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# KINCARDINE TOWER XD130 SCHEME MARINE LICENSE APPLICATION

Environmental Assessment Report





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## Environmental Assessment Report

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# EXECUTIVE SUMMARY

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This report presents a baseline of environmental aspects surrounding the location of the proposed development. An assessment of potential environmental impacts which might arise as a result of the proposed development has been undertaken by competent professionals based on certain assumptions relating to the development's construction and operation. The works involve the repair of existing structures within their existing footprint. There will be no changes to their existing operation. Recommended mitigation methodology which are in accordance with best practice have also been presented. As such, this report concludes that no further assessment is required as no significant residual effects are anticipated. This is presented and summarised in Table 7-1.



## Glossary of Acronyms

AWI – Ancient Woodland Index

AQMA – Air Quality Management Area

BPM – Best Practice Manual

CEMP – Construction Environment Management Plan

EAR – Environmental Assessment Report

ECoW – Ecological Clerk of Works

EIA – Environmental Impact Assessment

MD-LOT – Marine Directorate Licensing Operations Team

MHWS – Mean High Water Springs

MPZ – Marine Protected Zone

MS-LOT - Marine Scotland Licensing Operations Team

PEA – Preliminary Ecological Appraisal

SAC - Special Area of Conservation

SEPA – Scottish Environmental Protection Agency

SPA – Special Protection Area

SPEN – Scottish Power Energy Network

SSSI – Site of Special Scientific Interest

TPO – Tree Preservation Order

WFD – Water Framework Directive

# 1 INTRODUCTION

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## 1.1 PURPOSE OF THIS REPORT

This Environmental Assessment Report (EAR) has been prepared to support the Marine Licence application and will describe and summarise the environmental baseline and environmental assessments around the Kincardine Tower XD130 and make recommendations for appropriate mitigation measures.

## 1.2 PROJECT AREA

Kincardine is a town located on the north shore of the Firth of Forth in Fife, Scotland. Located approximately 12.5 kilometres (km) southeast of Stirling and approximately 27 km northwest of Edinburgh. This town is a former hub of shipbuilding and is found where the Firth of Forth turns north, narrows, and is crossed by the Kincardine Bridge.

The Firth of Forth is a designated Ramsar Site, Site of Special Scientific Interest (SSSI), and Special Protected Area (SPA).

Kincardine Tower XD130 was constructed in the early 1960s and is an integral element of the Scottish Power Energy Networks (SPEN) system. It is located in the Firth of Forth adjacent to the Kincardine Substation and Clackmannanshire Bridge approximately 650m west of densely populated residential areas at its nearest point.

**Figure 1-1 - Red Line boundary of Tower and Access**



\\uk.wspgroup.com\central\_data\Projects\70081\00\70081206 - Kincardine Tower XD130 Foundations and Access Bridge\00 Prospect\Marine Licence\Design\GIS\MXD\70081206-WSP-FG-OM-



Previous surveys and investigations recorded significant levels of deterioration to these structures, and it was deemed necessary to undertake a further review and repairs. WSP was commissioned by SPEN to produce a remedial works solution to the concrete foundations and access structures of Tower XD130 to maintain their serviceability for a period of 15 years.

## POLICY BACKGROUND

The Site is located within the boundary of Fife Council. The Fife Shoreline Management Plan 2011<sup>1</sup> sets out the policy for Kincardine (Table 1-1).

**Table 1-1 – Kincardine Shoreline Management Plan**

Policy	Preferred Policies		
	Years 0-20	Years 20-50	Years 50-100
Shoreline Management Plan 2 (01)	Hold the Line (Protecting rail link and power station)	Hold the Line (Protecting rail link and power station)	Hold the Line (Protecting rail link and power station)

## POLICY FRAMEWORK

Marine Planning was introduced in Scotland through the Marine (Scotland) Act 2010. The adoption of the first National Marine Plan provides a comprehensive overarching framework for all marine activity in Scottish waters. It enables sustainable development and use of the marine area in a way which protects and enhances the marine environment whilst promoting both existing and emerging industries. This plan covers the management of both Scottish inshore waters (out to 12 nautical miles) and offshore waters (12 to 200 nautical miles).

The Marine (Scotland) Act 2010 requires that public authorities must have regard to this Plan in taking decisions regarding activities which may impact on the marine area. This Plan therefore provides direction to a wide range of marine decisions and consents made by public bodies.

Proposals should conform with all relevant policies, taking account of economic, environmental and social considerations.

A proportionate approach will be taken when undertaking a marine plan assessment. The level of information required from an applicant will be equal to the level of risk the proposal presents.

## MARINE LICENSING

The Marine (Scotland) Act 2010 provides that a marine licence is required for certain activities carried out within the UK marine area.

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<sup>1</sup> Fife Shoreline Management Plan – Accessed at:  
[https://www.fife.gov.uk/\\_\\_data/assets/pdf\\_file/0020/270461/Fife-SMP-2011-Summary2.pdf](https://www.fife.gov.uk/__data/assets/pdf_file/0020/270461/Fife-SMP-2011-Summary2.pdf)

Marine licences are required for 'licensable marine activities' below mean high water spring tide level and in the waters of estuaries, rivers or channels, so far as the tide flows at mean high water spring tide (MHWS).<sup>2</sup>

As the works occur below MHWS and are considered to fall under 'construction in/over the sea, or on/under the seabed (e.g. breakwaters, piers, land reclamation, submarine cables, outfalls, slipways, bridges, jetties, seaweed farms etc.)', a Marine Licence is required to consent the works from Marine Directorate – Licensing Operation Team (MD-LOT).

## PRE-APPLICATION CONSULTATION

The Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013 ('the Regulations') were laid before the Scottish Parliament on 10 October 2013. They prescribe the marine licensable activities that are subject to pre-application consultation and, in combination with the Marine (Scotland) Act 2010, set out the nature of the pre-application process. The legislation comes into force on 1<sup>st</sup> January 2014 and applies to all relevant marine licence applications submitted to MS-LOT on or after 6 April 2014.

Prospective applicants for marine licences for the following marine licensable activities will be subject to the public pre-application consultation procedure:

- The deposit of a submarine cable into the sea or on or under the seabed from a vehicle, vessel, aircraft, marine structure or floating container, where that cable is over 1853 metres (approx. 1 nautical mile) in length and where it crosses the inter-tidal boundary.
- The deposit of any substance or object into the sea or on or under the seabed from a vehicle, vessel, aircraft, marine structure, floating container or a structure on land constructed or adapted wholly or mainly for depositing solids into the sea for the purposes of reclaiming land, where the area being reclaimed from the sea exceeds 10,000 square metres.
- The construction in or over the sea or on or under the seabed of a bridge, causeway or walkway over 50 metres in length.
- Construction works (other than for a renewable energy structure) in or over the sea or on or under the seabed where the area of the works exceeds 1000 square metres.
- Alteration or improvement of works (other than for a renewable energy structure) in or over the sea or on or under the seabed where the area of those works, as extended, exceeds 1000 square metres. (Though the works exceed 1000 square metres, they are within the footprint of existing structures, so a PAC is not required).
- The construction of a renewable energy structure in or over the sea or on or under the seabed, where the total area in which the structure is to be located exceeds 10,000 square metres.
- The alteration or improvement of a renewable energy structure in or over the sea or on or under the seabed which extends the structure, where the total area in which that structure is to be located to over 10,000 square metres.

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<sup>2</sup> [Marine licensing: overview - gov.scot \(www.gov.scot\)](http://www.gov.scot)



Based on the above and the nature of the Scheme, it is considered that pre-application consultation is not required.

## **ENVIRONMENTAL IMPACT ASSESSMENT**

Certain marine licence or section 36 consent projects require an Environmental Impact Assessment under the relevant EIA Regulations. The relevant EIA regulation that applies to the Proposed Works is The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (relevant to projects from 0-12 nautical miles (nm)).

Most applications for a marine licence will not require an EIA. EIA Screening is the process of determining whether the Proposed Works should be subject to an EIA, by identifying whether it is likely to have significant effects on the environment. The EIA Regulations set out thresholds for Schedule 1 and Schedule 2 developments, where an EIA is always required for Schedule 1 and potentially required for Schedule 2, dependent on the development's size, location or its potential to cause significant environmental effects.

An EIA Screening Opinion was sought from Marine Scotland – Licensing Operations Team (MS-LOT) on 10 December 2024 to determine whether it is considered that there are any significant effects likely to arise from the Proposed Works. They responded with a Screening Opinion on 20 December 2024 which states that the Proposed Works are not considered to fall within schedule 1 or schedule 2 of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and therefore an EIA is not required.

## **RELEVANT PLANNING DECISIONS AND POTENTIAL CUMULATIVE EFFECTS**

Cumulative effects result from multiple actions on receptors and resources over time and are generally additive or interactive (synergistic) in nature. Cumulative effects can also be considered as effects resulting from incremental changes caused by other past, present or reasonably foreseeable actions together with the Proposed Works, which will hereinafter be referred to as the 'Scheme'.

An initial cumulative appraisal has been undertaken to identify consented developments (referred to as 'committed developments') within 2km of the Scheme. Only committed developments of sufficient scale and size are taken forward for consideration within the cumulative appraisal. Sufficient scale and size were taken to include only major planning applications, which includes any application for residential development of between 10 or more dwellings, development of sites over 1 ha or more, and mineral and waste developments, among other things.

Following an initial screening exercise, the following committed developments were identified within 2km of the Scheme:

- Construction of new 400kv substation (Ref: 24/01402/PAN) and ancillary development including access, underground cable, landscaping, drainage and overhead line modifications at the Kincardine North Substation. This application was approved at Planning Committee in June 2024. It is approximately 1.9km from the Scheme.
- Kincardine Power Station Site (Ref: 24/00979/FULL) for erection of aggregate storage building (Class 6) including ancillary welfare unit and formation of car parking/hardstanding with associated loading areas. This application was validated in May 2024 and is awaiting decision. The development activities will be undertaken under the oversight of Coal Mining Risk



Assessment Plan, Dust Management Plan, Flood Risk Assessment, Low Carbon Checklist and Noise Assessment. Approximately 1.9 km from the site.

## 2 PROJECT DESCRIPTION

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### 2.1 OVERVIEW OF THE SCHEME

Kincardine Tower XD130 and the access bridge were constructed in the early 1960s and is an integral element of the SPEN system. It is located in the Firth of Forth adjacent to the Kincardine Substation and Clackmannanshire Bridge.

Previous surveys and investigations recorded significant levels of deterioration to these structures, and it was deemed necessary to undertake a further review and repairs to the structures. WSP was commissioned by SPEN to produce a remedial works solution to the concrete foundations and access structures of Tower XD130 to maintain their serviceability for a period of 15 years.

Based on WSP's surveys and investigations it is recommended that the most economical and practicable solution to meet SPEN's requirements would be to carry out the concrete repairs augmented with sacrificial galvanic cathodic protection.

WSP understands the following works will be needed:

- The areas of spalled and delaminated concrete are removed, and the areas repaired including supplementing corroded rebar as appropriate.
- Sacrificial galvanic cathodic protection is installed within the repairs to extend their life within this extreme environment and reduce the risk of anodic reactions.
- Existing handrail is replaced with a solid section galvanized steel pedestrian guard rail with vertical rails (group P4 parapet) to BS 7818.
- The structure is inspected in accordance with the Design Manual for Roads and Bridges guidance (CS450) with a series of General and Principal Inspections and any further maintenance identified carried out.

Only the installation of cathodic protection and concrete repair are expected to be below the Mean High-Water Springs (MHWS).

## 3 BASELINE ENVIRONMENTAL

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### 3.1 MARINE ENVIRONMENT

The baseline data has been obtained from Marine Scotland's Environment Map (<https://map.environment.gov.scot/sewebmap/>). The Firth of Forth River/estuary, on which the Tower XD130 is situated is a designated Marine Planning Zone (MPZ), as defined by the Town and Country Planning (Marine Fish Farming) (Scotland) Order 2007. The section of the Firth of Forth the Scheme is located on is categorised as a transitional point of the Upper Forth Estuary.

The nearest Historic Marine Protected Area is approximately 30 km east of the Scheme and approximately 2km south of Burntisland.

There are no Marine Consultation Areas within 30 km of Tower XD130.

Pow Burn (Wildlife Site) also flows into the Firth of Forth on the opposite side of the estuary to Tower XD130 (approximately 800 m southwest of the Scheme).

### 3.2 ECOLOGY

An extended Phase 1 Habitat survey was undertaken on the 25 November 2020 and updated on 17<sup>th</sup> April 2023. A further survey was conducted in 2024.

#### STATUTORY DESIGNATED SITES

The surveys recorded that the Firth of Forth is the only statutory designated wildlife site within 1 km of Tower XD130. The Firth of Forth is designated as a Site of Special Scientific Interest (SSSI), Special Protected Area (SPA), and Wetland of International Importance (Ramsar). The boundary of this site is located approximately 400 m northwest of Tower XD130. Marine mammals are highly mobile and wide ranging and therefore designated sites should be considered at a greater distance than 1 km. The closest designated site with a marine mammal listed as a feature of interest or primary reason for designation is the Isle of May Special Area of Conservation (SAC), which is located within the Firth of Forth and is approximately 77 km away from Tower XD13. Five seal haul-out sites, including three breeding colony sites, are present within the Firth of Forth, but do not overlap with the Scheme, with the closest being 29 km away.

The Firth of Forth SSSI is designated for various geological and geomorphological features, intertidal marine, coastal and terrestrial habitats, vascular plants, invertebrates, and breeding passage and wintering birds.

The Firth of Forth SPA is designed for regularly supporting wintering and passage populations of European importance of a number of species of waterfowl and seabird listed on Annex I of the EU Birds Directive. The SPA also qualifies for supporting wintering populations of both European and International importance of migratory waterfowl species and a large overwintering waterfowl assemblage of national importance.

The Firth of Forth Ramsar is similarly important for wintering waders and wildfowl which occur in nationally and internationally important numbers.

The PEA provides a list of qualifying bird populations for the Firth of Forth SSSI, SPA and Ramsar sites.

The Isle of May SAC is designated for grey seal, which are listed as an Annex II species that are a primary reason for selection of this site.

Seal haul-out sites within the Firth of Forth include Inchmickery and Cow & Calves, Inchkeith, Kinghorn Rocks, Craigleith and Fast Castle.

## **NON-STATUTORY DESIGNATED SITES**

Pow Burn and Estuary Wildlife Site is the only non-statutory designated site (wildlife site) within 1 km of Tower XD130 (approximately 800 m southwest of the Scheme).

This site supports a significant extent of saltmarsh and inundation habitat which are locally rare. A wide range of bird species is associated with the intertidal habitat. The site is an important part of the corridor of intertidal habitat along the edge of the Forth estuary and linked to the Firth of Forth SPA.

## **TREE PRESERVATION ORDERS AND ANCIENT WOODLAND**

There are no TPOs or TPO areas that could be impacted by the proposed works within Fife Council and Falkirk Council areas.

A search of Scotland's environment website identified four areas of woodland listed on the Ancient Woodland Inventory (AWI) within 1 km of the Scheme site; the closest of which, Tulliallan Castle Woods, is a long-established woodland of plantation origin located approximately 700 m northeast of Tower XD 130.

## **PROTECTED SPECIES**

An online search identified records of the following protected/notable species within 1 km of the Scheme site; therefore, these species may be present if suitable habitats are found around Tower XD 130:

- Terrestrial mammals including pipistrelle bat (*Pipistrellis* sp.) red squirrel (*Sciurus vulgaris*), brown hare (*Lepus europaeus*), European hare (*Lepus europaeus*) and European hedgehog (*Erinaceus europaeus*).
- A large number of bird species including:
  - Schedule 1 species of Wildlife & Countryside Act 1981 (as amended in Scotland); merlin (*Falco columbarius*), ruff (*Calidris pugnax*), scoup, greenshank (*Tringa nebularia*), and kingfisher (*Alcedo atthis*).
  - Red listed species under the Birds of Conservation Concern 4 (Eaton et al 2015); herring gull (*Larus argentatus*), linnet (*Linaria cannabina*), grasshopper warbler (*Locustella naevia*), grey wagtail (*Motacilla cinerea*), tree sparrow (*Passer montanus*), house sparrow (*Passer domesticus*), shag (*Phalacrocorax aristotelis*), spotted flycatcher (*Muscicapa striata*), starling (*Sturnus vulgaris*), song thrush (*Turdus philomelos*), mistle thrush (*Turdus viscivorus*), curlew, kittiwake (*Rissa tridactyla*), leaser redpoll (*Acanthis cabaret*), ringed plover, skylark (*Alauda arvensis*), twite (*Linaria flavirostris*), whinchat (*Saxicola rubetra*), woodcock (*Scolopax rusticola*), yellowhammer (*Emberiza citrinella*), white-fronted goose (*Anser albifrons*) and lapwing; and
  - Amber listed species under the Birds of Conservation Concern 4 (Eaton et al 2015); teal (*Anas crecca*), mallard, greylag goose (*Anser anser*), barnacle goose (*Branta leucopsis*), bar-tailed godwit, meadow pipit (*Anthus pratensis*), house martin (*Delichon urbicum*), reed bunting

(*Emberiza schoeniclus*), snipe (*Gallinago gallinago*), oystercatcher, common gull (*Larus canus*), black-headed gull (*Chroicocephalus ridibundus*), glaucous gull (*Larus hyperboreus*), great black-backed gull (*Larus marinus*), willow warbler (*Phylloscopus trochilus*), dunnoek (*Prunella modularis*), bullfinch (*Pyrrhula pyrrhula*), kestrel (*Falco tinnunculus*), mute swan (*Cygnus olor*), stock dove (*Columba oenas*), dipper (*Cinclus cinclus*), swift (*Apus apus*), pink-footed goose, wigeon, common sandpiper (*Actitis hypoleucos*), dunlin, eider, gannet (*Morus bassanus*), grey plover, guillemot (*Uria aalge*), knot, redshank, redstart (*Phoenicurus phoenicurus*), sanderling (*Calidris alba*), sandwich tern, shelduck, turnstone, spotted redshank (*Tringa erythropus*), shoveler (*Spatula clypeata*), short-eared owl (*Asio flammeus*) and tawny owl (*Strix aluco*).

- Amphibians including palmate newt (*Lissotriton helveticus*).
- Marine mammals including harbour seal (*Phoca vitulina*), grey seal (*Halichoerus grypus*), harbour porpoise (*Phocoena phocoena*) and common dolphin (*Delphinus delphis*).

The Tayside and Fife Raptor Study Group provided information on an active peregrine breeding site at Tower XD 130. A minimum of two chicks had fledged in 2020 and a minimum of one in 2019. This pair may also use the Kincardine Bridge as an alternate site. There are no other raptor breeding sites within proximity of the tower.

A bird survey conducted from a vantage point at a small bridge over to a platform under the Clackmannanshire Bridge in June 2016 identified an occupied carrion crow (*Corvus corone*) nest located on a stair platform just over halfway up the Tower XD130. Other species recorded during the survey included black-headed gull, chaffinch (*Fringilla coelebs*), chiffchaff (*Phylloscopus collybita*), goldfinch (*Carduelis Carduelis*), grey heron (*Ardea cinerea*), herring gull, mallard, oystercatcher (breeding), pheasant (*Phasianus colchicus*), starling, whitethroat (*Sylvia communis*) and yellowhammer. During a subsequent visit to retrieve survey equipment a raptor, likely kestrel (*Falco tinnunculus*) or [Redacted]

An otter survey carried out along the edge of the Firth of Forth estuary [Redacted]

[Redacted]

No signs of raptor activity were observed near the large nest in the centre of the middle cross-arm of this tower XD130 during the vantage point survey undertaken in May 2018.

Grey and harbour seal have been observed in the river near to tower XD130, with records showing presence of both species adjacent to the tower and numerous reports upstream of Kincardine (Forth Marine Mammals, 2024; NBN Atlas, 2024a; 2024b). Common dolphin have been recorded at Kincardine in groups of up to six individuals, as well as unidentified dolphin species (Forth Marine

Mammals, 2024). Stranded common dolphin, harbour porpoise, pilot whale, Sowerby's beaked whale, fin whale and northern bottlenose whale have also been recorded nearby to Kincardine (Brownlow et al., 2014; SMASS, 2024). Other marine mammals have been recorded within the Firth of Forth; however sightings are predominantly to the east of Queensferry Crossing road bridge and records as far upstream as Kincardine are often associated with strandings events and do not represent the regular occurrence of cetaceans in the area (Brownlow et al., 2014; Forth Marine Mammals, 2024; SMASS, 2024).

## **HABITATS**

### **Scrub (dense continuous and scattered)**

Patches of dense bramble-dominated scrub is scattered within semi-improved neutral grassland near tower XD130.

### **Semi-improved neutral grassland**

Semi-improved neutral grassland towards north-east of tower XD130 occurs on sloping ground and is unmanaged with a tall dense sward. This grassland is dominated by false-oat grass (*Arrhenatherum elatius*) with other grass species recorded including cock's-foot grass, Yorkshire fog and couch (*Elytrigia repens*). Large patches of tall ruderals and low-lying bramble scrub are present within the grassland at tower XD130.

### **Running Water**

Tower XD130 is situated in the River Forth that begins to widen into an estuary, the Firth of Forth. Here the river is tidal with slow and brackish water. Riverbanks and substrate are mainly composed of alluvial silt and sand, and boulders, although the northern bank has a sloping masonry part of which is above MHWS.

### **Intertidal boulders / rocks with brown algal bed**

A narrow strip of boulders/rocks colonised by brown algae is present below the sloping masonry of River Forth northern bank at tower XD130.

### **Bare ground/hardstanding**

An area of a concrete platform and a bridge to this platform is present at tower XD130. Sloping masonry is present on the River Forth northern bank at tower XD130.

The habitats within the vicinity of tower XD130 are generally of limited value for biodiversity and occur commonly within the wider landscape. However, the watercourses, in particular the River Forth and Pow Burn, provide important habitat for marine and semi-aquatic fauna.

## **3.3 AIR QUALITY**

The nearest Air Quality Management Area (AQMA) is Grangemouth AQMA, which is approximately 5 km Southwest of the Scheme.

## 3.4 NOISE

Based on information provided by Bowdens Ecology, the Project Ecologists, short-term attended noise measurements were undertaken at two locations considered to be representative of the terrestrial ecological receptors of the Firth of Forth SPA and Ramsar. The attended measurements were carried out between 10:00 and 16:00 hours on Tuesday 4 November 2024.

During the survey, there was no rain, cloud cover was 30%, the temperature was around 8 °C and wind speed was < 5 m/s.

The sound level meter was positioned on a tripod at a height of 1.5 m, in free-field conditions at the following positions:

Measurement Position 1 (MP1): Situated to the north of Clackmanannshire bridge and approximately 50 m to the west of the A876. The dominant noise was road traffic from the A876, with occasional pass-by on the overpass.

Measurement Position 2 (MP2): Situated to the north of Airth on Shore Road, approximately 120 m from River Forth. The dominant noise was distant traffic from the A876 and birds noise.

## 3.5 ARCHAEOLOGY AND HERITAGE

### STUDY AREA

The nature and extent of the cultural heritage resource has been examined to determine the potential direct impacts of the Scheme on heritage assets within 1km area extending from the edge of the Site. The Study Area has been used for the identification of designated heritage assets whose setting is significant enough to be affected by the Scheme. The extent of the Study Area and the heritage assets chosen was defined using professional judgement.

A 1 km study area was deemed appropriate to identify assets that may be impacted and provide a comprehensive list of both terrestrial and maritime archaeological remains. A wider search area also aided in evaluating the type of assets and the probability of unknown assets to exist. Furthermore, the magnitude of the remediation works extending inland or offshore is unclear and hence, a wider study area is warranted to offer suitable mitigation strategies. Appendix A provides further detail on Archaeology and Heritage features of the site.

### SITE LOCATION AND GEOLOGY

The Site lies on the eastern bank of the River Forth 1.3km northwest of the port town of Kincardine, officially called Kincardine-on-Forth. The Site is located within the Tulliallan parish formerly in Perthshire, now within Fife. Tulliallan parish was originally comprised of the barony of Tulliallan before its expansion in the mid-17th century to include the barony of Kincardine, and the former Culross lands of Lurg, Sands, and Kellywood (Simson 1794). It is likely that the Site was located within the intertidal of the Forth at the time though it is unclear what barony it was within.

The geology of the Site is comprised of reclaimed intertidal deposits overlying the Scottish Lower Coal Measures (British Geological Survey, 2024). The reclaimed intertidal silt and peaty clay holds potential for organic matter to survive, which may disclose archaeological evidence such as the remains of a palaeolandscape environment that once existed or the remains of boats or ships.

The Site was located within or adjacent to the Tulliallan pans (Canmore ID 48124, A48) comprised of 35 salt pans in 1735 which gradually declined to 21 by the mid-19th-century. The closest heritage

asset to the Site are two undated, unnamed wrecks that lie 175m (Canmore ID 315770, A32) and 145m (UKHO 2833, A80) south-east of the Site respectively. Further evidence testifying to the prolific shipping and maritime trade activity in the area includes 14 wrecks, most of which are undated with the exception of two wrecks (Canmore ID 147369, A33 and Canmore ID 147371, A35) belonging to the post-medieval period and three wrecks (Canmore ID 147381, Canmore ID 147370 and Canmore ID 147376) having a modern origin. Medieval features within the Study Area are limited to two features such as the chapel (Canmore ID 48120, A49) and the old Tulliallan castle (SM736, Canmore ID 48109, A2) that are located 700m and 800m north and north-east respectively.

## HERITAGE CONSTRAINTS

There is no heritage asset located within the Site boundary. The location of the designated and non-designated assets predominantly ranges from 500m to 1 km inland and offshore from the Study Area and considering the limited footprint of the Scheme, these assets are not expected to pose any constraints.

There are nine designated heritage assets within the Study Area (see Table 10.1 in Appendix):

- Kennetpans Distillery, Clackmannan Scheduled Monument (SM5012) (A1)
- Tulliallan Castle Scheduled Monument (SM736) (A2)
- Kincardine Conservation Area (CA153) (A3)
- Tulliallan Garden and Designed Landscape (GDL00379) (A4)
- Category C Listed Building 22-38 Hawkhill Road, Kincardine-on-Forth (LB15047) (A5 to A13)
- Category C Listed Building 2-20, Hawkhill Road, Kincardine-on-Forth (LB16583) (A14 to A23)
- Category C Listed Building 63, 65 Kilbagie Street, Kincardine-on-Forth (LB16575) (A24 & A25)
- Category B Listed Building 'Primrose Villa', 60 Kilbagie Street, Kincardine-on-Forth (LB16595) (A26)
- Category B Listed Building 36 ('Rosevale'); 38 and 40; 42; 44 Kilbagie Street, Kincardine-on-Forth (LB16594) (A27 to A30)

There are 72 non-designated assets within the Study Area. These finds primarily attest to the industrial development and maritime activities of the area.

## ENGAGEMENTS

Meetings will be held with MS-LOT, Scottish Environmental Protection Agency (SEPA) and Fife Council to discuss the Proposed Scheme.

### 3.6 WATER FRAMEWORK DIRECTIVE

The WFD applies to all water bodies, including those that are man-made. The consideration of the scheme under the WFD is therefore applied to all water bodies that have the potential to be impacted. Classification schemes for both estuarine and coastal waters out to one nautical mile have been developed in response to the WFD.

## 4 IMPACT ASSESSMENT METHOD

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A number of Specialist assessments have been undertaken to support this marine licence application.

These are listed below:

- Habitats Regulations Appraisal;
- Baseline Survey and Construction Noise;
- Otter Protection Plan;
- Preliminary Ecological Appraisal (PEA) – completed May 2024;
- Marine Archaeology.

In general, effects arising from construction are considered to be temporary. Effects arising from the operational phase are expected to be permanent. Further details on the assessment methods, assumptions and limitations in each of the assessments are summarised in sections 5 and 6 below.

## 5 POTENTIAL IMPACTS

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### 5.1 ECONOMIC IMPACTS

Previous surveys and investigations recorded significant levels of deterioration to tower XD130 and the access bridge. Although economic impacts are not anticipated as a result of the proposed works, negative impacts such as power outage could arise if the structures are left to deteriorate resulting in their collapse.

### 5.2 SOCIAL IMPACTS

#### ACCESS RESTRICTIONS TO PUBLIC

There will be temporary but localised restrictions to public access along the waterfront footpath. This is to avoid risks to the public associated with presence and operation of site plant and vehicles.

In the absence of mitigation, these works are expected to result in a temporary, slight adverse effect.

#### RISK TO MEMBERS OF THE PUBLIC FROM PLANT

There is a potential for members of the public to interact with project plant as it moves between the bridge, tower and site access point.

In the absence of mitigation, the works are expected to result in a temporary, slight adverse effect.

### 5.3 ENVIRONMENTAL IMPACTS

#### MARINE ENVIRONMENT

Any works will only commence upon receipt of a Marine Licence. The works which would include removal and repair works would be required over the Firth of Forth, which as stated in Section 3.1 is a designated MPZ, SSSI, SAC and Ramsar Site. Therefore, there is potential risk of various impacts to the marine environment including minor contamination of the water from waste materials plant and construction equipment and noise and vibration.

Without mitigation measures in place these impacts are anticipated to be temporary and minor, however due to the protective status of the Forth of Firth, it is recommended that best practice and mitigation measures are in place. These measures are discussed in Section 6.3.

#### ECOLOGY

##### Designated Sites

It is anticipated that the refurbishment works will not directly impact the Firth of Forth SSSI, SPA and Ramsar site, Pow Burn and Estuary WS, the Isle of May SAC and seal-haul-out sites as the proposed works are confined to small areas outside the boundary of these designated sites.

The areas of woodland listed on Ancient Woodland Inventory (AWI) are not considered to be at risk from the proposed works due to the relatively small scale of the works, and the distance of these woodlands from the areas of refurbishment.

## Habitats

The habitats within the vicinity of tower XD1301 are generally of limited value for biodiversity and occur commonly within the wider landscape. However, the watercourses, in particular the River Forth and Pow Burn, provide important habitat for marine and semi-aquatic fauna.

Given that works to the foundations of tower XD130 will occur within the River Forth estuary, without protection measures the watercourse is at risk of pollution events from chemical spillages and/or sediment run-off which may negatively impact the aquatic environment and associated species. Appropriate mitigation measures will therefore be implemented to prevent any negative impacts

## Species

### Otters

As stated in the Preliminary Ecological Appraisal update (PEA) 2024, [Redacted]

[Redacted] there is a risk of disturbance to otter through vibrations, noise and lighting and/or obstruction or destruction of the resting site by the works.

### Birds

Although no immediate evidence of peregrine was recorded during previous surveys (2016 and 2018), [Redacted]

Peregrine falcon is a Schedule 1 species on the Wildlife and Countryside Act 1981 (as amended), which means it is afforded additional protection against disturbance while at or near a nest containing eggs or young, to the basic level of protection afforded to most nesting wild birds (see above). [Redacted]

Disturbance can be either physical or as a result of noise or visual presence of people close to the nesting site.

### Reptiles and amphibians

The habitats within proximity of the Proposed Scheme namely woodland regeneration, scrub, tall ruderal vegetation, semi-improved neutral grassland, brash pile and hardstanding, provide suitable habitat for common reptiles and/or amphibians that may be encountered during the works. If unmitigated, plant/vehicle movement, as well as site clearance, risk causing harm or mortality to common amphibians and reptiles.

## **Marine Mammals**

Marine mammals have been recorded in low numbers in the region of tower XD130 including grey seal, harbour seal, common dolphin and harbour porpoise. The infrequency of sightings suggests that cetaceans are rarely present in the area, with grey and harbour seal sightings also recorded infrequently that far upstream. Marine mammals are protected under EU and UK legislation, with it being an offence to kill, injure or take a whale, dolphin, porpoise or seal species in Scottish waters. There is potential for marine mammals to be present in the immediate vicinity of tower XD130, however they are highly mobile and wide ranging, and can move away from the proposed works.

## **AIR QUALITY**

Although there are no AQMAs within close proximity of the Scheme, depending on the method of removing and repairing delaminated concrete, there is potential for this activity to result in some temporary dust generation. There is also risk of air quality deterioration resulting from use of site plant and vehicles.

In the absence of mitigation (Section 6.3), these works are expected to result in a temporary, slight adverse effect to human health.

During the operational phase of the Scheme, no further air quality impacts are anticipated.

## **NOISE AND VIBRATION**

Construction noise modelling has been undertaken to determine the likely noise levels arising from the proposed remedial works at representative areas within the Firth of Forth SPA and Ramsar sites. The noise modelling has been carried out in accordance with the guidance in BS 5228-11.

BS 5228-11 provides guidance on appropriate methods for minimising noise from construction activities. Techniques for predicting the likely noise effects from construction works are given, these are based on detailed information of the type and number of plant items being used, their location and the length of time they are in operation. Noise prediction methods are used to establish likely noise levels in terms of the LAeq,T over the core working day.

The plant and equipment required to remove areas of spalled and delaminated concrete is anticipated to result in temporary, short-term noise and vibration impacts during the Construction Stage. The nearest residential properties are approximately 660m east of the Proposed Scheme, therefore, there is potential for these residents to be temporarily impacted by noise generating activities of the Scheme. These impacts would only be during the Construction Stage of the Scheme and no further impacts are anticipated during the Operational Stage.

The specific sound level (the sound level produced by a source, without corrections for acoustic features) at the source, emitted by the remedial works, considered to be worst case scenario is predicted to be 114 dB (overall corrected sound power level). It is assumed that the Firth of Forth is an acoustically reflective ground surface, and the remaining surfaces are acoustically soft ground cover between the noise source and receptor. At a distance of approximately 350m from the source, the predicted noise levels for typical construction activities associated with the proposed works, the noise levels fall below 55 dB LAeq,T. Therefore, noise levels at the designated sites, which are located >350 m from the source, are anticipated to be below 55 dB LAeq,T. It should be noted that as a worst case, the modelling assumed maximum noise levels generated by the hydrodemolition plant operating at full power. In practice, emissions are likely to be lower. No works will occur at night.

## ARCHAEOLOGY AND HERITAGE

### Archaeological Potential

The Site has medium potential to contain archaeological remains from the medieval and post-medieval periods. These are likely to be related to salt-panning and the use of the Forth for maritime trade and travel. Remains of this type would be of up to medium significance.

There is low potential for prehistoric, Roman, and modern remains within the Site. The Site was located within the intertidal during the prehistoric and Roman periods and it is not possible to fully discount the possibility of isolated remains from these periods. Remains of this type would be of low significance. Any early modern remains would likely have been disturbed or removed when the Site was developed in the mid-20th century.

### Impacts

Given the limited footprint of the Scheme, there is no impact predicted on known archaeological remains.

Excavation to expose and repair the concrete foundations of the tower and access bridge will truncate or remove any archaeological remains within the footprint of the excavation. Therefore, the Scheme could have a major impact on any unknown archaeological remains within the footprint of the excavation areas.

The movement of heavy equipment along access tracks could cause damage to underlying unknown archaeological remains through compression. This is expected to be a minor impact.

## CUMULATIVE EFFECTS

The construction phase is expected to commence at the end of April 2025 onwards due to the Marine License approval timeframe and the construction can only start after the over-wintering bird season. Of the committed developments listed above, there is potential for cumulative effects with the Proposed Development for those either yet to begin construction or still being constructed, on the basis that the construction phases may overlap with that of the Proposed Works. As a result, there is potential for adverse cumulative effects for nearby sensitive receptors as a result of construction noise, visual impacts and construction traffic.

However, the committed developments and the Proposed Development will be constructed in accordance with their own Construction Environment Management Plan which ensures that adverse construction impacts are minimised for all sites which will reduce the potential for overall cumulative impact from the Proposed Works. There may also be potential for beneficial cumulative impacts in terms of local employment opportunities during construction.

## 6 PROPOSED MITIGATION AND ENHANCEMENT MEASURE

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### 6.1 ECONOMIC IMPACT MITIGATION

As stated in Section 5.1, no economic impacts are anticipated as a result of the proposed works. However, as a precautionary measure, the local council will provide notifications of the estimated location and timings of the proposed works for each activity on the council website.

### 6.2 SOCIAL IMPACT MITIGATION AND ENHANCEMENT MEASURES

#### LOCALISED RESTRICTIONS TO PUBLIC ACCESS

To minimise potential effects on the general public, it is recommended that the local council inform the general public of the proposed works date and duration on the council website.

It is also recommended that the Kincardine River path is temporarily closed to avoid plant, construction equipment and vehicle interaction with pedestrians.

### 6.3 ENVIRONMENTAL IMPACT MITIGATION AND ENHANCEMENT

#### ECOLOGY

##### Designated Sites

The Scheme is unlikely to result in a significant adverse effect on any qualifying birds for which the Firth of Forth is designated. However, implementation of best practice measures. Such as described under the birds section below.

##### Habitats

Habitat loss should be minimised by keeping the area used for temporary compounds, storage of materials or access to the minimum necessary.

To avoid potential impacts resulting from pollution of the watercourse, pollution prevention measures, in accordance with SEPA guidance, will be adhered to for the duration of the works. Recommended measures include, but may not be limited to:

- Any chemicals, fuels or synthetic substances will be stored and safe used in designated compounds/areas at least 10m from the watercourse/saltmarsh/ Groundwater Dependent Terrestrial Ecosystems.
- Drip trays or plant nappies to be used when refuelling and left under stationary machinery. Oil spill kits to be kept on site and within all machines.
- Upon completion of works all materials, debris, tools, plant and equipment will be removed and the work areas will be thoroughly checked for spillages or potential pollution sources.

##### Species

##### Otters

[Redacted]

Therefore, an otter licence from NatureScot will be required prior to the commencement of any works within 30m of the otter resting site. A species protection plan completed by a suitably experienced ecologist will be required to accompany the licence application.

Furthermore, a pre-construction survey should be timetabled into project plans. This is to enable checks for any new holts or resting places that may have become occupied after the original and update surveys, and to ensure the measures proposed to minimise impacts on otters remain appropriate.

Further detail on mitigation measures for otters can be found in the Otter Protection Plan, which was completed by Bowland Ecology in June 2023.

If any other small mammals are discovered during the works, they should either be allowed to leave the area naturally or be safely relocated to a sheltered location with plenty of vegetation cover, in an area off working areas which will remain undisturbed.

### **Birds**

If the tower's refurbishment works take place outside the breeding bird season, which runs from mid-February until August inclusive, this will avoid any impacts upon nesting birds, including Schedule 1 peregrine falcon.

However, if they take place within the breeding bird season, any habitats suitable for nesting birds that could be impacted by works will be subject to pre-works bird surveys carried out by a suitably experienced and licensed ecologist, where relevant. If an active nest is identified a suitable buffer around the nest should be enforced and the nest left until the young has fledged and no longer returning to the nest site. It should be recognised, particularly in relation to raptors, that disturbance buffers for ornithological features can be extensive (between 500 and 750m). Works will only be undertaken once a scheme ecologist has declared the nest to be no longer in use.

[Redacted]

It is recommended that the peregrine falcon nest (the old corvid nest) at Tower XD130 is retained and protected during the works. If not possible, an alternative nesting location should be provided allowing a full nesting season for the birds to find the alternative nesting location. The location and style of nest box will follow the guidance of the joint RSPB, English Nature, BTO and London Biodiversity Partnership publication "Peregrines Provision of Artificial Nest Sites on Built Structures"<sup>3</sup>.

### **Reptiles and amphibians**

To avoid potential impacts to common amphibians and reptiles the following precautionary working methods should be undertaken:

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<sup>3</sup> [https://www.lbp.org.uk/downloads/Publications/Management/peregrine\\_nest-box\\_advice.pdf](https://www.lbp.org.uk/downloads/Publications/Management/peregrine_nest-box_advice.pdf)

- Before works commence, all contractors must be made aware of the potential for reptiles and amphibians to be encountered during works by an Ecological Clerk of Works (ECoW);
- Suitable reptile/amphibian habitat, including refuge sites, should be cleared at appropriate times of the year following destructive measures; and
- Any common amphibians and reptiles encountered at any time during works should be moved to a safe location away from the works and placed within a similar habitat to which they were found.

### **Marine Mammals**

Disturbance from activities carried out above MHWS is not likely to disturb hauled out seals, as the nearest designated haul-out site is approximately 29km away and the nearest SAC is 79km away. Therefore, no mitigation measures are recommended.

Direct disturbance to marine mammals in the vicinity of Tower XD130 from current planned activities, on the concrete platform below MHWS, such as from minor noise and vibrations and accidental pollution are unlikely to cause behavioural impacts, injury or mortality in marine mammals. It is recommended that best practice measures and pollution prevention guidance are adhered to and that a Construction Environment Management Plan (CEMP) is implemented, specifically addressing noise and vibration levels. It is assumed that activities being carried out are low level and will not result in levels of underwater noise or vibration which will directly impact marine mammals. If the scope of works is altered or updated, a review of mitigation requirements should be undertaken.

Secondary impacts such as noise and vibration and degradation of water quality through pollution events have the potential to impact marine mammals in the area through adverse impacts to prey receptors. It is unlikely that secondary impacts will occur to prey receptors and their habitats due to the small scale and low impact of proposed works. Recommended mitigation for indirect impacts includes following best practice measures and pollution prevention guidance in addition to implementation of a CEMP. If the scope of works is altered or updated, a review of mitigation requirements should be undertaken.

### **Re-survey of the Site**

If no works are undertaken on site within 18 months of this survey or if any changes to the proposals are made, a further ecological survey may be necessary (because of the mobility of animals and the potential for colonisation of the site).

## **AIR QUALITY**

The project will utilise as low a number of vehicles as reasonably practicable for the Proposed Scheme.

Potential impacts to be mitigated as far as possible through measures set out in a CEMP according to 'best practice'. For example:

- Suppression of dust.
- Minimise vehicle speed in areas of potential dust generation.
- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Ensure all vehicle operators switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

- Maintenance of vehicles and plant to ensure they adhere to emissions standards

## **NOISE**

It is recommended that best practice measures and pollution prevention guidance are adhered to and that a Construction Environment Management Plan (CEMP) is implemented, specifically addressing noise and vibration levels. It is assumed that activities being carried out are low level and will not result in significant levels of noise.

## **ARCHAEOLOGY AND HERITAGE**

Potential impacts to be mitigated as far as possible through:

Archaeological recording (a watching brief) during construction activity is recommended to document any surviving archaeological remains.

Use of matting along access tracks to evenly distribute the weight of heavy equipment.

Since, the Scheme will be subject to best practice mitigation and pollution prevention measures during construction as outlined in its own CEMP. As a result, it is anticipated that any likely significant cumulative effects during the construction and operation of the Scheme in combination with the other developments will most likely be not significant, and mitigation outside of that agreed (or likely to be agreed) with each Committed Development will be potentially not required. In-combination effects are the combined action of different environmental topic-specific impacts upon a single receptor/resource which may, on an individual basis be insignificant, but cumulative may have a significant effect. It is considered that with the utilisation of mitigation measures and construction best practice the Scheme is not likely to result in significant in-combination effects, particularly given its scale and nature.

## 7 RESIDUAL EFFECTS

Table 7-1 - Residual Effects

Activity	Effect	Impact	Initial Risk	Summary of mitigation or enhancement measures	Residual Risk
Refurbishment works	Economic	No impacts are anticipated	No economic risks are anticipated	None required	No residual economic effects are anticipated
	Social	Access restrictions to public	A temporary, slight adverse effect during construction.	Disseminate information to local and interested stakeholders.  The closure of the Kincardine river path will be short term (only during construction works)	No residual effects anticipated
	Environment	Water quality	As some of the proposed works will take place within the Firth of Forth, there is risk of pollutants entering the river.	Pollution prevention guidance will be taken to ensure there is minimal risk of pollutants or construction waste entering the river.	Negligible adverse effect on water quality (and shoreline litter).
		habitats	If works take place during breeding bird season, habitats suitable for nesting birds could be impacted.	Pre-works surveys carried out by a suitably experienced and licensed, where relevant,	Provided mitigation measures are followed, no residual

Activity	Effect	Impact	Initial Risk	Summary of mitigation or enhancement measures	Residual Risk
			[Redacted]	ecologist to ensure no protected species are present.	effects are anticipated.
		Species	Direct and indirect impacts to marine mammals and prey receptors from minor noise and vibration and pollution events.	Compliance with pollution prevention best practice guidance, implementation of a CEMP and following of Marine Pollution regulations where relevant.	No residual effects anticipated.
		Air quality	Minor dust generation is anticipated as a result of construction activities.	Best practice measures (BPM) will be laid out within a CEMP	Provided BPM are adhered to, no residual effects are anticipated.
		Noise and Vibration	Minor noise and vibration impacts as a result of construction activities	Best practice measures (BPM) such as noise suppression jackets will be laid out within a CEMP	Provided BPM are adhered to, no residual effects are anticipated.
		Archaeology and Cultural Heritage	Excavation will truncate or remove any archaeological remains within the footprint of the excavation.	Archaeological watching brief	No residual effects anticipated



Activity	Effect	Impact	Initial Risk	Summary of mitigation or enhancement measures	Residual Risk
			Compression of remains through movement of heavy equipment along access tracks.	Use of matting along access tracks to evenly distribute the weight of heavy equipment	No residual effects anticipated

## 8 SUMMARY

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It is anticipated that the Scheme is unlikely to give rise to significant environmental effects during both the construction and operational phases. Where potential effects have been identified in Table 7.1, the approach to minimising and avoiding these effects through design and mitigation at construction has been outlined. Where required, further investigation and surveys will be carried out.

In conclusion, the foregoing information demonstrates that the Scheme is unlikely to give rise to significant environmental effects.

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# Appendix A

## CULTURAL HERITAGE



## Heritage Data Sources

The table below provides a summary of the key data sources. Occasionally there may be reference to assets beyond this study area, where appropriate, e.g., where such assets are particularly significant and/or where they contribute to current understanding of the historic environment.

**Table A-1 – Data Sources Consulted**

Source	Data	Comment
Historic Environment Scotland (HES)	National Heritage List (NHL) with information on statutorily designated heritage assets	Statutory designations (scheduled monuments; statutorily listed buildings; gardens and designed landscapes; historic marine protection areas; historic battlefields; conservation areas) can provide a significant constraint to development.
Historic Environment Scotland (HES)	National Record of the Historic Environment (NRHE): Canmore	Primary repository of archaeological information for both terrestrial and near shore and riverine marine environments. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources
British Geological Survey (BGS)	Solid and drift geology digital map; online BGS geological borehole record data.	Subsurface deposition, including buried geology and topography, can provide an indication of potential for early human settlement, and potential depth of archaeological remains.
United Kingdom Hydrographic Office (UKHO)	Database of wrecks and obstructions within the marine environment and navigable tidal rivers.	Primary repository of known wrecks or noted obstructions/snags within the marine environment, includes navigable portions of tidal rivers.
National Library of Scotland (NLS)	Ordnance Survey maps from the 1st edition (1860–70s) to present day	Provides a good indication of past land use and impacts which may have compromised archaeological survival. Provides an indication of the possible date of any buildings on the site. Goad maps can indicate the presence of basements if these were surveyed.
Internet	Web-published local history; Archaeological Data Service	Many key documentary sources, such as the Statistical Accounts of Scotland and local and specialist studies are now published on the web and can be used to inform the archaeological and historical background. The Archaeological Data Service includes an archive of digital fieldwork reports.

## Historical Background

The Forth Valley has a documented history of human habitation along the shore of the River Forth, in the wider expanse of the Site, as evidenced by a Mesolithic artefact, the Meiklewood antler-beam mattock found near a Rorqual whale skeleton in 1877, and Mesolithic shell middens found in Clackmannanshire (ScARF 2012). The only evidence of prehistoric activity within the Study Area are Iron Age pot sherds from three vessels found within three ditch features in a multi-period site by Headland Archaeology between 2005 and 2006 at Upper Forth Crossing located 700m north of the Site. Redeposited prehistoric remains, comprised of Neolithic flint implements, were found within a ballast mound (Canmore ID 349047, A79) at Kennetpans Distillery deposited during the post-



medieval period. The Site would have been located within the intertidal region of the Forth River. It may have been accessed or exploited for resources; therefore, the potential is limited to isolated remains.

There is no known evidence of Roman period activity within the Study Area; however, the Site is located within the intertidal Forth which was likely utilised by the Roman military to access installations on the Antonine Wall and the Gask Ridge.

The centre of medieval settlement within the area was the Old Tulliallan Castle (SM736, A2), 760m northeast of the Site and north-west of the 19th-century Tulliallan Castle (GDL00379, A4). Tulliallan Castle is a Scottish hall-house thought to have been originally built in the early 14th century, though it is reported that Edward I ordered the Sheriff of Clackmannan to strengthen the walls in 1304 which would push the date of original construction to the 13th century (Canmore 2024a, A2). The foundations of the castle are on a naturally occurring outcrop of bedrock, the surrounding ground is noted as marshy within the description and remains open unused land into the post-medieval period. The castle was granted to the Edminstones in the early 15th century before becoming part of the holdings of the Blackadders through the marriage of Elizabeth Edminstone and Patrick Blackadder in the late 15th century (Canmore 2024a, A2).

The 1794 Statistical Account of Tulliallan Parish (Simson 1794) states that an extensive colliery and salt panning operation was in place within the parish by the 1730s. The salt pans are recorded on the Roy Military Map of 1747-1752 (National Library of Scotland 2024a) which shows the location of the site within a broad intertidal flat labelled as 'Tulliallan Pans'. The most prominent settlement within the Site's vicinity is 'Kincarn', modern-day Kincardine, with the rest of the surrounding area taken up with small settlements, agricultural fields, and the manor of Tullyallan.

Kennetpans is noted on the Roy Military Map 950m to the north-west of the Site. Kennetpans was the site of a salt panning community thought to have been originally founded by the Kennetpans Abbey in the medieval before its likely abandonment following the dissolution in the mid-16th century (Kennetpans Trust 2019a). There is no known surviving evidence of this community, and it is possible that the construction of a distillery in the 17th century or the early 18th century may have removed any evidence (Kennetpans Trust 2019b). The remains of the Kennetpans Distillery, built in 1770, are still extant. The Kennetpans Distillery scheduled monument area (SM5012, A1) includes the main building, small harbour, pier, and ballast mound. The pier and harbour served both the Kennetpans and Kilbagie Distilleries, two of the biggest distilleries of malt spirit, used as a base for London gin, in Central Scotland. Kennetpans was closed in 1825 and the maritime trade to this area of the Forth would likely have tapered off at this point.

The 1845 Statistical Account of Tulliallan Parish (Monilaws 1845) states that the collieries, saltpans and distilleries of the area were extinct by 1845 and the land along the east bank of the Forth was in the process of being reclaimed. The completion of the reclamation activities can be seen on the 1st edition Ordnance Survey 6": mile map of 1861 (National Library of Scotland 2024b; Figure 3.5.2). The Site is within intertidal land adjacent to the edge of the reclaimed land.

The reclaimed agricultural lands were developed in the 1950s as the site of the Kincardine Power Station, a coal-fired power station constructed to take advantage of the areas low grade coal deposits (Canmore 2024b, Canmore ID 68086 (A61)). The Site was developed in response to the power station to facilitate the transport of electrical power.

**Table A-2 - List of Heritage Assets**

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
SM5012	NS 91351 88854/ 291351, 688854	Post Medieval	Kennetpans Distillery, Clackmannan	<p>Roofless remains of distillery built in the 1770s to supply malt.</p> <p>Three-storeyed and has an engine room.</p> <p>A wooden pier for shipping spirit and later used for coal.</p> <p>Remains of stone quay, earth mound and probable ballast bank to the east.</p> <p>Closed in 1825.</p> <p>By 1900s, no roof.</p>	A1
SM736/ Canmore ID 48109	NS 92684 88793 / 292684, 688793	Medieval	Old Tulliallan Castle	<p>Probable 14th-century castle built within a broad ditch, remodelled in the 15th-century.</p> <p>Built on large natural rock outcrop.</p> <p>Possible 17th-century garden exists.</p>	A2
CA153	293009, 687580	Multi- period	Kincardine	<p>Kincardine Conservation Area was designated in 1971.</p> <p>Appraised between Nov 2008 and Feb 2009.</p> <p>Extensive Roman activity identified near Kincardine.</p>	A3
GDL00379	NS 93448 88572/ 293448, 688572	Post Medieval	Tulliallan	<p>Castle designed by William Atkinson and build between 1818 and 1820 CE.</p> <p>Gothic in style with castellations.</p> <p>Three-storeyed attached to two wings.</p> <p>Landscape now run as Scotland's police training college.</p> <p>Comprises parkland, woodland, gardens.</p>	A4

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
LB15047	NS 92861 88037/ 292861, 688037	Post Medieval	22-38 Hawkhill Road, Kincardine on Forth	Category C, late 18th-century listed building.  Row of single-storeyed miners' cottage, rubble and harl, pantile and slate.	A5 to A13
LB16583	NS 92904 87956/ 292904, 687956	Post Medieval	2-20 Hawkhill Road, Kincardine on Forth	Category C, late 18th-century listed building.  Row of single-storeyed miners' cottages.  Rubble and harl, pantile, scroll skew-putts.	A14 to A23
LB16575	NS 92944 87819/ 292944, 687819	Undated	63, 65 Kilbagie Street Kincardine-on-Forth	Category C listed building.  Two plain single-storeyed cottage, ashlar and slate, scroll, skewputs, moulded door architraves, no. 65 inscribed	A24 to A25
LB16595	NS 92976 87762/ 292976, 687762	Post Medieval	'Primrose Villa', 60 Kilbagie Street Kincardine- On-Forth	Category B listed building.  Two-storeyed symmetrical house from 1800 CE.	A26
LB16594	NS 92985 87686/ 292985, 687686	Post Medieval	36 ('Rosevale'); 38 and 40; 42; 44 Kilbagie Street, Kincardine-On-Forth	Category B listed building.  Row of four two-storeyed houses from 1800 CE.	A27 to A30
LB16587	NS 93089 88255/ 293089, 688255	Post Medieval to Modern	Blackhall Lodge and Gateway Tulliallan Policies	Category B listed building.  Composite arched gateway and attached two-storeyed lodge with attic from 1833 CE built by George Angus.  Dated 1903 on down-pipe.	A31
Canmore ID 315770	NS 92256 88067/ 292256, 688067	Undated	Undated: Kincardine Power Station, River Forth	Wreck  Apparently lies in the intertidal zone SW and NE of the power station and navigable channel of River Forth respectively.  No description. Significance remains Undated.  Wreck may be comparable to the Kincardine Bridge Ship graveyard.	A32

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
				Location is tentative.	
Canmore ID 147369	NS 9250 8760/ 292500, 687600	Post Medieval	Oceanic or Ossianic ship; Kincardine Foreshore, River Forth	<p>Ossianic/ Oceanic (Passenger Vessel)</p> <p>The wreck lies NE-SW in deep silt, making accessibility difficult. Uncovers for 3 hours either side of low water.</p> <p>Measures 22.6 in length and 6.05 in beam.</p> <p>Wooden carvel construction with a frame spacing of 0.35m.</p> <p>Iron, wood and copper fastenings.</p> <p>Metal-strapped rudder post and the pintel of the collapsed ramp section.</p> <p>Twin-ruddered cattle ferry towed by two steam tugs, the Tulliallan Castle and the Robert Bruce.</p> <p>Abandoned as the tugs moved to Alloa.</p> <p>Part of the Kincardine Bridge ship graveyard.</p>	A33
Canmore ID 147370	NS 9250 8760/ 292500, 687600	Modern	Undated: Kincardine Foreshore, River Forth	<p>Yawl</p> <p>Modern fishing yawl.</p> <p>Wooden clinker construction with an engine.</p> <p>11.9m long, 3.75m in beam.</p> <p>Iron fastenings and rudder remains.</p> <p>Lied NE-SW in very deep silt, access is difficult.</p> <p>Dimensions of frames and futtocks recorded.</p> <p>Uncovers for two-three hours either side of low water.</p> <p>Part of the Kincardine Bridge ship graveyard.</p>	A34

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
Canmore ID 147371	NS 9250 8760/ 292500, 687600	Post Medieval	Undated: Kincardine Foreshore, River Forth	<p>Passenger Vessel</p> <p>19th-century fishing vessel or ferry; latter identification supported by oral tradition.</p> <p>20.2m in length and 6.1m in beam.</p> <p>Stone ballast is evident.</p> <p>Dimensions of frames and futtocks recorded.</p> <p>Lies NW-SE in very deep silt but easy access?</p> <p>Uncovers between three and four hours either side of low tide.</p> <p>Part of the Kincardine Bridge ship graveyard.</p>	A35
Canmore ID 147372	NS 9250 8760/ 292500, 687600	Undated	Undated: Kincardine Foreshore, River Forth	<p>Boat</p> <p>Incomplete remains of a small wooden boat.</p> <p>7.65m long and 2.6m in beam.</p> <p>Carvel construction.</p> <p>May have broken in two halves; one half buried or washed away.</p> <p>Dimensions of the frames and futtocks recorded.</p> <p>Stone ballast is evident.</p> <p>Wreck lies WNW-ESE in very deep silt and is easy to access?</p> <p>Uncovers one to two hours either side of low water.</p> <p>Part of the Kincardine Bridge ship graveyard.</p>	A36
Canmore ID 147376	NS 9250 8760/ 292500, 687600	Modern	Undated: Kincardine Foreshore, River Forth	<p>Boat</p> <p>One half of a modern wooden boat.</p> <p>Wreck located near a pipeline.</p> <p>13.9m in length with a frame spacing of 0.35m.</p> <p>Distinguishable stempost.</p>	A37

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
				<p>Stone ballast is evident.</p> <p>Lies NE-SW in 1m deep silt.</p> <p>Uncovers three to four hours either side of low water</p> <p>Part of the Kincardine Bridge ship graveyard.</p>	
Canmore ID 147373	NS 9250 8760/ 292500, 687600	Undated	Undated: Kincardine Foreshore, River Forth	<p>Boat</p> <p>Small wooden boat.</p> <p>Clinker construction.</p> <p>Small light frames secured by copper tacks.</p> <p>4.2m long.</p> <p>Stone ballast.</p> <p>Wreck lies ENE-WSW in deep silt.</p> <p>Uncovered for 1 to 2 hours at low tide.</p> <p>Part of the Kincardine Bridge ship graveyard.</p>	A38
Canmore ID 147381	NS 9250 8760/ 292500, 687600	Modern	Undated: Kincardine Foreshore, River Forth	<p>Boat (Possible)</p> <p>Small boat</p> <p>Half-buried under embankment rubble.</p> <p>4 pieces of timber protrude 0.2m out of 1m depth of silt.</p>	A39
Canmore ID 322253/ UKHO 2832	NS 92627 87687/ 292627, 687687	Undated	Undated	<p>Obstruction (Possible)</p> <p>Unclassified wreck</p> <p>Marked dead on UKHO as didn't show up on survey</p>	A40
Canmore ID 324806	NS 9269 8776/ 292690, 687760	Undated	Undated	<p>Craft (Possible)</p> <p>Undated</p> <p>Whittaker ID - 1370</p>	A41
Canmore ID 315757	NS 927 877/ 292700, 687700	Undated	Undated: Kincardine On Forth, River Forth	<p>Craft</p> <p>No description. Significance remains unclear</p>	A42

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
Canmore ID 322266/ UKHO 2854	NS 92687 87581/ 292687, 687581	Undated	Undated	Boat  Unclassified live wreck  Only lower hull remains	A43
Canmore ID 322265/ UKHO 2853	NS 92697 87526/ 292697, 687526	Undated	Undated	Boat  Unclassified live wreck  Only lower hull remains	A44
Canmore ID 289279	NS 91563 87364/ 291563, 687364	Undated	Undated: Pow Burn, Higgin's Neuck	Craft  Remains of the lower part of a 'hulk' in intertidal mud on the south side of the power station.  Vessel lies parallel to the bank and orientated WNW (bow) – ESE.  Parallel middle body, little rise in sides.  Timber, heavy scantlings, very heavy framing and iron fittings.  12.4m long, 5m in beam.  Detached probable stempost with iron fittings at the bow.  Rising planking at the port quarter 1.2m in slanting height, 0.6m in vertical height, has an iron fitting.  Iron fitting (poss. Rudder mounting) on the port side, near the stern.  Incomplete quernstone lies by the stern.  A line of nine strake crosses the mud of the pow to the ESE of the wreck.	A45
Canmore ID 325090	NS 9113 8817/ 291130, 688170	Undated	Undated	Craft (Possible)  Undated  Whittaker ID - 2174	A46
Canmore ID 48106	NS 9286 8800/ 292860, 688000	Undated	Kincardine on Forth, 19 Hawkhill Road	Cottage  No description.	A47

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
Canmore ID 48124	NS 92 88/ 292000, 688000	Undated	Tulliallan Parish	Salt Works 35 salt pans in 1735. Numbers decreased to 21 by mid 19th-century. Unlocated.	A48
Canmore ID 48120	NS 9294 8820/ 292940, 688200	Medieval	Chapel Hill, Kincardine	Chapel Excavations by the Kincardine Local History Group exposed this single cell building, measuring 10m x 7m, walls 0.6m high. Opposed entrances with large single threshold stone, well worn. An unusual mason's mark found not of a common mason, but associated with the abbey	A49
Canmore ID 93118	NS 9286 8800/ 292860, 688000	Undated	Kincardine On Forth, 21 Hawkhill Road	No classification – term pending	A50
Canmore ID 93119	NS 9286 8801/ 292860, 688010	Undated	Kincardine On Forth, 23 Hawkhill Road	No classification – term pending	A51
Canmore ID 93120	NS 9286 8802/ 292860, 688020	Undated	Kincardine On Forth, 25 Hawkhill Road	No classification – term pending	A52
Canmore ID 93129	NS 92826 88094/ 292826, 688094	Undated	Kincardine On Forth, 40 Hawkhill Road	No classification – term pending	A53
Canmore ID 93131	NS 92823 88099/ 292823, 688099	Undated	Kincardine On Forth, 42 Hawkhill Road	No classification – term pending	A54
Canmore ID 93075	NS 92972 87963/ 292972, 687963	Undated	Kincardine On Forth, Bridge Inn	Public House No description	A55
Canmore ID 93101	NS 9265 8737/ 292650, 687370	Post Medieval	Kincardine On Forth, Ferry pier	Pier	A56



HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
				A coursed-rubble ramped ferry pier built between 1826 and 1827.	
Canmore ID 93182	NS 92945 87735/ 292945, 687735	Undated	Kincardine On Forth, 47, 49, 51 Kilbagie Street, White Horse Inn	Inn No description	A57
Canmore ID 107099	NS 9290 8805/ 292900, 688050	Undated	Kincardine On Forth, Chapelhill Street	No description. Classified as General View	A58
Canmore ID 107287	NS 929 876/ 292900, 687600	Undated	Kincardine On Forth, Mill Road	Term pending – no description	A59
Canmore ID 123074	NS 92741 87632/ 292741, 687632	Undated	Kincardine On Forth, Kincardine Power Station, Jetty	Jetty No description.	A60
Canmore ID 68086	NS 9250 8810/ 292500, 688100	Modern	Kincardine On Forth, Kincardine Power Station	Power Station First of a series of giant coal-burning stations formed in 1955. Brought in service between 1958 and 1963. Designed to burn low-grade coal from local collieries	A61
Canmore ID 218055	NS 92 89/ 292000, 68900	Post Medieval	Kilbagie Canal	Canal Opened in 1780 which ran between Kennetpans and Kilbagie. Constructed in the SE of Alloa to transport grain from the Kennetpans wharfs. Abandoned in 1861. 1861 OS map survey cannot trace this canal. There is a winding east of Kennetpans and Kilbagie named Canal Burn	A62
Canmore ID 259537	NS 9245 8800/ 292450, 688000	Modern	Kincardine on Forth, Kincardine Power Station,	Canteen; Office; Workshop	A63

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
			Administration, Ablutions and Workshop Building	Canteen is modern in origin; the office and workshop are undated.  From the photos and nature of the assets, it appears that all the are modern.	
Canmore ID 269284	NS 92902 87607/ 292902, 687607	Undated	Kincardine On Forth, Kilbagie Street, Morgans Saw Mill	Saw Mill  No description	A64
Canmore ID 267766	NS 9225 8845/ 292250, 688450	Undated	Kincardine on Forth, Kincardine Power Station, Sub Station, Coal Sore and Coal Plant Conveyors	Coal Shed  Charcoal store.  Located near the power station.  Likely to be modern in date.	A65
Canmore ID 277533	NS 92667 88012/ 292667, 688012	Post Medieval to Modern	Kincardine On Forth, Kincardine Power Station, Water Treatment Plant House	Generating Plant  19th to 20th-century. No other description.	A66
Canmore ID 277534	NS 92699 88089/ 292699, 688089	Undated	Kincardine On Forth, Kincardine Power Station, Fire Fighting Pumphouse	Pump House  No description but possibly 19th to 20th-century based on photos.	A67
Canmore ID 277095	NS 92645 87998/ 292645, 687998	Undated	Kincardine On Forth, Kincardine Power Station, Ash Slurry House	Industrial Building  No description but possibly 19th to 20th-century based on photos.	A68
Canmore ID 277101	NS 92608 88020/ 292608, 688020	Undated	Kincardine On Forth, Kincardine Power Station, Chimneys	Chimneys  No description but maybe 19th to 20th-century based on photos.	A69
Canmore ID 277102	NS 92582 87947/ 292582, 687947	Modern	Kincardine On Forth, Kincardine Power Station, Water House	Water House  20th-century. No other description.	A70
Canmore ID 277103	NS 92629 87765/ 292629, 687765	Undated	Kincardine On Forth, Kincardine Power Station, Cooling Water Pumphouse	Pump House  No description but maybe 19th to 20th-century based on photos.	A71

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
Canmore ID 276991	NS 92553 88088/ 292553, 688088	Modern	Kincardine On Forth, Kincardine Power Station, Turbine Hall	Turbine House 20th-century. No other description.	A72
Canmore ID 278280	NS 9266 8748/ 292660, 687480	Undated	Kincardine	Bank (Earthwork), Fish Trap, Pier  Remains of piers, walkways, dock and 5-6 wooden ship hulks.	A73
Canmore ID 285041	NS 92819 88658/ 292819, 688658	Post Medieval	Alloa To Kincardine-on- forth Branch Railway, Kilbagie to Kincardine Section	Railway  19th-century. No other description. Photos only.	A74
Canmore ID 289257	NS 91848 87360/ 291848, 687360	Undated	Higgin's Neuck, River Wall	Wall  Wall containing squared boulders, set in courses, to retain the southern bank of the River Forth to the W of the Kincardine Forth Bridge.	A75
Canmore ID 289181	NS 92026 87762/ 292026, 687762	Modern	Kincardine on Forth, Kincardine, Clackmannanshire Bridge	Road Bridge  Clackmannanshire Bridge built between 2006 and 2008.  Archaeological investigations undertaken revealed Iron Age, medieval activity, including a 17th-century laird's house at Garlet (Canmore ID 48314).  This area is located c. 300m north of the edge of the 1km buffer.	A76
Canmore ID 377550	NS 92086 89021/ 292086, 689021	Modern	Kincardine, Clackmannan, Field F 10	Field System  20th-century. No other description of the field system.  Archaeological investigations undertaken revealed Iron Age, medieval activity, including a 17th-century laird's house at Garlet (Canmore ID 48314).  Revealed remains of ridge and furrow cultivation and possible remains of World War II glider traps.	A77

HES Ref	NGR/ Eastings, Northings	Period	Site Name	Description	Asset Ref.
Canmore ID 365159	NS 91920 87280/ 291920, 687280	Medieval to Post Medieval	Airth, Higgins Neuk	Corn Drying Kiln, wall and watermill (Post Medieval), Pier (Medieval), Slipway, Track (18th-century)	A78
Canmore ID 349047	NS 91422 88836/ 291422, 688836	Post Medieval	Kennet Pans	Ballast Mound  Mound created by ships dumping ballast.  Dug from river gravels that contained Neolithic flints.	A79
UKHO 2833	56°04,395'N, 03°43,948'W	Undated	Unknown	Wreck  Unclassified 'dead' wreck.	A80

## Appraisal Methodology and Significance

### Scope of the appraisal

The scope of the appraisal is to define the known heritage assets within the Site and the study areas surrounding the Site, to identify heritage assets that have the potential to be impacted upon by the Scheme. The Site is defined as the location of the Scheme. The appraisal will also identify areas within the Site that have the potential to contain unknown archaeological remains.

### Determining Magnitude of Impact and Value of Heritage Assets

The determination of the cultural significance or value of heritage assets is based on statutory designation and/or professional judgement against the characteristics and criteria expressed in HES Designation Policy and Selection Guidance and the Historic Environment Policy for Scotland. The criteria used for the determination are presented in Table A-3.

**Table A-3 – Criteria for Appraising the Value of Cultural Heritage Assets**

Value	Criteria
Very High	This category contains heritage assets that will be considered to be of international importance either for historic associations or their informative potential. This category includes World Heritage Sites (including nominated sites) and assets of acknowledged international importance.
High	This category contains heritage assets that will be considered to be of national importance either for historic associations or their informative potential. This category includes heritage assets designated as scheduled monuments, protected military remains, listed buildings (Category A and B), or Historic Marine Protected Areas (HMPAs) and those heritage assets of scheduled quality and importance. Also includes palaeoenvironment remains that are either very well-preserved or particularly important for understanding specific periods.

Medium	Heritage assets of regional importance for historic associations or their informative potential. This category includes Listed Buildings (Category C), well-preserved live wrecks that are not suitable for designation, or palaeoenvironmental remains that are typical of a region.
Low	Non-designated heritage assets of local importance for historic associations or their informative potential may include marine debris or less well-preserved marine material, or generally representative archaeological material or feature types.
Negligible	These include those features that are recorded but no longer extant, which are suggestive of further activity but not of intrinsic value (e.g. records of losses without identified wreck sites, some 'dead' wrecks, isolated finds, debris).

The criteria for assessing the magnitude of impact from the Scheme on heritage assets is shown in Table A-4.

**Table A-4 – Criteria for Appraising the Magnitude of Impact on Cultural Heritage Assets**

Value	Adverse Criteria	Beneficial Criteria
Major	<p>Loss of most or all key archaeological materials or key historic building elements such that the significance of the heritage asset is totally altered.</p> <p>Comprehensive changes to setting such as extreme visual effects, gross change of noise or change to sound quality, or fundamental changes to use or access.</p>	<p>Preservation of a heritage asset in situ where it would otherwise be completely or almost lost.</p> <p>Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated, and experienced.</p>
Moderate	<p>Changes to many key archaeological materials or key historic building elements, such that the significance of the heritage asset is clearly modified.</p> <p>Considerable changes to setting that affect the character of the heritage asset such as visual change to many key aspects or views, noticeable differences in noise or sound quality, or considerable changes to use or access.</p>	<p>Changes to important elements of a heritage asset's fabric or setting, resulting in its cultural significance being preserved (where this would otherwise be lost) or restored.</p> <p>Changes that improve the way in which the heritage asset is understood, appreciated, and experienced.</p>
Minor	<p>Changes to key archaeological materials or key historic building elements, such that the significance of the heritage asset is slightly altered.</p> <p>Slight changes to setting such as slight visual changes to few key aspects or views, limited changes to noise levels or sound quality, or slight changes to use or access.</p>	<p>Changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed.</p> <p>Changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.</p>
Negligible	Changes to archaeological materials or historic buildings elements such that alterations to the significance of the heritage asset are very minor.	Very minor changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed.

Value	Adverse Criteria	Beneficial Criteria
	Very minor changes to setting such as virtually unchanged visual effects, very slight changes in noise levels or sound quality, or very slight changes to use or access.	Very minor changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.
No Change	Changes to fabric or setting that leave significance unchanged.	

The terms shown in the matrix below have been used to define the Overall Impact identified and apply to both beneficial and adverse impacts. For the purpose of this appraisal, Overall Impacts of Moderate or greater are considered potentially material to the planning process and are highlighted in bold in Table A-5.

**Table A-5 – Overall Impact**

Value	Magnitude of Impacts					
		Major	Moderate	Minor	Negligible	No change
Very High	Very Large	Large or Very Large	Moderate / Large	Slight	Neutral	Neutral
High	Large / Very Large	Moderate / Large	Moderate / Slight	Slight	Neutral	Neutral
Medium	Moderate / Large	Moderate	Slight	Neutral / Slight	Neutral	Neutral
Low	Slight / Moderate	Slight	Neutral / Slight	Neutral / Slight	Neutral	Neutral
Negligible	Slight	Neutral / Slight	Neutral / Slight	Neutral	Neutral	Neutral

### Limitations and Assumptions

The desk-based data gathering and walkover survey on which this appraisal has been based was extensive but not exhaustive, thus there remains the possibility that there may be heritage assets that have not been identified. It has been assumed that the information obtained from data sources listed in Table A-1 are accurate and up to date at the time of appraisal.



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