



**TRANSPORT  
SCOTLAND**  
CÒMHDHAIL ALBA

# **Environmental Impact Assessment Record of Determination**

## **M9 Junction 10 NB**

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## Project Details

### Description

BEAR Scotland has been commissioned by Transport Scotland to carry out resurfacing works on the M9 carriageway. The works will consist of carriageway resurfacing, including the hard shoulder, and reinstatement of road markings for a length of 1.14km (approximately 0.91ha) on the northbound (NB) carriageway.

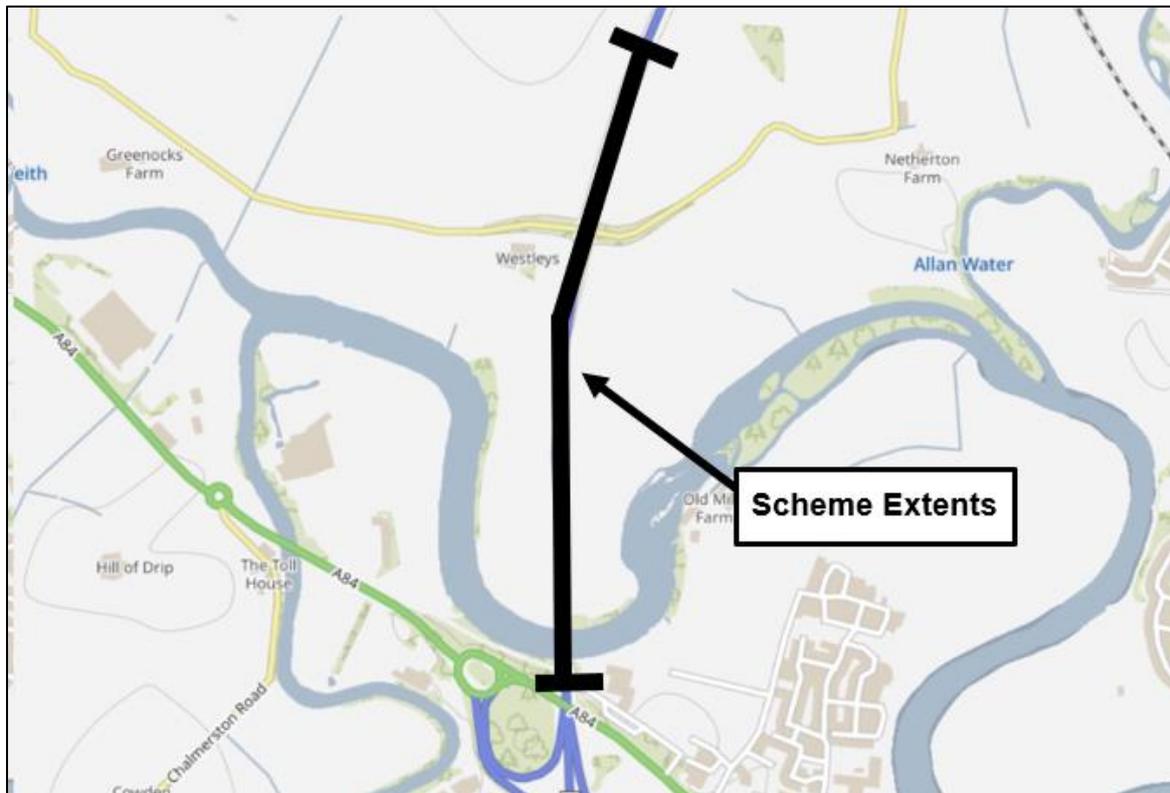
The construction activities for the resurfacing procedure are as follows:

- Set up traffic management (TM) and mark out site;
- Milling of existing bituminous material by road planer;
- Jackhammer and compressor for breaking up surfaces not accessible by planer (e.g., around gullies);
- Loader/excavator used to collect and move excess material;
- Sweeper to collect loose material and provide clean laying surface;
- Milled out/excavated materials all taken off site;
- Tack/bond coat laid;
- Binder material laid and compressed by paver (where required);
- Material compacted using a heavy roller;
- New bituminous surface course material laid by paver;
- Material compacted using a heavy roller;
- Mechanical sweeper to collect loose material;
- HGV for removal and replacement of material;
- Road markings and studs applied where necessary;
- Remove TM and open road.

The works are currently programmed to be completed within the 2024/2025 financial year with works expected to begin on 15<sup>th</sup> April 2024. Works are programmed to be completed over two nights (19:30 – 06:00). Traffic management (TM) is currently anticipated to comprise of a full closure of the M9 northbound (NB) carriageway with signed diversion. Traffic will be diverted off the M9 at Junction 9 and follow the A91 and then the A9 to rejoin the M9 at Junction 11. The diversion will add approx. 1.8km and 13 minutes onto existing journeys.

## Location

The scheme lies on the M9 NB carriageway at Junction 10 approx. 2.95km northwest from the centre of Stirling and is surrounded predominantly by areas of arable land with the River Forth being spanned by the scheme in the southern extent and a small number of commercial properties located to the south (Figure 1).



**Figure 1: Location Plan** Source: Asset Management Performance System (AMPS). © Europa Technologies Ltd. Contains Ordnance Survey data © Crown copyright and database right 2018.

## Description of local environment

### Air quality

A search of the [Air Quality in Scotland](#) online mapping tool records that the scheme extents are not located within an Air Quality Management Area (AQMA). Sites monitoring air quality in the wider area records bandings to be within the 'green zone' (Low Index 1-3).

The scheme is located within the Stirling Council boundary area, which currently has no Air Quality Management Areas (AQMAs) within its administrative boundary. The closest AQMA, 'Falkirk Town Centre', is located approx. 18.7km southeast of the scheme extents and is declared for nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>).

There are nine sites registered on the Scottish Pollutant Release Inventory ([SPRI](#)) for pollutant releases to air within 10km of the scheme extents:

- 'Bakelite Synthetics UK Ltd, Cowie' (located approx. 9.27km southeast of the scheme) for formaldehyde (CH<sub>2</sub>O).
- 'Boards Quarry, Denny, Falkirk' (located approx. 9.85km southeast of the scheme) for particulate matter (PM<sub>10</sub>),
- 'Cambusview Poultry Unit, Cambus, Alloa' (located approx. 6.46km east of the scheme) for ammonia (NH<sub>3</sub>), and particulate matter (PM<sub>10</sub>),
- 'Cowiehall Quarry, Stirling' (located approx. 9.2km southeast of the scheme) for particulate matter (PM<sub>10</sub>),
- 'Norbord Europe Ltd, Station Road, Cowie' (located approx. 8.88km southeast of the scheme) for antimony (Sb), arsenic (As), benzopyrene (C<sub>20</sub>H<sub>12</sub>), cadmium (Cd), carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), chromium (Cr), copper (Cu), formaldehyde (CH<sub>2</sub>O), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), nitrogen oxides (NO and NO<sub>2</sub>), non-methane volatile organic compounds (NMVOCs), particulate matter (PM<sub>10</sub>), and zinc (Zn),
- 'Scotbeef Ltd, Longleys Farm, Bridge of Allan' (located approx. 750m northeast from the northern end of the scheme) for hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs).
- 'Stirling STW, 29 Whitehouse Road, Stirling' (located approx. 3.64km southeast of the scheme) for methane (CH<sub>4</sub>),
- 'Superglass Insulations Ltd, Stirling' (located approx. 3.79km southeast of the scheme) for ammonia (NH<sub>3</sub>), carbon dioxide (CO<sub>2</sub>), formaldehyde (CH<sub>2</sub>O), methane (CH<sub>4</sub>), nitrogen oxides (NO and NO<sub>2</sub>), non-methane volatile organic compounds (NMVOCs), and phenols (C<sub>6</sub>H<sub>5</sub>OH), and
- 'UCP, Bridge of Allan, Stirling' (located approx. 1.27km northeast of the scheme) for hydrofluorocarbons (HFCs).

The baseline air quality within the scheme extents is primarily influenced by motor vehicles travelling along the M9 trunk road. Secondary sources are most commonly derived from motor vehicles travelling along local network roads and day-to-day agricultural land management activities.

## Cultural heritage

The [PastMap](#) and [Historic Environment Scotland](#) (HES) online mapping tools records that there are no designated cultural heritage assets within 300m of the scheme extents. The nearest designated cultural heritage asset pertains to 'Drip Bridge Conservation' (ID: LB6725) located approx. 540m west from the southern end of the scheme.

There are approx. 17 undesignated cultural heritage assets (UCHAs) located within 300m of the scheme extents. Four of which are found within the scheme extents, these relate to Kildean Historic Environment Record (HER) (ID:5667), 'Craigforth Bridge' HER (ID: 5934), and 'Old Mills Farm Motorway Bridge, Canmore site (ID:

187107) which are found within the southern extents of the scheme and 'Westleys Farm, Bridge, Canmore site (ID: 187109) located within the northern extents of the scheme. Out with the scheme extents, the closest UCHA is located 40m west.

Construction of the M9 carriageway is likely to have removed any archaeological remains that may have been present within the trunk road boundary. The potential for the presence of unknown archaeological remains in the study area has therefore been assessed to be low.

Factor has no constraints that are likely to be impacted by the proposed works and has therefore been scoped out of further environmental assessment.

## Landscape and visual effects

The scheme is not situated within a [National Park](#) (NP) or [National Scenic Area](#) (NSA).

The Landscape Character Type (LCT) within the study area is 'Carselands' (no. 153) ([Scottish Landscape Character Types](#)), the key characteristics of which are:

- Flat, open, large scale Carselands of predominantly open agricultural landcover forming the floor and former floodplains of the River Forth, River Devon and Black Devon,
- Important as landscape setting of Stirling, Stirling Castle, and the Ochil Hills,
- Absence of settlement across the Carselands, restricted to villages on the peripheral slopes and scattered farmsteads along the valley floors,
- Periodic extensive flooding continues to influence land use,
- Trunk roads run in parallel to the northern and southern perimeters of the Carselands,
- Distinct character of group of Hillfoot villages, and their relationship with streams issuing from Ochil Hills within Lower Devon area, as well as major overhead power lines and their pylons,
- Recent expansion of settlement boundaries at edge of carse making new development very visible,
- Industrial and agricultural buildings, and bonded warehouse on open carseland prominent in views within Lower Devon area,
- Largest remaining intact raised bog in Britain at Flanders Moss, with integration importance for nature conservation,
- Importance of Carse of Forth open farmland for flocks of wintering geese, and
- Open views across carse accentuated by consequent dramatic contrast with the adjacent escarpments of the Ochil and Fintry, Gargunock and Touch Hills.

[Land use](#) located within 300m of the scheme extents can be categorised as the following:

- Rectilinear fields and farms,

- Plantation,
- Rough grazing,
- Motorways and major roads,
- Freshwater area, and
- Industrial or commercial area.

The [national scale land capability for agriculture](#) classifies land surrounding the scheme as being:

- 'Class 3.2' – Land capable of average production though high yields of barley, oats and grass can be obtained. Grass leys are common.

Approx. 1.8ha of broadleaved woodland borders the M9 carriageway within the southern extents of the scheme along the banks of the River Forth. Additionally, there is one area of woodland registered on the [Native Woodland Survey of Scotland](#) located within 300m of the scheme extents:

- Approx. 0.07ha of wet woodland (located approx. 60m southwest from the southern end of the scheme).

There are no areas of woodland registered on the [Ancient Woodland Inventory Scotland](#) database within 300m of the scheme extents and there are no trees covered by a Tree Preservation Order (TPO) with connectivity to the scheme extents.

The existing trunk road is a prominent linear landscape feature. The trunk road corridor, for example, has a distinct character shaped by high volume, fast-flowing traffic, road markings, safety barriers, signage, landscaping, etc. The scale of the trunk road detracts from the quality and character of the wider landscape.

## Biodiversity

According to the online mapping tool [NatureScot SiteLink](#) the River Teith Special Area of Conservation (SAC) flows directly beneath the M9 at the southern end of the scheme extents.

There are no other European sites designated for nature conservation i.e. Special Protection Areas (SPA) or Ramsar Sites located within 2km of the scheme extents. However, the Firth of Forth SPA and Ramsar Site is located approx. 20.5km downstream (hydrological distance) of the scheme. The Firth of Forth SPA and Ramsar Site are designated for a number of bird species.

No Sites of Special Scientific Interest (SSSI), Local Nature Conservation Sites (LNCSs) or Local Nature Reserves (LNRs) designated for biodiversity features have been identified within 300m of the scheme extents. The Firth of Forth SSSI is however, located approx. 20.5km (hydrological distance) downstream of the scheme extents.

A search of the NBN online mapping tool records the following within 2km of the scheme extents (within last 10-years):

Three invasive non-native species (INNS):

- Japanese knotweed (*Reynoutria japonica*),
- Himalayan balsam (*Impatiens glandulifera*),
- Giant hogweed (*Heracleum mantegazzianum*).

The closest of which relates to giant hogweed located approx. 180m south east of the scheme.

A search of the Asset Performance Management System (AMPS) online mapping tool records the following within the scheme extents (within the last 10-years):

One invasive native perennial:

- Rosebay willowherb (*Chamaenerion angustifolium*).

INNS giant hogweed has also been identified on AMPS along the southbound carriageway approx. 15m east of the scheme.

The habitat immediately bordering the M9 NB carriageway consists primarily of arable land, intermitted broadleaved trees, made verges which undergo cyclic maintenance (e.g., grass-cutting, weed control, etc.), and the River Forth waterbody which flows beneath the southern end of the scheme. While there is high availability of roadside vegetation, the habitat immediately bordering the trunk road is assessed to be of reduced ecological value, due to the likelihood of trunk road disturbances from traffic flow and that the M9 trunk road limits the connectivity and continuity for species between their potential habitats on either side of the road.

## Geology and soils

The M9 within the scheme extents is not located within any [Geological Conservation Review Site](#) (GCRS) and there are no [Local Geodiversity Sites](#) (LGS) with connectivity to the scheme extents.

The [National Soil Map of Scotland](#) online mapping tool records one generalised soil type and major soil group beneath the scheme extents:

- Alluvial soils, and
- Mineral gleys.

The [British Geological Survey](#) online mapping tool records that the superficial geology in the scheme extents is comprised of:

- Alluvium – Clay, silt, sand, and gravel.

The bedrock geology in the scheme extents is recorded as:

- Sheriffmuir Sandstone Member – sandstone, and
- North Britain Siluro – Devonian calc-alkaline dyke suite, basalt and microgabbro.

There is no evidence of historical industrial processes or the storage of hazardous materials that could have given rise to significant land contamination.

Factor has no constraints that are likely to be impacted by the proposed works and has therefore been scoped out of further environmental assessment.

## Material assets and waste

The proposed works are required to resurface the worn carriageway and reinstate road markings. Materials used will consist of:

- TS2010 surface course,
- EME2 binder,
- Bitumen emulsion,
- Hot bitumen,
- Cold bitumen sealant,
- Marker paint,
- Tar glue remover,
- Thermoplastic road markings, and
- Milled in/surface-mounted road studs.

The 1.14km scheme involves removal of the surface course and localised areas of base and binder course. In total, approx. 235 tonnes of bituminous material (European Waste Catalogue Code: 17 03 02) will be removed from site. No bituminous material classified as hazardous material containing coal tar (European Waste Catalogue Code: 17 03 01\*) will be removed from site.

As the value of the scheme does not exceed £350,000, a Site Waste Management Plan (SWMP) will not be required for these works.

## Noise and vibration

Works are not located within a [Candidate Noise Management Area](#) (CNMA) or [Candidate Quiet Areas](#) (CQA).

The night-time noise level (L<sub>night</sub>) modelled within the scheme extents ranges between 70 and 75 decibels with noise levels ranges dropping to between 50 and 55 decibels for the nearest surrounding Noise Sensitive Receptor (NSR) (residential property) ([Scotland's Noise Scotland's Environment](#)).

The baseline noise and vibration in the scheme extents is primarily influenced by vehicles travelling along the M9 trunk road. Secondary sources are most commonly from day-to-day agricultural activities and from motor vehicles travelling along nearby local network roads.

## Population and human health

There are a small number of business premises located within 300m of the scheme extents, however there are no residential properties. The nearest property (residential) is located approx. 470m east of the scheme and is screened by intervening topography. Several of the business and industrial premises (located only at the southern end of the scheme) have reduced screening from the scheme extents while others are screened by a mix of intervening topography and/or properties.

In addition to the above, Little Stars Nursery is located approx. 255m east from the southern end of the scheme.

There are no non-motorised user (NMU) or community facilities present on the M9 within the scheme extents or that share connectivity with the scheme.

Street lighting is not present throughout the scheme extents.

The M9, within the scheme extents, is a dual carriageway with a speed limit of 70mph applying throughout. The Annual Average Daily Traffic (AADT) flow is high (34,842 motor vehicles (ID: 40702, 2022 data)) ([Road Traffic Statistics](#)) and is comprised of:

- 40 two wheeled motor vehicles,
- 25,582 cars and taxis,
- 79 bus and coaches,
- 5,791 Light Goods Vehicles (LGVs), and
- 3,350 Heavy Goods Vehicles (HGVs)

There are no congestion issues noted on the M9 within the scheme extents during the proposed working hours.

## Road drainage and the water environment

The Scottish Environment Protection Agency ([SEPA](#)) River Basin Management Plan online mapping tool records two classified surface waterbodies within 300m of the scheme extents:

- River Forth (below River Teith confluence) ID: 4700, flows directly beneath the southern end of the scheme extents. It is within the River Forth catchment of the Scotland river basin district with the main stem being approx. 5.7km in length and has been classified as 'Moderate'.
- River Forth (Goodie Water to River Teith confluences) ID: 4701, is located approx. 266m southwest from the southern end of the scheme extents. It is within the River Forth catchment of the Scotland river basin district with the main stem being approx. 18.8km in length and has been classified as 'Good'.

A search of the [SEPA's Flood Map](#) online mapping tool records a high likelihood of flooding within the scheme extents at the River Forth location, however at this location the trunk road is on an elevated structure (bridge) which passes over the River Forth waterbody. As such, it is not expected to be impacted by flooding events.

A search of [Scotland's Environment \(SE\)](#) online mapping tool determined that the trunk road lies on the 'Teith and Forth Valley' groundwater, which has been classified as 'Good'.

A search of the [Scotland's Environment \(SE\)](#) determined that the trunk road, within the scheme extents, does not lie within a Nitrate Vulnerable Zone (NVZ).

## Climate

The Climate Change (Scotland) Act 2009 sets out the target and vision set by the Scottish Government for tackling and responding to climate change ([Climate Change \(Scotland\) Act 2009](#)). The Act includes a target of reducing CO<sub>2</sub> emissions by 80% before 2050 (from the baseline year 1990). The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 amended the Climate Change (Scotland) Act 2009 to bring the target of reaching net-zero emissions in Scotland forward to 2045 ([Climate Change \(Emissions Reduction Targets\) \(Scotland\) Act 2019](#)).

The Scottish Government has since published its indicative Nationally Determined Contribution (iNDC) to set out how it will reach net-zero emissions by 2045, working to reduce emissions of all major greenhouse gases by at least 75% by 2030 ([Scotland's contribution to the Paris Agreement: indicative Nationally Determined Contribution](#)). By 2040, the Scottish Government is committed to reducing emissions by 90%, with the aim of reaching net-zero by 2045 at the latest.

Transport Scotland is committed to reducing carbon across Scotland's transport network and this commitment is being enacted through the Mission Zero for Transport ([Mission Zero for transport | Transport Scotland](#)). Transport is the largest contributor to harmful climate emissions in Scotland. In response to the climate emergency, Transport Scotland are committed to reducing their emissions by 75% by 2030 and to a legally binding target of net-zero by 2045.

## Policies and plans

This Record of Determination has been undertaken in accordance with all relevant regulations, guidance, policies and plans, notably including the Environment and Sustainability Discipline of the Design Manual for Roads and Bridges ([Design Manual for Roads and Bridges \(DMRB\)](#)) and Transport Scotland's Environmental Impact Assessment Guidance ([Guidance - Environmental Impact Assessments for road projects](#)).

## Description of main environmental impacts and proposed mitigation

### Air quality

During the construction phase, activities undertaken on site could potentially have some minor localised and short-term air quality impacts in proximity to the works. The construction phase will, for example, require a range of ancillary plant, vehicles, and non-road mobile machinery (NRMM) which will contribute to local dust and air pollutants. The main sources are likely to be dust generated by cold milling in preparation of carriageway resurfacing, as well as exhaust emissions from ancillary plant and vehicles. As a result, there is potential impacts to local air quality.

However, considering the nature and duration of the scheme, along with implementation of mitigation detailed below, the proposed works impacts on local air quality levels during the construction period are assessed to be temporary, negligible adverse in magnitude.

Upon completion of the works, no residual air quality impacts are anticipated.

Air quality mitigation measures:

- A water-assisted dust sweeper will sweep the carriageway after dust-generating activities, and waste will be contained and removed from site as soon as is practicable.
- Materials that have a potential to produce dust will be removed from site as soon as possible, and vehicles that remove cold-milled material from site will have sheeted covers.
- Ancillary plant, vehicles and NRMM will have been regularly maintained, paying attention to the integrity of exhaust systems.
- Ancillary plant, vehicles and NRMM will be switched off when stationary to prevent exhaust emissions (e.g., there will be no idling vehicles).
- Cutting, grinding, and sawing equipment (if required) will be fitted or used in conjunction with suitable dust suppression techniques e.g., local exhaust ventilation system that fits directly onto tools.
- Regular monitoring (e.g., by engineer or Clerk of Works) will take place when activities that have the potential to impact local air quality are occurring. In the unlikely event that unacceptable dust or exhaust emissions are emanating from the site, the operation will, where practicable, be modified and re-checked to verify that the corrective action has been effective. Actions to be considered include: (a) minimizing cutting and grinding on-site, (b) reducing the operating hours, (c) changing the method of working, etc.

## Landscape and visual effects

There will be a short-term impact on the landscape character and visual amenity of the site as a result of the presence of construction plant, vehicles, and TM. However, people, ancillary plant, vehicles, NRMM and materials are restricted to areas of made/engineered ground on the M9 NB carriageway, and construction works are programmed to be undertaken at night (two nights) on a rolling programme. As such, the visual impact of the works will be somewhat reduced.

Considering the nature, duration, size, and scale of the scheme, and with implementation of mitigation detailed below, impacts on landscape and visual effects are assessed as temporary, negligible adverse in magnitude.

Upon completion of the works, no residual impacts on landscape and visual effects are anticipated.

Landscape and visual effects mitigation measures:

- The site will be monitored regularly for signs of litter and other potential contaminants, and litter will be removed before and after works take place.
- The site will be left clean and tidy following construction.
- Where possible, construction vehicles will not be left in places where soil or vegetation can be damaged. If damage to road verge occurs this must be lightly cultivated or graded (upon completion of the works) to allow natural recolonization by local species and promote integration with existing landscape character.

## Biodiversity

The River Teith Special Area of Conservation (SAC) flows directly beneath the southern end of the scheme extents. In addition the Firth of Forth SPA, Ramsar site and SSSI is located approx. 20.5km downstream. A Habitats Regulations Appraisal has been undertaken for this scheme which has concluded that providing standard working methods and spill procedures are employed on site the works will not result in likely significant effects to the European designated sites or their qualifying features.

A temporary short-term increase in noise levels may cause disturbance to local wildlife if present in the vicinity of the works during construction. The works will, for example, require a range of ancillary plant, vehicles and NRMM which will emit noise and create potential disturbance. The works will also require delivery of materials and the presence of personnel to facilitate the improvements to the road surface. However, the number of construction vehicles and construction operatives required onsite is low given the scale and scope of works. In addition, any species in the area are likely to be accustomed to noise and visual disturbance pertaining to vehicle movements on the M9, and the scheme is of short duration (two nights). The potential for species disturbance within the area of likely construction disturbance is therefore somewhat diminished.

Rosebay willowherb has been identified on the carriageway verge within the scheme extents, however, all works are restricted to a 1.14km stretch of made-ground on the M9 carriageway surface, with only like-for-like replacement of carriageway road surface being undertaken. As such, there is no requirement for operatives, equipment, or machinery to enter the verge and as such there is limited potential for the spread of this invasive native perennial or for the works to result in the spread of or introduction of INNS, other invasive native perennials, or injurious flowering plant species. Rosebay willowherb will also be controlled/treated by cultural methods and/or chemical weed control as per the South East Annual Landscape Management Plan. While giant hogweed has been identified along the M9 in proximity to the works it is located within the southbound verge separated from the scheme by the active M9 southbound carriageway and as such will not be impacted.

Considering the nature, duration, size, and scale of the scheme, and with implementation of mitigation detailed above, the proposed works impacts on biodiversity throughout the construction period are therefore assessed to be temporary, minor adverse in magnitude.

Upon completion of the works, no residual impacts are anticipated in relation to biodiversity.

Biodiversity mitigation measures:

- Where possible, artificial lighting used during night works will be sufficiently screened and aligned so as to ensure that there is no direct illumination of neighbouring habitat (e.g., River Forth below, locations adjacent to tree shelterbelt, woodland etc.) to ensure minimal impact on nocturnal species.
- All site personnel will be briefed on the location, importance and sensitivity of the River Teith SAC.
- All site workers will have received adequate training relevant to their role prior to working on the site, including specific environmental inductions and 'toolbox talks' as required.
- Toolbox Talk TTN-009 'Working with Injurious Weeds & Invasive Plants' will be briefed prior to works commencing. Site personnel will remain vigilant for the presence of any potentially unrecorded instances of invasive or injurious weeds in road verges throughout the works period.
- Site personnel will remain vigilant for protected species and will not approach or touch any animals seen on site. Any sightings of protected species will be reported to BEARs Environmental Team. Should a protected species be encountered or move within 50m of the active works (including compounds), works will be temporarily halted until the animal(s) move at least 50m away from the construction site, or until BEARs Environmental Team can provide advice.
- The Contractor will employ 'soft start' techniques for all noisy activity to avoid sudden and unexpected disturbance during works. Each time the activity is started up after a period of inactivity, the noise levels will be gradually increased over a period of 30 minutes to permit animals (including birds) to move away from the disturbance.

- In the event, equipment is stored onsite it will be checked at the start of each shift to ensure mammal species are not present. Any storage containers/plant left on site will also be secured overnight to prevent exploration by mammal species. Any areas where an animal could become trapped (e.g., storage containers) will also be covered at the end of each working day.
- People, ancillary plant, vehicles, NRMM and materials will be restricted to areas of made/engineered ground (as much as is reasonably practicable). If during works unforeseen access to the surrounding environment is required, works will cease in this area and BEAR Scotland's Environmental Team will be contacted to allow consideration of potential environmental effects.
- BEAR Scotland's Environmental Team will be contacted to allow consideration of potential environmental effects if:
  - unforeseen site clearance is required,
  - unplanned works must be undertaken out with the carriageway boundary,
  - there is any deviation from the agreed plan, programme and/or method of working,
- BEAR Scotland's Control Room will be contacted if there is a pollution incident.

## **Material assets and waste**

Minimising impacts arising from construction materials are focussed upon making the most efficient use of materials onsite to reduce the need for imported primary materials and minimise the creation and disposal of waste through (i) reduction, (ii) re-use, and (iii) recycling. Potential impacts have been assessed for both the construction and operational phases of this scheme. It is anticipated that most material impacts are likely to arise during construction, though long-term residual impacts could occur post construction during the operational phase e.g., during the disposal of materials arising from routine maintenance operations.

However, the detailed design will reduce the requirements for primary materials e.g., the carriageway surfacing, and subbase will be carefully considered to minimise the requirements for importing primary material. Materials will also be derived from recycled, secondary, or re-used origin as far as practicable within the design specifications to reduce natural resource depletion. Specifying TS2010 surface course also allows a wider array of aggregate sources to be considered when compared to typical stone mastic asphalt (SMA). As a result, the use of TS2010 should reduce the usage of imported aggregates and increase the use of a wider range of sustainable aggregate sources. The design life for the TS2010 surfacing is also estimated to be 20 years. The enhanced durability of TS2010 therefore reduces reoccurring routine maintenance and associated levels of traffic disruption to this section of road over the period.

Considering the nature, duration, size, and scale of the scheme, and with implementation of the mitigation detailed below, the proposed works impacts on material assets and waste throughout the construction period are therefore assessed to be temporary, negligible adverse in magnitude. Upon completion of the works, no residual impacts are anticipated on materials or waste.

Material assets and waste mitigation measures:

- Good materials management methods (e.g., 'just-in-time' delivery) will be implemented wherever possible.
- The Contractor will comply with all 'Duty of Care' requirements, ensuring that any surplus materials or waste are stored, transported, treated, used, and disposed of safely without endangering human health or harming the environment. Waste transfer notes and/or waste exemption certificates (if required) will also be completed and retained.
- The Contractor is responsible for the reuse / disposal of non-hazardous road planings, and this has been registered in accordance with a Paragraph 13(a) waste exemption issued by SEPA as described in Schedule 3 of the Waste Management Licensing Regulations 2011 (exemption number: WML/XS/2008144), the rules of which will be complied with.
- Designated areas will be identified within which all materials and personnel will be contained to limit environmental disturbance during construction works. This will include a designated area (if required) for segregation and reuse of waste materials.
- The selection of areas for materials stockpiling will avoid sensitive locations such as road drainage. Stockpiled materials with leachate potential, for example, will be stored away from road drainage to prevent cross-contamination with other materials, wastes, or groundwater.
- Materials will be stored with the appropriate security to prevent loss, theft, or vandalism.
- All temporary road signs and traffic cones will be removed from site on completion of works.
- Wastewater from welfare facilities (if required) will be subject to effluent treatment followed by tanker removal.
- If hazardous substances are used onsite, each substance will be subject to assessment under the Control of Substances Hazardous to Health (COSHH) Regulations 2002. Hazardous substances will also be clearly labelled, and disposed of, in line with COSHH safety data sheets and the Special Waste Regulations 1996. Special waste will also not be mixed with general waste and/or other recyclables.

## Noise and vibration

Activities undertaken on site could potentially have some localised and short-term noise impacts in proximity to the works. The road works will, for example, require a range of ancillary plant, vehicles and NRMM for cold milling in preparation for carriageway resurfacing. Noise will also be generated by using breakers (jackhammers), chipping hammers, use of rollers, etc. As a result, there is potential for noise and vibration effects.

However, the works are not located within a CNMA or CQA, and works will also be completed over two nights, with the aim being to complete the noisiest works by 23:00.

The nearest residential property lies approx. 470m east and is screened from the works by shelterbelt plantation and intervening properties and as such are unlikely to be impacted by the works.

A small number of business premises, including 'Little Stars Nursery', are located within 300m of the scheme. However, the works will be undertaken exclusively at night when the businesses are not expected to be operating as such, it is unlikely that noise and vibration associated with the works will lead to significant impacts, disruption and/or complaints. The proposed scheme is therefore anticipated to result in temporary, negligible adverse noise impacts.

The road surface is in a poor condition, with a series of defects. Replacing the life-expired surface course with TS2010 road surfacing affords the benefits of a reduction in mid-to-high frequency traffic noise and a reduction in the ground vibrations. As a result, upon completion of the work, noise associated with the movement of vehicles on the trunk road should decrease post construction.

Noise and vibration mitigation measures:

- The local authority environmental health department will be notified of nighttime working by BEAR Scotland's design engineer.
- Where possible, the noisiest work operations (e.g., cold milling, using breakers (jackhammers), chipping hammers, use of rollers, etc.) will be completed before 23:00.
- If unacceptable noise is emanating from the site the operation will, where possible, be modified and re-checked to verify that the corrective action has been effective. Actions to be considered include (a) minimizing cutting and grinding on-site, (b) reducing the operating hours, (c) repositioning equipment, (d) changing the method of working etc. Corrective actions will be actioned through the non-conformance reporting procedure, which ensures a root-cause analysis is carried out on each incident. The non-conformance procedure also ensures that appropriate corrective and preventative action measures are agreed and implemented in a timely fashion with all parties, and are recorded and actioned through to closeout, and fully auditable and traceable.
- Ancillary plant, vehicles and NRMM with directional noise characteristics will (where practical) be shut down in intervening periods between site operations.
- The use of paving breakers (jackhammers), chipping hammers, etc. will be avoided (except where there is an overriding justification), and if used will be fitted with mufflers or silencers of the type recommended by the manufacturer.
- Drop heights from vehicles and NRMM will be kept to a minimum to minimise noise when unloading.
- All ancillary plant, vehicles and NRMM used onsite will have been regularly maintained, paying attention to the integrity of silencers and acoustic enclosures.

- All compressors will be 'sound-reduced' models fitted with properly lined and sealed acoustic covers which will be kept closed when in use.
- HGV, site vehicles and NRMM will be switched to the minimum setting required by HSE and, where possible, will utilise 'broadband non-tonal' or 'directional sound reversing' alarms. Speed limits will also be reduced through the works.

## Population and human health

During construction, activities undertaken on site have the potential to have temporary adverse impacts on local residents and road users. However, TM will only be in place for two nights (when traffic flows will be at a minimum), and no congestion issues are noted during the proposed construction hours. Furthermore, no residential properties are found within 300m of the scheme.

Considering the nature, duration, size, and scale of the scheme, and with implementation of the mitigation described above, impacts on population and human health are assessed as temporary, minor adverse in magnitude.

Upon completion of the works, there will be a positive impact in relation to population and human health due to the improvement of usability and safety provided by the new carriageway surface.

Population and human health mitigation measures:

- Where appropriate, a communication strategy (e.g., social media, consultation with local authority and other stakeholders etc. will be initiated to keep local residents and/or businesses informed of the proposed working schedule, particularly the times and durations of noisy construction activities. The communication strategy will also provide a 24-hour contact number for the BEAR Scotland Control Room.
- Advanced signage will be strategically placed on the trunk road to notify road users of the road closure and diversion.
- Construction lighting will consider the need to avoid illuminating surrounding properties to avoid a nuisance at night, and non-essential lighting will be switched off at night.
- A Traffic Management Plan (TMP), which includes measures to avoid or reduce disruption to road traffic, will be produced in accordance with the Traffic Signs Manual (Department of Transport 2009). The TMP will ensure that there is no severance of community assets, access routes or residential development.

## Road drainage and the water environment

During resurfacing works, there is potential for temporary adverse impacts on the water environment. Potential changes in water quality e.g., from pollution events (either by accidental spillage of sediments, particulate matter, chemicals, fuels or by mobilisation of these in surface water caused by rain) during works have the potential to have a direct or indirect effect on the River Forth and surrounding waterbodies.

However, the works will be restricted to the existing M9 carriageway. All land out with the M9 road boundary is also considered out-of-bounds to all construction staff during the works (i.e., no 'in-water' works required) and there is no requirement for land take, site clearance or resources from within a waterbody. There is also no requirement for the abstraction or transfers of water from, or discharges to, a waterbody. The potential for a direct pollution incident within a waterbody is also unlikely e.g., experience gained from BEAR maintenance schemes elsewhere on the network has shown that where standard best working practice is adopted (e.g., adherence to SEPA GPPs or PPGs, appropriate spill procedures, utilisation of drain covers or similar, etc.), water quality is protected.

Considering the nature, duration, size, and scale of the scheme, and with implementation of the mitigation detailed below, the proposed works impacts on the road drainage and water environment are assessed as temporary, negligible adverse in magnitude.

Upon completion of the resurfacing works, no residual impacts are anticipated in relation to the road drainage and water environment.

Road drainage and the water environment mitigation measures:

- If any works are identified that would require entering the River Forth, BEAR Scotland's Environmental Team will be contacted (before works commence) to allow consideration of potential environmental effects.
- The abstraction or transfers of water from, discharges to, or the washing of tools in the River Forth is not permitted.
- An edge protection system will be utilised along the River Forth parapets to prevent material, debris, sediment, etc., from entering the River Forth below during works. Sandbags will be located at the bottom of the containment systems and debris netting will cover the edge protection system.
- The Contractor will implement measures to minimise the risk of sediment or accidental spillages entering the road drainage system e.g., prior to works commencing any roadside gullies within 10m of work activities will be bunded (e.g., utilisation of drain covers or similar) to ensure full segregation of the works from the road drainage system. The Contractor will inspect bunds periodically to ensure that they have not been removed, damaged, or interfered with and they will be cleaned of silt and debris as necessary. If it is identified that bunds are not up to standard, the works will not commence until they have been reinstated to the condition, they were originally in.
- All site personnel will be made aware of site spillage response procedures and in the event of a spill, all works associated with the spill will stop, and the incident reported to the Site Supervisor. Small spills that did not leave the site boundary and are cleaned up without material environmental harm or residual environmental impact would most likely not be required to be notified to SEPA or other authorities. However, all such incidents will be recorded and reported to BEAR Scotland's Environmental Team. In the event of a 'serious incident', SEPA will be notified without delay. Such notification will include: (i) the time and duration of the incident, (ii) a description of the cause of the incident, (iii) any

effect on the environment as a result of the incident, and (iv) any measures taken to minimise or mitigate the effect and prevent a recurrence.

- All waste, vehicles, ancillary plant, NRMM and fuels will be stored in the compound(s) or laydown area and will be secured and located, if space is available, at least 10m from drainage entry points, in order to comply with GPP 5 'works and maintenance in or near water'. Refuelling, where necessary, will only be undertaken at designated refuelling areas (e.g., on hardstanding, with spill kits available, and >10m from the River Forth and drainage entry points, where practicable). Spill kits will also be available within all site vehicles and spill kits will be replenished onsite when required. Only designated trained and competent operatives will be authorised to refuel plant. Generators, and other ancillary plant and NRMM, where there is a risk of leakage of oil or fuel, will have internal bunding or must have a secondary containment system placed beneath them that meets 110% capacity requirements. Containment systems will also be emptied regularly. All waste, vehicles, ancillary plant, NRMM and fuels will also be stored in a manner that ensures they are protected from damage by collision or extremes of weather.
- Regular visual pollution inspections of the designated laydown area and work site (particularly near road drainage entry points) will be conducted (e.g., site walkover by engineer or Site Supervisor), especially during periods of heavy rain.
- All vehicles and NRMM onsite will have been regularly maintained, paying attention to the integrity of oil tanks, coolant systems, gaskets etc. A checklist will be present to make sure that the checks have been carried out.

## Climate

BEAR Scotland, working on behalf of Transport Scotland, undertake carbon monitoring of major projects and operational activities. Emissions from activities are recorded using Transport Scotland's Carbon Management System. BEAR Scotland also undertakes resource efficiency activities to manage and reduce emissions contributing to climate change. The works will also extend the maintenance intervals required for future works. In doing so, the service life of the trunk road is also extended.

During works there is potential for impacts as a result of the emission of greenhouse gases through the use of equipment, vehicles, and NRMM, material use and production, and transportation of material/waste. However, considering the nature, duration, size and scale of the scheme, and the mitigation detailed below, the risk of significant impacts to climate are considered to be negligible and adverse in magnitude.

Upon completion of the proposed scheme no residual impacts are anticipated on the climate.

Climate mitigation measures:

- Local contractors and suppliers will be used as far as practicable to reduce fuel use and greenhouse gases emitted as part of the works.

- BEAR Scotland will adhere to its Carbon Management Policy.
- Where possible, waste will be removed to local waste management facilities.

## Vulnerability of the project to risks

There will be no change to the likelihood of flooding on the M9 within the scheme extents upon completion of the works.

Works are restricted to the M9 NB carriageway boundary, with access to the scheme gained via the M9 mainline. TM will employ a road closure with signed diversion beginning at M9 Junction 9 NB and ending at M9 Junction 11 NB. There are no pedestrian or other NMU facilities with direct connectivity to the scheme extents. As such, the proposed work impacts on road traffic accidents are assessed to be of negligible magnitude.

A Site Environmental Management Plan (SEMP) will be produced by BEAR Scotland which sets out a framework to reduce the risk of adverse impacts from construction activities on sensitive environmental receptors. The Contractor will comply with all conditions of the SEMP during works and may be subject to audit throughout the contract.

Considering the above, the vulnerability of the project to risks is considered to be low.

## Assessment cumulative effects

The proposed works are not anticipated to result in significant environmental effects. Due to the nature of the proposed works, no cumulative effects are anticipated with any other developments in the vicinity. Any future BEAR Scotland schemes will be programmed to consider already-programmed works and as such, any cumulative effects will be limited.

In addition, a search using [Stirling Council 'Simple Search'](#) identified no planning applications within 300m of the scheme.

A search of the Scottish Road Works Commissioner's website ([map search](#)) has identified that no other road works are currently ongoing, or noted as being planned, on the M9 trunk road or surrounding roads in proximity to the scheme which will be undertaken at the same time.

Considering the nature and scale of the minor resurfacing works being undertaken by BEAR, no in-combination effects are anticipated.

## Assessments of the environmental effects

A Habitats Regulations Appraisal (HRA) has been undertaken as the works will be taking place within the River Teith SAC, which concluded that there will be no Likely Significant Effects (LSE) as a result of the proposed works. Works will be completed

over two nights from the M9 bridge deck which will employ standard working and spill procedures and as such will not result in LSE to qualifying features of the SAC.

As detailed in the Description of Main Environmental Impacts and Proposed Mitigation section, there are no significant effects anticipated on any environmental receptors as a result of the proposed works.

## **Statement of case in support of a Determination that a statutory EIA is not required**

This is a relevant project in terms of section 55A(16) of the Roads (Scotland) Act 1984 as it is a project for the improvement of a road and the works (together with any area occupied by apparatus, equipment, machinery, materials, plant, spoil heaps, or other such facilities or stores required during the period of construction) does not exceed 1 hectare in area, but are situated in whole or in part in the River Teith SAC which is a sensitive area within the meaning of regulation 2(1) of the Environmental Impact Assessment (Scotland) Regulations 1999.

The project has been subject to screening using the Annex III criteria to determine whether a formal Environmental Impact Assessment is required under the Roads (Scotland) Act 1984 (as amended by The Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017). Screening using Annex III criteria, reference to consultations undertaken and review of available information has not identified the need for a statutory EIA.

The project will not have significant effects on the environment by virtue of factors such as:

Characteristics of the scheme:

- Works are restricted to like-for-like replacement of worn/damaged road surface, with all works restricted to made/engineered ground on the M9 carriageway boundary.
- Works are not expected to result in significant disturbance to protected species that may be present in the wider area.
- The risk of major accidents or disasters is considered to be low.
- Removal of the carriageway defects will provide this section of the M9 carriageway with another life cycle, and significantly improve the ride quality, which will result in safer conditions for road users.
- Any potential impacts of the works are expected to be temporary, short-term, not significant, and limited to the construction phase. No impacts on the environment are expected during the operational phase as a result of the works.

Location of the scheme:

- The works will be taking place within the River Teith SAC, as such a HRA has been undertaken which concluded that there will be no LSE.

- The scheme does not lie within and does not share connectivity with any designated cultural heritage sites.
- The scheme is not located within any areas designated for landscape interests.
- Land use will not change as a result of the works.
- The works do not require any private land acquisition.
- The scheme is not located within a densely populated area.

Characteristics of potential impacts of the scheme:

- The waste hierarchy will be followed to reduce waste to landfill.
- Works are programmed to take two nights to be completed on a rolling programme, with the aim being to complete the noisiest works by 23:00.
- With good practice pollution prevention measures implemented onsite, there is a negligible risk of a pollution event e.g., compliance with the SEMP.

## Annex A

“Sensitive area” means any of the following:

- land notified under sections 3(1) or 5(1) (sites of special scientific interest) of the Nature Conservation (Scotland) Act 2004
- land in respect of which an order has been made under section 23 (nature conservation orders) of the Nature Conservation (Scotland) Act 2004
- a European site within the meaning of regulation 10 of the Conservation (Natural Habitats, &c.) Regulations 1994
- a property appearing in the World Heritage List kept under article 11(2) of the 1972 UNESCO Convention for the Protection of the World Cultural and Natural Heritage
- a scheduled monument within the meaning of the Ancient Monuments and Archaeological Areas Act 1979
- a National Scenic Area as designated by a direction made by the Scottish Ministers under section 263A of the Town and Country Planning (Scotland) Act 1997
- an area designated as a National Park by a designation order made by the Scottish Ministers under section 6(1) of the National Parks (Scotland) Act 2000.



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