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Environmental Impact Assessment Record of Determination

A985 Kincardine Bridge – Maintenance Schemes

Contents

Project Details

Description

Maintenance works are required to repair and replace poor condition or broken features of Kincardine Bridge. The works are required to allow for the safe continual operation of the bridge.

Southern Piled Viaduct (SPV) Propping System Repairs

The proposed works include repairs to bases of the steel columns of the SPV propping system. The expected duration of the SPV propping system repairs is 7 weeks. Temporary lane closures for material deliveries might be required. Southbound footway closures will be required in order to allow materials movement from the site compound to the construction site.

The proposed works to repair the bases of the steel columns comprise two options depending on the severity of the corrosion, which can only be determined following the excavation of the existing ground:

Option 1: A proposed light reinforced concrete surround to be constructed around the bottom ends of the steel propping columns (corroded sections within the wet/dry zone). The works will involve removal of the existing ground by hand digging around the steel columns in order to expose the concrete foundations, installation of formworks around each one of the steel columns, concreting and removal of formwork (once the concrete is dry). The ground will be reinstated following completion of the works.

Option 2: A proposed steel protection paint applied to the bases of the steel columns to prevent further corrosion of the steel columns. The works will involve removal of the existing ground by hand digging around the steel columns in order to expose the concrete foundations, the removal of loose corroded steel by wire brushing and application of a protection paint. The ground will be reinstated following completion of the works.

The majority of works will be carried out during daytime working hours 08:00 – 17:00 with the exception of possible lane closures for material deliveries which will be done during night-time.

Machinery and equipment for the propping system repairs includes alloy towers, timber/plastic shutters, a generator, concrete, grout, steel shims, concrete vibrators, water pumps, geotextile matting, a telehandler and hand tools. The SPV propping system repairs may potentially require consumption of 12m^3 of concrete or a quantity of steel protection paint, depending on the working method chosen. A negligible amount of rusted/corroded steel waste and paint waste may potentially arise from the SPV propping system repairs works.

SPV Concrete Repairs

The concrete columns, crossbeams and deck soffit across the SPV are in poor condition. The whole SPV is programmed to be replaced, commencing in 2022, however the actual demolition of the SPV will not commence until the

temporary/diversion bridge is in place. The construction of the temporary/diversion structure will take up to 8 months after the commencement of the SPV replacement works i.e., actual demolition of the SPV is not programmed to happen until 2023.

As an interim measure it is proposed to carry out concrete repairs to stop further deterioration of concrete elements described above. The design for these concrete repairs will comprise a concrete collar/coating solution and localised concrete repairs with a repair mortar.

A second option for the concrete element of the SPV is to treat with a coating system, similar to that proposed for the steel elements (above). This would require the removal of salt deposits from concrete elements, and rust from steel elements prior to the application of the coating system. The removal of salt deposits and rust will require air and water pressure techniques and no heavy machinery or plant access to the saltmarsh area is required for this option. The same site compound area, as identified for other schemes, as well as the same identified access/egress to the working area will be used.

The expected duration of the SPV concrete repairs is 7 weeks. Temporary lane closures for material and equipment deliveries/removals might be required. All works will be carried out during daytime working hours: 08:00 17:00. Daytime lane closures might be required for material and deliveries/removal.

Machinery and equipment for the SPV concrete repairs includes scaffolding (below SPV), a generator, concrete breakout tools, access geotextile matting, concrete delivery, waste removal, a telehandler and hand tools.

Installation of Navigation Lights

The proposed works also require the installation of six navigation lights on the south swing span (three on either side of the south swing span). The installation of the navigation lights is anticipated to be completed within 2 weeks, during daytime working hours (08:00 – 17:00), with temporary northbound footway closures potentially required for material deliveries and the installation of the lighting units.

Equipment required for the installation of the navigation lights includes a specialist access system (platform) or rope access, welding equipment, cables, a generator, site welfare vans and cars, and hand tools.

All waste arising from the navigation light installation works will be removed and disposed to a licensed facility.

Asbestos Containing Material (ACM) Removal from the Swing Span

As ACM has been identified on various areas and components at both the engine and control rooms on the swing span, it is anticipated that the removal of ACM will be carried out across phases and may take a few months to complete.

Consultation with asbestos specialist contractors is required in order to establish required access and options. It is very likely that this scheme will be split in two phases: the removal of asbestos containing materials below and above deck level. Full encapsulation of the working areas will be required. Only specialist contractors (registered with HSE) will be considered for the removal of these materials.

ACM has been identified on the ceilings, pipes and cable covers. Following removal, some of these materials will be replaced with other similar materials.

Equipment required for the removal of ACM includes specialist accesses, encapsulation system of working areas, and hand tools.

ACM is expected to be the primary type of waste from the ACM removal works; however, the quantity of waste cannot be determined at this stage. All wastes arising from the ACM removal works will be fully disposed to a licensed facility.

Decommissioning of Unused Elements

The proposed works also include the decommissioning of unused elements (including the safety barriers currently set to fixed/closed position on the concrete portals (gates) on either end of the swing span, fuel tanks located below deck level, and cables and pipes which are no longer used and obstruct visual inspection of hidden defects on the bridge) across the whole length of the Kincardine Bridge. It is anticipated that this work, excluding the installation/removal of temporary access arrangements, will take 10 weeks to complete and will commence in July/August 2022.

Works will commence on the swing span concrete portals, where specialist temporary access will be required. It is likely that this phase of the works will require upstream footway closure (no access to members of the public can be permitted for the whole duration of the works).

As Kincardine Bridge is a Category A listed structure, consultation with the Local Authority will be undertaken regarding the works. A detailed programme of works will be prepared showing the sequence and phases of the proposed works.

Equipment required for the decommissioning works includes specialist temporary access, hand tools, cutting equipment and lifting equipment.

Steel elements are expected to be the primary type of waste; however, the quantity of waste cannot be determined at this stage. All wastes arising from the decommissioning works will be fully disposed to a licensed facility.

Site Compound and Routine Maintenance Activities

For the proposed works outlined above, a site compound and welfare facilities will be installed adjacent to the east side of the sustainable drainage system (SuDS) pond located to the south-east of Higgins Neuk Roundabout, south-west of Kincardine Bridge.

In addition to the proposed works outlined above, there are a number of smaller routine maintenance activities which can be carried out at the Kincardine Bridge on a regular basis, including (but not limited to) graffiti removal, vegetation clearance, debris and bird dropping removal, landscape maintenance, and the inspection and maintenance of safety fences and barriers.

A diagram showing the east elevation of Kincardine Bridge is provided in the following section.

Location plans for the SPV propping system repairs (Figure 2), SPV concrete repairs (Figure 3) and navigation lights (Figure 4) are provided in the following section. The proposed ACM removal works are located on the central swing span of the bridge and the proposed decommissioning works are located across the whole length of the bridge

Location

The proposed works are located on the SPV propping system, SPV (concrete columns, crossbeams and deck soffit), south swing span, and the engine and control rooms on the swing span of Kincardine Bridge. The regular routine maintenance activities referred to above may be required at any location on the Kincardine Bridge. The Kincardine Bridge crosses the Firth of Forth between Higgins Neuk in Falkirk Council area and the town of Kincardine in Fife Council area. The Kincardine Bridge is used to carry the A985 Kincardine – Rosyth Trunk Road (A985) over the Firth of Forth via a two-lane single carriageway road. The A985 connects to the A876 at the Higgins Neuk Roundabout which lies to the south-west of the Kincardine Bridge.

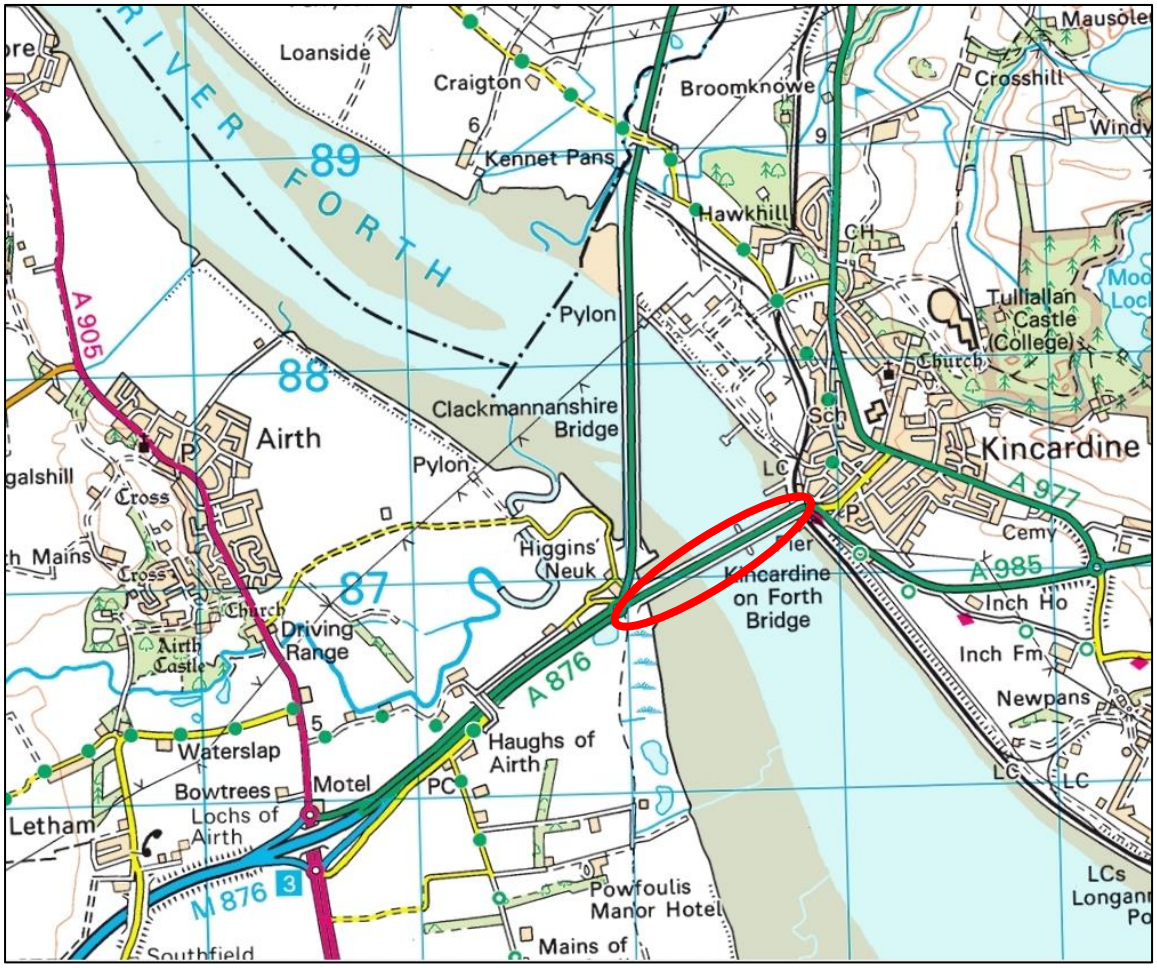

Figure 1: Proposed works Location

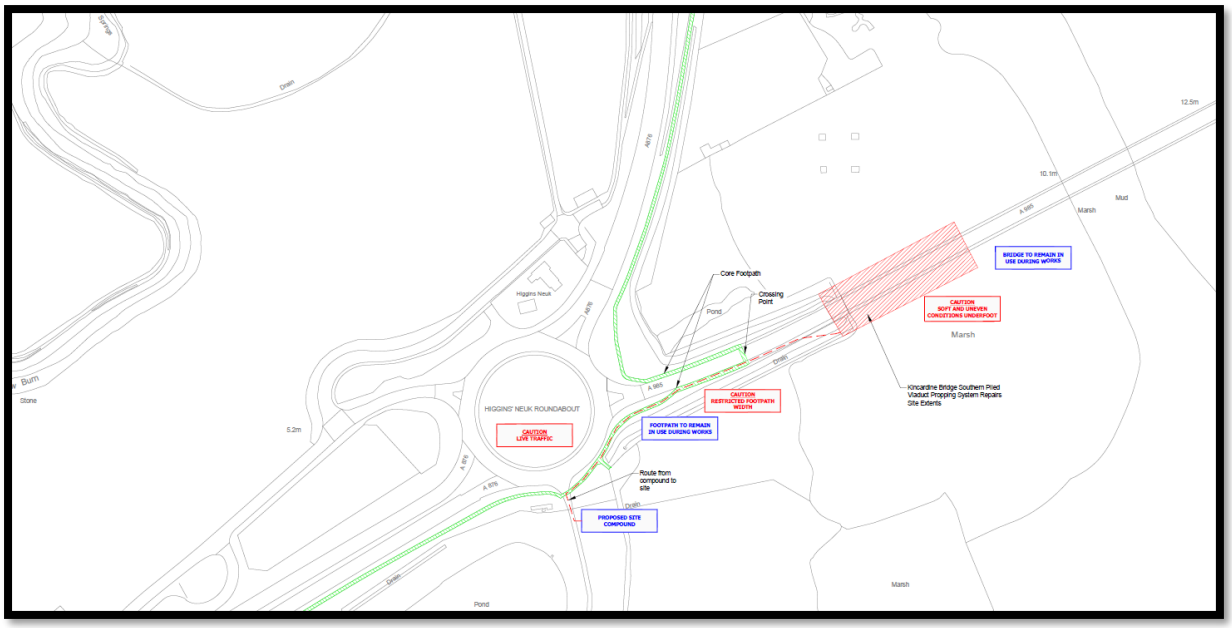

Figure 2: SPV Propping System Repairs Scheme Location Plan

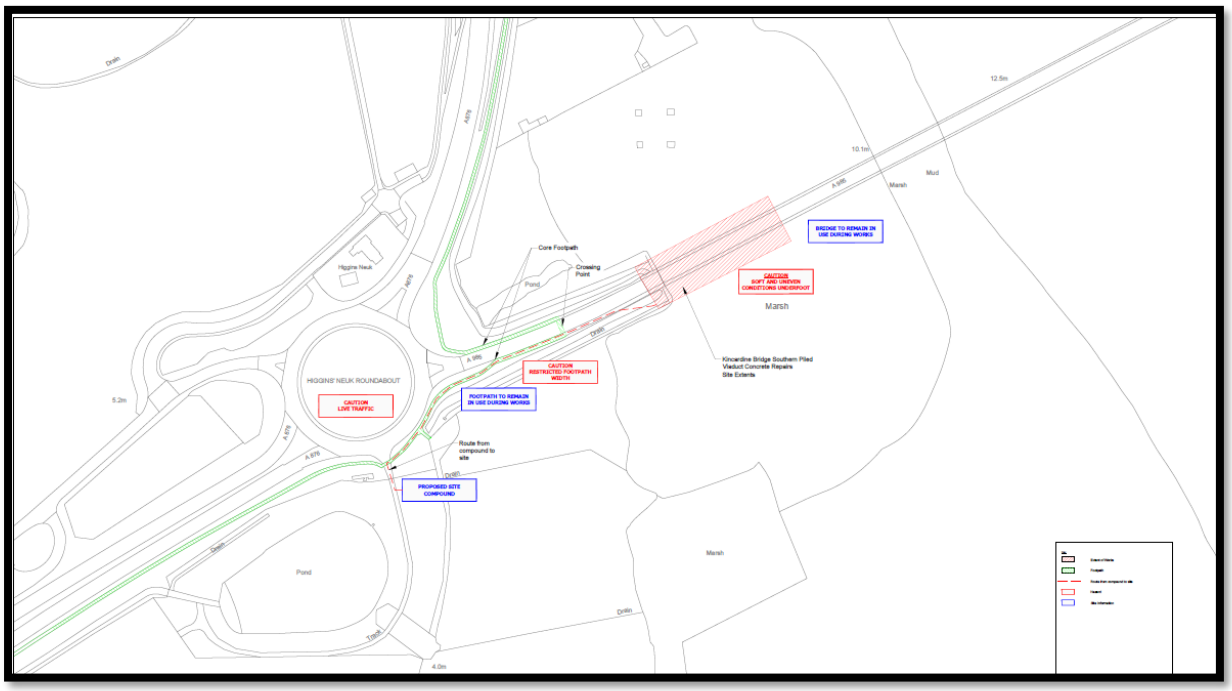

Figure 3: SPV Concrete Repairs Location Plan

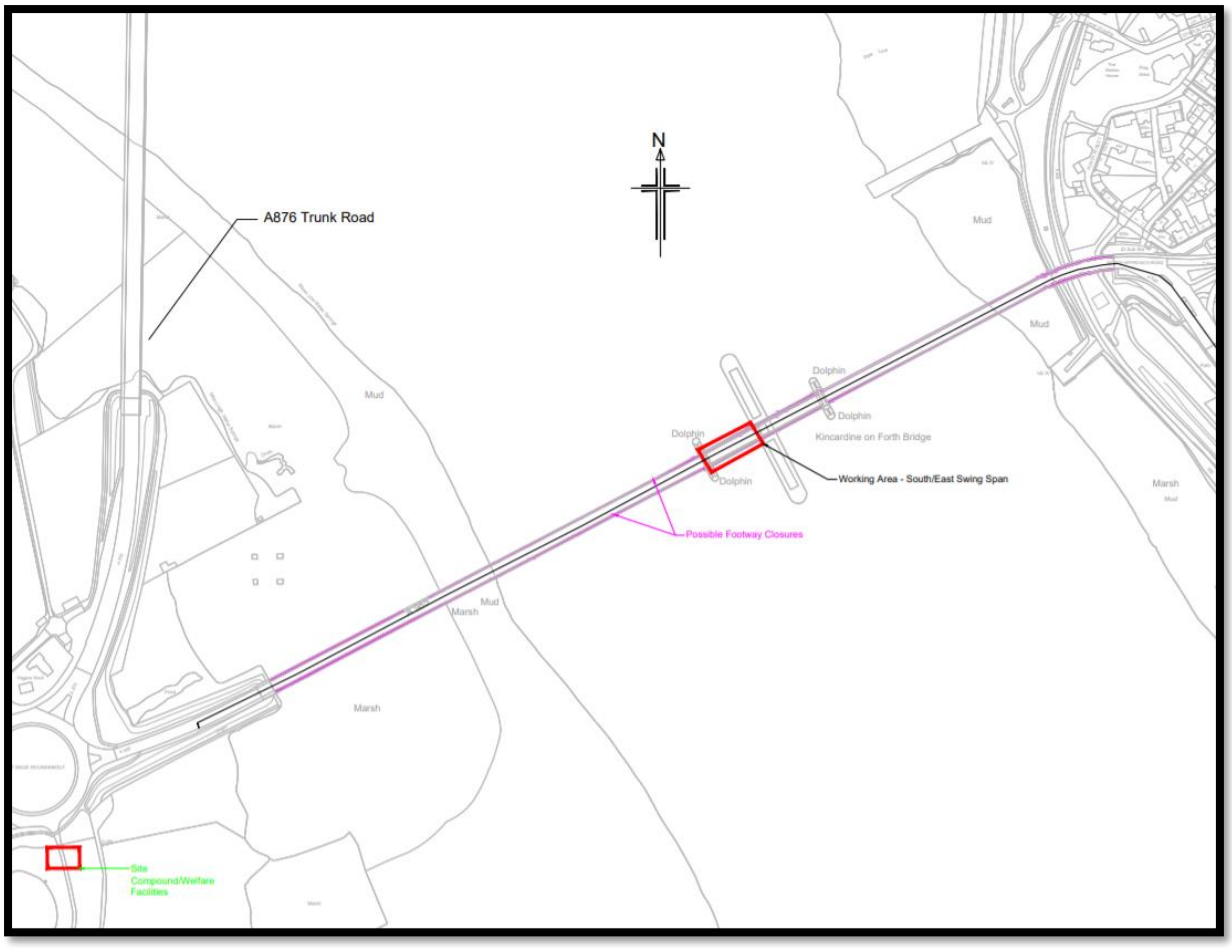

Figure 4: Navigation Lights Location Plan

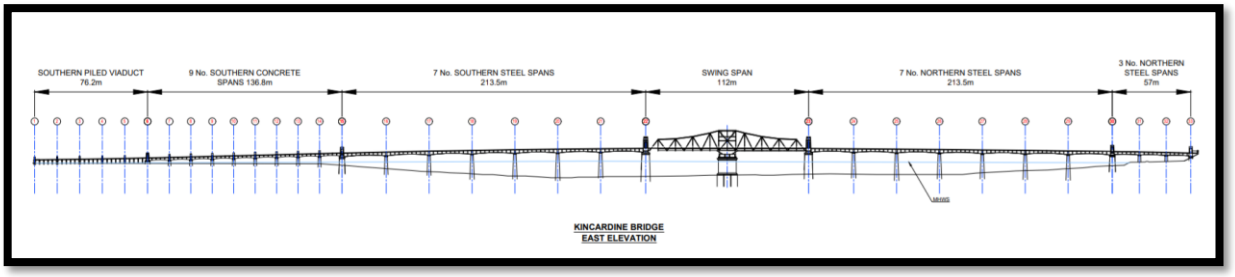

Diagram 1: East Elevation of Kincardine Bridge

Description of Local Environment

Population and Human Health

There are two residential properties at Higgins Neuk approximately 180m and 190m away from the works at their closest point (the SPV) respectively, and approximately 140m and 150m to the north of the proposed compound respectively. There are no commercial properties located within 300m of the western side of the proposed works. There are numerous residential properties within 300m of the eastern side of the proposed works located within the town of Kincardine, in addition to several

commercial properties including The Auld Hoose, The Railway Tavern and Co-op Food.

Planning permission has been granted for the demolition of an existing kiosk and the erection of a petrol filling station and associated kiosk adjacent to the A876 and within 300m of the western side of the proposed works (P/20/0398/FUL) (Falkirk Council, 2021). The West of Fife Enhancement (WOFE) Project comprises proposed connectivity improvements to the existing railway network between Alloa Station and Longannet. Fife Council provided a formal EIA Screening opinion (20/02427/SCR) which concluded that an EIA would not be required for the proposed development. An application has also been made for the formation of a public park at an area of land located to the south of Riverside Terrace in Kincardine and within 300m of the eastern side of the proposed works (20/03230/FULL) (Fife Council, 2021). Several planning applications for modifications to residential and commercial properties within 300m of the eastern side of the proposed works within Kincardine have also been submitted for approval (20/01176/LBC, 21/00425/FULL, 20/01408/FULL) (Fife Council, 2021).

The Kincardine Bridge has segregated footways either side of the carriageway. Core Path 010/100 (Higgins Neuk to Clackmannanshire Bridge) crosses Kincardine Bridge to the west and connects to the Right of Way CF97 at the south of Higgins Neuk Roundabout. The Right of Way CF97 starts to run south from Higgins Neuk Roundabout and passes adjacent to the existing sustainable urban drainage system (SuDS) pond. At the eastern side of the Kincardine Bridge, both footways connect into Core Path P746/06 (Old Kincardine Power Station loop) and National Cycle Network (NCN) Route 76, leading to the beginning of the Fife Coastal Path. NCN Route 76 crosses the A876 south-west of the Higgins Neuk Roundabout.

The land to the eastern side of Kincardine Bridge is predominantly urban within the town of Kincardine and its associated infrastructure. The land to the western side of Kincardine Bridge is predominantly saltmarsh and non-prime agricultural land (land capable of use as improved grassland and land capable of average production though high yields of barley, oats and grass can be obtained) (Scotland's environment, 2021a).

Noise and Vibration

There are no Candidate Noise Management Areas (CNMA) or Candidate Quiet Areas (CQA) located within proximity to the proposed works (Scotland's environment, 2021b). The existing noise climate is influenced by the traffic on the existing surrounding infrastructure. There are two Annual Average Daily Flow (AADF) count points on Kincardine Bridge which in 2019 calculated the AADF as 12303 of which 6% consisted of Heavy Good Vehicles (Department for Transport, 2019).

Biodiversity

The Firth of Forth Special Protection Area (SPA), Ramsar site and Site of Special Scientific Interest (SSSI) cover the intertidal area and saltmarsh habitats within and adjacent to the western extents of the proposed works.

The biological features for which the SSSI is notified for are: coastlands (maritime cliff, saltmarsh, sand dunes); mudflats and saline lagoons; lowland neutral grassland; fen transition grassland; and species including vascular plants, invertebrates, wintering and breeding birds (NatureScot, 2021).

The SPA is designated for its internationally important population of waders and wildfowl which visit the area during winter, and for Sandwich tern migration (NatureScot, 2021).

The Ramsar site is designated for its non-breeding waterfowl assemblage and passage and non-breeding bird species populations of international importance (NatureScot, 2021).

The site qualifies under Ramsar criterion 5 by regularly supporting waterbirds in numbers of 20000 or more. The site also qualifies under Ramsar Criterion 4 by supporting the waterbird species at a critical stage in their life cycles.

The site qualifies under Ramsar criterion 6 by regularly supporting 1% or more of the individuals in a population of waterbirds.

Immediately downstream of the western side of the proposed works, on the southern bank of the estuary, is Skinflats Royal Society for the Protection of Birds (RSPB) Reserve which encompasses saltmarsh and mudflat habitats, offering important bird habitat particularly for over-wintering and passage birds including migrant and wintering wildfowl, pink-footed geese and waders. The vast majority of the reserve is situated within the Firth of Forth SPA, SSSI and Ramsar sites boundary.

The following Invasive Non-Native Species (INNS) have been recorded within 5km of the proposed works in the past 10 years under CC-BY and OGL licences (NBN Atlas, 2021):

- Eastern grey squirrel (*Sciurus carolinensis*)
- rhododendron (*Rhododendron sp*.)
- Japanese knotweed (*Reynoutria japonica*)

The site of the proposed works has been surveyed as part of the A985 Kincardine Bridge Refurbishment: Piled Viaduct Replacement Environmental Impact Assessment Report (EIA Report). Ecological constraints identified during these surveys have been considered in regard to the proposed works.

The A985 Kincardine Bridge Refurbishment: Piled Viaduct Replacement EIA Report also identified that sea lamprey (*Petromyzon marinus*), river lamprey (*Lampetra fluviatilis*), European eel (*Anguilla anguilla*), sea trout, sparling and other migratory and non-migratory fish use the area around Kincardine Bridge (Transport Scotland, 2020). Occurrences of grey seals and harbour seals are relatively uncommon in the vicinity of the Kincardine Bridge, with the closest designated haul-out site over 30km downstream. Occurrences of cetaceans are rare around the Kincardine Bridge.

Landscape

Either end of the Kincardine Bridge is located within a different Landscape Character Type (LCTs) however the majority of the proposed works (over the Firth of Forth) are not located within a LCT. The western extent of the proposed works encroaches into Carselands LCT which has the following key characteristics:

- 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 international importance for nature conservation.
- Importance of Carse of Forth open farmland for flocks of wintering geese.
- Open views across carse accentuated by consequent dramatic contrast with the adjacent escarpments of the Ochils and Fintry, Gargunnock and Touch Hills.

The eastern extent of the proposed works encroaches into Coastal Flats – Fife LCT which has the following key characteristics:

- Flat, low-lying, open, large scale, exposed coastal landscapes at sea level.
- Intensively cultivated, geometrically laid out, large to medium scale, predominantly arable fields or forests with rectilinear, fenced enclosures or without enclosure.
- Variety of other land uses, particularly industrial and other built developments, golf courses and other grasslands.
- Slightly sinuous or angular roads raised above the fields with stone dykes or open sides.
- Isolated, scattered or regularly spaced farmsteads, conspicuous due to lack of screening, in contrast to the designed landscapes which are well screened by policy planting and shelterbelts.
- Straight ditches, sea walls and flood banks with small bridges.
- Conspicuous landmarks in the flat landscape, such as the large hotels at St Andrews, docks and harbours.
- Coastal landscape character always influenced by the sea and views of the sky and the sea.

- Typically dominated either by the areas of development or the coast.
- Away from the urban areas and forestry it is a large scale, open (and in high winds very exposed), simple, flat, balanced landscape with varied textures and colours and slow movement.
- In the plantations it is a small scale, confined, uniform, tended, very calm and sheltered landscape with straight lines, simple patterns and little variation in colours or textures.
- Seaward views are invariably extensive and may be extensive across the Flats themselves. Landward, views are generally towards the Coastal Cliffs, Coastal Braes, Coastal Hills - Fife or Coastal Terraces - Fife.

The land surrounding the proposed works lacks any dense or high vegetation with no woodland registered on the Ancient Woodland Inventory Scotland and no trees on the Native Woodland Survey of Scotland within 300m of the proposed works. The proposed works are not within an area designated as a National Park of National Scenic Area.

Geology and Soils

The vast majority of the proposed works are suspended above the Firth of Forth which lacks superficial geology. The superficial geology at either side of Kincardine Bridge is characterised as reclaimed intertidal deposits of silt and clay from the intertidal zone. Bedrock geology at the site of the proposed works is composed of Carboniferous sedimentary rock of the Passage Formation and Lower Coal Measures Formation. The Passage Group is a cyclic formation which directly underlies the proposed works, consisting primarily of sandstones and seatearths. The Scottish Lower Coal Measures Formation consists of Sandstone, siltstone and mudstone in repeated cycles that most commonly coarsen upwards, but also fine upwards locally, with seatclay or seatearth and coal at the top and underlies the viaducts at either side of Kincardine Bridge.

The primary soil type surrounding the western side of Kincardine Bridge is saltings (intertidal deposits) derived from saltmarsh, marine and estuarine alluvial deposit material. The eastern side of Kincardine Bridge is located on built-up land and lacks a primary soil type (Scotland's environment, 2021a).

The western extent of Kincardine Bridge falls within the Firth of Forth SSSI. The Firth of Forth SSSI covers an extensive coastal area located on the east coast of Scotland, stretching from Alloa to Crail on the north shore and to Dunbar on the south shore. Bedrock features designated within the SSSI include Stratigraphy of the Lower and Upper Carboniferous. The SSSI is also designated for coastal geomorphology and quaternary deposits although these are not located within 300m of the proposed works.

There are no Geological Conservation Reviews (GCR) within 300m of the proposed works.

Road Drainage and the Water Environment

Kincardine Bridge is directly adjacent to both the Upper Forth Estuary (SEPA ID: 2000437) and the Middle Forth Estuary (SEPA ID: 200436). The Upper Forth

Estuary is 9.7km^2 and is designated as a heavily modified water body on account of physical alterations that cannot be addressed without a significant impact from an increased risk of subsidence or flooding. The Middle Forth Estuary is 38.2 km2 and is designated as a heavily modified water body on account of physical alterations that cannot be addressed without a significant impact on navigation and from an increased risk of subsidence or flooding (SEPA, 2021a).

The transitional water bodies both have an overall status of 'Moderate ecological potential' and overall ecology of 'Moderate'. The physico-chemical status for both water bodies is classified as 'Good' (SEPA, 2021a). The intertidal area (between Mean Low Water Springs (MLWS) and Mean High Water Springs (MHWS)) of both water bodies form part of the Firth of Forth SPA, SSSI and Ramsar site.

The proposed works are located within the Airth groundwater waterbody (SEPA ID: 150441) which SEPA classified as having an overall status of 'Poor' in 2018 (SEPA, 2021a).

There are small scattered areas of medium surface water flood risk ((0.5% Annual Exceedance Probability (AEP) 200-year flood event)) adjacent to either side of Kincardine Bridge. However, the majority of the area surrounding Kincardine Bridge including the Firth of Forth and its banks has a high risk of coastal flooding (10% AEP, 10-year flood event) (SEPA, 2021b).

Air Quality

The proposed works are not located within an AQMA with the closest being Grangemouth AQMA located 4.2km to the south. Four air quality monitoring stations are located within Grangemouth which at the time of writing were reporting a Low (Index 1) pollution level which includes PM2.5, PM10, nitrogen dioxide, sulphur dioxide, and nitrogen oxides (Scotland's environment, 2021d).

Existing air quality is primarily influenced by the traffic using the A876, A985, the local road network in Kincardine and Kincardine Bridge.

There are two residential properties at Higgins Neuk located approximately 180m and 190m away from the works at their closest point (the SPV) respectively, and approximately 140m and 150m to the north of the proposed compound respectively. There are also several properties within 300m of the eastern side of the proposed works located within the town of Kincardine, in addition to several commercial properties including The Auld Hoose, The Railway Tavern and Co-op Food.

Climate

The Climate Change (Scotland) Act 2009 creates mandatory climate change targets to reduce Scotland's greenhouse gas emissions. BEAR Scotland have a Carbon Management Policy in place with the core aim of reducing the carbon footprint that the company measures and reports annually.

Material Assets and Waste

The SPV propping system repairs may potentially require consumption of 12m^3 of concrete, or a quantity of steel protection paint to be determined, depending on the

working method chosen. A negligible amount of rusted/corroded steel waste and paint waste may potentially arise from the SPV propping system repairs works.

The concrete repairs to the SPV are anticipated to require consumption of 30m^3 of wet concrete. Approximately 20m^3 of deteriorated concrete waste will be removed and disposed to a licence facility in advance of the pouring the new concrete to stop the deterioration.

A negligible amount of raw material consumption or waste is anticipated to be produced through the installation of the navigation lights.

ACM is expected to be the primary type of waste arising from the ACM removal works on the swing span. However, the quantity of ACM waste cannot be determined at this stage.

All wastes arising from this scheme will be fully disposed to a licenced facility.

Cultural Heritage

The Kincardine Bridge is designated a Category A Listed Building and is located at an historic crossing point of the River Forth. It is a large and important swing bridge that when completed (in the 1930s) it was the largest road bridge in Britain and the largest swing span bridge in Europe (HES, 2021).

There are undesignated cultural heritage assets of known interest within 300m of the proposed works. A number of these are archaeological remains associated with the Kincardine Ship Graveyard and comprise the approximate locations of wooden hulks and vessels, revetments, and other marine remains on the Firth of Forth.

A small extent of the Kincardine Bridge (the eastern end of the bridge) is located within Kincardine Conservation Area.

Vulnerability of the Project to Major Accidents and Disasters

The proposed works are not located within a geographical region that is subject to natural disasters.

On either side of the Kincardine Bridge there are small scattered areas of medium surface water flood risk ((0.5% Annual Exceedance Probability (AEP) 200-year flood event)). However, the majority of the area surrounding the proposed works including the Firth of Forth and its banks has a high risk of coastal flooding (10% AEP, 10-year flood event) (SEPA. 2021b).

The total number of reported road accidents in Falkirk Council in 2019 were 127, accounting for 2.2% of the total reported in Scotland. The total number of reported for accidents in Fife Council in 2019 were 306, accounting for 5.3% of the total reported in Scotland (Transport Scotland, 2019).

Description of Main Environmental Impacts and Proposed Mitigation

Population and Human Health

Construction activities will be contained to the Kincardine Bridge and Scottish Ministers land and will not require any private land acquisition. As such, the proposed works are assessed as having no impacts on residential, commercial, or community land.

The proposed works have the potential to affect road traffic and pedestrian access over the bridge. It is anticipated that the proposed works activities will require temporary single lane overnight closures of the A985 and southbound footway closures to facilitate the delivery of materials and equipment. Temporary northbound footway closures will also be required for material deliveries and the installation of the navigation lighting units.

Specialist access and encapsulation of the swing span control room will also be required for the removal of ACM, and is likely to include the access stairs and upstream footway closure. As a result, no access to members of the public for the whole duration of the ACM works will be permitted.

The Right of Way, Core Path, and National Cycle Network will remain open and require no diversions during the works.

Due to the nature of the works, distance from receptors, and in consideration of the below mitigation, impacts on population and human health are assessed as temporary minor adverse in magnitude. Upon completion of the proposed works no residual impacts are anticipated in relation to population and human health.

Mitigation proposed:

- Any changes to the proposed programme of construction should be appropriately advertised via the Traffic Scotland website.
- Traffic management will be appropriately designed in line with best practice for vehicular and non-vehicular travellers. Traffic management will allow for the safe provision of vehicular and non-vehicular travellers during the works and will limit disruption to designated non-vehicular routes in the surrounding area.

Noise and Vibration

Construction activities associated with the proposed works have the potential to cause noise and vibration impacts through the use of equipment, as well as through the use of access platforms and construction vehicles for the proposed activities. No noisy activities are expected at the compound. The works are anticipated to take place between 08:00 and 17:00. Given the proximity to sensitive receptors, nature of the works, and in consideration of the below mitigation, the proposed works impacts on noise levels throughout the construction period are assessed to be temporary

negligible adverse in magnitude. Upon completion of the proposed works no residual impacts are anticipated in relation to noise.

Mitigation proposed:

- All works will adhere to Best Practicable Means (BPM), in accordance with Section 72 of the Control of Pollution Act 1974.
- On-site construction tasks should be programmed to be as efficient as possible, with a view to limiting noise disruption to local sensitive receptors.
- All plant, machinery and vehicles will be switched off when not in use.
- All plant will be operated in such a way that minimises noise emissions and will have been maintained regularly to the appropriate standards.
- Where fitted, and where permitted under Health and Safety requirements, white noise reversing alarms should be utilised during construction.

Biodiversity

No vehicular access to the saltmarsh will be required and operatives will access the areas where the concrete repairs are to take place only i.e., under the footprint of the SPV. The majority of the works are to be conducted during daytime working hours (08:00 to 17:00), with the exception of potential materials to be delivered during the night-time period. The proposed works have the potential to cause impacts on local biodiversity and environmentally protected sites within, and adjacent to, the works footprint.

The proposed works have the potential to cause noise and visual disturbance impacts to the qualifying interests of the SPA, Ramsar and SSSI. This disturbance would be caused by the installation and removal of access systems and platforms, operation of machinery/tools used during the works, lighting and presence of personnel on and adjacent to the Kincardine Bridge. However, the disturbance will be localised working areas, the compound, and their immediate surrounding areas.

The proposed works will not require any vehicular access to the saltmarsh area, and the only access to the saltmarsh required will be for operatives to access the area under the SPV for the SPV propping system repairs and the SPV concrete repairs. Works within the intertidal area may result in localised fragmentation/temporary loss of habitat for qualifying interests of the SPA, especially those which rely on this habitat over winter. However, as access to the saltmarsh as part of the proposed works will be made on foot only, and will be very temporary in nature, the area of habitat temporarily unavailable to qualifying interests of the SPA over winter is likely to be negligible.

The proposed works also have the potential to result in disturbance to otter, and any night-time working could cause disturbance to foraging and commuting otter adjacent to the site. The proposed works require a disturbance licence to be obtained from NatureScot prior to any mobilisation on site.

The proposed works, particularly any night-time works required for the delivery of materials and associated construction lighting, also has the potential to result in disturbance to foraging and commuting bats.

Given the short-term duration, nature of the works, and in consideration of the below mitigation, the proposed works impacts on biodiversity throughout the construction period are assessed to be temporary minor adverse in magnitude. Upon completion of the proposed works no residual impacts are anticipated in relation to biodiversity.

Mitigation proposed:

- The Contractor will utilise a Site Environmental Management Plan (SEMP), which will detail the mitigation to be implemented and how this will be monitored. The SEMP will include best practice construction methods and include the use of appropriate pollution controls (i.e., Guidance for Pollution Prevention (GPPs)) and removal of all loose materials from the intertidal area.
- A suitably qualified Ecological Clerk of Works (ECoW) will be appointed by the Contractor. The ECoW will:
    - provide ecological support to the Contractor during the proposed works and ensure the ecological mitigation within the SEMP is adhered to.
    - supervise and advise on the placement of noise and visual screens around the compound.
    - be present on site during daytime inspections to observe birds' reactions to the proposed works to identify if there is significant disturbance. If significant disturbance is identified, works will cease and appropriate mitigation will be proposed and discussed with NatureScot. Further mitigation could include: extending the "soft-start" process; amendments to lighting plans; and use of additional screening.
- The proposed works may require working during the hours of darkness to facilitate the delivery of materials only. The Contractor will provide a construction lighting plan and method statement detailing the specific mitigation requirements with regards to lighting during the proposed works. Mitigation will include, but will not be limited to, measures to avoid light spill/reflections and avoidance of white-blue spectrum and high UV emitting lighting, to protect SPA/Ramsar qualifying interests roosting adjacent to the bridge and foraging/commuting bats. Published guidance on lighting (e.g., Institution of Lighting Professionals (2011), The Royal Commission on Environmental Pollution (2009) and Bat Conservation Trust and Institution of Lighting Professionals (2018)) will be adhered to. The lighting design will be developed specifically to prevent illuminating sensitive habitats including saltmarsh, watercourses and woodland edges, particularly to the southeast of the

piers where large numbers of pink-footed geese were recorded roosting during surveys (see Figure 9.5 of A985 Kincardine Bridge Refurbishment: Piled Viaduct Replacement EIA Report). Where this is not possible the Contractor will agree any exceptions with the ECoW.

- To reduce disturbance to roosting pink-footed geese, working during the hours of darkness during September to March will be avoided as far as practicable. Standard construction hours will be 08:00-17:00 (Monday to Friday), with exceptions for certain activities. Some working during the hours of darkness will likely be unavoidable during winter. Lighting management will be detailed within a construction lighting plan, as discussed above.
- If any night-time work coincides with severe winter weather (i.e. Alert Level 3 as defined by the Met Office as mean daily temperature of less 2^{o}C and/or widespread ice and heavy snow (Met Office, 2021)), working methods should be agreed with the ECoW before they proceed to protect roosting birds from additional physiological stress during harsh winter conditions.
- The proposed works, specifically on the SPV and southern span, will be timed, as far as practicable, to avoid peak times when qualifying interests are present, specifically undertaking as much of the work as practicable out with the winter period (September to March).
- The Contractor will employ “soft-start” techniques will be used 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 allow birds (and other animals) to move away from the disturbance.
- An otter disturbance licence must be provided by NatureScot prior to the works. A copy will be kept on site at all times and all conditions within will be strictly adhered to.
- The footprint of the working area will be minimised as far as possible and vehicles, plant and personnel will be constrained to this area through the use of temporary barriers to minimise the damage to habitats located within and adjacent to this footprint. The working area for the proposed works will comprise the bridge structure itself and an area under the bridge required to facilitate repairs to the SPV.
- The access track and working areas on the saltmarsh will be created through use of geotextile mats. This will prevent construction materials sinking into, and machinery/vehicles compacting the saltmarsh.

- On completion of the works all access tracks and working platforms will be removed in their entirety from the saltmarsh. There will be no materials stored on the saltmarsh or below Mean High Water Springs (MHWS) during the works.
- The positioning of works compounds, storage areas, temporary access tracks and other works, should avoid otter commuting routes as far as practicable.
- All equipment stored on site and the immediate area will be checked at the start of each workday to ensure otters or other protected species are not present. Any storage containers/shed within the compound will be secured overnight to prevent exploration by otter.
- The site supervisor will brief all site personnel as part of the induction process with regard to the potential presence of protected species and sensitive habitats, the mitigation measures, their legal obligations and any licensing conditions imposed on them.
- Toolbox Talks as appended to the SEMP will be given to all site personnel prior to any works commencing and will provide details of all protected species that have the potential to be impacted by the works (including bats, breeding birds and otters) and any mitigation measures required to prevent disturbance.
- Any sightings of protected species should be reported to Jacobs Environmental Team. Should a protected species be noted during construction, works should temporarily halt until the Jacobs Environmental Team can advise.

Landscape

Construction activities associated with the proposed works including the use of vehicles and machinery, working areas and personnel, will result in a temporary impact to the landscape and views to and from the Firth of Forth. No vegetation is expected to be removed as a result of the proposed works. Due to the nature and duration of the works, impacts on landscape are assessed as temporary negligible adverse in magnitude. Upon completion of the proposed works no residual impacts are anticipated to local landscape.

Geology and Soils

Construction activities, including gaining access to concrete and steel spans, are mostly located within the existing Kincardine Bridge. No vehicular access to the saltmarsh area will be required., and operatives will access the areas where the concrete repairs are to take place only, i.e., under the footprint of the SPV. As a result, there is no potential to disturb geology or soils.

Upon completion of the proposed works no residual impacts are anticipated on geology and soils.

Road Drainage and the Water Environment

Construction activities are located directly above the Firth of Forth and in the intertidal area. Potential changes in water quality from pollution events (either by accidental spillage of sediments / particulate matter / chemicals / fuels or by mobilisation of these in surface water caused by rain or tidal movements) during works have the potential to have an indirect effect on the Firth of Forth.

Given the nature of the proposed works, and with the implementation of mitigation detailed below, the proposed works impacts on the water environment are assessed as negligible. Upon completion of the proposed works no residual impacts are anticipated on the water environment.

Mitigation proposed:

- No materials are to be stored below the Mean High Water Springs level during the works.
- Monitoring of all works will be undertaken by BEAR Scotland Engineer to ensure works are undertaken in compliance with approved method statements and best practice.
- Works should adhere to the standard set out in SEPA Pollution Prevention Guidelines (PPGs), Guidance for Pollution Prevention (GPPs) and the General Binding Rules (GBR) set out in the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR).
- Specific documents refer to: GPP 5: Works and maintenance in or near water; PPG 7: Safe storage – The safe operation of refuelling facilities; PPG 22: Incident response – dealing with spills; PPG 1: Understanding your environmental responsibilities – good environmental practices; PPG 6: Working at construction and demolition sites; and GPP 21: Pollution incident response planning.
- A spillage control procedure must be in place and all staff should be trained on how to deal with spillages.
- Suitable spill kits must be present on site and staff should know how and when to use them.
- Storage of Control of Substances Hazardous to Health (COSHH) material, oil and fuel containers should be distanced more than 10m away from any watercourses.
- If required, a designated refuelling area must be identified. Fuel bowsers should be stored on an impermeable area and be fully bunded. This should be distanced more than 10m from any watercourses.

- Generators and static plant may have the potential to leak fuel and / or other hydrocarbons and must have bunding with a capacity of 110%. If these are not bunded then drip trays should also be supplied beneath the equipment with a capacity of 110%.
- During refuelling of smaller mobile plant, a funnel must be used, and drip trays must be in place. Care must be taken to reduce the chance of spillages. Spill kits must be quickly accessible to capture any spills should they occur. The ground / stone around the site of a spill must be removed, double bagged and taken off site as special contaminated waste.
- All spills must be logged and reported. In the event of any spills into the water environment, all works will stop, and the incident be reported to the project manager and the Jacobs Environment Team. SEPA must be informed of any such incident as soon as possible and within 24 hours at the latest.
- All plant and equipment must be regularly inspected for any signs of damage and leaks. A checklist must be present to make sure that the checks have been carried out.
- For the ACM removal works, working areas must be fully encapsulated, including the full encapsulation of the control room.

Air Quality

Construction activities associated with the proposed works have the potential to cause local air quality impacts through the production of dust and particulate matter during investigative works to the concrete and steel spans, as well as through the increase of emissions from plant and construction vehicles for all proposed activities. Given the proximity to sensitive receptors, nature of the works, and in consideration of the below mitigation, the proposed works impacts on local air quality levels throughout the construction period are assessed to be negligible adverse in magnitude. Upon completion of the proposed works no residual impacts are anticipated to local air quality.

Mitigation proposed:

- All plant, machinery and vehicles associated with the scheme must be maintained to the appropriate standards and must switch off their engines when not in use.
- Material stockpiles will be reduced as much as is reasonably practicable.
- Materials that have a potential to produce dust and particulate emissions will be removed from site as soon as possible, unless being re-used on site.

- Cutting, grinding and sawing equipment will be fitted or used in conjunction with suitable dust suppression techniques e.g. water spray or local exhaust ventilation system that fits directly onto tools.
- For the ACM removal works, working areas must be fully encapsulated, including the full encapsulation of the control room.

Climate

During works there is potential for impacts as a result of the emission of greenhouse gases through the use of vehicles and machinery, material use and production, and transportation of materials to and from site.

However, taking into account the nature and scale of the works and the following mitigation measures, the risk of significant impacts to climate is considered to be low.

- Local contractors and suppliers will be used as far as practicable to reduce fuel use and greenhouse gas emitted as part of the works.
- BEAR Scotland will adhere to its Carbon Management Policy.

Material Assets and Waste

There will be limited consumption of materials and natural resources or generation of waste associated with the proposed works. Where possible, materials will be reused on site and the handling of any waste will adhere to the waste hierarchy. Mitigation for material assets and waste will be provided in a SEMP. Environmental impacts from the use of materials and natural resources and disposal of waste during the construction phase are not expected to be significant.

Cultural Heritage

The proposed works will mostly be restricted to the existing Kincardine Bridge, with access to the saltmarsh area to be taken by foot and confined to under the footprint of the SPV only. The elements identified for removal as part of the decommissioning works are considered to impose low historical interest. As such, the proposed works are assessed as having no risk to disturb or damage previously undiscovered items of cultural interest or other cultural items not associated with category A listed Kincardine Bridge.

BEAR Scotland will consult with the Local Authority regarding the programme of works and potential listed building requirements would require to be adhered to.

The SEMP will detail required cultural heritage mitigation. With mitigation in place no significant adverse cultural heritage impacts are anticipated.

Vulnerability of the Project to Major Accidents and Disasters

A SEMP will be put in place which will set out a framework to reduce the risk of adverse impacts from construction activities on sensitive environmental receptors. The SEMP will set out the commitments and constraints and will identify the procedures and measures that will be used to manage and control these aspects. The Contractor will be required to comply with all conditions of the SEMP.

Due to the location of the SPV propping system repairs and the SPV concrete repairs works below MHWS, there is potential for flooding impacts for the proposed works. However, the works will be timed appropriately during lower tidal states to avoid potential flooding and pollution.

The proposed works require limited single lane carriageway and footpath closures at night-time. Traffic is expected to be low at these times and appropriate traffic management will be in place to ensure any potential impacts on traffic accident risk are negligible.

Considering the above, it is considered that the residual impacts of the scheme on the environment as a result of risks of major accidents and disasters is negligible.

Cumulative Effects

The proposed works on its own is not anticipated to have significant effects.

The Kincardine Bridge SPV Replacement scheme (hereafter the 'SPV Replacement scheme') is scheduled to commence in the second half of 2022 with an estimated construction period of up to 24 months. The proposed works are scheduled to be completed prior to the commencement of the SPV Replacement scheme. The low impact and small scale nature of the proposed works will be fully mitigated and there is no cumulative effect anticipated with the SPV Replacement scheme.

A separate programme of maintenance works is proposed for the Kincardine Bridge and a Marine Licence application (covering a 7-year period) is in preparation. In addition to routine maintenance activities over the 7-year period, specific activities such as repairs to the 50ft concrete spans, bridge drainage replacement, steelwork repairs and refurbishment of the timber jetties are proposed, with indicative timescales covering 2023-2026. The proposed works will be completed prior to the commencement of the maintenance works under the 7-year licence.

Due to the nature of the proposed works no cumulative effects are anticipated with any planning applications / developments within 300m.

Overall, it is unlikely that the proposed works will have a significant cumulative effect.

Assessments of the Environmental Effects

As detailed in 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. A Habitat Regulations Appraisal (HRA) has been prepared for the proposed works and has concluded that no likely significant effects (LSEs) are anticipated on the Firth of Forth SPA, Firth of Forth Ramsar, and River Teith SAC.

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 part in the Firth of Forth SPA, SSSI and Ramsar site which are sensitive areas 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:

- The works consist of repair and maintenance of the existing Kincardine Bridge.
- The works are required in order to repair and replace poor condition or broken features of Kincardine Bridge to allow for the safe continual operation of the bridge.
- The works are temporary and short-term and are anticipated to be completed during daytime working hours (08:00 to 17:00). Night-time working may be required for the delivery of materials only.
- There will be limited consumption of materials and natural resources or generation of waste associated with the works.

Location of the scheme:

- The scheme is located within a relatively small area within the Firth of Forth SPA, SSSI and Ramsar site and the potential impacts are highly localised. An HRA for the proposed works concluded that no LSEs are anticipated on these sensitive sites as a result of the works.

Characteristics of potential impacts of the scheme:

- As the works are restricted to maintenance works only, the impacts of the scheme on the environment as a result of the risks of major accidents and disasters is negligible.
- With good practice pollution prevention measures implemented on site, there is a negligible risk of a pollution event, and any potential impacts of the works are expected to be temporary, short-term, and limited to the construction phase.
- Measures will be in place to ensure appropriate removal and disposal of waste.
- No significant impacts on the environment are expected during the operational phase as a result of the works.

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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Published by Transport Scotland, February 2022

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