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TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Environmental Impact Assessment Record of Determination

M9 Prior to Junction 5 Northbound

Contents

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 and reinstatement of road markings for a length of approx. 740m (0.74ha).

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 programmed to be completed within the 2025/2026 financial year with works expected to begin on 28th May 2025. Works are programmed to be completed over five nights (19:30 – 06:00). Traffic Management (TM) is currently programmed to be in the form of a full night time road closure with a signed diversion. Traffic will be diverted via M9 Junction (Jct) 4 northbound (NB) Offslip, A803 westbound (WB), B805 NB, A9 eastbound (EB) where traffic can rejoin the M9 at Jct 5 NB.

Location

The scheme lies on the M9 carriageway adjacent to Polmont, within Falkirk Council, and is surrounded by areas of urban development and agricultural land (Figure 1).

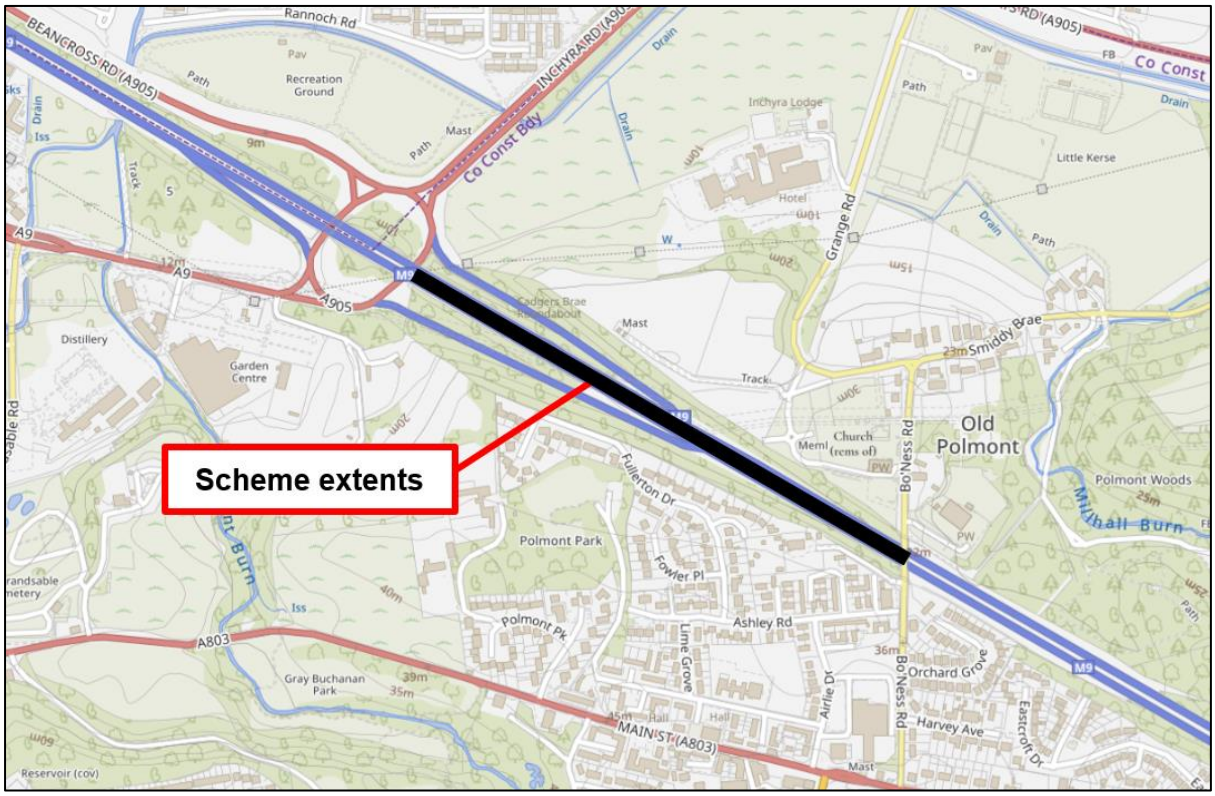

Figure 1. Extents of the Works. - Source: Asset Management Performance System (AMPS). © Europa Technologies Ltd. Contains Ordnance Survey data © Crown copyright and database right 2018.

Description of local environment

Air quality

Properties within 300m of the scheme – refer to 'Population and Human Health'.

A search of the Air Quality in Scotland online mapping tool records that the air quality zones in the wider area record bandings in the 'green zone' (Low Index 1-3).

The scheme lies within the boundary of Stirling Council which has no Air Quality Management Areas (AQMAs) within its administrative boundary. The nearest AQMA, 'Falkirk Town Centre', lies within the boundary of Falkirk Council. It has been declared for nitrogen dioxide (NO_2) and particulate matter (PM_{10}) and is found approx. 3.7km west of the scheme extents.

There are 13 sites registered on the Scottish Pollutant Release Inventory (SPRI) for pollutant releases to air within the last 10 years, within 10km of the scheme extents:

- Avondale Non-Hazardous Landfill, Polmont - Waste and waste-water management - located 1.6km east and declared for:
    - Carbon dioxide (kt),
    - Carbon monoxide (kt),
    - Chlorofluorocarbons (CFCs) (kg),
    - Hydrochlorofluorocarbons (HCFCs) (kg),
    - Methane (t),
    - Nitrogen oxides, NO and NO_2 as NO2 (kt),
    - Particulate matter - PM_{10} and smaller (t), and
    - Tetrachloroethane (kg).

- Grangemouth CHP, Boness Road, Grangemouth - Energy sector – located 1.9km north and declared for:
    - Carbon dioxide (kt), and
    - Nitrogen oxides, NO and NO_2 as NO_2 (kt).

- INEOS Chemicals Grangemouth Ltd, Grangemouth - Chemical industry – located 1.9km north and declared for:
    - Benzene (t),
    - Butadiene (kg),
    - Carbon dioxide (kt),
    - Carbon monoxide (kt),

  - Hydrofluorocarbons (HFCs) (kg),
  - Methane (t),
  - Nitrogen oxides, NO and NO_2 as NO_2 (kt),
  - Non-methane volatile organic compounds (NMVOCs) (t),
  - Particulate matter - PM_{10} and smaller (t), and
  - Toluene (kg).

- Versalis UK Ltd, Grangemouth - Chemical industry – located 2.1km northeast and declared for:

  - Butadiene (kg),
  - Carbon dioxide (kt),
  - NMVOCs (t), and
  - Styrene (kg).

- CHP Plant, Earls Road, Grangemouth- Energy sector - located 2.1km northwest and declared for:

  - Carbon dioxide (kt).

- Grangemouth Chemical Plant - Chemical industry – located 2.2km northwest and declared for:

  - Ethylbenzene (kg),
  - NMVOCs (t),
  - Toluene (kg), and
  - Xylene - all isomers (t).

- Syngenta, Grangemouth Man Centre, Grangemouth - Chemical industry – located 2.3km northwest and declared for:

  - HFCs (kg),
  - Methyl chloride (t),
  - NMVOCs (t), and
  - Toluene (kg).

- INEOS FPS Ltd, Kinneil Terminal, Grangemouth - Energy sector – located 2.5km northeast and declared for:

  - Carbon dioxide (kt),
  - Carbon monoxide (kt),
  - HCFCs (kg),
  - Methane (t),
  - Nitrogen oxides, NO and NO_2 as NO_2 (kt),

  - NMVOCs (t), and
  - Sulphur oxides, SO_2 and SO_3 as SO_2 (kt).

- INEOS Infrastructure (Grangemouth) Ltd - Energy sector – located 2.7km north and declared for:

  - Carbon dioxide (kt),
  - Carbon monoxide (kt),
  - Methane (t),
  - Nitrogen oxides, NO and NO_2 as NO_2 (kt),
  - Particulate matter - PM_{10} and smaller (t), and
  - Sulphur oxides, SO_2 and SO_3 as SO_2 (kt).

- Grangemouth Refinery - Energy sector – located 2.9km north and declared for:

  - Ammonia (t),
  - Arsenic (kg),
  - Benzene (t),
  - Butadiene (kg),
  - Carbon dioxide (kt),
  - Carbon monoxide (kt),
  - HFCs (kg),
  - Mercury (kg),
  - Methane (t),
  - Nickel (kg),
  - Nitrogen oxides, NO and NO_2 as NO_2 (kt),
  - NMVOCs (t),
  - Particulate matter - PM_{10} and smaller (t),
  - Particulate matter - total (t),
  - Sulphur oxides, SO_2 and SO_3 as SO_2 (kt),
  - Tetrachloroethylene (kg),
  - Toluene (kg),
  - Vanadium (kg),
  - Xylene - all isomers (t), and
  - Zinc (kg).

- Falkirk STW, Abbots Road, Falkirk - Waste and waste-water management - located 3.7km northwest and declared for:

  - Methane (t).

- Longannet PS, Kincardine, Alloa - Energy sector – located 6.1km north and declared for:

  - Antimony (kg),
  - Arsenic (kg),
  - Carbon dioxide (kt),
  - Carbon monoxide (kt),
  - Chlorine and total inorganic chlorine compounds - as HCl (t),
  - Chromium (kg),
  - Copper (kg),
  - Dioxins and furans - as ITEQ (g),
  - Dioxins and furans - as WHO TEQ (g),
  - Fluorine and total inorganic fluorine compounds - as HF (t),
  - Manganese (kg),
  - Mercury (kg),
  - Methane (t),
  - Nickel (kg),
  - Nitrogen oxides, NO and NO_2 as NO_2 (kt),
  - Nitrous oxide (t),
  - NMVOCs (t),
  - Particulate matter - PM_{10} and smaller (t),
  - Particulate matter - total (t),
  - Polychlorinated biphenyls (PCBs) - as WHO TEQ (g),
  - Polycyclic aromatic hydrocarbons (PAHs) (four indicator compounds of LRTAP) (kg),
  - Selenium (kg),
  - Sulphur oxides, SO_2 and SO_3 as SO_2 (kt), and
  - Vanadium (kg).

- Bathgate Compressor Station (Site 2) - Energy sector – located 8.4km south and declared for:

  - Carbon dioxide (kt),
  - Methane (t), and
  - NMVOCs (t).

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

Cultural heritage

According to the PastMap and Historic Environment Scotland (HES) online mapping tools there are two World Heritage Sites (WHS) which lie within 300m of the scheme extents. Antonine Wall World Heritage Site Buffer Zone crosses the M9 carriageway

within the northern scheme extents and Antonine Wall World Heritage Site borders the southbound carriageway boundary within the scheme extents.

Four scheduled monuments (SM) lie within 300m of the scheme extents. The nearest of which lies 40m north of the scheme extents.

Three listed buildings (LB) lie within 300m of the scheme extents. The nearest LB lies 40m south of the scheme extents.

Of lesser cultural heritage value, 11 undesignated cultural heritage assets (UCHAs), lie within 300m of the scheme extents, the nearest UCHA is located approx. 40m north of the scheme.

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

Landscape and visual effects

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

The Landscape Character Types (LCTs) within the study area are 'Urban' (no.0) which has no key characteristics and 'Lowland River Valleys - Central' (no. 152) (Scottish Landscape Character Types).

The key characteristics of the 152 LCT are:

- Well-defined river corridors, most with flat valley floor enclosed by often commanding hills.
- Strong topographic and visual identity, with varying scale and character.
- Glacial terrain and deposits located on valley margins, often subject to mineral extraction.
- Relatively high proportion of tree cover, with roadside and hedgerow trees and seminatural woodland.
- Dense areas of coniferous forest cover the slopes surrounding the reservoir in the Upper Carron Valley.
- Road corridors often running parallel to river corridor form key linear features.
- Settlement often closely linked to the river corridor and parallel road corridors.
- Intensive settlement and urban development on margins of valleys south and north of Firth of Forth.

- Predominance of traditionally managed estate, policy and designed landscapes.
- Nature conservation importance of river and associated habitats.
- Frequently enclosed and focussed views along the river valley.
- Visibility of remnant derelict land, motorway and road corridors, power lines, wind farms and industrial sites from the urban fringe of Falkirk/Denny.

Land use within 300m of the scheme is categorised into the following:

- Cemetery.
- Recreation area.
- Industrial-scale farming unit.
- Motorway and major roads.
- Urban area.
- Rough grazing.
- Cultivated former parkland.
- Rectilinear fields and farms.

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.
- 'Class 888' – Urban.

Woodland within the study area consists of:

- Approx. 1.7ha of broadleaved woodland borders the northbound carriageway within the scheme extents and is recorded on the Native Woodland Survey of Scotland (NWSS).
- Approx. 0.9ha of broadleaved woodland located approx. 20m southwest of the scheme extents.
- Polmont Woods, consisting of approx. 14ha of mixed conifer and broadleaved woodland located approx. 20m east of the scheme extents, 9.5ha of which is recorded on the Ancient Woodland Survey of Scotland and 4.5ha of which is recorded on the NWSS.
- Approx. 0.6ha of broadleaved woodland borders the southbound carriageway within the scheme extents.
- Approx. 2.5ha of broadleaved woodland located approx. 130m south of the scheme extents.
- Approx. 0.7ha of mixed mainly conifer woodland located approx. 150m northwest of the scheme extents.

- Approx. 1ha of broadleaved woodland located approx. 160m northwest of the scheme extents which is recorded on the NWSS.
- Approx. 1.3ha of mixed mainly broadleaved woodland located approx. 290m northwest of the scheme extents.

There are no trees covered by a Tree Preservation Order (TPO) with connectivity to the scheme extents.

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

Biodiversity

The NatureScot Sitelink online mapping tools identifies that the scheme is not situated within 2km of, and does not share connectivity with a European Site designated for biodiversity features e.g., SAC, SPA, Ramsar.

Polmont Park Site of Importance for Nature Conservation (SINC) is located 90m south of the scheme and Polmont Woods Wildlife Site Local Nature Conservation Site (LNCS) is located 190m northeast.

There are no SSSIs, or Local Nature Reserves (LNRs) designated for biodiversity features within 300m of, or which share connectivity to, the scheme.

A search of the NBN online mapping tool recorded the following plant species as listed within the Network Management Contract within 2km of the scheme extents (within the last 10-years):

Invasive non-native species (INNS):

- Japanese knotweed (*Reynoutria japonica*)
- Himalayan balsam (*Impatiens glandulifera*).

Injurious weed (as listed under the Weeds Act 1959):

- Common ragwort (*Senecio jacobaea*).

Invasive native perennials (as listed in the Trunk Road Inventory Manual)

- Broad-leaved Dock (*Rumex obtusifolius*),
- Spear Thistle (*Cirsium vulgare*),
- Rosebay willowherb (*Chamaenerion angustifolium*).

The closest record pertains to Japanese knotweed, which lies approx. 1.1km south of the scheme extents, recorded in 2024.

A search of the Asset Management Performance System (AMPS) records INNS rhododendron (*Rhododendron Ponticum)* and invasive native perennial rosebay willowherb (as listed in the Trunk Road Inventory Manual) within the scheme extents (2015, 2018 and 2021).

Habitat immediately bordering the trunk road tends to be of low intrinsic value because the existing road verge is subject to cyclic maintenance e.g., grass cutting, weed control, tree, and shrub cut-back etc. The roadside verges within the scheme extents are comprised of strips of managed grassland on steep embankments bordered by broadleaved tree and shrub shelterbelt and woodland areas. The presence of the trunk road is likely to restrict continuity of, and connectivity between, habitats either side of the trunk road boundary.

Outwith the trunk road boundary, agricultural land to the north and east of the scheme forms a pattern of open and exposed fields containing both pastoral and arable land. The result of this intensive agricultural land management is to restrict the occurrence of semi-natural and natural vegetation types. Most field boundaries are comprised of stone wall and wooden fencing, with vegetative features further delineating field boundaries e.g., shrub hedgerow, rough grassland, ruderal herb stands, scrub and tree shelterbelt. Linear features at field boundaries have wildlife value, both as corridors in an intensively managed landscape, and as habitats for birds and small animals. Areas to the south and west are dominated by pockets of woodland and residential areas.

Geology and soils

The M9 within the scheme extents is not located within a 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 that the generalised soil type recorded beneath the scheme extents is brown soils and mineral gleys and the major soil group recorded beneath the scheme extents is brown soils and gleys.

The British Geological Survey online mapping tool records that the superficial geology within the scheme extents is comprised of:

- Alluvium – (clay, silt, sand and gravel).
- Raised Marine Deposits, Devensian – (clay, silt and sand).
- Raised Marine Deposits, Devensian – (clay, silt, sand and gravel).

The bedrock geology within the scheme extents is recorded as:

- Passage Formation – (sedimentary rock cycles, Clackmannan group type).

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

Given that works are restricted to like-for-like replacement of the existing road surface within the carriageway boundary with no earthworks are required, there is no potential to impact upon geology and soils. Therefore, geology and soils has 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,
- AC20 dense binder,
- Bitumen emulsion,
- Hot bitumen,
- Marker paint,
- Cold bitumen sealant,
- Tar glue remover,
- Thermoplastic road markings, and
- Surface mounted and milled road studs.

As the value of the scheme is less than £350,000, a Site Waste Management Plan (SWMP) is not required for these works. The scheme involves removal of the surface course and localised areas of base and binder course. Bituminous material (European Waste Catalogue Code: 17 03 02) will be removed from site, none of which is classified as hazardous material containing coal tar.

Noise and vibration

Receptors – refer to ‘Population and Human Health’.

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

The day-time modelled noise level (Lden) within the scheme extents ranges between 75 and 80 decibels (dB) and at the nearest noise sensitive receptor (NSR)

(residential property) ranges between 70 and 75 dB (Scotland's Noise Scotland's Environment).

Baseline noise and vibration in the study area is mainly influenced by vehicles travelling along the trunk road. Secondary sources are derived from vehicles travelling along the local road network, day-to-day urban, woodland and agricultural land management activities.

Population and human health

The scheme extents border Polmont, as such numerous properties (including residential properties, farmsteads, and business premises) lie within 300m of the scheme extents, the closest of which lies approx. 40m south of the trunk road and has limited screening from the scheme provided by a 2m high garden fence. All remaining properties are screened from the scheme by a combination of roadside tree shelterbelt (approx. 15m wide), raised roadside embankment, woodland, and/or topography.

Of note the following are found within 300m of the scheme:

- Polmont Cemetery borders the scheme extents and has limited screening from the works.
- Polmont Old Parish Church is located 60m northeast of the scheme and has limited screening from the works.

Two core paths (ID: 360 and 4549) are present within Polmont Woods bordering the southbound carriageway at the eastern scheme extents. There are no other non-motorised user (NMU) or community facilities with connectivity to the scheme.

Street lighting is absent throughout the scheme extents.

The M9, within the scheme extents is a motorway with the national speed limit applying throughout. The Annual Average Daily Traffic (AADT) flow along the M9 within the scheme extents is moderate (43,833 motor vehicles) (ID: 20703, 2023)) (Road Traffic Statistics) and is comprised of:

- 177 two-wheeled motor vehicles,
- 31,654 cars and taxis,
- 41 bus and coaches,
- 9,209 Light Goods Vehicles (LGVs), and
- 2,752 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 no classified surface waterbodies within 300m of the scheme extents.

Three small minor unclassified surface waterbodies, considered to be minor tributaries, or drainage channels lie within 300m of the scheme extents. Details are as follows:

- Drain1 (Flood relief channel) – located approx. 250m north of the scheme extents.
- Millhall Burn – located approx. 260m northeast of the scheme extents.
- Drain2 - located approx. 260m north of the scheme extents.

All three waterbodies are too small (in terms of catchment area) to be classified as a main stem waterbody by SEPA under the Water Framework Directive (WFD).

A search of the SEPA's Flood Map online mapping tool records that areas of the trunk road throughout the scheme extents are not at risk of surface water flooding.

A search of the Scotland's Environment (SE) online mapping tool determined that the trunk road, within the scheme extents, lies on the 'Grangemouth' and 'Avon Sand and Gravel' groundwaters, which have been classified as 'Good'.

A search of the SE online mapping tool 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_2 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 for 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:

- Careful consideration will be given to the siting and orientation of ancillary plant, vehicles, and NRMM, so that it is located, as far as is possible, away from receptors. Activities which have the potential to produce air pollution (e.g., cutting and grinding of materials) will also, if possible, be undertaken away from any surrounding properties.
- 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.

Cultural Heritage

The 'Antonine Wall' World Heritage Site (WHS) Buffer Zone lies partially within the scheme extents. However, the works are restricted to the like-for-like replacement of the existing carriageway boundary and depth, and do not include any alterations that would affect the historic and architectural character of these features. As such, application for consent or any other permission is not required. Additionally, providing mitigation measures detailed below are adhered to, there is negligible potential for the works to impact upon the WHS.

Furthermore, the construction of the M9 road corridor is likely to have removed any archaeological remains that may have been present within the trunk road boundary. Therefore, the potential for the presence of unknown archaeological remains in the study area has therefore been assessed to be low. Moreover, there is no requirement for earthworks or vegetation clearance and people, ancillary plant, vehicles, NRMM and materials are restricted to areas of made/engineered ground within the boundary of the M80. As such, there is negligible risk of disturbing or damaging previously undiscovered or unrecorded items of cultural interest.

Given the nature of the scheme, and with implementation of mitigation detailed below, the proposed works impacts on cultural heritage during the construction period are assessed to be negligible in magnitude.

Upon completion of the works, no residual impacts on cultural heritage are anticipated..

Cultural heritage mitigation measures:

- All site personnel will be briefed on the sensitivity and proximity of the 'Antonine Wall' World Heritage Site (WHS) Buffer Zone, prior to works commencing.
- People, ancillary plant, vehicles, NRMM and materials will be restricted to areas of made/engineered ground (as much as is reasonably practicable). No plant, machinery or equipment will be situated within the carriageway verge within the boundary of the Antonine Wall WHS Buffer Zone. Where access outwith the M9 carriageway is required for the safe and effective completion of the scheme, the area will be reduced as much as is reasonably practicable, and ideally will be accessed on foot.

- If a change to the construction programme onsite is required that necessitates earthworks or vegetation clearance, BEAR Scotland's Environmental Team will be contacted.

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, and construction works are programmed to be undertaken at night (five nights). 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 e.g., when complete the visual appearance will remain largely unaffected, with a renewed road surface being the only discernible change.

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 it will 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

Two LNCS are located within 300m of the scheme extents, the closest of which is located 90m south of the scheme. Due to the distance separating the works from the LNCS there is no potential for impacts.

A temporary short-term increase in noise levels may cause disturbance to local wildlife. 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 carriageway. 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 (five nights). The potential for significant species disturbance within the area of likely construction disturbance is therefore somewhat diminished.

INNS rhododendron, and invasive native species rosebay willowherb have been recorded along the verge within the scheme extents, however given that the works are restricted to the carriageway boundary, and no earthworks or vegetation clearance are required, providing the mitigation detailed below is adhered to there is limited potential to spread or introduce INNS, invasive native perennials, or injurious flowering plant species.

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:.

- Due to the recorded presence of rhododendron and rosebay willowherb within the verge of the scheme extents, Toolbox Talk TTN-009 ‘Working with Injurious Weeds & Invasive Plants’ will be briefed to all staff prior to the commencement of works. No access into the verge or storage or materials, equipment or signage within the verge will be permitted at this location.
- 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., locations adjacent to tree shelterbelt, woodland etc.) to ensure minimal impact on nocturnal species.
- 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.
- 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 BEAR’s 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.

- All equipment stored onsite, if necessary, will be checked at the start of each workday to ensure mammal species are not present. Any storage containers/plant within the compound 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,
    - nesting birds are found onsite.
- 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 recycling / 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/2010849), the rules of which will be complied with.
- Designated areas will be identified within which all materials and personnel, including construction compounds, where necessary, 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 relevant waste regulations. 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, and rollers, etc. As a result, there is potential for noise and vibration effects to residential properties within the local area, the closest of which is located approximately 40m south of the scheme extents.

However, the works are not located within a CNMA or CQA, and works will also be completed over five nights, with the aim being to complete the noisiest works by 23:00. In addition, the proximity of road space suggests that residents have a degree of tolerance to noise and disturbance.

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.

Considering the likely sources of noise and vibration, with the nature, duration, size, and scale of the scheme, and with implementation of the mitigation detailed below, 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, minor adverse noise impacts.

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.
- Wherever possible, careful consideration will be given to the siting and orientation of particularly noisy items of NRMM so that it is located away from surrounding properties. Activities which have the potential to produce excessive noise e.g., cutting and grinding of materials will also, if possible, be undertaken away from surrounding properties.
- 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. A number of residential properties lie within 300m of the scheme and as such, there is potential for impacts to local residents in the form of noise/vibration impacts, visual disturbance and delays due to traffic management. However, TM will only be in place for five nights (when traffic flows will be at a minimum), as such no congestion issues are noted during the proposed construction hours. Providing mitigation measures detailed below and those listed within the noise and vibration section are adhered to, the impacts are assessed to be somewhat reduced.

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:

- Given the proximity of urban development to the scheme extents, Toolbox Talk TTN-042 Being a Good Neighbour will be briefed prior to works commencing.
- Construction lighting will take into account the need to avoid illuminating surrounding properties to avoid a nuisance at night, and non-essential lighting will be switched off at night.
- Where appropriate, a communication strategy (e.g., social media, consultation with local authority and other stakeholders, letter drop (for night-time works), 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 stakeholders of the road closure and diversion at least seven days in advance.
- 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.
- Journey planning information will be available for drivers online at the trafficscotland.org website. Journey planning information will also be available for drivers online through BEARs social media platforms.

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 surrounding waterbodies. However, the closest waterbody is noted as being approx. 250m north, as such given the distance separating the works from the waterbodies the potential for direct impacts is assessed to be negligible.

Furthermore, no ‘in-water’ works are required, with all land outwith the trunk road boundary is considered out-of-bounds to all construction staff during the works. The potential for indirect pollution incident to a waterbody is considered 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, 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:

- No work has been identified that would require entering any surface waterbodies. If such a need were identified onsite, 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 surface waterbodies will not be permitted.
- 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 protected (e.g., utilisation of drain covers or similar) to ensure full segregation of the works from the road drainage system. The Contractor will inspect these periodically to ensure that they have not been removed, damaged, or interfered with and they will be cleaned of silt and debris as necessary.
- Appropriate measures will be implemented during resurfacing operations to limit the potential for wastes (i.e. road planings) and materials (i.e. new asphalt) to enter any gullies present on site. On completion of resurfacing operations, any gullies present on site will be visually checked to ensure they have not become blocked as a result of the scheme.
- 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 will only be undertaken at designated refuelling areas (e.g., on hardstanding, with spill kits available, and >10m from 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 will 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 areas of made ground on the M9 carriageway surface, with access to the scheme gained via the M9 mainline. TM will employ a full road closure

with signed diversion. There are no NMU or community facilities with connectivity to the scheme that could be impacted by the works. As such, the proposed works' 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 of major accidents and disasters 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.

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.

In addition, a search using Falkirk Council Planning Portal identified seven planning applications within 300m of the scheme extents within the last two years.

Table 1: Planning Applications within the Last Two Years

Reference	Description	Status	Decision	Distance
P/23/0481/FUL	Alterations to Dwelling and Installation of External Stairs	Awaiting decision	Unknown	Approx. 45m south
P/24/0388/CPL	Alterations to Dwellinghouse	Decided	Certify the Proposed Use / Dev as Lawful	Approx. 60m south
P/24/0120/FUL	Construction of Car Port	Decided	Grant Planning Permission	Approx. 35m southeast
P/20/0617/COND01	Compliance with Condition 11 of P/20/0617/FUL - Construction of 6 Dwellinghouses	Unknown	Condition(s) Discharged	Approx. 120m south
P/23/0290/FUL	Extension to Dwellinghouse	Decided	Grant Planning Permission	Approx. 130m south
P/23/0603/FUL	Installation of Electric Vehicle Charging Substation and Associated Development.	Decided	Grant Planning Permission	Approx. 150m southwest
P/23/0604/ADV	Display of Non-Illuminated Advertisements	Decided	Grant Advertisement Consent	Approx. 200m southwest

While it is not possible to gain an understanding on the timing or duration of the above granted planning applications, it is considered that even in the event that the

above planning applications were being progressed at the same time as the planned BEAR Scotland resurfacing works, given the distance separating them from the scheme, coupled with the minor nature of the BEAR Scotland resurfacing works, no in-combination effects are expected.

Assessments of the environmental effects

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 completed 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) are situated in whole or in part in the 'Antonine Wall World Heritage Site Buffer Zone' 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 ground on the M9 carriageway surface
- 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.

- By removing the carriageway defects, this 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.

Location of the scheme:

- The scheme is not situated within 2km of, and does not share connectivity with, a European Site designated for biodiversity features e.g., SAC, SPA, Ramsar.
- The scheme will not have any impact on the Antonine Wall World Heritage Site Buffer Zone.
- 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 five nights to complete 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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