management Guidelines, 2009¹⁵⁷;
 - SEPA's Promoting the sustainable reuse of greenfield soils in construction, 2010¹⁵⁸,
 - SEPA's Guidance on the Production of Fully Recovered Asphalt Road Planings; and
 - SEPA's Guidance on Recycled Aggregates from Inert Waste.
- 15.5.5. Although, not obligatory in Scotland, WRAP Scotland consider a SWMP as an important and useful tool for the reduction of waste destined for disposal. The project will have a SWMP that will assist the client, consultant, construction contractors and their sub-contractors to:
- Reduce raw materials costs;
 - Reduce waste destined for landfill;
 - Reduce waste disposal costs;
 - Meet legislative requirements; and
 - Meet the client's expectation.
- 15.5.6 WRAP also advocates the use of a construction Resource Management Plan (RMP). This plan provides a management structure to enable the user to consider and manage the key resource efficiency components of the project, across its lifecycle.
- 15.5.7 Transport Scotland's Corporate Plan 2012 to 2015 states that Transport Scotland will "...embed resource efficiency into our practices and adopt the next generation of Waste & Resources Action Programme Construction Commitments". These WRAP commitments are presently being drafted and will likely be published this year.

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<http://www.scotland.gov.uk/Resource/Doc/300760/0093908.pdf>
<http://www.zerowastescotland.org.uk/content/waste-resources-action-programme>
 The Scottish Government, Zero Waste Plan, 2010
<http://www.scotland.gov.uk/Resource/Doc/360341/0121809.pdf>
http://www.legislation.gov.uk/sdsi/2012/9780111016657/pdfs/sdsi_9780111016657_en.pdf
www.sepa.org.uk/waste/waste
 Regulatory Guidance: 'Promoting the sustainable reuse of greenfield soils in construction (March 2010), SEPA

15.5.8

The priority of Scotland's Zero Waste Plan is to treat resources as high up the waste hierarchy as possible by preventing, reusing or recycling resources wherever feasible and to achieve the best overall environmental outcome. The project will consider the Zero Waste Plan and the waste hierarchy in the management of waste generated on site including, excess soil, general vegetation, felled trees, packaging, excess construction materials, etc. The Zero Waste Plan sets out the following relevant targets:

- Development of a Waste Prevention Programme for all wastes, ensuring the prevention and reuse of waste is central to all our actions and policies;
- Landfill bans for specific waste types therefore reducing our greenhouse gas emissions and capturing the value from these resources;
- 70 per cent waste to be recycled and maximum 5 per cent sent to landfill by 2025; and
- Measure the carbon impacts of waste to prioritise the recycling of resources which offer the greatest environmental and climate change outcomes.

Project Objectives

15.5.9.

The outcome of the scheme development must satisfy the following STAG¹⁵⁹ objectives:

- Protect the Environment;
- Enhance Safety;
- Assist Economic Growth;
- Improve Accessibility; and
- Integrate Transport.

15.5.10.

To minimise the environmental impact of the trunk road wherever practicable infers that materials use and waste management should be approached in a responsible manner.

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Transport Scotland, September 2003, Scottish Transport Appraisal Guidance (STAG).

Local Waste Management Structure

- 15.5.11. The Envirocheck Report, provided within Atkins PSSR¹⁶⁰, has not identified any waste management facilities including waste transfer sites, waste treatment sites and landfills within a 1 kilometre radius of the site. The Highland Council¹⁶¹ indicate an historical landfill site at NGR 284467 807904, approximately 194 metres north-west of the site, likely to have been active between publication of the 1970 and 1986 historical maps, and occupying an area of approximately 429m².
- 15.5.12. Table 15.1 provides a summary of information held by SEPA on the active landfills currently authorised by SEPA¹⁶² within the Highland area. As the design is ongoing, there is insufficient information at present to accurately forecast waste streams that will be produced on the site. Therefore, Table 15.1 below provides information on local landfill capacity as a whole.

Table 15.1 SEPA Data on Active Landfills within the Highland Area

Name	Approximate Distance and Location in Relation to the Site	Type of Landfill	Capacity as at 31 December 2011 (2012 data not available)	
			Annual Capacity on Permit (tonnes)	Remaining Capacity (tonnes)
Granish Landfill Site Cell 3, By Aviemore	5 miles North-East	Non-Hazardous	25,000	95,800
Duisky Landfill Site, Kinlocheil, Fort William	65 miles South-West	Non-Hazardous (with asbestos cell)	24,000	535,000
Skitten Quarry, Wick	140 miles North	Inert	25,000	82,100
Seater Landfill Site, Bower, by Wick	150 miles North	Non-Hazardous	65,000	342,000

- 15.5.10. At this stage, apart from the capacity of the local landfills, no specific constraints have been identified with regards to inert and non hazardous waste infrastructure. However, there is limited treatment and disposal infrastructure for hazardous waste in the region and Scotland as a whole.

160 Atkins Limited, A9 Dualling, Kinraig to Dalraddy, Preliminary Source Study Report, 2013.
 161 The Highland Council, Consultation Response with regards to queries on land issues for the A9 Kinraig to Dalraddy project, issued a reply dated 26 November 2012.
 162 SEPA, http://www.sepa.org.uk/waste/waste_data/waste_site_information/landfill_sites__capacity.aspx, accessed February 2013.

15.6. Conclusions

- 15.6.1. Currently, as the proposed Scheme is in the early stages of design, there is limited quantifiable information on the anticipated types and quantities of materials required to undertake a forecast of waste arisings. However, the available information gathered for the assessment is summarised in Tables 15.2 and 15.3 below.
- 15.6.2. It is recommended that further work be completed to quantify the magnitude of materials required and waste generated once the detailed design and ground investigation has been completed which will recommend mitigation measures aligned to the SEA, WRAP protocols and relevant authoritative guidance as mentioned previously in this chapter and in the Schedule of Mitigation.
- 15.6.3. Feasible technical solution(s) for waste prevention, minimisation, reuse and recycling and specifically the reuse of greenfield soils can only be done at detailed design stage when the ground investigation has been completed and the quantity and quality of the excess materials and wastes to be generated is better defined. However, mitigation measures through detailed design and construction could relate to the reduction of excess materials generated, the minimisation of soil extraction required, the sustainable re-use of greenfield soils on site, segregation of materials generated on site, onsite pre-treatment and processing of materials for reuse on the proposed Scheme, identifying recycling centres for waste materials, and sourcing of sustainable recycled materials. The Schedule of Mitigation identifies the requirements: to adopt the waste hierarchy of prevent, reuse and recycle; the completion of a SWMP and a Resource Management Plan; and adherence to the SEA, SEPA's requirements, and current authoritative guidance such as the Zero Waste Plan and the WRAP protocols.

Table 15.2 Simple Assessment Reporting Matrix for Material Resources

The following estimated quantities of materials required for the proposed Scheme are based on the available information generated from the Stage 3 Construction Cost Estimate:

Project Activity	Material Resource Required for the Project	Quantities of Materials Resource Required	Additional Information on Materials Resources
Site Remediation / Preparation	<p>Little or no site remediation is anticipated at this stage.</p> <p>Site preparation will include the raising of levels for some of the temporarily diversion routes within the wetland areas, etc. The bulk of the fill material will either be site won or imported. New pavement will be required along the temporary diversions. Temporary drainage is also anticipated.</p> <p>Possibly diversion of SSE overhead power line to an underground line. Diversion works for existing British Telecom and Scottish Water apparatus.</p>	<p>Exact quantities unknown at this stage. Likely to include:</p> <ul style="list-style-type: none"> • Aggregate; • Fill materials; • Asphalt; • Concrete / plastic pipes; • Sand / filter medium for drainage; • Paints; and, • Cabling. 	<p>Detailed design will provide further information on the materials required for the construction of the proposed scheme.</p> <p>However, the scheme will attempt to re-use and recycle as much material as possible from the site and source recycled materials from off site.</p>
Demolition	<p>Limited demolition is anticipated and is associated with the demolition of the reinforced concrete bridge and abutment at Dunachton and Alt an Fhearna and the demolition and replacement of the existing Armco culvert.</p> <p>Removal of the existing road furniture is also planned and the removal of existing pavement is likely due to it's poor condition.</p>	None.	

<p>Site Construction</p>	<p>Material requirements will be associated with the following:</p> <ul style="list-style-type: none"> • The construction of the temporary site compound / storage area(s); • The completion of new road, including road markings; • The completion of a new cycle path to the north of the carriageway; • The replacement of existing damaged pavement; • The installation of new road drainage, culvert and 6 drainage outfalls; • Drainage of cuttings / embankments; • Swales and Attenuation ponds; • The creation of 4 new underpasses including foundations; • The installation of road signage and marker posts; • The placement of potentially imported topsoil; and • Landscape planting and seeding. 	<p>Materials are likely to include:</p> <ul style="list-style-type: none"> • Fill materials; • Asphalt; • Concrete; • Aggregates; • Fencing; • Metal / concrete (signs); • Plastic pipes; • Sand / filter medium for drainage; • Paints, solvents; and • Growing medium / compost / topsoil. <p>Estimated quantities include:</p> <ul style="list-style-type: none"> • Safety barriers: 8,000m; • Terminals: 28 No.; • Drainage: 23,500m; • Chambers: 258 No.; • Road Gullies: 17 No.; • Concrete headwall: 12 No.; • Swales: 400m; • Topsoil: 40,500m³; • Imported Class 6 fill: 51,000m³; • Type 1 sub-base: 36,000m³; • Pavement: 434,000m²; • Bituminous tack coat: 1,317,000m²; • Precast concrete kerbs: 470m; • Bituminous footways: 1,200m²; • Asphalt Concrete cycleways: 23,000m²; • Road markings: 40,000m; • Road studs: 2,529 No.; • Marker Posts: 27 No.; and, • Traffic Signs: 18 No. 	
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Operation and Maintenance	Materials will be required during the operation and maintenance of the length of road. However, as the project is at an early stage in its development there is little or no information available to indicate what these requirements would be.	Surface course, binder course, road markings and studs assumed to be replaced every 20year for the 60 year life of the road. Estimated quantities include: Binder: 60,540m ³ ; Surface course: 15,600m ³ .	
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Table 15.3: Simple Assessment Reporting Matrix for Waste

The following estimated quantities of existing materials to be removed from the proposed Scheme are based on the information generated from the Stage 3 Construction Cost Estimate:

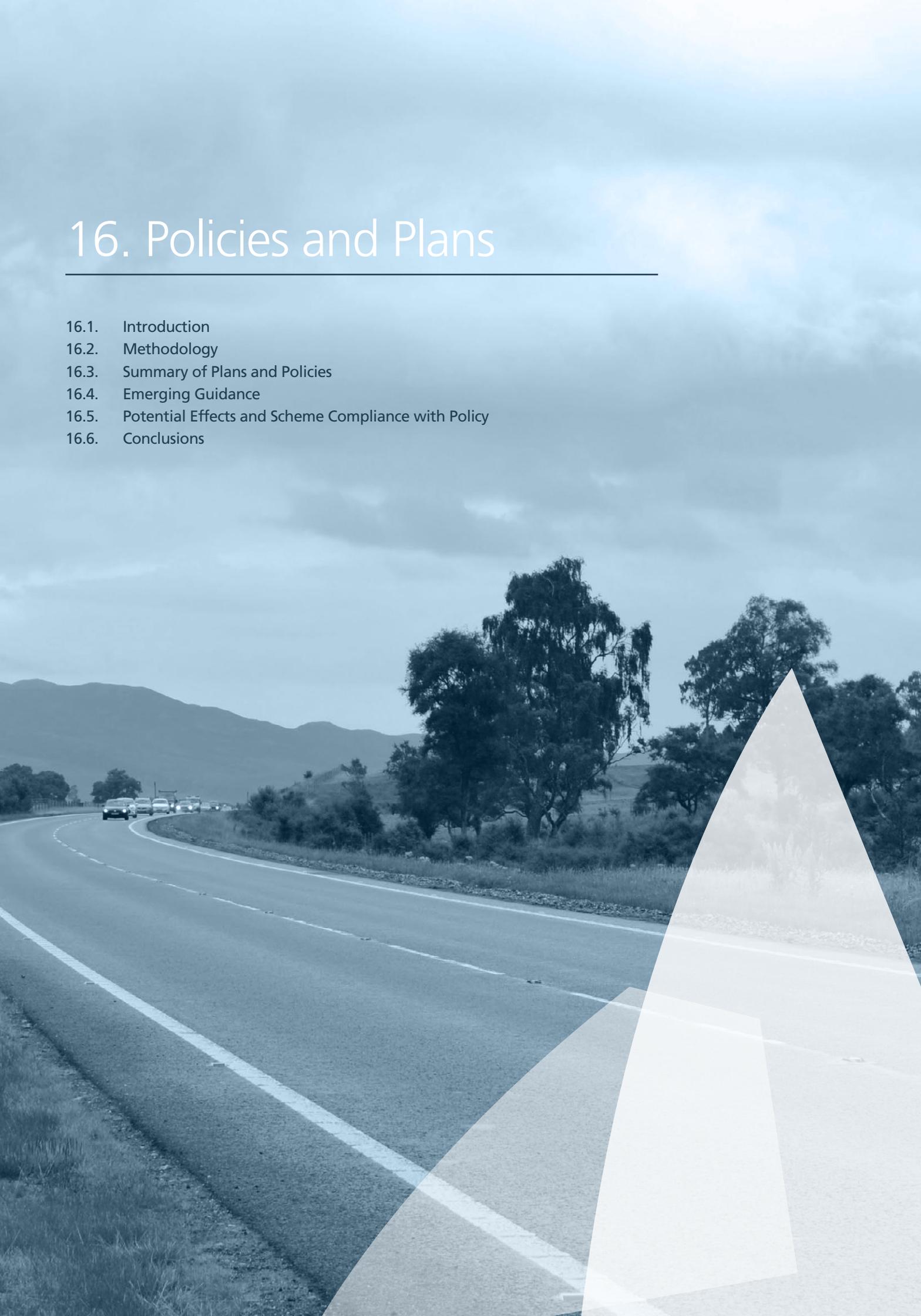
Project Activity	Material Resource Required for the Project	Quantities of Materials Resource Required	Additional Information on Materials Resources
Site Remediation / Preparation	<p>Little or no site remediation is anticipated at this stage.</p> <p>Site preparation likely to include the removal of vegetation within the proposed construction areas and general site clearance.</p> <p>Site preparation will also include the excavations or raising of levels for the temporarily diversion routes which will need to be restored once the road is complete.</p> <p>In addition temporary drainage is being proposed to control run-off and prevent pollution of watercourses prior to construction of the permanent drainage. Materials removed for the construction of the temporary works or the reinstatement after completion of construction works will need to either be used in the wider A9 scheme or disposed of.</p> <p>Diversion works for the existing British Telecom and Scottish Water apparatus.</p> <p>Mainly inert / non-hazardous, but possibly some hazardous.</p>	<p>General Site clearance estimated to be 36.8 hectares. Assumed 0.1m surface scrape this equates to 36,800m³ of materials.</p> <p>Quantities associated with the temporary diversion routes, drainage, and the BT and Scottish Water diversion routes are unknown at present.</p> <p>Materials likely to include:</p> <ul style="list-style-type: none"> • Aggregate; • Asphalt; • Fill materials; • Concrete / plastic pipes; • Sand / filter medium for drainage; • Cabling; and • Vegetation 	<p>Detailed design will provide further information on the likely waste materials generated from the proposed Scheme.</p> <p>However, the scheme will attempt to prevent waste generation, and re-use and recycle the waste generated on the site as much as possible.</p>

<p>Demolition</p>	<p>Removal of existing road furniture / signage, fencing, manholes and gullies.</p> <p>Demolition of reinforced concrete bridge and abutment at Dunachton and Alt an Fhearna and existing Armco culvert.</p> <p>Possible removal of overhead lines associated with SSE power cable.</p> <p>Removal of existing damaged pavement.</p> <p>Likely to be inert / non-hazardous waste.</p>	<p>Quantities likely to be:</p> <ul style="list-style-type: none"> • Gullies: 329 No.; • Traffic signs: 2 No.; • Fencing: 15,000m; • Manholes: 55 No.; • Concrete kerbs: 15,000m; • Safety fencing: 1,235m; • Reinforced concrete: 544.25m³. <p>Quantities associated with the possible removal of overhead lines and damaged pavements are unknown at present.</p> <p>Materials likely to include:</p> <ul style="list-style-type: none"> • Asphalt; • Aggregates; • Metal; • Concrete; and • Paints, solvents 	<p>The waste materials likely to be generated in the construction works such as metals, plastics, soil, vegetation, asphalt, and aggregate will likely be segregated and reused on site or recycled off site.</p>
<p>Site Construction</p>	<p>It is anticipated that there will be waste arisings associated with the following:</p> <ul style="list-style-type: none"> • Excavations proposed along the length of the scheme; • Construction of 4 new underpasses; • Excavations for the installation of new road drainage, culvert and 6 drainage outfalls; • Excavations for the Swales and Attenuation Ponds; • The installation of road signage and marker posts; <p>Mainly inert / non-hazardous, but possibly some hazardous.</p>	<p>Quantities unknown at this stage. However, wastes likely to include:</p> <ul style="list-style-type: none"> • Surplus excavated soils, possibly up to 170,000m³; • Surplus aggregate; • Surplus asphalt; • Surplus construction materials, including concrete, metals, plastics, etc. • Waste packaging, wrapping, formwork, etc; and, • Waste cabling, pipework, ductwork, etc. 	

Operation and Maintenance	<p>Small amounts of waste likely to be produced on an ongoing basis. Unlikely to be a significant increase on quantities currently produced during routine operation and maintenance.</p> <p>Mainly inert / non-hazardous, but possibly some hazardous.</p>	<p>Types and quantities similar to current wastes from maintenance activities.</p> <p>Surface course, binder course, road markings and studs assumed to be replaced every 20year for the 60 year life of the road. Estimated quantities include:</p> <ul style="list-style-type: none"> • Binder: 60,540m³; • Surface course: 15,100m³. 	
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16. Policies and Plans

- 16.1. Introduction
- 16.2. Methodology
- 16.3. Summary of Plans and Policies
- 16.4. Emerging Guidance
- 16.5. Potential Effects and Scheme Compliance with Policy
- 16.6. Conclusions



16. Policies and Plans

16.1. Introduction

- 16.1.1. This Chapter presents results of the Stage 3 Assessment and sets out how the proposed Scheme has been assessed in terms of the wider context of national, regional, strategic and detailed planning policies.
- 16.1.2. With important interactions between transport and land use, the assessment was undertaken in accordance with guidance provided in the DMRB Volume 11, Section 3, Part 12 'Impact of Road Schemes on Policies and Plans' (August 1994), and other relevant guidance, including landscape and access principles.
- 16.1.3. Strategic Policies and their implications for the road improvement are set out based on current guidance in the form of National Planning Framework 2 (2009) (NPF2) and the Scottish Planning Policy (2010) (SPP). Relevant structure and local plan policies and proposals are then discussed together with an assessment on whether or not the proposed Scheme complies with such policies.
- 16.1.4. Principally, the various environmental Chapters of this Stage 3 Assessment focus on protection or wherever relevant, enhancement of the environmental resources identified throughout the EIA process. There are, however, additional policies of relevance that also include the economic and social impacts that a scheme of this nature will have on the wider community.
- 16.1.5. Due to its overarching nature, this Chapter is therefore, structured differently to the other disciplines in that it presents an overview of relevant policy guidance, undertakes an assessment of the likely impact of the proposed Scheme on the applicable policies and plans, and provides an indication of the Planning Authorities views on those impacts.

16.2. Methodology

- 16.2.1. With reference to STAG, the approach taken follows DMRB guidance and applies a desk study approach to the analysis of the policies and plans of relevance to the development of the proposed Scheme.
- 16.2.2. This Stage 3 Assessment considers the significance of the impacts arising from the development of the proposed Scheme on the objectives and aims of national, regional, and local planning policies.
- 16.2.3. As the proposed Scheme has developed, the assessment of the impact on policies and plans has become increasingly detailed. This Stage 3 Assessment builds upon information gathered at Stage 2 and provides the following:
- A schedule of the relevant national, regional, county and local policies;
 - A commentary setting out the significance of the impact of the preferred route on each policy objective; and
 - A note of the views of the relevant planning authorities, on the impact of the proposed Scheme on planning policy objectives.

Limitations to the assessment

- 16.2.4. DMRB Volume 11, Section 3, Part 12, which relates to the assessment of Policies and Plans has not been updated since 1994. Since then, major changes have occurred to the Scottish planning system with the introduction of The Planning etc. (Scotland) Act 2006 ('the 2006 Act') and the NPF2. Therefore, references to certain documents and/or organisations in the DMRB are no longer applicable.

Magnitude of Effect and Significance of Impact

- 16.2.5. In considering the proposed Scheme against the policy framework, Magnitude of Effect and Significance of Impact have been identified as defined by the STAG.
- *Positive Large, Positive Moderate and Positive Slight*
 - Where the scheme accords with planning policies to varying levels of impact.
 - *Neutral*
 - No benefit or impact in either direction.
 - *Negative Slight*
 - Where the scheme is slightly contrary to planning policies which can be readily overcome. For example, this could result in some direct physical impact on regionally important sites, resulting in the loss of features to such a degree that the integrity of the site is compromised, but not destroyed, and adequate mitigation could be specified.
 - *Negative Moderate*
 - Where the scheme is adversely contrary to planning policies that can only be partially resolved. For example, this could result in a major direct physical impact on regionally important sites, resulting in the loss of features to such a degree that the integrity of the site is destroyed, but adequate mitigation has been specified.
 - *Negative Large*
 - Where the scheme is adversely contrary to policies and may not be overcome. This leads to loss of identified development potentials or consented development, and affects the integrity of the authority's development plan.

16.3 Summary of Plans and Policies

- 16.3.1. The 'Town and Country Planning (Scotland) Act 1997' ('the 1997 Act') (as amended by the 2006 Act) provides the framework for land use planning and the development of planning policy in Scotland. The 2006 Act is an enabling Act. Its purpose is to amend existing planning legislation and provide a mechanism for the delivery of a modernised planning system.
- 16.3.2. A key feature of the 2006 Act is the statutory role and application of the National Planning Framework. The Scottish Government's influence on the planning system also extends to the production of a Scottish Planning Policy (SPP) statement. The SPP merges previously separate Scottish Planning Policy and National Planning Policy Guidance (NPPG), consolidating a series of topic specific policy statements into a single document.

National Strategies

National Planning Framework 2 (2009)

16.3.3. The 2006 Act puts NPF2 and any future iteration on a statutory footing, making it a material consideration in planning decisions. NPF2 guides Scotland's spatial development to 2030, setting out strategic development priorities to support the Scottish Government's central purpose - to promote sustainable economic growth. The main elements of the spatial strategy up to 2030 are to:

- Support strong, sustainable growth for the benefit of all parts of Scotland;
- Promote development which helps to reduce Scotland's carbon footprint and facilitates adaptation to climate change;
- Promote development which helps to improve health, regenerate communities and enable disadvantaged communities to access opportunities;
- Promote more sustainable patterns of transport and land use; and
- Deliver strategic improvements in internal connectivity.

16.3.4. NPF2 outlines the Scottish Government's aim of investing in a transport network required to enhance essential infrastructure, to support urban expansion, to improve access to facilities and services and to facilitate sustainable economic growth. This also includes a need to reduce journey times between cities and a need to support rural communities through improvements in transport infrastructure. Paragraph 107 states that:

"We need to reduce the journey times and make them more reliable; make connections which build and sustain economic growth and improve links between cities, towns and rural communities throughout the country".

16.3.5. In addition, it further focuses on tackling congestion on trunk roads where it affects journey time reliability, targeted enhancement of capacity, managing demand on the network and addressing the accessibility needs of rural areas. As outlined in the report:

"The Government is committed to further improvements to nationally strategic trunk routes, including the A9 as its continued maintenance and improvement is essential to ensure the safety of the network and to support long-term development"¹⁶³.

The Government Economic Strategy (2011)

16.3.6. Published in September 2011, the Government Economic Strategy's (Scottish Government, 2011) aim is to make Scotland a more successful country, with opportunities for all to flourish, through increasing sustainable economic growth. The strategy identifies six Strategic Priorities that are most critical to economic growth:

- Supportive Business Environment;
- Transition to a Low Carbon Economy;
- Learning, Skills and Well-being;
- Infrastructure Development and Place;
- Effective Government; and
- Equity.

- 16.3.7. The key strategic approaches that will be pursued in relation to the Infrastructure Development and Place strategic priority include:
- To focus investment on making connections across and within Scotland better, improving reliability and journey times, seeking to maximise the opportunities for employment, business, leisure and tourism;
 - Invest in maintaining our existing transport infrastructure to ensure it remains safe and reliable, so safeguarding current connectivity;
 - Facilitate the transition to a low carbon economy by providing integrated and cost-effective public transport and better connecting people, places and work; and
 - A planning and development regime, which is joined up, reflects strategic priorities, ensures greater certainty and speed of decision making and supports sustainable economic growth and the development of good quality sustainable places.
- National Transport Strategy (2006)**
- 16.3.8. The National Transport Strategy (NTS) (Scottish Executive, December 2006) considers Scotland's transport needs over the medium to long-term and sets the framework for the Strategic Transport Project Review (STPR). Three key strategic objectives identified within the NTS are:
- To improve journey times and connections, to tackle congestion and the lack of integration and connections in transport which impact on high level objectives for economic growth, social inclusion, integration and safety;
 - To reduce emissions, to tackle the issues of climate change, air quality and health improvement which impact on high-level objectives for protecting the environment and improving health; and
 - To improve quality, accessibility, and affordability, giving people a choice of public transport where availability means better quality services and value for money, providing an alternative to the car.
- Strategic Transport Projects Review (STPR) (2009)¹⁶⁴**
- 16.3.9. Published in 2009, the Review was undertaken by Transport Scotland in order to assist in the future proofing of Scotland's transport system. The STPR identifies strategic transport interventions, which reflect the diversity of the country, whilst seeking to address the issues that presently exist or are anticipated in future years. The Review is based on the findings of a number of detailed reports, which have identified 29 transport investment priorities for the next 20 years including the A9 upgrading between Dunblane and Inverness.
- 16.3.10. The STPR supports both NPF2 and the delivery of the three strategic outcomes identified within the NTS. The outcomes of the STPR are structured on a tiered approach to investment, based around the priorities of:
- Maintaining and safely operating existing assets;
 - Promoting a range of measures, including innovative solutions, that make better use of existing capacity; and
 - Promoting targeted infrastructure improvements where these are necessary, affordable and practicable.

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Strategic Transport Projects Review <http://www.transportscotland.gov.uk/strategy-and-research/strategic-transport-projects-review>

Regional Strategies

HITRANS Regional Transport Strategy (2008)

- 16.3.11. HITRANS is one of the seven Scottish Regional Transport Partnerships that was formed in 2005. The Transport Scotland Act 2005 requires the HITRANS partnership to prepare a Transport Strategy with the intention of:
- Enhancing economic well being;
 - Promoting safety;
 - Social inclusion and equal opportunity;
 - Planning for a sustainable transport system; and
 - Integration across boundaries with other Partnerships.
- 16.3.12. The overall objective of the Strategy is to improve interconnectivity between strategic services and destinations in order to enable the region to compete and support growth. Within this a “Central Strategic Corridor” is identified that runs from Inverness to Perth with the intention of reducing journey times and improving journey reliability along this route.

National Planning Policy

Scottish Planning Policy (SPP)

- 16.3.13. Published on 4th February 2010, SPP is a statement of Scottish Government policy on land use planning, outlining the key objectives of the planning system in Scotland as providing direction for the future development and use of land in cities, towns and rural areas in the long term public interest. The aim of SPP is to ensure that development and changes in land use occur in suitable locations and are sustainable. The following ‘subject policies’ are relevant to the proposed Scheme:
- SPP Subject Policy: Economic Development*
- 16.3.14. This policy places an emphasis on the need to promote a successful economy through an effective and efficient transport infrastructure. The Scottish Government has embarked on a continuing programme of reinvigorating the transport system to meet Scotland’s economic and social needs without threatening the health of the environment.
- SPP Subject Policy: Rural Development*
- 16.3.15. The policy sets out how the planning system can assist rural areas of Scotland in achieving sustainable development. It acknowledges that people in rural areas are more heavily dependent on private transport and that car ownership is higher than the Scottish average, reflecting the fact that most rural dwellers have little alternative for many journeys. Nevertheless, it is proposed that through effective and planned development, proper consideration can be given to meet economic, housing and social needs for access to rural services.
- 16.3.16. Essentially the policy sets out a guiding principle for councils considering proposals for rural development and the concept that development in rural areas should benefit local communities economically, socially and environmentally.

SPP Subject Policy: Historic Environment

- 16.3.17. This policy recognises that the planning system provides a mechanism for the co-ordination and integration of conservation policies with other land-use, transport and environmental policies affecting the historic environment. It also seeks to encourage the preservation of the nation's heritage sites and landscapes of archaeological and historic interest. Essentially, the Government aims to accommodate development without eroding environmental assets.
- 16.3.18. It recognises that planning has a positive role to play in enabling development that is appropriate in terms of land-use, location and design. However, in doing so it seeks to safeguard the historic environment from inappropriate development and provide for change that respects the character of an area whilst providing for the needs of the local population. In addition, the policy emphasises the need to have appropriate regard for archaeological remains as a limited, and often highly fragile, resource.
- 16.3.19. The ultimate objective is therefore to secure the best possible treatment of the archaeological heritage, whilst accommodating the need for development.

SPP Subject Policy: Landscape and Natural Heritage

- 16.3.20. This policy gives guidance on how the Government's policies for the conservation and enhancement of Scotland's natural heritage and landscape should be reflected in land use planning. In this context, Scotland's natural heritage includes its flora and fauna, its landforms and geology, and its natural beauty and amenity. Natural heritage encompasses both physical attributes and aesthetic values and, given the long interaction between human communities and the land in Scotland, has important cultural and economic dimensions.
- 16.3.21. Although the protection of the landscape and natural heritage may sometimes impose constraints on development, with careful planning and design, the potential for conflict can be minimised and the potential for enhancement maximised.

SPP Subject Policy: Transport

- 16.3.22. The overriding objective of this policy is to promote an integrated approach to land use, economic development, transport and the environment. The Strategic Transport Network (STN), which includes trunk roads and motorways, is critical in supporting a level of national connectivity that facilitates sustainable economic growth.
- 16.3.23. The primary purpose of the STN is to provide for the safe and efficient movement of planned long distance traffic between major centres. Additionally in rural areas, it seeks to perform important local functions.

SPP Subject Policy: Flooding and Drainage

- 16.3.24. This policy provides guidance in relation to the preparation of development plans and the determination of planning applications, the management of flood risk and flood risk assessment. The policy advises that any development which would have a significant probability of being affected by flooding or would increase the probability of flooding elsewhere should not be permitted.
- 16.3.25. The Flood Risk Management (Scotland) Act 2009 sets in place a statutory framework for delivering a sustainable and risk-based approach to managing flooding. This includes a requirement to provide an assessment of flood risk where a development is likely to result in a material increase in the number of buildings at risk of being damaged by flooding.
- 16.3.26. Furthermore the policy provides guidance in relation to the implementation of SuDS and the requirements of the Water Environment (Controlled Activities) (Scotland) Regulations 2005.

NPF3 and SPP Review

- 16.3.27. On 18th September 2012, the Scottish Government announced that it will begin a major review of the country's planning policy. On 30th April 2013, they launched the National Planning Framework 3 (NPF3) Main Issues Report and draft Scottish Planning Policy for consultation.
- 16.3.28. Undertaken in parallel, both documents are subject to separate 12-week periods of public consultation, ending on 23rd July 2013. It is the Government's intention to publish the finalised SPP before the end of 2013.
- 16.3.29. With regards to the proposed Scheme, reference is made to A9 improvements within the NPF3. Paragraph 5.24 indicates that the NPF3 could support the development and promotion of key scenic corridors, including the A9, which have an important role in providing access to national parks.
- 16.3.30. At this stage it should be noted that neither document is a material consideration in the determination of the proposed Scheme.

Draft Historic Environment Strategy for Scotland (2013)

- 16.3.31. Published in May 2013, the Draft Historic Environment Strategy for Scotland is intended to provide an overarching strategy for the protection and promotion of the historic environment. The strategy sets out a long term vision for the next 10-15 years and makes proposals for the need for a cohesive partnership approach in order to address the key challenges for the historic environment, whilst maximising the many opportunities that exist within it.
- 16.3.32. The strategy recognises the importance of the historic environment as a driver of tourism and as a unique economic asset, which generates income and jobs across Scotland. Therefore the strategy proposes the following overarching principles:
- Recognition of the importance of the historic environment;
 - A proactive approach to the preservation of the historic environment; and
 - A need to face the various challenges.

Planning Advice Notes (PANs)

Planning Advice Note 51: Planning, Environmental Protection and Regulation

- 16.3.33. The purpose of PAN 51 is to provide support to existing planning policy on the role of the planning system in relation to environmental protection regimes. These regimes stipulated within the PAN that have specific relevance to the proposed Scheme include:
- Pollution Prevention and Control;
 - Protection of the Water Environment;
 - Contaminated Land;
 - Local Air Quality Management; and
 - Environmental Noise.

Planning Advice Note 60: Planning for Natural Heritage

- 16.3.34. This PAN provides guidance on how development and the planning system can contribute to the conservation, enhancement, enjoyment and understanding of Scotland's natural environment, The PAN emphasises the Scottish government's commitment to protecting, enhancing and promoting enjoyment of Scotland's natural heritage. Additionally the PAN describes the application of ecological principles in the design of new developments.

Planning Advice Note 69: Planning and Building Standards Advice on Flooding

- 16.3.35. PAN 69 provides background information and best practice advice in support of SPP 7, and the Technical Handbooks published by the Scottish Building Standards Agency, which provide guidance for the Building (Scotland) Regulations 2004. The information contained within the Note provides background information on the water environment and the factors, which contribute to flooding, including watercourses and groundwater. In addition, the document also contains guidance on flood resistant materials.

Planning Advice Note 79: Water and Drainage

- 16.3.36. The purpose of PAN 79 is to provide advice on good practice in relation to the provision of water and drainage in a planning context. This includes guidance in relation to water and drainage infrastructure and the provision of sustainable drainage systems as a means of reducing potential detrimental impacts on existing watercourses at risk of pollution from development/ construction.

The Development Plan

- 16.3.37. The National Park area falls within the jurisdiction of five councils (Aberdeenshire, Angus, Highland, Moray and Perth & Kinross). Planning decisions are made with reference to the development plans of the appropriate council.
- 16.3.38. Under the 2006 Act, Local Authorities are required to produce a new kind of Development Plan. Some authorities have commenced preparation of plans under this new system but until these are published and adopted, the existing Development Plans remain in force.
- 16.3.39. In the Cairngorms a Local Development Plan for the entire area will replace the numerous local and structure plans currently in operation.
- 16.3.40. However, until the CNPA Local Development Plan is adopted, the Cairngorms National Park Local Plan (2010) will be read in conjunction with the Highland Structure Plan (2001).

The Highland Structure Plan (2001)

- 16.3.41. Adopted on 26th March 2001, the Highland Structure Plan's (HSP) aim is to create a shared vision of how people in the Highlands can work together to develop a prosperous future, strong communities and a healthy environment.
- 16.3.42. The HSP identifies the need to promote the development of an efficient road network. This is given particular emphasis in the Plan as the area is heavily dependent on the movement of goods through the road network.
- 16.3.43. In terms of access to services, there is a need to develop efficient and imaginative ways to increase access by all sections of the community to a full range of good quality services. The region as a whole is seen as disadvantaged by its peripheral location. The strengthening of both internal and external transport links, with the assistance of the EU Structural Funds, is of strategic importance for the continued development of a sustainable regional economy.
- 16.3.44. With regards to integrated transport, a strategic approach is encouraged to improve critical links and integrate different transport modes. Due to the growth in road traffic and increase in car ownership, combined with need to alleviate the problems of public health, road safety, congestion, and atmospheric pollution, it is acknowledged that there is likely to be a continued need for improvements to the existing road network.

- 16.3.45. The issue of improving accessibility to goods, services and markets is identified as a strategic theme within the HSP. To that end an emphasis is placed on improvements to the road network as a continuation to the work already completed over recent years.
- 16.3.46. A number of key policies relevant to the analysis of impact broadly follow the headings of transport and environmental protection.
- 16.3.47. In general, policies should encourage a move away from dependence on car-use where realistic, encourage the generation of transport options for people, including new forms of community transport, and focus on the local provision of services.
- 16.3.48. The following provides a summary of those policies of relevance.
- Policy G1: Conformity with Strategy**
- 16.3.49. This policy states that the Council will support developments, having regard to the Plan's sustainable objectives, which promote and enhance the social, economic and environmental wellbeing of the people of the Highlands.
- Policy G2: Design for Sustainability**
- 16.3.50. This policy relates to sustainability and states that proposed developments will be assessed on the extent to which they:
- Are compatible with service provision (water and sewerage, drainage, roads, schools, electricity);
 - Are accessible by public transport, cycling and walking as well as car;
 - Maximise energy efficiency in terms of location, layout and design, including the utilisation of renewable sources of energy;
 - Are affected by significant risk from natural hazards, including flooding, coastal erosion, land instability and radon gas, unless adequate protective measures are incorporated, or the development is of a temporary nature;
 - Are affected by safeguard zones where there is a significant risk of disturbance and hazard from industrial installations, including noise, dust, smells, electro-magnetism, radioactivity and subsidence;
 - Make use of brownfield sites, existing buildings and recycled materials;
 - Impact on individual and community residential amenity;
 - Impact on non-renewable resources such as mineral deposits of potential commercial value, prime quality or locally important agricultural land, or approved routes for road and rail links;
 - Impact on the following resources, including pollution and discharges, particularly within designated areas:
 - Habitats freshwater systems;
 - Species;
 - Marine systems;
 - Landscape;
 - Cultural heritage;
 - Scenery; and
 - Air quality.
 - Demonstrate sensitive siting and high quality design in keeping with local character and historic and natural environment and in making use of appropriate materials;

- Promote varied, lively and well-used environments which will enhance community safety and security and reduce any fear of crime;
- Accommodate the needs of all sectors of the community, including people with disabilities or other special needs and disadvantaged groups; and
- Contribute to the economic and social development of the community.

16.3.51. Developments which are judged to be significantly detrimental in terms of the above criteria shall not accord with the Structure Plan.

Policy G3: Impact Assessments

16.3.52. This policy states that the Council will require the preparation of appropriate impact assessments where environmental and/or socio-economic impacts of a proposed development are likely to be significant by virtue of nature, size or location.

Policy TC6: Road network improvements

16.3.53. This policy states that the Council, as the roads authority, will improve as a priority Premium and Strategic Routes to a modern two-lane standard and Rural Distributor Routes according to its roads hierarchy, especially where such roads are important for the effective functioning of the Structure Plan's settlement hierarchy.

16.3.54. Improvements will have regard for the proper safeguarding of the environmental qualities of the areas through observance of the "Fitting Roads" guidance. Local roads will be protected from damage by heavy traffic through improvements where resources are available or alternatively by weight and length restrictions.

Policy A1: Safeguarding of Agricultural Land

16.3.55. Development on prime quality or locally important agricultural land will not be permitted except where the development is essential to the interests of the local community and no reasonable alternative location is feasible.

Policy N1: Nature Conservation

16.3.56. This policy states that developments should seek to minimise their impact on the nature conservation resource and enhance it wherever possible.

Policy L4: Landscape Character

16.3.57. This policy states that the Council will have regard to the desirability of maintaining and enhancing present landscape character in the consideration of development proposals.

Policy G5: Integration of environmental and community interests

16.3.58. The Council will support measures that link the protection, enhancement, understanding and enjoyment of the natural and cultural heritage with the sustainability and vitality of local communities.

Policy G6: Conservation and promotion of the Highland heritage

16.3.59. The Council will seek to conserve and promote all sites and areas of Highland identified as being of a high quality in terms of nature conservation, landscape, archaeological or built environment.

Policy BC1: Preservation of Archaeological Sites

- 16.3.60. Archaeological sites affected by development proposals should be preserved, or, in exceptional circumstances where preservation is impossible, the sites will be recorded at developers' expense to professional standards. Provision will be made in Local Plans for the appropriate protection, preservation and enhancement of archaeological sites.

Policy BC5: Listed buildings and Conservation Areas

- 16.3.61. The Council will seek to preserve Highland's buildings and groups of buildings of historic or architectural interest, some of which may be at risk from neglect, by the identification in Local Plans of opportunities for their productive and appropriate use.

Policy T5: Strategic Tourist Routes

- 16.3.62. The Council will support the development and maintenance of a high quality network of strategic tourist routes based on a range of modes of travel.

Policy T6: Scenic Views

- 16.3.63. The Council will protect important scenic views enjoyed from tourist routes and viewpoints, particularly those specifically identified in Local Plans. There will be a presumption against development in narrow areas of land between roads and railways and open water.

Policy F3: Native Woodlands

- 16.3.64. This policy states that the Council will encourage the conservation and expansion of native woodland, and identifies Strathspey and the Cairngorms as an area.

Policy F5: Amenity Woodlands

- 16.3.65. The Council will support the maintenance and expansion of amenity woodlands throughout Highland, including provisions through The Council's Community Woodland Plan.

Policy TC1: Modal shift

- 16.3.66. The Council will support measures to achieve a shift from private car and road haulage to alternative forms of transport where appropriate. Proposals, which assist with the switching of freight from roads to rail or water will generally be supported.

Policy TC12 Passenger rail improvements

- 16.3.67. The Council recommends to railway authorities the maintenance of existing infrastructure and priority improvements to the following parts of the rail network as a contribution to the implementation of the Highland Transport Strategy:
- Commuter rail service between Nairn/Culloden, Tain and Inverness, with additional halts;
 - Rail/bus interchange at Inverness;
 - Rail/bus/air interchange at Inverness Airport;
 - Reduced journey times between Inverness-Wick/Thurso, Inverness-Aberdeen and Inverness-Edinburgh; and
 - Re-opening by Strathspey (Steam) Railway of the Aviemore - Grantown-on-Spey line.

Policy W2: Waste Minimisation

16.3.68. Proposals for major developments should include a method statement identifying the waste implications of the development and measures taken to minimise and manage the waste generated. Permission for the proposed development may not be granted where this has not been adequately addressed.

Policy W12: Air Quality

16.3.69. This policy states that high standards of air quality should be maintained within the Highland area. Where appropriate, new developments will be required to submit an environmental assessment, which addresses the subject of air pollution.

Cairngorms National Park Local Plan (2010)

16.3.70. The Cairngorms National Park Local Plan (CNPLP) was adopted by the Cairngorms National Park Authority (CNPA) in October 2010. The CNPLP sets out detailed planning policies with the intention of guiding development in the park over future years. The CNPLP is accompanied by Supplementary Guidance.

16.3.71. The CNPLP is committed to safeguarding the high-level landscape and environmental values of the surrounding countryside areas, and thus new development must not compromise this aim.

16.3.72. It seeks to locate future housing development within existing settlements. In close proximity to the proposed Scheme, within the settlement of Kincaig, the land in-between the A9 and the B9152 is identified for future housing and related community development ('Proposal Site KC/H1'). This Site (5.7 hectares) will consolidate the housing in Kincaig around the school.

16.3.73. Within the immediate proximity of the slip road junction leading from the A9 to the B9152, the Site of 'Baldow Smiddy' and land to the rear ('Proposal Site KC/ED1') have been identified as an opportunity for enhancing economic development within the settlement.

16.3.74. Whilst these sites have not been considered as committed developments in terms of assessing the cumulative impact of surrounding developments, they have been noted within this assessment. It is considered that the proposed Scheme would have a positive effect on the sustainability of these sites in terms of greater access provision should they be brought forward at a future date.

16.3.75. The following summarises those policies of relevance to the proposed Scheme.

Policy 2: National Natural Heritage Designations

16.3.76. Development that would adversely affect the Cairngorms National Park, a Site of Special Scientific Interest, National Nature Reserve or National Scenic Area will only be permitted where it has been demonstrated that:

- The objectives of designation and the overall integrity of the designated area would not be compromised; or
- Any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social or economic benefits of national importance and mitigated by the provision of features of commensurate or greater importance to those that are lost.

Policy 3: Other Important Natural and Earth Heritage Sites and Interests

16.3.77. Development that would adversely affect an ancient woodland site, semi-natural ancient woodland site, Geological Conservation Review Site, or other nationally, regionally or locally important site recognised by the planning authority will only be permitted where it has been demonstrated that:

- The objectives of the identified site and overall integrity of the identified area would not be compromised; or,
- Any significant adverse effects on the qualities for which the area or site has been identified are mitigated by the provision of features of commensurate or greater importance to those that are lost.

Policy 4: Protected Species

16.3.78. Development that would have an adverse effect on any European Protected Species will not be permitted unless:

- There are public health, public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;
- There is no satisfactory alternative solution; and
- The development will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

16.3.79. In addition, development should avoid any adverse impact of proposals on species listed in Schedules 1, 5 and 8 of the Wildlife & Countryside Act 1981, as amended, Annexes II and V of the EC Habitats Directive and Annex I of the EC Birds Directive.

Policy 5: Biodiversity

16.3.80. Development that would have an adverse effect on habitats or species identified in the Cairngorms Local Biodiversity Action Plan, UK Biodiversity Action Plan, or by Scottish Ministers through the Scottish Biodiversity List, including any cumulative impact will only be permitted where:

- The developer can demonstrate to the satisfaction of the planning authority, that the need and justification for the development outweighs the local, national or international contribution of the area of habitat or populations of species; and
- Significant harm or disturbance to the ecological functions, continuity and integrity of the habitats or species populations is avoided, or minimised where harm is unavoidable, and appropriate compensatory and/or management measures are provided and new habitats of commensurate or greater nature conservation value are created as appropriate to the site.

16.3.81. Where there is evidence to indicate that a habitat or species may be present on, or adjacent to, a site, or could be adversely affected by the development, the developer will be required to undertake a comprehensive survey of the area's natural environment to assess the effect of the development on it.

Policy 6: Landscape

16.3.82. There will be a presumption against any development that does not complement and enhance the landscape character of the Cairngorms National Park, and in particular, the setting of the proposed development. Proposed development that does not complement and enhance the landscape character of the Park and the setting of the proposed development will be permitted only where:

- Any significant adverse effects on the landscape character of the Park are clearly outweighed by social or economic benefits of national importance; and
- All the adverse effects on the setting of the proposed development have been minimised and mitigated through appropriate siting, layout, scale, design and construction to the satisfaction of the planning authority.

Policy 8: Archaeology

16.3.83. There will be a presumption in favour of preserving in situ Scheduled Monuments and other identified nationally and regionally important archaeological resources, and within an appropriate setting. Developments, which have an adverse effect on Scheduled Monuments or the integrity of their setting will not be permitted unless there are exceptional circumstances.

16.3.84. All other archaeological resources will be preserved in situ wherever feasible. The planning authority will weigh the significance of any impacts on archaeological resources and their settings against other merits of the development proposals in the determination of planning applications.

16.3.85. The developer may be requested to supply a report of an archaeological appraisal prior to determination of the planning application. Where the case for preservation does not prevail, the developer will be required to make appropriate and satisfactory provision for archaeological excavation, recording, analysis and publication, in advance of development.

Policy 9: Listed Buildings

16.3.86. The policy states that there will be a presumption in favour of development that preserves a listed building, or its setting, or any features of special architectural or historic interest, which it possesses.

Policy 11: The Local and Wider Cultural Heritage of the Park

16.3.87. There will be a presumption against development that does not protect or conserve and enhance a site, feature, or use of land of local or wider or cultural historic significance, or its setting.

16.3.88. Any development that would adversely affect a site, feature, or use of land of local or wider cultural or historic significance or its setting, will take reasonable measures to avoid, minimise and mitigate those effects.

Policy 12: Water Resources*A Use of Resources*

16.3.89. There will be a presumption against development, which does not meet all of the following criteria:

- Minimises the use of treated and abstracted water;
- Does not result in the deterioration of the current or potential ecological status or prejudice the ability to restore water bodies to good ecological status;
- Treat surface water and foul water discharge separately and in accordance with SUDS Manual Ciria C697; and
- Have no significant adverse impact on existing or private water supplies or wastewater treatment services.

B Flooding

16.3.90. There will be a presumption against development, which does not meet all of the following criteria relating to flooding:

- Be free from significant risk of flooding;
- Does not increase the risk of flooding elsewhere;
- Does not add to the area of land that requires flood prevention measures; and
- Does not affect the ability of the functional floodplain to store or move flood waters.

16.6.91. Note: Development in areas susceptible to flooding will require a developer-funded flood risk assessment, carried out by a suitably qualified professional.

Policy 16: Design Standards for Development

16.3.92. Design of all development will seek, where appropriate, to:

- Minimise the effect of the development on climate change;
- Reflect and reinforce the traditional pattern and character of the surrounding area and reinforce the local vernacular and local distinctiveness, whilst encouraging innovation in design and use of materials;
- Use materials and landscaping that will complement the setting of the development;
- Demonstrate sustainable use of resources (including the minimisation of energy, waste and water usage) throughout construction, within the future maintenance arrangements, and for any decommissioning which may be necessary;
- Enable the storage, segregation and collection of recyclable materials and make provision for composting;
- Reduce the need to travel;
- Protect the amenity enjoyed by neighbouring properties and all proposals will be designed to help create environments that can be enjoyed by everyone; and
- Be in accord with the design standards and palette of materials as set out in the Sustainable Design Guide and any other Supplementary Planning Guidance produced relating to design for new developments.

16.3.93. All proposals must be accompanied by a design statement, which sets out how the requirements of the policy have been met.

Policy 14: Contaminated Land

16.3.94. Development proposals on land that is contaminated, or suspected of being contaminated, will be approved where:

- If the risk is considered to be significant, investigations and assessments, including site specific risk assessments, are submitted with planning applications to identify actual or potential significant risks to human health and safety associated with the current condition of the site, and how contaminants currently interact with the surrounding ecosystem and the Cairngorms National Park's special qualities; and
- Assessments are undertaken to identify actual and potential impacts, on site and off site, of all stages of development proposals on the risks to human health and also to the Park's biodiversity, geodiversity, hydrology and other special qualities; and
- Effective remedial action, including action controlling and limiting the release of contaminant to the surrounding environment, is taken to ensure that the site is made suitable for the development proposal use and potential reuse by other development, and that there are no significant detrimental effects on the Park's special qualities on or off site.

Policy 29: Integrated and Sustainable Transport Network

- 16.3.95. Development proposals will be favourably considered where the planning authority is satisfied that adequate consideration has been given to maintaining or improving the sustainable transport network within the Cairngorms National Park through the use of:
- Methods to reduce car dependency;
 - Promotion of sustainable transport modes; and
 - Creation of, or linking to, any existing hierarchy of travel modes, based on walking and cycling, including core paths network, safe routes to schools and workplaces, public transport and then motorised modes; and mechanisms to reduce the need to travel.

- 16.3.96. Where the transport impacts of a proposed development are considered to be significant, by virtue of its size, nature or location, developers will be required to submit a transport assessment covering the local transport impacts of the development, including those during the construction phase, and also where appropriate, submit a green transport plan indicating measures to reduce the impact of travel to the development. Such proposals should make a positive contribution towards the sustainable transport network in the Cairngorms National Park.

Policy 34: Outdoor Access

- 16.3.97. Development, which improves opportunities for responsible outdoor access which adheres - to the Cairngorms National Park Outdoor Access Strategy will be encouraged. Developments will be required to be consistent with the Scottish Outdoor Access Code and the Cairngorms National Park Core Paths Plan.
- 16.3.98. Development proposals, which would result in a reduction of public access rights, or loss of linear access (such as core paths, rights of way, or other paths and informal recreation areas, or loss of access to inland water) will only be permitted where an appropriate or improved alternative access solution can be secured to the satisfaction of the planning and access authorities.

Material Considerations and Supplementary Planning Guidance

- 16.6.99. Adopted Supplementary Planning Guidance (SPG) documents accompanying the CNPLP and relevant to the proposed Scheme include:
- Cairngorms National Park Partnership Plan¹⁶⁵ (2012);
 - Cairngorms National Park Core Paths Plan¹⁶⁶ (2010);
 - Natural Heritage (2010); and,
 - Wildness (2011).

165 <http://cairngorms.co.uk/resource/docs/publications/21062012/CNPA.Paper.1827.Cairngorms%20National%20Park%20Partnership%20Plan%202012-2017.pdf>

166 <http://cairngorms.co.uk/resource/docs/publications/08062010/CNPA.Paper.1533.Cairngorms%20National%20Park%20Core%20Paths%20Plan.pdf>

- 16.3.100. The purpose of a CNPA is to ensure that the National Park aims as set out in the National Parks (Scotland) Act 2000 are collectively achieved in a co-ordinated way. With regards to the proposed Scheme, a major material consideration would be the Government's four aims (listed below) which are integral to sustainable development needed to support communities and businesses in order to protect and enhance these areas for future generations. The four aims, as outlined in the National Parks (Scotland) Act 2000 are:
- To conserve and enhance the natural and cultural heritage of the area;
 - To promote sustainable use of the natural resources of the area;
 - To promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public; and
 - To promote sustainable economic and social development of the area's communities.
- 16.3.101. However, where there appears to be a conflict between the aims of the Park, the National Parks (Scotland) Act 2000 requires that greater weight be given to the first aim (conserving and enhancing the natural and cultural heritage). This is a sustainable development approach in action, which all partners should take to ensure that the environment, with which the economy and visitor experience is interwoven, remains special for future generations.
- Cairngorms National Park Partnership Plan**
- 16.3.102. This five-year Plan sets out how the Cairngorms National Park will be managed, namely:
- Delivering outstanding tourism destinations;
 - Investing in some of Scotland's most loved landscapes and wildlife; and
 - Generating growth in rural economies.
- 16.3.103. The Plan outlines various policy priorities to help deliver the five-year outcomes. With regards to the proposed Scheme, Policy 1.2 'Enable sustainable patterns of settlement growth, infrastructure and communications' supports sensitively designed improvements to the A9 and other trunk roads as an integral part of enhancing the connectivity of the Highlands.
- Cairngorms National Park Core Paths Plan**
- 16.3.104. The Plan sets out the core paths network for the Cairngorms National Park with the intention of identifying and designating a network of core paths, which will allow local residents and visitors to make full use of the outdoor opportunities such paths provide. The core paths network includes:
- Existing paths and tracks;
 - Paths that need to be built;
 - Quiet roads;
 - Pavements; and
 - The River Spey.
- 16.3.105. The above is supported by the overall vision of the Plan, which states that:
- "The Core Paths Plan will help people to enjoy and understand the special qualities of the Cairngorms National Park by identifying a network of paths which offer a wide range of high quality outdoor access opportunities".*

- 16.3.106. The Plan does not identify the existing A9 as forming part of the core paths network. Within the Plan it is stated that roads have only been included if no suitable off-road alternatives could be identified.
- CNPA Supplementary Planning Guidance**
- Natural Heritage*
- 16.3.107. Published in 2010, this guidance provides additional information relating to natural heritage as outlined within policies 1-5 and policy 18 of the CNPLP.
- 16.3.108. There are six key principles that will be used to assess developments in relation to natural heritage in the Cairngorms National Park. The 6 key principles are:
- Principle 1:** Development should result in no net loss of natural heritage interest of the Cairngorms National Park. This includes natural heritage interest that may be outside the boundaries of the development site;
- Principle 2:** In any situation where loss of, or damage to, natural heritage interest is unavoidable then the loss or damage will always be minimised as far as possible;
- Principle 3:** If loss of or damage to the natural heritage is unavoidable then it will be fully mitigated on the development site;
- Principle 4:** If full mitigation is not possible on site then it should be completed with a combination of onsite mitigation and off site compensation;
- Principle 5:** Where full mitigation or compensation measures are not possible, financial compensation will be required. This will be used to benefit natural heritage within the Cairngorms National Park; and
- Principle 6:** Calculation of compensation will take into account the quality of outcomes over time. The calculation will be based upon the method set out in the Supplementary Planning Guidance on Developer Contributions. Any new habitat created as compensation shall be permanently set aside for that purpose. This will be achieved through Section 75 planning obligation agreements (Section 75 of the Town and Country Planning (Scotland) Act 1997).
- 16.3.109. It should be noted, the for the purpose of DMRB and the proposed Scheme, Principle 5 and 6 are not relevant.
- Wildness*
- 16.3.110. Published in July 2011 by the CNPA, this supplementary planning guidance sets out to provide detailed information to ensure developments in the National Park comply with Policies 2: National Natural Heritage Designations and 6: Landscape in the Cairngorms National Park Local Plan.
- 16.3.111. Values attributed to wildness of the land, have been grouped in to three broad Bands for the purpose of assessing the impacts of development. The purpose of the Bands is to highlight the particular wildness sensitivities within each one.
- 16.3.112. The proposed Scheme appears to fall within Band C (Low Value). Band C areas include transport corridors, quarries and other well developed areas. In terms of development sensitivity, it is considered that well designed development that is of an appropriate scale and finish that compliments the landscape character of the area is unlikely to reduce wildness.

16.4. Emerging Guidance

Cairngorms National Park Local Development Plan

- 16.4.1. Work has begun on the next Local Development Plan, which will in due course, replace the Local Plan. Consultation on the proposed Local Development Plan was undertaken between April and July of this year. At present, this plan is not a material consideration in the assessment of the proposed Scheme.

16.5. Potential Effects and Scheme Compliance with Policy

- 16.5.1. As part of the consultation process, advice was received from the CNPA Planning Team and THC relating to both the suggested policies to be considered as well as the potential positive and negative effects. Copies of those consultation responses are attached in Appendix 1 of Volume 3 of this ES.
- 16.5.2. THC provided comments on the acceptability of the proposed Scheme in terms of its accordance with the Development Plan and sustainability criteria set out within the HSP and CNPLP. No objections were raised to the principle of dualling this section of the A9, although it was suggested that potential impacts could be significantly greater than those of the previously proposed W2+1 scheme. As a result, it was acknowledged that THC would expect a greater degree of survey, justification and mitigation to ensure that the relevant policies of the Development Plan are to be satisfied.
- 16.5.3. As part of this Stage 3 Assessment, the proposed Scheme has subsequently been assessed in accordance with DMRB and other relevant guidance to ensure that it could be sufficiently demonstrated whether the policy objectives would be facilitated or hindered by the proposed Scheme and consequently the significance of the effects.
- 16.5.4. Table 16.1 sets out the relevant policies considered under each DMRB topic and assesses the proposed Schemes compliance, taking into account the significance of key effects alongside the initial views of the relevant planning authorities.
- 16.5.5. Further details of the significant effects arising from the proposed Scheme and appropriate mitigation measures are identified within the relevant ES Chapter and summarised within Chapters 17 and 18 respectively.

Table 16.1 Potential Effects and Scheme Compliance

Policy REF	Policy Content	Significance of Effect	Scheme Compliance with Policy
GENERAL			
SPP Subject Policy:	Economic Development	<i>Positive Large</i>	<p>The subject policy makes reference to a need to ensure that new economic opportunities are realised, with the planning system intended to support economic development in all areas by:</p> <ul style="list-style-type: none"> • Taking account of the economic benefits of proposed development in development plans and development management decisions; and • Supporting development, which will provide new employment opportunities and enhance local competitiveness. <p>Furthermore the policy states that planning authorities should ensure that new development safeguards and enhances an area’s environmental quality, and where relevant, should promote and support opportunities for environmental enhancement.</p> <p>The proposed Scheme would provide the opportunity for significant inward investment within the Highland region, with improved transport links encouraging businesses to locate additional facilities due to significant improvements in travel times.</p>
SPP Subject Policy:	Rural Development	<i>Positive Moderate</i>	<p>The subject highlights the positive role planning authorities can make in helping rural businesses and communities to flourish. The aim it is stated, is to enable development in all rural areas which supports prosperous and sustainable communities, whilst protecting and enhancing environmental quality. The strategy for rural development within the development plan should reflect the overarching aim of supporting the growth of the rural economy. Furthermore the importance of access to good quality services is referenced. Major facilities are on the whole concentrated in larger settlements, and whilst the policy subject states a preference for public transport to serve such facilities, the nature of remote areas and the constraints these encapsulate are recognised.</p> <p>The subject policy supports development, which would have a positive impact on the accessibility of residents to good quality facilities, and where economic regeneration and development can be enhanced. The provision of an NMU will also improve the interconnectivity between the main settlements within the area, improving the access of local residents to existing, and potential new facilities.</p>

SPP Subject Policy:	Transport	<i>Positive Large</i>	<p>The policy identifies an aim to reduce transport emissions and a shift from car-based travel to more sustainable modes of transport. This includes tackling congestion which should it is stated support sustainable economic growth and reduce emissions. Additionally the policy states that improvements to active transport networks, such as paths and cycle routes, in urban and rural areas will support more sustainable transport choices.</p> <p>The proposed Scheme will reduce the current issue of traffic congestion associated with the existing A9. The provision of an adjacent cycle route will also provide alternative transport methods and help to further reduce emissions.</p>
PAN 51:	Planning, Environmental Protection and Regulation	<i>Positive Slight</i>	<p>PAN 51 provides support to existing planning policy on the role of the planning system in relation to environmental protection regimes.</p> <p>The proposed mitigation and environmental commitments will ensure that any impacts on the environment are managed, and where possible, the environment will be enhanced.</p>
HSP Policy G1:	Conformity with Strategy	<i>Positive Slight / Neutral</i>	<p>THC makes reference to a range of potential negative effects. These include encouragement of modal shift from rail to road as a consequence of reduced road journey times; increased quarry and coach traffic southbound on the B9152 and impaired access between the B9152 and facilities and premises west of the A9.</p> <p>However, discussions with THC indicate no objections in principle.</p> <p>THC confirmed that the proposed Scheme is referred to in the current Council administration's programme and in principle would accord with HSP Policy G1 and with the both the following HSP and CNPLP sustainability objectives including:</p> <p>HSP</p> <ul style="list-style-type: none"> • Accessibility by public transport, cycling and walking as well as by car; • Impact on individual and community residential amenity; and • Impact on habitats, species, landscape, scenery, freshwater systems and air quality. <p>CNPLP</p> <ul style="list-style-type: none"> • Minimising the effect of the development on climate change; • Reduce the need to travel; and • Protect amenity enjoyed by neighbouring properties and help create environments which can be enjoyed by everyone.
HSP Policy G2:	Design for Sustainability		
HSP Policy G3:	Impact Assessments		
HSP Policy TC1	Modal shift		
HSP Policy TC12	Passenger rail improvements		
CNPLP Policy 16:	Design Standards for Development		
CNPLP Policy 29:	Integrated and Sustainable Transport		

			<p>The proposed Scheme alignment has been developed to closely follow that of the existing A9. It has been assessed through the DMRB Environmental Assessment and this ES identifies the significance of effects and ensures mitigation measures have been proposed where necessary.</p> <p>The proposed Scheme would improve the Trunk Road Network as well as contribute to a high quality road network, which would benefit long distance traffic and Scotland’s economy. As such it is considered that the proposed Scheme accords with HSP and CNPLP policies relating to the principle of the development.</p>
AIR QUALITY			
HSP Policy G2:	Design for Sustainability	<i>Neutral</i>	<p>THC originally identified air pollution as being a potential negative effect. Air Quality and Environmental Health officers at THC have been consulted in regard to acceptance of the assessment methodology. Northern Ecological Services and SNH were consulted in relation to selection of habitat type for assessment of air quality effects on sensitive ecosystems.</p> <p>Chapter 4 of this DMRB Stage 3 Assessment considers the existing air quality conditions, potential effects of construction and operation of the proposed Scheme.</p> <p>There is potential for the elevation of ambient dust levels during the construction phase, however this would be short term in duration.</p> <p>There are 27 residential properties and one school within 200 metres of the proposed Scheme that could be affected by dust during construction. The contractor will be required to ensure that Best Practicable Means are applied to control dust emissions to avoid any adverse effects.</p> <p>The results of the assessment in the opening year indicate that the proposed Scheme would result in an imperceptible change in air quality conditions. Based on these results the requirement for assessment of air quality effects in the Design Year (2032) have been scoped out.</p> <p>As concentrations are likely to remain well below Government objective levels, the overall effect on air quality is considered to be ‘negligible’.</p> <p>Throughout the completion of this assessment, consultation has been maintained and comments addressed, therefore it is not envisaged that significant issues will emerge as a result of the assessment findings.</p> <p>As such it is considered that the proposed Scheme accords with HSP and CNPLP policies relating to air quality.</p>
HSP Policy G3:	Impact Assessments		
HSP Policy N1:	Nature Conservation		
HSP Policy W5:	Air Quality		
CNPLP Policy 29:	Integrated and Sustainable Transport		

CULTURAL HERITAGE			
HSP Policy G2:	Design for Sustainability	<i>Negative Slight</i>	SEPA, THC and HS provided feedback in terms of the proposed method of working and potential archaeological impacts.
HSP Policy G3:	Impact Assessments		Chapter 5 of this DMRB Stage 3 Assessment considers the construction and operational effects on assets within the study area.
HSP Policy G6:	Conservation and Promotion of the Highland Heritage		This assessment has shown the proposed Scheme would affect a small number of known heritage assets, and would be limited to potential truncation of two former post-medieval farmsteads, a post-medieval quarry, a short section of an 18th century military road, and a short length of post-medieval dry stone wall.
HSP Policy BC1:	Preservation of Archaeological Sites		It would also cause minor changes to the setting of Kincaig House and meat larder, and Drostan's Chapel and graveyard.
HSP Policy BC5:	Listed Buildings and Conservation Areas		The nature and scale of the project means the wider historic landscape would not be adversely affected by the proposed Scheme.
CNPLP Policy 3:	Other Important Natural and Earth Heritage Sites and Interests		The assessment proposes to mitigate these effects through screen planting and a programme of archaeological watching brief, the scope of which would be agreed with the Local Planning Archaeologist prior to any enabling or construction proceeding and would include an appropriate level of post-fieldwork reporting. This approach was accepted by the THC.
CNPLP Policy 8	Archaeology		Throughout the completion of this assessment, consultation has been maintained and comments addressed, therefore it is not envisaged that significant issues will emerge as a result of the assessment findings.
CNPLP Policy 9:	Listed Buildings		As such, it is considered that the proposed Scheme accords with HSP and CNPLP policies relating to cultural heritage and archaeology.

DISRUPTION DUE TO CONSTRUCTION			
CNPLP Policy 16	Design Standards for Development	<i>Neutral</i>	<p>Chapter 6 of this DMRB Stage 3 Assessment considers the potential disruption due to construction.</p> <p>No specific consultation was carried out for this element of the assessment. However, each individual topic assesses impacts during the construction period.</p> <p>The proposed Scheme does not deviate significantly from the existing alignment. It requires the formation of embankments and cuttings including reconstruction and widening of the existing road pavement. Due to the constraints associated with following the existing alignment closely, there is a surplus of excavated material.</p> <p>Best construction management practices will be in place to ensure the safety of construction workers, residents and other members of the public during construction of the proposed scheme. Diversions, lane closures, and vehicle entrance locations will be well signed and managed appropriately to minimise disruption.</p> <p>During construction, the Contractor will be responsible for job-site safety and security. The procurement contract will include penalties for prolonged occupation of the A9. This will drive down the projected construction duration and thus minimise the potential effects of construction.</p> <p>A CEMP will be produced by the Contractor providing further detail.</p> <p>The type of work involved is likely to require some temporary traffic management and generate nuisance in the form of noise and dust and vibration. However, these are all controllable. There will also be the potential for some temporary visual impacts.</p> <p>Whilst disruption due to construction is likely to cause a negative effect, the Contractor will ensure measures within this assessment are in place to mitigate where possible.</p> <p>As construction impact has been assessed individually within each topic, it is considered that the proposed Scheme accords with HSP and CNPLP policies relating to effects during this period.</p>
CNPLP Policy 29	Integrated and Sustainable Transport		
CNPLP Policy 34	Outdoor Access		

ECOLOGY AND NATURE CONSERVATION			
HSP Policy G2:	Design for Sustainability	<i>Neutral to Negative Slight</i>	<p>THC made reference to the Dunachton Burn as being part of an SAC and suggests protection of its qualifying interests will require care in the design and construction management of the underpass and the road widening in its immediate vicinity. With adherence to best standards during construction in relation to minimising the risk of water pollution, no significant effects are anticipated upon the Spey SAC.</p> <p>THC suggest there is the potential to cause disturbance impact of breeding birds from construction noise on Scheduled Sites such as Insh Marshes SAC/SPA. To minimise this risk any works that may generate high impact noise above the ambient level of vehicle movements, will be undertaken outside the bird breeding season.</p> <p>THC also recommended that all watercourse crossings whether designated or not should be surveyed for otters. The assessment concludes that construction disturbance could affect otters, though use of the reach by otters appears light and sporadic and no holts or other resting places have been found in the 1 kilometre reach surveyed around the new crossing.</p> <p>THC recommend care in the design and construction management of the underpass and the road widening in the immediate vicinity of the Allt an Fhearna. Land-take here may result in a minor incursion into the Alvie SSSI. To mitigate this loss, a new area of wet woodland will be planted to provide a habitat at least double that of the area under permanent loss.</p> <p>Consultation has also been undertaken with SNH, Scottish Badgers, Spey Fishery Board, Transerv and the RSPB in order to gather additional data relating to the ecological baseline condition and to invite views on the proposed Scheme and approaches to mitigating any perceived adverse impacts.</p> <p>Chapter 7 of this DMRB Stage 3 Assessment considers the potential construction and operational effects on ecology and nature conservation and predicts that, with mitigation in place and supervised by a suitably qualified ecological or environmental clerk of works, there is unlikely to be any significant adverse ecological effects arising from the construction of the additional carriageway and subsequent operation of the proposed Scheme. There is the opportunity, through mitigation and appropriate management adopted by the highway maintenance authority, for biodiversity gains, significant at the site, local and possibly district levels.</p> <p>Throughout the completion of this assessment, consultation has been maintained and comments addressed, therefore it is not envisaged that significant issues will emerge as a result of the assessment findings.</p> <p>As such it is considered that the proposed Scheme accords with HSP and CNPLP policies relating to effects on ecology and nature conservation.</p>
HSP Policy G3:	Impact Assessments		
HSP Policy G6:	Conservation and Promotion of the Highland Heritage		
HSP Policy N1:	Nature Conservation		
HSP Policy F3:	Native Woodland		
HSP Policy F5:	Amenity Woodlands		
CNPLP Policy 2	National Natural Heritage Designations		
CNPLP Policy 3	Other Important Natural and Earth Heritage Sites and Interests		
CNPLP Policy 4	Protected Species		
CNPLP Policy 5	Biodiversity		

LANDSCAPE AND VISUAL			
HSP Policy G2:	Design for Sustainability	<i>Neutral to Negative Slight</i>	<p>THC indicated that the road itself is unlikely to have a significant adverse impact on the landscape except at its southern end, where the earthworks west of the existing carriageway risk making the quarry at Meadowside more visible from the far side of the strath.</p> <p>Chapter 8 of this DMRB Stage 3 Assessment considers the potential landscape and visual effects on the surrounding landscape character and visual amenity.</p> <p>In terms of landscape character impacts, the proposed Scheme does not deviate significantly from the existing alignment and therefore impacts are contained and restricted within the immediate vicinity of the road corridor. The improvement works will require re-profiling of existing slopes, formation of new embankments on both sides of the existing road corridor and creation of new underpasses. This will result in the permanent removal of some existing woodland and Ancient Woodland. The proposed Scheme has been developed to avoid, retain and protect existing landscape features and elements. The proposed mitigation measures will compliment the character of the overall area and reduce the wider direct and indirect landscape effects of the proposed Scheme</p> <p>The proposed Scheme will cause slight adverse impacts on the Kincaig Village & Pastoral Farmland LCA and Alvie Estate & Extensive Coniferous Woodland LCA at Opening Year. However mitigation measures will reduce impacts to neutral by Design Year 15.</p> <p>Slight adverse impacts caused to the Dunachtonmore Estate and Extensive Broadleaved Woodland LCA at Opening Year will continue to be slight adverse by Design Year 15.</p> <p>By Design Year 15, adverse visual amenity impacts will be reduced to neutral for all of the visual amenity receptors.</p> <p>Throughout the completion of this assessment, consultation has been maintained and comments addressed, therefore it is not envisaged that significant issues will emerge as a result of the assessment findings.</p> <p>As such it is considered that the proposed Scheme accords with HSP and CNPLP policies relating to landscape and visual impact.</p>
HSP Policy G3:	Impact Assessments		
HSP Policy G6:	Conservation and Promotion of the Highland Heritage		
HSP Policy T6:	Scenic Views		
HSP Policy F3:	Native Woodland		
HSP Policy F5:	Amenity Woodlands		
HSP Policy L4:	Landscape Character		
CNPLP Policy 2:	National Natural Heritage Designations		
CNPLP Policy 3:	Other Important Natural and Earth Heritage Sites and Interests		
CNPLP Policy 5:	Biodiversity		
CNPLP Policy 6:	Landscape		
CNPLP Policy 9:	Listed Buildings		
CNPLP Policy 16:	Design Standards for Development		

LAND USE			
HSP Policy G2:	Design for Sustainability	<i>Neutral to Negative Slight</i>	<p>Landowners and the community council provided comment during consultation meetings (8th August 2012 and 16th November 2012) relating to access issues. Representatives of Dunchaton Estate provided advised on the preferred details for improvements to existing estate access such as alignment and carriageway make-up. Alvie and Dalraddy Estates representatives confirmed acceptance of proposed access at Alvie. The Kincaig and Vicinity Community Council conveyed concern about the lack of informal access to the A9 from Kincaig. Traffic data was presented to justify not having an access.</p> <p>Chapter 9 of this DMRB Stage 3 Assessment considers the potential impacts and assesses the effects of the proposed Scheme on the surrounding land use.</p> <p>The proposed Scheme involves on line widening of the corridor of the existing A9. There will be no loss of buildings as a result of the proposed Scheme.</p> <p>The scheme does not involve the loss of any prime land and total land take, including that acquired in 2009, is very small in relation to the overall size of the two affected estates. Construction impacts of the scheme have the potential to be negative major without appropriate mitigation in terms of provision of access and boundary fencing. With mitigation the impacts will be neutral both in opening year and in Design Year 15.</p> <p>Throughout the completion of this assessment, consultation has been maintained and comments addressed, therefore it is not envisaged that significant issues will emerge as a result of the assessment findings.</p> <p>As such it is considered that the proposed Scheme accords with HSP and CNPLP policies relating to the use of existing land.</p>
HSP Policy A1:	Safeguarding of Agricultural Land		
HSP Policy N1:	Nature Conservation		
HSP Policy F3:	Native Woodland		
HSP Policy F5:	Amenity Woodlands		
CNPLP Policy 2:	National Natural Heritage Designations		
CNPLP Policy 3:	Other Important Natural and Earth Heritage Sites and Interests		

TRAFFIC NOISE AND VIBRATION			
HSP Policy G2:	Design for Sustainability	<i>Long Term Neutral</i>	<p>THC was consulted to identify any noise issues or particular constraints within the study area. THC suggested specific noise and vibration guidelines that should be followed and suggested a standard planning condition relating to construction working hours.</p> <p>Chapter 10 of this DMRB Stage 3 Assessment considers the construction and operational effects of road traffic noise and vibration.</p> <p>The construction of a new carriageway next to the existing carriageway will move a proportion of the noise source closer to sensitive receptors by around 12 metres. Whilst there is no significant change in traffic flow predicted there are predicted increases in average speeds. As a result of these changes, noise levels would be expected to increase by up to 2 dB(A) on opening at the nearest properties to the proposed Scheme resulting in a minor short term noise impact.</p> <p>Heavy vehicle composition is not predicted to change as a result of the proposed Scheme.</p> <p>During Design Year 15 the maximum noise increase when compared with the opening year Do-Minimum is predicted to be under 3 dB(A) and all long term noise impacts are predicted to be negligible.</p> <p>The Do-Minimum situation in Design Year 15 would similarly result in negligible noise impacts.</p> <p>No specific mitigation has been recommended, however, a low noise surface will be implemented as part of the scheme.</p> <p>Throughout the completion of this assessment, consultation has been maintained and comments addressed, therefore it is not envisaged that significant issues will emerge as a result of the assessment findings.</p> <p>It is therefore considered that the proposed Scheme accords with HSP and CNPLP policies relating to traffic noise and vibration effects.</p>
HSP Policy TC6:	Road network improvements		
HSP Policy T5:	Strategic Tourist Routes		
CNPLP Policy 2:	National Natural Heritage Designations		
CNPLP Policy 3:	Other Important Natural and Earth Heritage Sites and Interests		
CNPLP Policy 5:	Biodiversity		
CNPLP Policy 16:	Design Standards for Development		
CNPLP Policy 29:	Integrated and Sustainable Transport		

PEDESTRIANS, CYCLISTS, EQUESTRIANS AND COMMUNITY EFFECTS			
CNPLP Policy 16:	Design Standards for Development	<i>Positive Moderate</i>	<p>Consultation was carried out with THC, CNPA and the British Horse Society who also consulted their local members. The CNPLP does not highlight any proposals for new pedestrian, cycle or equestrian facilities within the corridor study area. However, following discussions with the CNPA, a cycle route has been included within the proposed Scheme.</p> <p>Chapter 11 of this DMRB Stage 3 Assessment considers the impact of the proposed Scheme on journeys made in its locality by pedestrians (including ramblers), cyclists and equestrians as well as any associated community effects.</p> <p>Through upgrading existing underpasses and the network of private access tracks within the affected estates, there will be a neutral effect on existing travel patterns for pedestrians, and equestrians. Alvie Primary School is located in the corridor study area and safe access from the B9152 will remain unchanged by the scheme.</p> <p>The introduction of a cycle as part of the proposed Scheme will provide added value for the local community and potential cyclists who use the existing NCN cycle track.</p> <p>Throughout the completion of this assessment, consultation has been maintained and comments addressed, therefore it is not envisaged that significant issues will emerge as a result of the assessment findings.</p> <p>As such it is considered that the proposed Scheme accords with policies relating to non-motorised users.</p>
CNPLP Policy 29:	Integrated and Sustainable Transport		
CNPLP Policy 34:	Outdoor Access		
VEHICLE TRAVELLERS			
HSP Policy T6:	Scenic Views	<i>Neutral</i>	<p>No specific consultation was carried out for this topic. However, consultation regarding the wider route principles were carried out with CNPA with respect to Landscaping and key views from the road and have been taken into account in this assessment.</p> <p>Chapter 12 of this DMRB Stage 3 Assessment considers the impact of the proposed Scheme on vehicle travellers in terms of views gained of the surrounding landscape from the road and driver stress levels.</p> <p>In terms of views from the road, at Opening Year, without mitigation, impacts are likely to range from neutral to slight adverse, primarily due to views of un-vegetated embankments. Impacts on the view from the road on the motorist by the design year will be reduced to neutral. After the introduction of the proposed Scheme driver stress is expected to be low.</p> <p>By the design year, applying traffic growth factors and following DMRB guidance, driver stress will remain low. Following construction, the average journey time is expected to decrease as overtaking opportunities and speed limits increase. As such it is considered that the proposed Scheme accords with policies relating to vehicle travellers.</p>
CNPLP Policy 29:	Integrated and Sustainable Transport		

ROAD DRAINAGE AND THE WATER ENVIRONMENT			
SPP Subject Policy:	Flooding and Drainage	<i>Positive Slight to Neutral</i>	<p>THC identified the corridor of the Dunachton Burn, and the area of widened embankment north of the Allt an Fhearna culvert, are shown as areas of medium to high flood risk in the SEPA flood maps. THC suggested that an FRA should inform the design of the project particularly in the latter case where the embankment has the potential to displace flood storage capacity.</p> <p>Chapter 13 of this DMRB Stage 3 Assessment outlines the assessment undertaken to determine the potential for water quality and drainage constraints associated with the proposed Scheme.</p> <p>In accordance with further advice received from SEPA relating to the avoidance of high flood-risk areas and the consideration of flood risk mitigation options where unavoidable, a FRA has been produced which assesses any increase in flood risk.</p> <p>The assessment predicts a low risk of pollution from surface water runoff, a medium impact to groundwater and a low risk of pollution from Spillages. With implementation of mitigation measures during construction and operation, the potential impacts to the River Spey and its tributaries for the 15 year assessment remains low. Groundwater risk will remain minimal as the surface water runoff is intercepted and treated before leaving the proposed Scheme.</p> <p>Good drainage design, run-off attenuation and pollution control measures incorporated into the design, construction and operation phases will minimise the risk of adverse impact from the proposed Scheme. The proposed Scheme will have a Minor Beneficial impact on the water features assessed. This will have Moderate/Large significance as the water features in this area are of very high importance. This is to be achieved through the incorporation of flow attenuation and pollution removal measures for road surface runoff as there are none currently present.</p> <p>Throughout the completion of this assessment, consultation has been maintained and comments addressed, therefore it is not envisaged that significant issues will emerge as a result of the assessment findings.</p> <p>As such it is considered that the proposed Scheme accords with policies relating to road drainage and the water environment.</p>
PAN 69:	Planning and Building Standards Advice on Flooding		
PAN 79:	Water and Drainage		
HSP Policy G2:	Design for Sustainability		
HSP Policy G3:	Impact Assessments		
CNPLP Policy 12:	Water Resources		

GEOLOGY AND SOILS			
HSP Policy G2:	Design for Sustainability	N/A	<p>SNH confirmed agreement of our approach to proposed ground investigations but suggested that their comments are on designated sites and European Protected Species only.</p> <p>Chapter 14 of this DMRB Stage 3 Assessment outlines the assessment undertaken to determine the potential impacts on geology and soils as a result of the proposed Scheme.</p> <p>Consultations with THC and SEPA have been undertaken as part of the assessment process to identify any restrictions or sensitive areas. SEPA indicated that they hold no information which would impact the proposed scheme and THC advised of the presence of a previously undetermined landfill site within 250 metres of the current A9 position. THC subsequently confirmed that the site was visible within a 1970 historical map but not visible on the 1986 map. The landfill was not shown on any historical maps provided within the Envirocheck report.</p> <p>Contact was also made with both CNPA and 'BEAR Scotland' relating to the provision of a suitably qualified Ecological Clerk of Works (ECoW) to work alongside a suitably qualified competent ground investigation contractor.</p> <p>With the exception of the surplus of fill material generated, the impacts on the underlying soils and geology identified as a consequence of the proposed Scheme are likely to be negligible to low and therefore do not require detailed consideration when assessing the acceptability of the scheme.</p> <p>As such it is considered that the proposed Scheme accords with policies relating to geology and soils.</p>
HSP Policy G3:	Impact Assessments		
CNPLP Policy 14:	Contaminated Land		

MATERIALS AND WASTE			
HSP Policy G2:	Design for Sustainability	N/A	An initial consultation with SEPA in relation to the project as a whole did not reveal any specific concerns, and indicated that they hold little information on the area.
HSP Policy W2:	Waste Minimisation		Further consultation with SEPA in relation to the large quantity of excess material proposed and options to stockpile and re-use this material on site and the wider scheme has also been undertaken.
HSP Policy W3:	Reuse and Recycling		Chapter 15 of this DMRB Stage 3 Assessment comprises a review of the potential impacts on materials as a result of the proposed Scheme.
CNPLP Policy 16:	Design Standards for Development		As the scheme is in the early stages of design, there is limited quantifiable information on the anticipated types and quantities of materials required to undertake a forecast of waste arisings. As such, a simple assessment has been undertaken in accordance with DMRB. The assessment makes recommendations that further work be completed to quantify the magnitude of materials required and waste generated once the detailed design has been completed and a detailed assessment can then be completed.

16.5.

Conclusions

- 16.6.1. The proposed Scheme has been assessed against relevant national, regional and local level plans and policies in order to quantify the likely impact of the proposed Scheme on the surrounding area.
- 16.6.2. From a national perspective the proposed Scheme would accord with SPP guidance which seeks to promote a successful economy through the provision of an effective and efficient transport infrastructure. Additionally NPF2 states an aim to regenerate communities, through which it could be argued the proposed Scheme provides; through reducing travelling times and enabling improved connectivity between the highlands and economic hub of Scotland (the 'Central Belt' settlements of Edinburgh and Glasgow).
- 16.6.3. The Development Plan comprising of The Highland Structure Plan and the Cairngorms National Park Local Plan has been used to carry out an assessment of the proposed Scheme against relevant planning policy. As table 16.1 identifies, the impact on each environmental topic varies, with Cultural Heritage, Landscape and Visual Effects and Land Use likely to experience slight negative effects in relation to the Development Plan policies. However, Road Drainage and the Water Environment, Ecology and Nature Conservation and general policy objectives are likely to be benefited by the construction of the proposed Scheme.
- 16.6.4. In summary, the proposed Scheme has the potential to support the objectives and policies of the Development Plan.

17. Environmental Impact Survey

- 17.1. Introduction
- 17.2. Environmental Impact Table



17. Environmental Impact Survey

17.1 Introduction

17.1.1. This chapter presents a summary of the potential key impacts associated with the proposed Scheme and the mitigation commitments the Contractor will be required to adhere to.

17.2. Environmental Impact Table

17.2.1. An Environmental Impacts Table has been prepared within this ES in order to present the main predicted residual impacts associated with the proposed Scheme. The table presents these impacts in summarised form.

17.2.2. The table outlines the following:

- Item Number;
- Description of Potential Impact;
- Mitigation Objective and Commitment;
- Sensitivity/ Value of Receptor;
- Duration of Impact (Short Term/ Long Term);
- Significance of Effect with Mitigation; and
- Mitigation Item Number.

17.2.3. The mitigation measures referenced in Table 17.1 are described in more detail in Chapters 5-16 and summarised into a Schedule of Environmental Commitments as outlined in Chapter 18.

Table 17.1 Summary of Potential Impacts and Significance of Effects

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
Air Quality							
AQ1	Potential for 27 properties within 200 metres of the proposed Scheme to be affected by construction dust.	The Contractor will employ Best Practicable Means (BPM) in application of dust control measures, implemented in accordance with a Construction Environmental Management Plan to be approved by the Local Authority.	If not properly controlled, fugitive dust emissions may cause a perceived loss of amenity, or even Statutory Nuisance.	Temporary, short term, for the duration of the construction works.	Implementation of BPM will minimise the potential for an adverse impact.	Negligible	A1
AQ2	Potential for the proposed Scheme to change pollutant concentrations at sensitive human receptor locations.	N/A	Air Quality Objectives have been set that define the level of pollution below which health effects are unlikely to be experienced even by the most sensitive members of the population.	Long term.	The changes in pollutant concentrations due to the proposed Scheme are imperceptible.	The proposed Scheme would have a negligible effect on local air quality.	N/A

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
AQ3	Potential for the proposed Scheme to change pollutant concentrations at sensitive ecological receptor locations	N/A	The River Spey - Insh Marshes ecological designations, and Alvie SSSI, may be sensitive to a change in NOx concentrations and N depositions rates in excess of the relevant limit value and critical loads respectively.	Long term.	The assessment indicated that the proposed Scheme would not adversely affect NOx concentrations or N deposition rates within the identified ecological designations.	Negligible	N/A
Cultural Heritage							
CH1	Setting of Grade B St Drostan's Chapel and Graveyard, Dunachton	Ensure limited land-take in the vicinity of the site and no temporary compounds or lay-down areas to be sited adjacent to highway during construction	Medium	Short Term - temporary	Negligible	Neutral	C1

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
CH2	Setting of Grade B and C buildings at Kinraig House	Ensure limited land-take in the vicinity of the site and no temporary compounds or lay-down areas to be sited adjacent to highway during construction No tree screening in this area to conserve existing historic landscape character.	Low (Baden Cottage) and Medium (Kinraig House and Meat Larder)	Long Term - permanent	Minor	Slight adverse	C2
CH3	Setting and potential physical impact on sections of the General Wade's Military Road	Ensure limited land-take in the vicinity of the site and no temporary compounds or lay-down areas to be sited adjacent to highway during construction compound storage.	Low	Long Term - permanent	Minor	Neutral to Slight adverse	C3

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
CH4	Re-siting of a portion of Leault Burn drystone wall	Limited land-take to prevent loss of dry stone walling as far as possible. Where the walling runs parallel to the carriageway and requires removal, it is proposed that the stone be removed and stored and then reinstated along the new line to the edge of the carriageway. The reinstatement of the walling will reduce the impacts to negligible.	Low	Long Term – permanent	Negligible	Neutral	C4
CH5	Physical impact on site of farmstead at Milehead	An Archaeological Watching Brief is proposed to monitor and record potential buried remains during construction. This will include appropriate finds and environmental analysis, and reporting of results.	Low	Short Term – permanent	Moderate	Slight adverse	C5

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
CH6	Physical impact on site of farmstead at Mid Delfour	An Archaeological Watching Brief is proposed to monitor and record potential buried remains during construction. This will include appropriate finds and environmental analysis, and reporting of results.	Low	Short Term – permanent	Moderate	Slight adverse	C5
Disruption Due to Construction							
DDC1	Disruption to access during construction	The Contractor will be required to implement careful phasing of construction to ensure that alternative routes and means of access are provided for Dunachton, Alvie and Dalraddy Estates during construction of underpasses and in the vicinity of existing accesses	Medium	Short term - Temporary	Minor	Slight Adverse	D1
DDC2	Disruption to trunk road users during construction	The construction contract will include penalties for prolonged occupation of the A9. This will minimise disruption to trunk road users	High	Short	Minor	Slight Adverse	D2

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
DDC3	Disruption and increase in traffic on local road network adjacent to Kincaig village during construction	The adjacent side road will not be promoted as a temporary diversion route. The Contractor will be required to consult and comply with the requirements of the Highland Council with respect to the B9152 and local road network.	Medium	Short	Minor	Slight Adverse	D2
DDC4	Increase in Noise and Vibration During Construction. In particular adjacent to Alvie Primary School	Noise related impacts will require to be minimised by the Contractor through careful planning and phasing of works with particular regard to school opening hours. For works immediately adjacent to Alvie Primary School, the contractor will be required to programme these activities to coincide with school holidays and through consultation with The Highland Council.	Low High for Alvie Primary School	Short	Minor	Slight Adverse	D3

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
DDC5	Disruption to Ecology during Construction	The Contractor will be required to develop an acceptable site management plan to minimise disturbance to watercourses, wildlife and otherwise take all reasonable steps to minimise disturbance and nuisance	Medium	Short	Minor	Neutral	D4
Ecology & Nature Conservation							
ENC1	Additional "resistance in" or severance of animal conduits	Improvement of bridge and underpass crossings, provision of dry culverts	International/ National (eg. Wild cat), Regional (pine marten, otter), County (badger)	Permanent	Potential for significant enhancement of ecological network and reduction in road kill	Minor to Moderate Positive	E1
ENC2	Additional "resistance in" or severance of the Dunachton Burn (part of the Spey SAC)	Enhance conduit for otters and, if required, fish passage	Regional	Permanent	Likelihood of improved permeability of crossing	Minor positive	E2

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
ENC3	Loss of riparian woodland from Alvie SSSI at the Ailt an Fhearna bridge	Replanting of compensation wet woodland at a ratio of 3:1 woodland gained to woodland lost	Local	Permanent for loss to carriageway, medium to long-term losses to temporary bridge diversions	Potential for gains to wet woodland habitat	Minor to Moderate Positive	E3
ENC4	Additional loss of riparian woodland at Dunachton burn floodplain	As above	As above	As above	As above	As above	E3
ENC5	Pollution risks at watercourses	Pre-construction where possible of interceptors, best works practice	International/ National (Spey SAC, Alvie SSSI)	Short term	Unlikely to be of high risk, potential for improvements to quality of run-off from operational scheme	Neutral to Minor Positive	E4
ENC6	Noise impacts on breeding birds of the Insh Marshes SAC	Seasonal working in the case of any operations involving excessive noise emissions in the alignment adjacent to the Marshes	International	Short term	Unlikely to be of high risk	Neutral	E5

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
ENC7	Localised losses to adjacent habitats of local value (parkland oaks, unimproved and semi-improved grasslands)	Tree replanting and seeding of wildflower grasslands on re-formed and landscaped verges. Potential for offsite management of wildflower grassland at Baldow Smiddy underpass	Site to Local	Long term	Biodiversity gains over the longer term in relation to tree planting, shorter-term gains for new wildflower grasslands	Neutral to Minor Positive	E6
ENC8	Loss of tree roosts for bats	Survey all trees to be lost within the works corridor, provide bat boxes for any potential bat roosts lost to a ratio of 3 boxes per roost	Potentially Local	Long-term	Impacts expected to be limited	Neutral to Minor Positive	E7
ENC9	Loss of bird's nests	Remove woody vegetation outside the bird breeding season, undertake pre-construction surveys.	Site	Short to Medium term depending on habitat	Impacts expected to be limited	Neutral	E8
ENC10	Disturbance to other protected species (e.g. otter)	Pre-construction surveys for "resting places". Avoidance of night-time working.	Local to Regional	Short term	Impacts expected to be very limited	Neutral	E9

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
ENC11	Loss of wood ant's nests	Translocate all nests identified in works corridor. Undertake habitat management for wood ants within the highway corridor.	Local to Regional	Permanent loss to land-take, medium-term impacts on population	Moderate negative impacts likely at outset. Monitoring and management required for successful outcome.	Neutral to Minor or Moderate. Positive given successful long-term management for wood-ant habitat	E10
Landscape							
LVIA1	Direct impacts on designated sites	Designated landscapes to be retained and protected. Any losses to be mitigated with replacement planting.	LCA1 – High LCA 2 – Medium LCA 3 – High	Long term, permanent losses to some Ancient Woodland areas.	LCA 1 – Low LCA 2 – Negligible LCA 3 – Low	LCA 1 – Slight adverse LCA 2 – Neutral LCA 3 – Slight adverse	L1
LVIA2	Direct loss of vegetation	Land-take to be limited to minimise loss of existing vegetation. Mitigation planting/ seeding proposed on new/re-profiled embankments		Short term			L2

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
LVI A3	Indirect impacts on overall pattern of elements that contribute to landscape character	Footprint of new works to be minimized. Prominent features, local landmarks to be retained and protected.		Short term			L3
LVI A4	Adverse landscape and visual effects from earthworks.	Use of natural landform characteristics in the design and the use of sensitive and innovative methods to avoid long consistent earthwork profiles.	Medium- High	Long term	Low- Negligible	Neutral- Slight negative	L3
Visual Amenity							
VA1	Changes in available views of the landscape from receptors	Provision of new planting/seeding as appropriate to screen views of the road and new embankments from receptors.	Varies from low- high	Short term, temporary	Varies from negligible - medium	Neutral	V1
Land Use							
LU1	Increased severance by proposed Scheme including disruption of access to estates	Rationalisation of existing surface accesses to safe underpass locations through upgrading network of accommodation works accesses.	Negative Major	Short term and Long term	Implementation of upgrading and connecting the network of accommodation works access tracks will reduce the impacts of severance.	Minor Negative	LU1

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
LU2	Removal of stock/deer fencing to construct the scheme	Immediate replacement in areas agreed with landowners as accommodation works	Negative Major	Short term	Implementation of accommodation works boundary fencing in advance of or early in the construction contract will minimise the potential for adverse impact.	Neutral	LU2
LU3	Damage to field drains	Repair, divert, connect to appropriate drainage system	Negative Minor	Short term and Long term	Implementation of the mitigation will minimise the potential for adverse impacts	Neutral	LU3
LU4	Loss of timber trees	Compensation for the loss of timber trees.	Negative Minor	Short term	The commercial value of loss of timber can be compensated to reduce the significance of the impacts on Land Use.	Neutral	LU4
LU5	Loss of land	Compensation for the loss of land	Negative Minor	Long Term	The loss of land cannot be mitigated. The commercial value of land lost will be compensated.	Minor Negative	LU5

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
Noise							
NO1	Changes in traffic noise and vibration	No specific mitigation is proposed although a low noise surface will be implemented as part of the scheme	Human habitation and school – no method of categorizing sensitivity for noise impacts	Short term on opening impacts (sudden change) Long term impacts between opening and design year	Minor Short term impact (opening year) Negligible long term impact (design year)	Minor Short term impact (opening year) Negligible long term impact (design year)	N/A
NO2	Temporary Construction Noise &Vibration Impacts	Use of quieter plant & methods where possible Consideration of phasing and working hours to minimize impacts to all receptors and especially to Alvie School Siting, orientation and, where necessary, use of localized screening for noisy processes Siting of site compound away from sensitive receptors Temporary noise barriers to reduce noise from moving plant	Human habitation and school – no method of categorizing sensitivity for noise impacts.	Short term temporary impacts	> 65 dB LAeq,T possible at closest receptors including Alvie School	Significant (as per BS 5228 'ABC' method)	N1

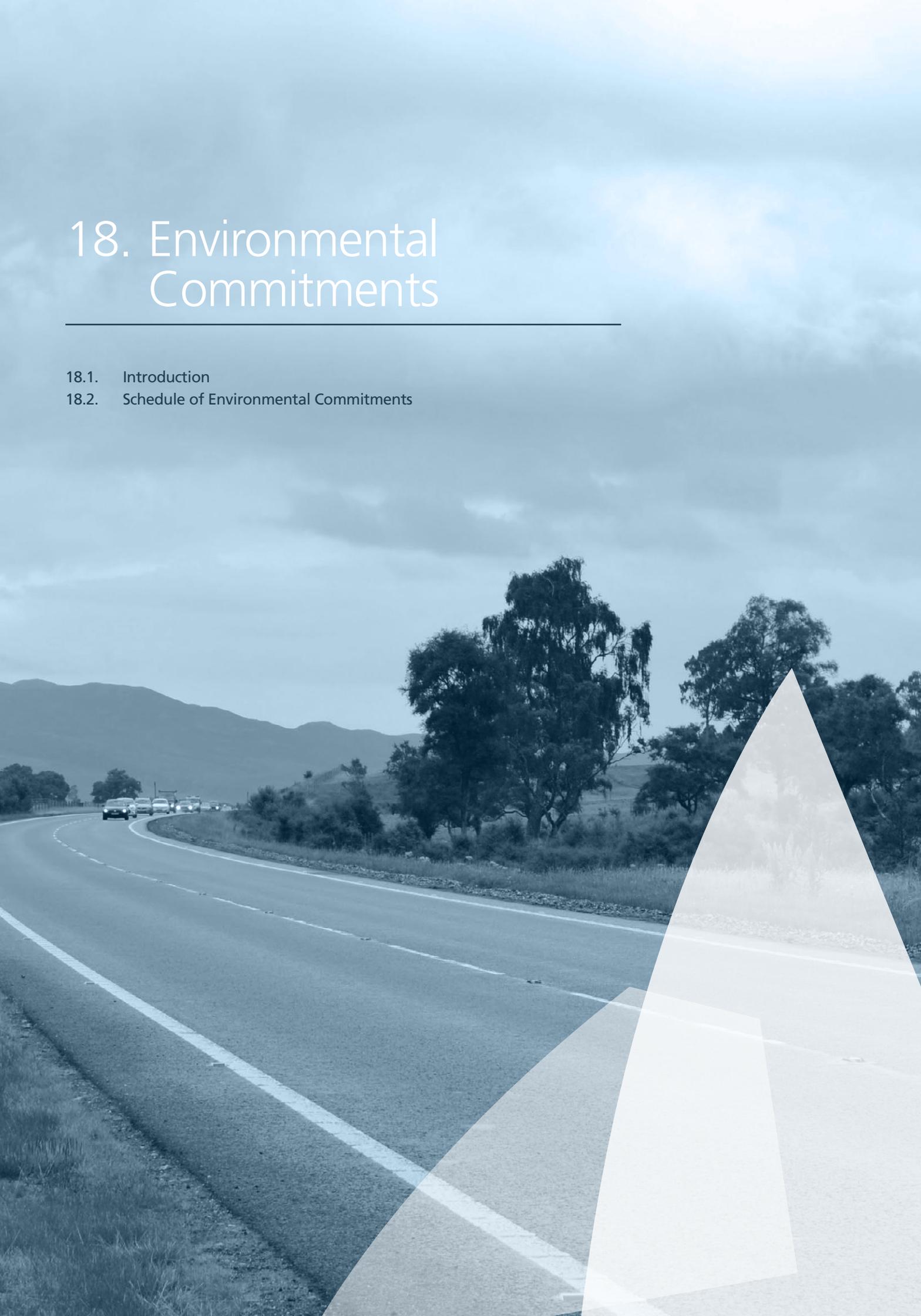
Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
Vehicle Travellers							
VT1	Removal of woodland fringes resulting in un-vegetated and exposed embankments A wider road corridor, together with associated infrastructure and earthworks will be prominent in views for travellers.	Tree and shrub planting with a high percentage of quick growing and evergreen species where in keeping with the landscape character. Seeding of verges and earthworks. Retention of key views from the A9	Existing traveller views from the road vary from 'no view' in the sections with dense woodland or the road is in cutting; 'restricted and intermittent views' through breaks in the roadside vegetation and landform; and 'open views' to the landscape close to the road corridor and to the hills and mountains beyond. Along the A9 views are of the existing road corridor.	Short Term	Views from the road will continue to vary from 'no view' where the A9 is enclosed by woodland or earthworks to open views to the landscape. By the design year along the A9 corridor the road materials will have weathered and landscape planting and seeding will have established.	Views from the road to the wider landscape will remain largely unchanged. The wider road corridor will be less visually prominent than at opening year.	VT1

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
Road Drainage and the Water Environment							
RD1	Pollution to watercourses and groundwater due to spillages during construction and operation	The Contractor will employ Good Working Practises from key guidance in PPG 1, 5, 6, 21, 22 On-site availability of oil spill cleanup equipment Use drip trays under mobile plant Sediment trapping Filter drains, swales and SUDS ponds will provide treatment to polluted water Update incident response plan	High	Short term and long term	Minor Beneficial	Minor Beneficial	R1
RD2	Pollution to watercourses from surface water runoff	The Contractor will employ Good Working Practises from key guidance in PPG 1, 5, 6, 21, 22 Filter drains, swales and SUDS ponds will provide treatment to polluted water	High	Short term and long term	Minor Beneficial	Minor Beneficial	R2

Item Number	Description of Potential Impact	Mitigation Objective and Commitment	Sensitivity/ Value of Receptor	Duration of Impact (Short Term/ Long Term)	Magnitude of Impact with Mitigation	Significance of Effects with Mitigation	Mitigation Item Number
RD3	Pollution to groundwater	The Contractor will employ Good Working Practises from key guidance in PPG 1, 5, 6, 21, 22 Filter drains, swales and SUDS ponds will provide treatment to polluted water Line SuDS where groundwater contamination may occur.	Low	Short term and long term	Minor Beneficial	Minor Beneficial	R3
RD4	Increased risk of flooding due to increase surface water runoff from dualled road	Increased runoff volumes will be attenuated through SuDS	Low	Long term	Negligible	Negligible	R4
RD5	Increased risk of flooding due to the changes in watercourse crossing and road embankments	Hydraulic modelling found that the proposed designs for each watercourse did not increase water levels or flow. The Contractor will employ Good Working Practises from key guidance in PPG 1, 5, 6, 21, 22 to avoid an increased risk of flooding during construction	High	Short term	Negligible	Negligible	R5

18. Environmental Commitments

- 18.1. Introduction
- 18.2. Schedule of Environmental Commitments



18. Environmental Commitments

18.1. Introduction

- 18.1.1. All necessary mitigation measures that have been identified within this ES to protect the environment, prior to, or during construction, or during operation of the proposed Scheme will be incorporated into the Method Statements and the Contractor's Environmental Management System (EMS) including the Construction Environment Management Plan (CEMP) and the Site Waste Management Plan (SWMP). These documents, along with the contents of this Environmental Statement will provide the necessary mechanism to ensure full compliance with the outlined environmental commitments.
- 18.1.2. Specifically the legal and other environmental requirements will be defined, and other responsibilities established in order to ensure:
- Their implementation;
 - The adoption of monitoring procedures to check their implementation; and
 - The identification any specific consultation requirements to make certain that these mitigation measures are implemented and adhered to properly.
- 18.1.3. This Chapter will therefore collate all the previously identified mitigation measures required as a result of the proposed Scheme in order to provide a record of commitments that the Contractor will be obliged to adhere to through the contract period. It is however, recognised that there may be a need to revise or supplement the commitments by agreement between the successful Contractor, THC, CNPA, TS and other interested parties.

18.2. Schedule of Environmental Commitments

- 18.2.1. The purpose of the Schedule of Environmental Commitments (Table 18.1 below) is to collate mitigation measures identified throughout the Environmental Statement for ease of reference. A fuller discussion of mitigation requirements is supplied in [Chapters 4 to 16](#).
- 18.2.2. This table should be read in conjunction with Table 17.1, which describes the potential effects of the proposed Scheme and assigns a Mitigation Item No., which is carried forward into Table 18.1.

Table 18.1 Schedule of Environmental Commitments

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
Air Quality				
A1	To minimise the risk of causing a Statutory Nuisance the Contractor will adopt Best Practicable Means (BPM) to control dust and other emissions to air, implemented in accordance with the scheme specific Method Statements for the works and Construction Environmental Management Plan to be approved by the Local Authority.	For the duration of the construction works.	Monitored on Site daily during the construction phase. Details to be included in CEMP.	N/A
Cultural Heritage				
C1 St Drostan's Chapel and Graveyard (LB 4377)	Widening road on the eastern side ensures no direct physical impact. Ensure limited land-take in the vicinity of the site, maintain existing screening and no temporary compounds or lay-down areas to be sited adjacent to highway during construction.	For the duration of the construction works.	Monitored on Site during construction phase. Details to be included in CEMP.	N/A

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
C2 Kincraig House (LB 1674)	Ensure limited land-take in the vicinity of the site and no temporary compounds or lay-down areas to be sited adjacent to highway during construction. Detailed design and construction programming must ensure no impacts on the dykes and stone field boundaries on the hillslopes between Kincraig House (LB 1674) and the A9 corridor. This is to safeguard the important character of this historic landscape. No Scheme tree planting in this area to conserve existing historic landscape character.	Whole Scheme, during detailed design and construction.	Monitored on Site during construction phase. Detailed design and construction programming must ensure no impacts on identified features. Details to be included in the CEMP and where relevant, with a Methods Statement.	N/A
C3 General Wade's Military Road (MHG30067)	Ensure limited land-take in the vicinity of the site and no temporary compounds or lay-down areas to be sited adjacent to highway during construction compound storage.	For the duration of the construction works.	Monitored on Site during construction phase. Details to be included in CEMP.	N/A
C4 Leault Burn dry stone wall (MHG30073 & 45749)	Limited land-take to prevent loss of dry stone walling as far as possible. Where the walling runs parallel to the carriageway and requires removal, it is proposed that the stone be removed and stored and then reinstated along the new line to the edge of the carriageway using traditional techniques. The reinstatement of the walling will reduce the impacts to negligible.	Whole Scheme, during detailed design and construction.	Monitored on Site during construction phase. Details to be included in CEMP and where relevant in a Methods Statement.	Consultation to be undertaken with Historic Scotland.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
C5 Due to the presence of known archaeological sites i.e. the former farmsteads of Milehead and Mid Delfour, and the potential for further archaeological remains to be present	An Archaeological Watching Brief must be in place to monitor and record potential buried remains during construction. This will include appropriate finds and environmental analysis, and reporting of results.	For the duration of any enabling works and during the construction works.	Exact scope of the archaeological watching brief will be defined in a Written Scheme of Investigation (WSI) and approved by the local authority planning archaeologist in advance of enabling and construction work. Furthermore, the WSI must include provision for recording potential remains associated with the Battle of Dunachton.	Consultation to be undertaken with THC/ CNPA Archaeologist.
Disruption Due to Construction				
D1	To minimise Disruption to access during construction. Careful phasing of construction to ensure that alternative routes and means of access are provided for Dunachton, alive and Dalraddy Estates during construction of underpasses and in the vicinity of existing accesses.	Whole scheme, throughout mobilisation, enabling works and construction.	Monitored on Site during construction phase. Details to be included in CEMP and where relevant in a Methods Statement and Traffic Management planning.	Consultation with Landowners, Trunk Road Operating Company and THC as appropriate.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
D2	To minimise disruption to trunk and local road users through including penalties within the construction contract to ensure that 2 way traffic on the A9 trunk road is maintained wherever possible throughout the construction and maintenance phase.	Whole scheme, throughout mobilisation, enabling works and construction.	Monitored on Site during construction phase. Details to be included in CEMP and where relevant in a Methods Statement and Traffic Management and Planning.	Consultation with Transport Scotland, Trunk Road Operating Company and THC as appropriate.
D3	To minimise impacts relating to noise and vibration during the construction phase by ensuring that the contractor is required to plan and phase works to use the quietest plant available, implement temporary screening for noise and vibration where appropriate to keep noise limits within the requirements of THC wherever possible. To ensure that works are only undertaken immediately adjacent to Alvie Primary school during school holidays.	Whole scheme, throughout detailed design, mobilisation, enabling works and construction.	Monitored on Site during construction phase. Details to be included in CEMP and where relevant in a Methods Statement.	Consultation with THC and Primary School as appropriate.
D4	To minimise disruption to ecology during construction by ensuring that the contractor implements acceptable site management, in line with the requirements of statute and guidance from SNH, SEPA etc to minimise disruption to watercourses and habitats.	Whole scheme, throughout detailed design, mobilisation, enabling works and construction.	Monitored on Site during construction phase. Details to be included in CEMP and where relevant in a Methods Statement.	Consultation with SEPA, SNH and SNPA.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
Ecology & Nature Conservation				
E1 Animal Pathways	Improvement of bridge and underpass crossings, provision of dry culverts. Temporary off-line crossings, and new on-line bridges to retain terrestrial strips along both river banks to allow safe passage by otters, and other fauna, and prevent adverse impacts to the bankside or in-channel habitats of the watercourses. Appropriate animal guidance and /or permeable fencing to be provided and/or reinstated.	Across the whole Scheme where improvements are proposed. During detailed design and construction.	Details to be included in Method Statements and CEMP.	N/A.
E2 Dunachton Burn	Enhance conduit for otters and, if required, fish passage The proposed design of the crossing will either retain the current fish pass and flow conditions within the channel under the new bridge, or include a re-designed fish pass to ensure that flow conditions within the channel are suitable for fish passage across an agreed range of flows and target species.	Whole Scheme, during detailed design and construction.	Ensure continued functionality of any provided structures over the long term.	Consultation with SNH.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
E3 Loss of riparian Woodland	Replanting of compensation wet woodland at a ratio of 3:1 woodland gained to woodland lost. Loss due to temporary works will be reinstated using retained original woodland soils and replanted with native wet woodland species.	Whole Scheme, during detailed design and construction.	Post planting aftercare and monitoring to confirm successful establishment of the woodland against criteria set out in DMRB and scheme design details.	Consultation with CNPA and SNH.
E4 Pollution risks at watercourses	Pollution control measures will be applied throughout construction. Appropriate precautionary measures will be put in place pre-construction where possible including interceptors and best works practice.	Whole Scheme, during detailed design pre-construction and construction.	Best works practice implemented across whole of proposed Scheme. Details to be included in Methods Statement. The contractors will be required to undertake daily visual inspections of the burns during ongoing construction works and will be responsible for undertaking prompt remedial action to prevent any pollution from entering the watercourses. The works will be subject to regular inspections by an ecological or environmental clerk of works.	Consultation with SEPA.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
E5 Noise impacts on breeding birds of the Insh Marshes SAC	Seasonal working in the case of any operations involving excessive noise emissions in the alignment adjacent to the Marshes to avoid the nesting season from April to July inclusive.	For the duration of the construction works.	Details to be included in Methods Statement and CEMP.	Consultation with Ecologist/ SNH.
E6 Localised losses to adjacent habitats of local value (parkland oaks, unimproved and semi-improved grasslands)	Tree replanting and seeding of wildflower grasslands on re-formed and landscaped verges. Potential for offsite management of wildflower grassland at Baldow Smiddy underpass	Whole Scheme, during detailed design and construction.	Monitoring of planting and seeding establishment during the period of aftercare.	Consultation with CNPA and SNH.
E7 Bats	Survey all trees to be lost within the works corridor, provide long-lasting 'woodcrete' bat boxes for any potential bat roosts lost to a ratio of 3 boxes per roost to retained mature trees in the immediate locality.	To be undertaken pre-construction.	Details to be included in Methods Statement and CEMP.	In agreement with Ecologist/ environmental Clerk of Works.
E8 Birds	Remove woody vegetation outside the bird breeding season (mid-July to mid-March), undertake pre-construction surveys.	Before and during the period of construction.	Details to be included in Methods Statement and CEMP.	Consultation with Ecologist/ SNH.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
E9 Otter	Pre-construction surveys for "resting places". Avoidance of night-time working.	Entire footprint of scheme and construction compounds, pre-construction.	Details to be included in Methods Statement and CEMP.	N/A
E10 Wood Ants	Need for the translocation of around 24 Wood Ant nests identified. Undertake habitat management for wood ants within the highway corridor.	To be undertaken pre-construction with translocation into prepared and safeguarded sites.	Details to be included in Methods Statement and CEMP. The periodicity of woodland thinning and the consequent effect on the wood ant population will be monitored by site visits and nest counts within the highway land.	Works to be undertaken under direction of Ecologist/ Environmental Clerk of Works.
E10 Site for greater butterfly orchid	Undertake search for orchids during late June/early July prior to works taking place. Any orchids found to be transplanted as whole cohesive turves to a suitable receptor site. Restore new cutting face by seeding with wildflower grasslands.	Pre-construction with translocation into suitable safeguarded sites.	Details to be included in Methods Statement and CEMP. Translocated orchids to be subject to management and monitoring with appropriate aftercare agreed.	Works to be undertaken under direction of Ecologist/ Environmental Clerk of Works.
Landscapes				
L1 Direct impacts on designated sites	Designated landscapes to be retained and protected. Any losses to be mitigated with replacement planting.	Whole Scheme, during detailed design and construction.	5 year aftercare, maintenance and management required for planting and seeded areas.	Species selection, seed mixes and woodland design in consultation with the SNH and the CNPA.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
L2 Direct loss of vegetation	Land-take to be limited to minimise loss of existing vegetation. Mitigation planting/seeding proposed on new/re-profiled embankments. Original soils reused to retain seed bank of localised vegetation communities.	Whole Scheme, during detailed design and construction.	5 year aftercare, maintenance and management required for planting and seeded areas.	N/A
L3 Indirect impacts on overall pattern of elements that contribute to landscape character	Footprint of new works to be minimized. Prominent features, local landmarks to be retained and protected.	Whole Scheme, during detailed design and construction.	N/A	N/A
L4 Adverse landscape and visual effects from earthworks.	Use of natural landform characteristics in the design and the use of sensitive and innovative methods to avoid long consistent earthwork profiles.	Whole Scheme, during detailed design and construction.	N/A	N/A

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
Visual Amenity				
V1 Changes in available views of the landscape from receptors	Provision of new planting/seeding as appropriate to screen views of the road and new embankments from receptors. General Mitigation Principles and Specific Mitigation Measures identified within the LVIA Chapter 8 and within the Indicative Planting Works figures of this ES to be developed and refined.	Whole Scheme, during detailed design and construction.	Monitoring of planting and seeding establishment during the period of aftercare.	In consultation with SNH, CNPA and Ecologist.
Land Use				
LU1	Rationalisation of existing at grade accesses to safe underpass locations through upgrading network of accommodation works accesses.	Whole Scheme, during detailed design and construction.	N/A	Liaison between Contractor and Landowner if required.
LU2	Immediate replacement of deer fencing in areas agreed with landowners as accommodation works.	During the periods of construction and operation.	N/A	Liaison between Contractor and Landowner if required.
LU3	All damage to field drains will be repaired, diverted and connected to appropriate drainage system.	For the duration of the construction works.	N/A	Liaison between Contractor and Landowner if required.
LU4	Compensation for the loss of timber trees.	Whole Scheme, wherever timber trees are lost as a result of the works associated with the Scheme.	N/A	Liaison between Contractor and Landowner if required.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
LU5	Compensation for the loss of land.	Whole Scheme, whenever land is required on a temporary or permanent basis.	N/A	Liaison between Contractor and Landowner if required.
Noise				
N1	Use of quieter plant & methods where possible Consideration of phasing and working hours to minimize impacts to all receptors and especially to Alvie School Siting, orientation and, where necessary, use of localized screening for noisy processes Siting of site compound away from sensitive receptors Temporary noise barriers to reduce noise from moving plant	For the duration of the construction works.	Further detailed assessment and planning to minimise construction noise impacts should be undertaken once a contractor has been appointed. Details to be included in Methods Statement and CEMP.	Consultation with THC Environmental Health Officers.
Vehicle Travellers				
VT1	Tree and shrub planting with a high percentage of quick growing and evergreen species where in keeping with the landscape character. Retain open views to historic designed landscape associated with Kincaig House. Retain key view across the strath at Dalraddy through woodland blocks.	Whole Scheme, during detailed design and construction.	5 year aftercare, maintenance and management required for planting and seeded areas. Development of view management plans.	Consultation with Ecologist, SNH and CNPA. Any offsite works would require the agreement of landowners.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
	The potential to open up new views by thinning trees in agreement with local landowners or establishing view cones through proposed planting.			
Road Drainage				
R1 Pollution to watercourses and groundwater due to spillages during construction and operation	The Contractor will employ Good Working Practises from key guidance in PPG 1, 5, 6, 21, 22. On-site availability of oil spill cleanup equipment. Use drip trays under mobile plant. Sediment trapping. Filter drains, swales and SUDS ponds will provide treatment to polluted water. Update incident response plan	For the duration of the construction works and during operation.	Details to be included in Methods Statement and CEMP.	N/A
R2 Pollution to watercourses from surface water runoff	The Contractor will employ Good Working Practises from key guidance in PPG 1, 5, 6, 21, 22 Filter drains, swales and SuDS ponds will provide treatment to polluted water.	For the duration of the construction works and during operation.	Details to be included in Methods Statement and CEMP.	Consultation with SEPA.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
R3 Pollution to groundwater	The Contractor will employ Good Working Practises from key guidance in PPG 1, 5, 6, 21, 22 Filter drains, swales and SUDS ponds will provide treatment to polluted water Line SuDS where groundwater contamination may occur.	For the duration of the construction works and during operation.	N/A	N/A
R4 Increased risk of flooding due to increase surface water runoff from dualled road	Increased runoff volumes will be attenuated through SuDS.	For the duration of the construction works and during operation.	N/A	Consultation with The Highland Council.
R5 Increased risk of flooding due to the changes in watercourse crossing and road embankments	The Contractor will employ Good Working Practises from key guidance in PPG 1, 5, 6, 21, 22 during construction to ensure there is no increase risk to flooding during construction.	For the duration of the construction works	N/A	Consultation with SEPA.
Pedestrians, Cyclists and Equestrians				
P1	The proposed carriageway layout will include 1 metre hard strips to assist and improve safety for any cyclists using the route.	Whole Scheme during operation.	N/A	N/A

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
P2	Safe, segregated NMU provision will be provided at all underpass locations, with appropriate diversions in place during construction.	During construction and operation.	N/A	N/A
Geology and Soils				
GS1	To reduce impacts from contaminated land and increase potential for site won material to be reused.	During detailed design and through construction stage.	Contamination testing required during earthworks to ensure suitability for re-use. Details to be provided in Earthworks Specification and SWMP.	Consultation with SEPA.
Materials and Waste				
MW1	Adherence to Scotland's Zero Waste Plan and the waste hierarchy of prevent, reuse and recycle.	During detailed design and throughout construction stage.	Details to be provided in SWMP.	Consultation with SEPA.
MW2	Use of a SWMP.	Created at Design stage but implemented and updated throughout the construction stage.	Management and movements of stockpiles, waste storage, testing of materials for reuse and for disposal.	Consultation with SEPA.
MW3	Use of a Resource Management Plan (RMP).	Created at Design stage but implemented and updated throughout the construction stage.	N/A	Consultation with SEPA.
MW4	Adoption of the WRAP protocols.	Design and construction stage.	N/A	Consultation with SEPA.

Mitigation Item Number	Mitigation Objective and Commitment	Potential Timing of Mitigation	Potential Monitoring Requirements	Potential Additional Consultation Required
MW5	SEA commitment to minimise waste generation, maximise re-use of material resources and use of recycled materials, and minimise use of scarce/ rare earth resources.	During detailed design and throughout construction stage.	Details to be provided in SWMP.	Consultation with SEPA.
MW6	SEA commitment to use and manage raw and site won materials taking cognisance of environmentally sensitive areas and local water bodies.	During detailed design and throughout construction stage.	Regular monitoring of local water bodies during construction.	Consultation with SEPA.
MW7	As some soils are of specific types, where possible, the contractor will be encouraged to store and reuse soils as close to their source as practical.	During detailed design and throughout construction stage.	N/A	Consultation with SEPA

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