EDF Energy Nuclear Generation Ltd

Decommissioning of Hunterston B Nuclear Power Station

Outline Environmental Management Plan

November 2023

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Report for

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Contents

1. Introduction

1.1.1 Hunterston B Nuclear Power Station (HNB) Nuclear Site Licence Boundary (hereafter referred to as 'the Site'), ceased generation of electricity in January 2022. Defueling of the Site commenced shortly after, with this process due to complete in 2025. Decommissioning, namely the dismantling and decommissioning of plant and buildings at the Site, is anticipated to start shortly after this. Prior to the commencement of decommissioning activities at the Site, EDF, the licensee of the Site[1] [2], is legally required to gain consent to carry out the decommissioning project from the Office for Nuclear Regulation (ONR)) under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (EIADR).

1.1.2 In line with EIADR, this Outline Environmental Management Plan (EMP) has been prepared to demonstrate the proposed structure of the future detailed EMP (hereafter referred to as the 'detailed EMP') to be utilised for the management of the decommissioning proposals, to provide confidence that the licensee will follow requirements across the Proposed Works following consent from the ONR. The detailed EMP shall:

- list the mitigation measures identified in the Environmental Statement (ES) and evidence submitted (to the ONR) to verify information in the ES;
- list the options to implement work activities where mitigation measures may be required but where selection of an option will only be possible in the future; and
- list the work activities where mitigation may be required but where assessments to identify mitigation measures will only be possible in the future.

1.1.3 Under a transfer agreement made in June 2021 between UK Government and EDF, the Advanced Gas-cooled Reactor stations will transfer from EDF ownership to the Nuclear Decommissioning Authority (NDA) after EDF has ceased generating electricity and defueled. Once Magnox Limited (hereafter 'Magnox Ltd'), a subsidiary of the NDA, has obtained the necessary regulatory approval to become the holder of the Nuclear Site Licence for HNB, the ownership of HNB will transfer to Magnox Ltd. In November 2023, Magnox Ltd commenced a re-branding exercise to Nuclear Restoration Services. The legal entity at the time of

[1] A nuclear site licence granted by the ONR is a legal document, issued for the full life cycle of a nuclear facility. It contains site-specific information and defines the number and type of installations permitted. Such installations include nuclear power stations (like HNB), research reactors, nuclear fuel manufacturing and reprocessing, and the storage of radioactive matter in bulk.

[2] The Site Licensee is the holder of the nuclear site licence. The current Site Licensee for HNB is EDF. Following the end of generation and defueling, the Nuclear Decommissioning Authority (NDA) and Magnox Ltd (a subsidiary of the NDA) will become the Site Licensee and the responsible party for implementing decommissioning at the Site.

submission is still Magnox Ltd, and thus, throughout this EIADR submission, references to 'Magnox Ltd' are retained.

1.1.4 Since the transfer agreement was signed, EDF, NDA and Magnox Ltd have been working together to realise synergies within the decommissioning process and identify opportunities to share site infrastructure across Hunterston A (HNA, and currently undergoing decommissioning) and HNB and sharing best practice and experience. The assumptions that underpin the application for consent to decommission HNB have been shared with NDA and Magnox Ltd and confirmed as an appropriate basis for undertaking an Environmental Impact Assessment (EIA) of the effects of decommissioning at the time the EIADR application has been submitted. The environmental effects and environmental measures reported in the ES and this Outline EMP have also been shared with NDA and Magnox Ltd.

1.1.5 If consented by EIADR, the decommissioning works would include the dismantling and deconstruction of buildings and structures in areas within and outside of the Nuclear Site Licence (NSL) boundary that are part of the power station (the Proposed Works).

1.1.6 It is expected that, prior to the commencement of the Proposed Works, a detailed EMP will be prepared by the Site Licensee and approved by the ONR. The detailed EMP will be used by the Site Licensee to manage the Proposed Works. The detailed EMP will be a live document implemented by the Site Licensee and its contractors, and reviewed and updated as necessary during the Proposed Works. The Site Licensee will engage with ONR and other stakeholders as required to ensure inclusion of sufficient detail within the document. The detailed EMP will be reissued periodically in agreement with the ONR. In addition to the submission of the detailed EMP to the ONR, the Site Licensee will also provide copies to the following bodies prior to its implementation on-site and when subsequent updates are made:

- Hunterston Site Stakeholder Group;
- The Nuclear Decommissioning Authority (NDA);
- North Ayrshire Council; and
- Scottish Environmental Protection Agency (SEPA).

1.1.7 The detailed EMP will be made available for viewing at the following locations when it is being implemented:

- Fairlie Library (Main Road, Fairlie, Largs, KA29 0AD).
- Millport Library (Garrison House, The Garrison, Millport, Isle of Cumbrae KA28 0DG).
- Largs Library (26 Allanpark Street, Largs, KA30 9AG).
- West Kilbride Library (Halfway Street, West Kilbride, KA23 9EQ).

1.1.8 It is anticipated that further documents will be prepared at different stages of the Proposed Works which will support the detailed EMP, for example (but not limited to):

- Construction Traffic Management Plan (CTMP);
- Dust Management Plan;
- Pollution Prevention Plan (PPP); and
- Site Waste Management Plan.

2. Scope of the Environmental Management Plan

2.1 Overview

2.1.1 This Outline EMP has been designed with the objective of outlining compliance with the relevant environmental legislation and recommended environmental measures to manage the Site for the Proposed Works outlined by the HNB EIADR Environmental Statement. It identifies the potential impacts of the Proposed Works alongside the relevant environmental measures that need to be implemented to prevent or reduce their effects in environmental receptors. The document also provides a review of monitoring requirements (frequency, duration) which will ensure the effectiveness of the implementation of these measures to prevent environmental effects during the Proposed Works.

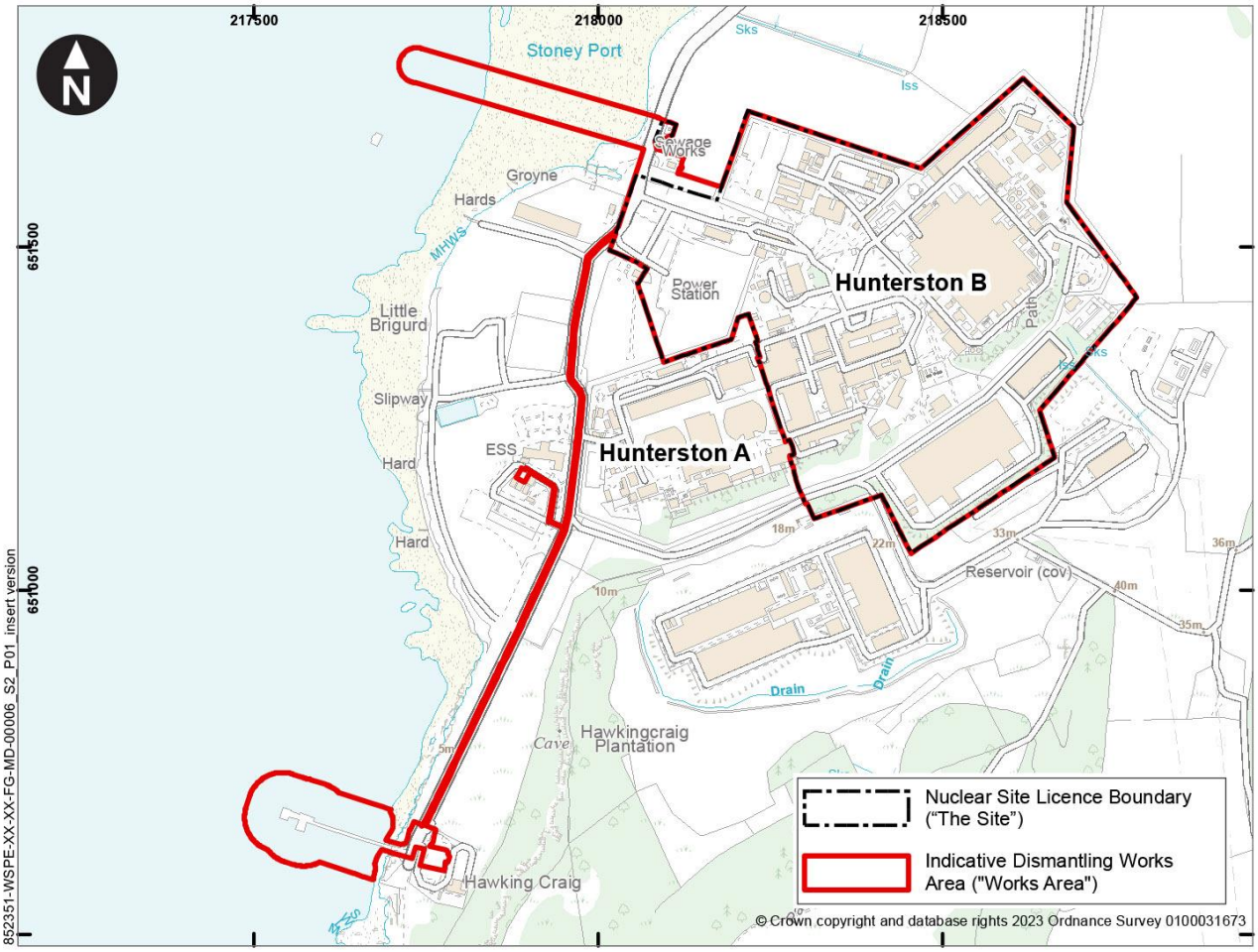
2.1.2 This Outline EMP provides:

- A brief overview of the Site, Indicative Dismantling Works Area (hereafter the 'Works Area') and surrounding area;
- A brief overview of the Proposed Works and associated programme;
- A summary of the environment impacts anticipated during each stage of the Proposed Works and the environmental measures that are identified in the ES;
- The work activities where mitigation measures may be required but where assessments to identify mitigation measures will only be possible in the future (such as remediation of contaminated land identified by future monitoring); and
- The options to implement work activities where mitigation measures may be required but where selection of an option will only be possible in the future, and identify the mitigation measures for those options, giving reasons for their selection.

2.2 Geographical scope

2.2.1 The HNB Nuclear Site Licence area (the 'Site') occupies approximately 30 hectares. The Proposed Works cover some areas outside of the nuclear site licence boundary such as the those related to the cooling water infrastructure and thus a wider Works Area which covers approximately 34.5 hectares is set out in **Graphic 2.1.**

Graphic 2.1 Location of the Site and Works Area



2.2.2 This Outline EMP provides a means of ensuring appropriate environmental management (including monitoring) is undertaken during the works and that amendments to environmental management measures are identified and implemented as necessary.

2.3 Duration

2.3.1 The Proposed Works will be undertaken over the following phases:

- Preparations for Quiescence:

  This phase includes the de-planting, dismantling and deconstruction of all plant and buildings not included within the Safestore structure on-site and the relevant management of wastes arising from the activities undertaken during this phase. In addition, it includes the modification of the existing reactor building to create the Safestore structure.

- Quiescence:

  A period of relative inactivity with management of a mainly quiescent state to allow further radioactive decay of materials within the Safestore. The duration of this phase is approximately 70 years, during which there would be a regime

of continuous monitoring and surveillance, with periodic maintenance interventions as required.

- Final Site Clearance:

  The reactors and debris vaults will be dismantled and removed. Construction and engineering works to prepare for these final dismantling tasks will take place to ensure the provision of the necessary infrastructure, services and facilities. Upon clearance and delicensing, the land will be released for future re-use.

2.3.2 It is expected that mitigation measures may change in the future in light of experience and developing technologies. Where mitigation measures are still to be identified, developed in more detail, or require changes, these will be described in subsequent iterations of the detailed EMP together with reasons for changes made.

2.3.3 The embedded measures described in the ES have been extracted and tabulated in **Section 5.**

2.4 Environmental aspects

2.4.1 A brief description of the HNB Site, Works Area and its surroundings is presented in this Outline EMP (see **Section 3**).

2.4.2 Beneficial or adverse environmental impacts as a result of the Proposed Works which have been identified through the EIADR have been divided into 15 environmental aspect areas, as reported within the HNB EIADR ES, and relate to the following:

- Air quality;
- Climate change;
- Terrestrial biodiversity and ornithology;
- Marine biodiversity;
- Coastal management and water quality;
- Surface water and flood risk;
- Soils, geology and hydrogeology;
- Historic environment;
- Landscape and visual;
- Noise and vibration;
- Traffic and transport;
- People and communities;
- Major accidents and disasters;
- Conventional waste; and

- Radioactive waste and discharges.

2.5 Maintaining an Environmental Impact Assessment baseline

2.5.1 The following records will be transferred from EDF to Magnox Ltd and will form the basis of an 'EIA Baseline' for HNB:

- The environmental baseline surveys and findings that underpin the environmental baseline for the HNB EIADR application;
- The HNB ES that includes the Project Description, EIA Methodology, the conclusions of environmental assessment on effects and significant impacts, and associated mitigation measures;
- The HNB Decommissioning EIADR Assumptions Register; and
- The HNB Decommissioning Environmental Mitigation Register (these measures are set out in **Section 5** and **7** of this Outline EMP).

2.5.2 Magnox Ltd will maintain and update the EIA Baseline on a periodic basis to reflect:

- Any significant updates to the environmental baseline that arise from the programme of monitoring and environmental surveys in so far as they have potential to result in changes to the assessment reported in the HNB ES;
- Any significant updates to the environmental baseline that arise from changes in environmental designations, environmental features or receptors, in so far as they have potential to result in changes to the assessment reported in the HNB ES;
- Any changes to the HNB Decommissioning Plan that would require an alteration to the Environmental Statement Project Description and/or the EIADR Assumptions Register in so far as they have potential to result in changes to the assessment reported in the HNB ES; and
- Any changes to mitigation, to replace or improve the effectiveness of mitigation.

3. The Site, Works Area and surrounding area

3.1 Site and Works Area description

3.1.1 The Site is located 3.5 km north-west of West Kilbride, Scotland. In the centre of the Site lies the Reactor Building and Turbine Hall which are surrounded by a range of smaller buildings and structures which include those ancillary to the energy generation process, as well as access roads.

3.1.2 A graphic displaying the Site at the End of Generation is shown in **Graphic 3.1** below.

Graphic 3.1 Layout of the Site at End of Generation

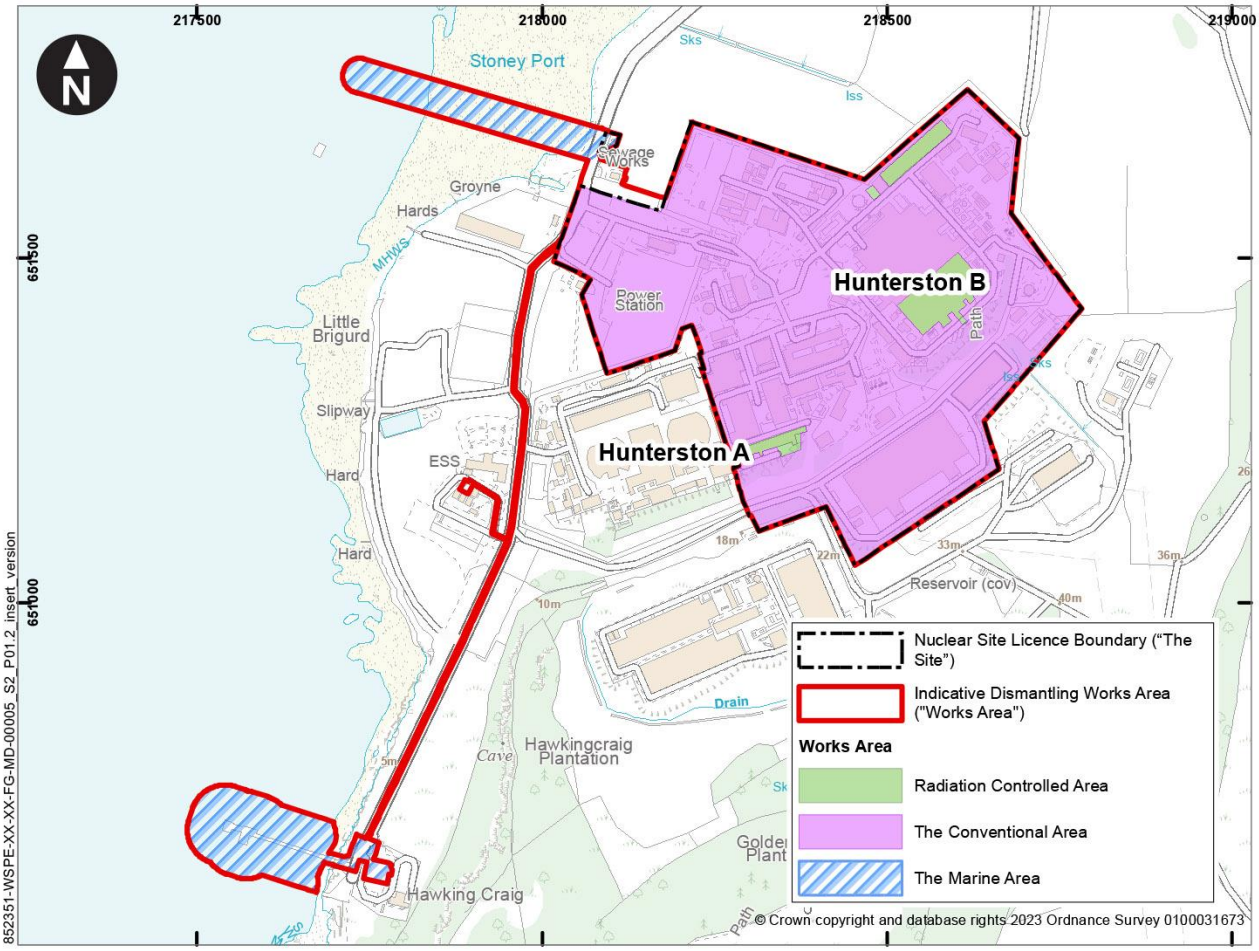
3.1.3 Three areas (identified in **Graphic 3.2**), within the Works Area are referred to throughout the ES for the purposes of describing the Proposed Works as follows:

- The Radiation Controlled Area (RCA) – This is made up of three areas on the HNB Site. The main central location consists of the Reactor Building (containing the two reactors) and a number of adjoining structures containing plant and structures that have the potential to contain radioactive contamination. This area includes areas such as the fuel cooling ponds, the debris vaults and other radioactive waste treatment plant and buildings. The northern RCA area is where the Site laundry and existing Low Level Waste (LLW) building is located which will be converted into a Decommissioning Waste Processing Facility (DWPF) for the Preparations for Quiescence phase. The southernmost RCA area is the former Gas circulator workshop and former

health physics centre from when HNB and HNA were operated as a combined site.

- The Conventional Area - consists of the area outside of the RCA. It includes ancillary plant and buildings such as the Turbine Hall and services building, cooling water systems and numerous other buildings, compounds, roadway and hardstandings which make up the operational site. For the purposes of assessment, it also includes areas outside of the main security fence such as the car parks, and other structures that require removal as part of the Proposed Works such as the Sewage Treatment Plant, electricity transmission buildings and the Cooling Water Intake and Outlet Land Shafts.
- The Marine Works Area – The Cooling Water Intake and Outfall, associated tunnels and the Jetty and are not included within the Site but are key parts of the power station that will be decommissioned.

Graphic 3.2 Layout of the Works Area



3.2 Surrounding landscape

3.2.1 The Site is located on a gentle north-facing slope which rises from an elevation of approximately 5 m Above Ordnance Datum (AOD) close to the northern boundary of the Site to approximately 25 m AOD at its southern boundary. Furthermore, it is located on the west coast of Scotland on the Firth of Clyde, opposite the islands of Great and Little Cumbrae. The Site lies within the jurisdiction of North Ayrshire Council (NAC).

3.2.2 It neighbours the Hunterston A (HNA) nuclear power station which ceased generation in 1990 and is currently being decommissioned. Both stations are largely surrounded by land in agricultural use with regular, medium sized fields divided by drainage ditches and hedges. The coastal foreshore of Hunterston Sands and mudflats to the north and west of the Site, and the Southannan Sands and raised beach to the north-east are prominent features in the local landscape. The Ayrshire Coastal Path uses the Power Station Road Access from the Jetty past the Site, through the Works Area.

3.2.3 To the south of the station are 132 kV and 400 kV substations which connect the station to the national transmission network. Additionally, a High Voltage Direct Current (HVDC) converter station is located to the south of the Site to support the export of electricity to the rest of the UK, mainly generated by wind power from across Scotland.

3.3 Transport infrastructure

3.3.1 The Power Station Road connects directly to the A78 which is part of the Scottish Trunk Road Network. The A78 largely follows the coastline from Greenock, through Largs, past the Site and towards Ayr. The main vehicle access to Glasgow from the Site is provided via the A78 southbound in combination with the A737. The A78 northbound provides an alternate route to Glasgow, but requires transportation through Fairlie, Largs and Greenock prior to joining the A8 and the wider motorway network west of Glasgow. A narrowing of the highway in Fairlie has been identified by other local development projects to provide a constraint to HGV access, and thus it is anticipated that HGV access to the Site will be primarily utilise the A78 south of the Power Station Roundabout.

3.3.2 The nearest train stations to the Site are located in Fairlie (3.3 km north of the Site by road), West Kilbride (4 km by road). There is a further station at Largs where the line terminates.

3.3.3 The Clyde Port (Hunterston Terminal) is the closest port with marine shipping facilities although these are not anticipated to be utilised by the Proposed Works.

3.4 Local watercourses and hydrogeology

3.4.1 There are no significant watercourses in the immediate surroundings of the Site. There are several drainage ditches in the fields to the north and south of the Site.

3.4.2 Approximately 30 m to the east of the Western High Voltage Direct Current Substation building car park, a swale captures surface water which is directed underneath Goldenberry Road and alongside the Site boundary. There is also a network of roadside drainage ditches alongside Goldenberry Road.

3.4.3 Groundwater monitoring undertaken within the Site indicates flow is generally flowing to the north-west beneath HNB and discharges to the sea. There is a varying permeability of made ground and the superficial deposits and the presence of below ground infrastructure and basements will result in local variations in groundwater flow on the Site.

3.5 Sensitivity of the receiving environment

3.5.1 **Table 3.1** provides a summary of the nearest sensitive human, biodiversity and heritage receptors which have been scoped in to the EIA and considered within the ES. These are illustrated on **Graphic 3.3** and **Graphic 3.4**.

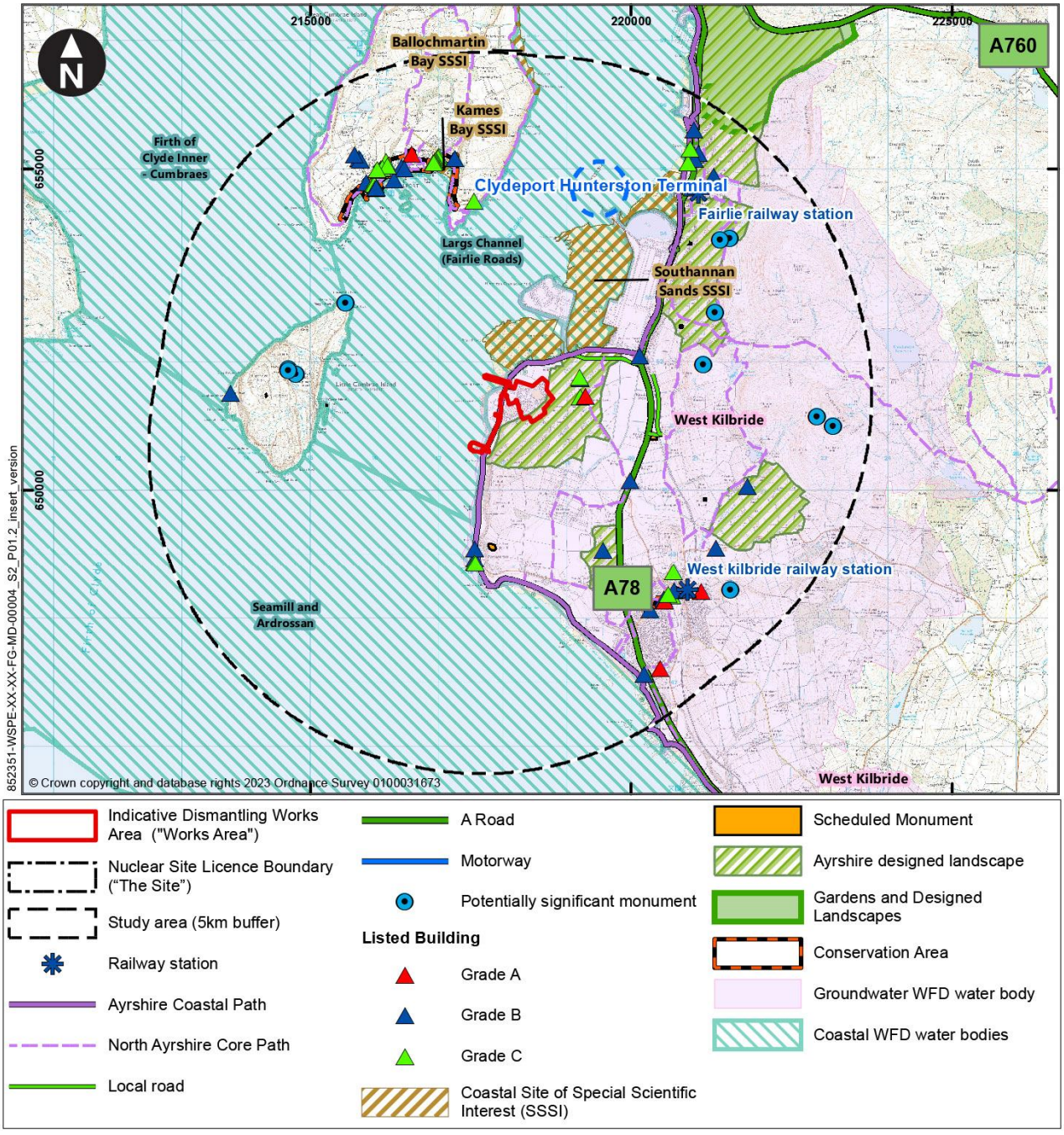
Table 3.1 Summary of nearest sensitive human, biodiversity and heritage receptors considered within the scope of the ES

Nearest Receptors	Distance to the Works Area
Human	
Workers at Hunterston A power station	Adjacent
Residential property	Nearest residential properties are located 0.45km east. These are illustrated on **Graphic** 3.4 which shows those residential properties close to the Site as well as noise monitoring locations.
Biodiversity	
Portencross Woods Site of Special Scientific Interest (SSSI)	0.05 km east
Southannan Sands SSSI	0.18 km north

Nearest Receptors	Distance to the Works Area
Goldenberry Hill Local Nature Conservation Site (LNCS) and Ancient Woodland Inventory (AWI)	0.08 km south-east
Portencross Woods AWI	0.03 km to the east
Heritage	
Scheduled monument, Castle Knowe (SM3694)	1.7km south-east
Hunterston Castle (LB14313)	0.56 km east
Walled Garden at Hunterston (LB14288)	0.48 km east
Hunterston House (LB14286), North Gate (LB14314), South Gate (LB14315) and associated Category C listed Well In Front Of Mansion (LB14287)	0.51 km east
Robertson Building Millport Field Centre (LB52288)	2.9 km north-west
Little Cumbrae Lighthouse	3.9 km west
Little Cumbrae Castle (SM2195)	2.9 km west
Millport Conservation Area	2.9 km north-west
Non-designated including • **designed landscape associated with Hunterston House;** • **Stoney Port/Hunterston, Landing Point (HER55532)** • **Hunterston B Power Station/Hunterston Nuclear Generating Station (HER14108);**	Within the Works Area

Nearest Receptors	Distance to the Works Area
• Fences, Cinerary Urn, bead (findspot) (HER5235); • Hunterston Nuclear Generating Stations/Hunterston Power Station (HER5244); • Hunterston, Pier/Fairlie Roads, Pier (HER55535); and • Stoney Port, Limekiln (HER66202).	

Graphic 3.3 Environmental context



Graphic 3.4 Location of sensitive receptors

4. Site management and decommissioning

4.1 General site management

Hours of work

4.1.1 HNB has operated a 24 hours a day, seven days a week operational working pattern through operations and subsequently defueling. During the Preparations for Quiescence phase, working hours will change to represent the different types and nature of ongoing activities on the Site. Whilst some aspects of active area deplanting may necessitate the need for maintaining shift working, the majority of the Proposed Works, such as conventional deplanting and deconstruction and Safestore construction, will be limited to normal working hours between 07:30 and 18:00 hours Monday to Friday. There may be occasional infrequent exceptions when the working day may be extended in order to complete specific items of work safely. During the Preparations for Quiescence phase, it is anticipated that security personnel will remain on site 24 hours a day, seven days a week, using shift arrangements.

Lighting

4.1.2 The existing night-time illumination within the Site consists mainly of internal lights within the transparently clad parts of the Reactor Building and Turbine Hall, together with low level ‘street’ lights. During the Preparation for Quiescence phase, additional lighting may be necessary at the start and end of the working day during the winter months. Use of such lighting will be at the discretion of the relevant Site Supervisor. Compared to the current night-time illumination at the Site, any visual difference from this temporary additional lighting will be negligible and in-line with lighting that has been occasionally required during station outages during operation. Consideration will be given to the use of directional lighting to minimise any light spill when any further on-site lighting is required for the works. The existing security lighting will be retained through the Preparations for Quiescence phase.

4.1.3 It is anticipated that lighting requirements on site will reduce during the Quiescence phase before increasing during Final Site Clearance in areas around the Safestore to levels similar to those seen during the Preparations for Quiescence phase.

Transport

4.1.4 It is assumed that all materials and wastes will be transported to and from the Site via road. Whilst it is not possible to rule out the need for Abnormal Indivisible Loads (AILs), it is not expected to be commonplace throughout the decommissioning lifecycle. Radioactive wastes consigned off-site will be transported off-site utilising processes already embedded during station operation and in-line with the requirements of the Radioactive Materials (Road Transport) Act 1991 (as amended).

4.1.5 Traffic generated by the Proposed Works will be managed in accordance with a CTMP. An outline CTMP is provided in **Appendix 16A** of the ES.

Security

4.1.6 For works within the security perimeter fence, it is assumed the existing security arrangements, required by the NSL, will apply. For works outside the security perimeter fence, the Works Area will be secured, typically using Heras type fencing.

4.1.7 In accordance with the Construction Design and Management (CDM) Regulations (Regulation 18), all working areas/sites will comply with either or both of the following:

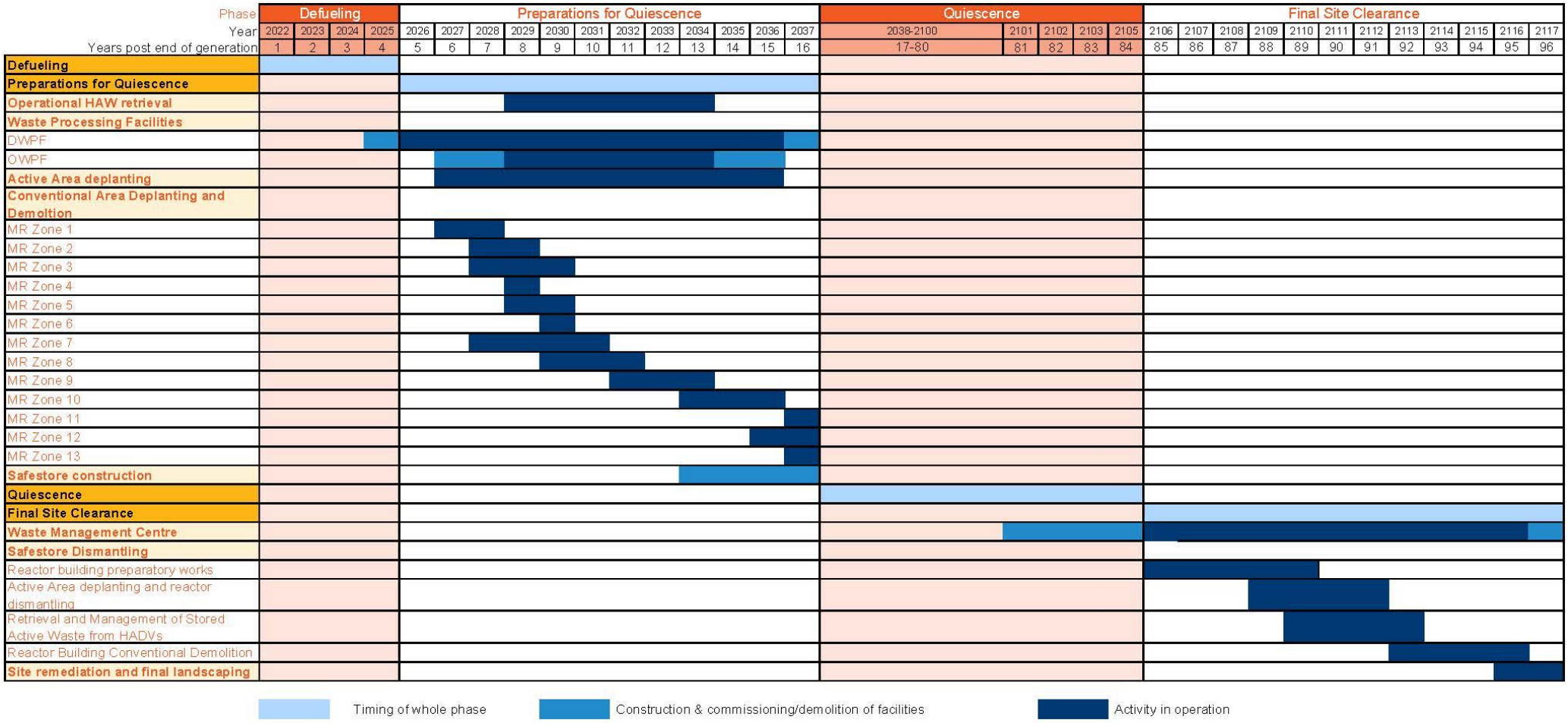
- have its perimeter identified by suitable signs and be arranged so that its extent is readily identifiable; or
- be fenced off.

4.2 Decommissioning methods

Decommissioning programme

4.2.1 The indicative decommissioning timeline within **Graphic 4.1** has been utilised for the purposes of assessment. It represents the current understanding for the 'best case scenario' for the completion of works in the Preparations for Quiescence phase which also is considered to represent the worst-case for the assessment via an intensification of the Proposed Works on site relative to a slower Preparations for Quiescence phase.

Graphic 4.1 Decommissioning timeline



Deplanting and deconstruction

Conventional Area

4.2.2 The deplanting and deconstruction of buildings and structures in the Conventional Area during the Preparations for Quiescence phase is broken into 13 zones. The location of these zones can be found on **Graphic 4.2**. The northern and southern 'satellite Radiation Controlled Areas' at HNB lie within zones 8 and 11 respectively. It is expected that these will be deplanted and fully decontaminated under the Active Area Deplanting works which will enable them to be demolished as conventional buildings using conventional methods as outlined in the programme in **Graphic 4.1**.

Graphic 4.2 Location of Buildings within each Managed Retreat building group

*Note – Group 3 also includes the work to decommission the Jetty, CW Intake and CW Intake Land Shaft structures

4.2.3 Exact methodologies to be used during deconstruction will be determined by the appointed contractor at the time, although it is expected that larger plant will be cut or split on site into components or sub-components to facilitate its simpler removal from the Works Area.

4.2.4 All Conventional Area buildings and structures will be demolished in their entirety, including the removal of any cabling to ground level. Whilst demolition is generally to ground level, some buildings on-site contain basements that also require demolition and deconstruction. Likewise, there is a need to undertake some works below ground level to remove trenched pipework where land contamination may have occurred during operation.

4.2.5 The EIADR assumes that a demolition material suitable for use as in-fill will be retained on-site to be used as in-fill for voids, specifically those of the CW system and the Turbine Hall basement. This will be subject to regulatory approvals from SEPA in the future. Prior to use as in-fill, it is anticipated that rubble debris from the demolition of buildings will first be crushed. Where practicable, concrete crushers that use compression rather than pneumatic hammers will be selected due to their lower noise profile.

4.2.6 Roads and hardstandings on the Site will be retained on-site through the Quiescence phase.

Marine area

4.2.7 Following the installation of an alternate Active Effluent Discharge Line in the Cooling water (CW) Outlet Tunnel (more information in **Section 4.3** below), the CW System can be decommissioned.

4.2.8 Before decommissioning of the CW system can commence, it will be necessary to isolate the CW system from the sea. The first stage of this is to lower the existing gates for the forebay/drum screen apertures and seal pit simultaneously at low tide. The inlet system from the drum screen bay to the turbines will be dewatered by pumping out the water into the forebay. The outlet system from the turbines to the Seal Pit will be dewatered by pumping out the water into the Seal Pit at the access chamber to the culverts adjacent to the Seal Pit.

4.2.9 The existing gate for the CW system sealing the intake structure at the end of the Hunterston Jetty will be lowered into position utilising a mobile crane. The intake tunnel will then be dewatered from the top of the intake structure into the Firth of Clyde.

4.2.10 At the intake and outlet land shafts, a concrete plug will be created on the seaward side of the structures within the tunnels, above ground sections of the shaft structures will be demolished and the shafts filled with fill material generated from deplanting and deconstruction activities. Water retained between the CW Outlet Land Shaft and the seal pit will then be pumped into the Firth of Clyde subject to necessary permissions from SEPA. Tunnels between the CW intake and the CW Outfall are at this point assumed to be abandoned and left in-situ.

4.2.11 Following the completion of the concrete plug at the intake land shaft, the intake structure at the end of the Jetty can be demolished. This is assumed to be demolished by cutting sections of the deck of the intake structure and lifting this away by crane (located on the jetty). Each section of deck will be transported to a processing area. The jetty piles will be cut off at the sea bed level and removed. Where safe and practicable, the decommissioning will be undertaken from the shore, and at low tides. However, the works to remove the intake structure and part of the jetty will require the assistance of a dive team operating from a pontoon.

Active area deplanting and deconstruction

4.2.12 The RCA consists of a number of buildings that have been used to handle radioactive materials. Apart from the Reactor Building and adjoining structures, these structures include: the LLW Store, the Laundry, the Health Physics Services Building, the Contaminated Plant and Gas Circulator Main Workshop and the former Health Physics Base Facilities. All these buildings set away from the Reactor Building will be demolished to ground level during the Preparations for Quiescence phase.

4.2.13 Although the basic deplanting and demolition techniques applied to radioactive facilities will be similar to those used for plant and buildings in the Conventional Area, well-established and effective techniques for controlling and containing radioactive contamination and reducing radiation exposure will be applied in line with the As Low As Reasonably Practicable (ALARP) principle. For example, where necessary, work will be done within temporary enclosures or containment structures, which will be specially ventilated and filtered. In addition, after de-contamination and prior to demolition, a fixative may be sprayed on exposed surfaces in order to control dust generation. If appropriate, further dust control will be ensured through the use of water sprays with appropriate management of the wastewater arising.

4.2.14 Deplanting within the Reactor Building will be undertaken to make the plant safe prior to the modification of the building into the Safestore for the Quiescence phase and to ease monitoring and maintenance of the facility through this period.

4.2.15 Prior to demolition, radioactive facilities (excluding the Safestore), will be de-planted and de-contaminated down to pre-specified levels. Monitoring checks will also be made on the building and on the demolition rubble to confirm that the radioactive contamination has been removed to the required level. The objective of this monitoring will be to ensure solid wastes classed as LLW are transferred to the Decommissioning Waste Processing Facility (DWPF) for further re-processing and packaging prior to waste consignment. All discharges of airborne radioactive contamination or liquid effluents will be monitored and controlled in accordance with the Environmental authorisations (Scotland) Regulations 2018 permit. Following this, buildings will be removed to ground-level as part of conventional deconstruction as outlined above.

4.2.16 The active area deplanting works in the Preparations for Quiescence phase also require the removal of some operational ILW currently stored on site within specially designed tanks, vaults and stores. These wastes will be processed and removed from site in accordance with Best Practicable Means Studies. Some may require processing and packaging within the Operational Waste Processing Facility (OWPF) to make them ready for long term storage within the HNA Interim Storage Facility (ISF).

Modification of the Reactor Building to create the Safestore

4.2.17 The major plant and structures inside the Reactor Building are substantial, robust items within which the radioactivity is shielded and either naturally immobile or fully contained in high integrity vessels. Prior to the Reactor Building being put into a safe and secure state, some deplanting will be undertaken as outlined in the Active area deplanting and demolition section above.

4.2.18 The Reactor Building will be modified during the Preparation for Quiescence phase to ensure that the building and contents remain safe, secure and weatherproof during Quiescence.

4.2.19 These works will involve:

- Scaffolding of the Safestore to assist removal of glazing and existing cladding;
- Use of Cranes to assist removal/ replacement of structural elements of the building; and
- Re-cladding of the Safestore to provide a secure weatherproof envelope.

4.2.20 It is assumed that the Safestore will remain the highest building on-site at 66.5 m until Final Site Clearance. The assessment also assumes the retention of the Active Effluent Treatment Plant within an annexe on the southern facade of the Safestore as including this plant within active area deplanting in the Preparations for Quiescence could cause delays to the completion of the Preparations for Quiescence phase.

4.2.21 Any change from the current cladding would have to be considered under the Town and Country Planning Act regime whereby an application for consent would be submitted to NAC. For the purposes of this EIADR assessment, and in particular in undertaking the LVIA (see **Chapter 14: Landscape and Visual Impact Assessment**), it is assumed that the Reactor Building will be re-clad using standing seam aluminium cladding and would be coloured Dark Grey/blue.

4.2.22 Any necessary equipment to enable appropriate monitoring and management of conditions within the Reactor Building and to ensure security throughout the Quiescence phase will be installed during the Preparations for Quiescence phase.

4.3 Waste management

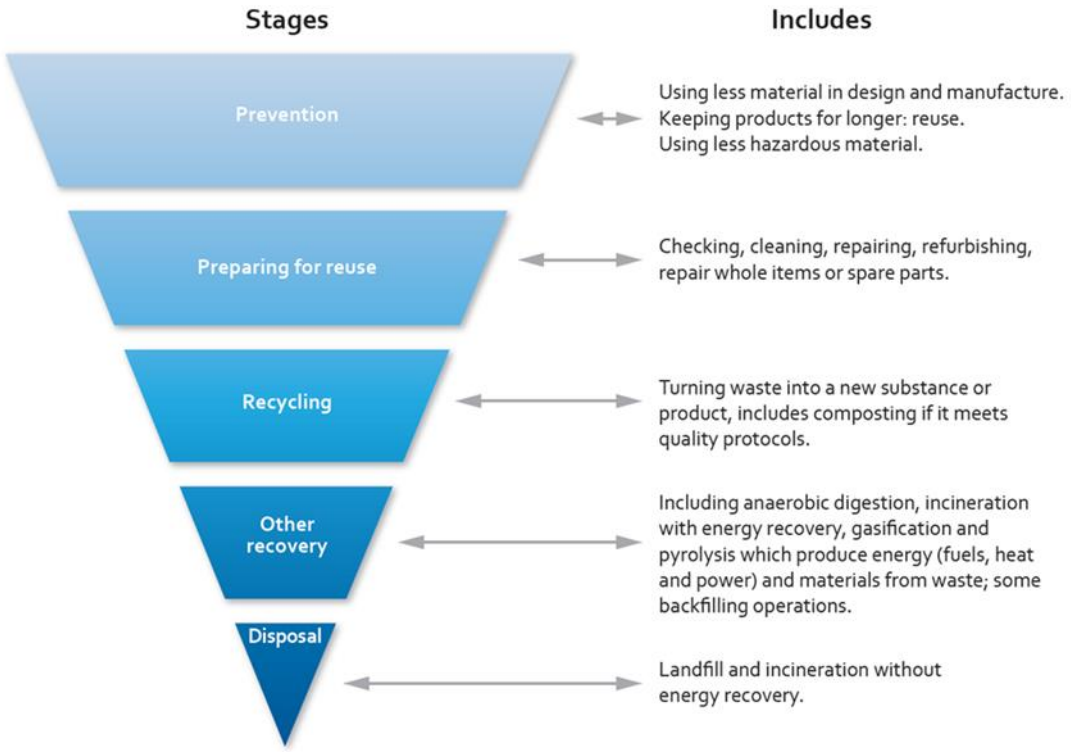
Conventional waste management

4.3.1 During the Preparations for Quiescence phase, the production of waste on-site will vary dependent upon the programme of works ongoing in each year.

4.3.2 Anticipated conventional wastes arising from the Proposed Works may include metals, glass, plastics and other miscellaneous wastes similar to any other demolition of industrial type buildings. Due to the age of the buildings and plant at the Site, the demolitions will generate some hazardous wastes such as asbestos and lagging that will require special management during removal to protect both our workers and the environment.

4.3.3 All waste will be managed using the Site Licensee's existing procedures and processes in accordance with the waste hierarchy shown in **Graphic 4.3**.

Graphic 4.3 Waste hierarchy



4.3.4 Adherence to these will ensure waste streams are managed in accordance with applicable UK legislation, policy and guidance.

Radiological waste management

4.3.5 The Proposed Works will require management of both Higher Activity Waste (HAW) and Lower Activity Waste (LAW). These waste streams are also frequently defined as Low Level Waste (LLW)[3], Intermediate Level Waste (ILW)[4] and High Level Waste (HLW) which overlap the HAW and LAW categories. There is no requirement for managing HLW during the Proposed Works[5].

3 LLW is defined as waste containing radioactive materials not exceeding 4 gigabecquerels per tonne (GBq/te) of alpha radioactivity or 12 GBq/te of beta/gamma radioactivity. The term is usually taken to refer to solid wastes that are not exempt under the RSA93 but which are suitable for disposal or treatment at various off-site locations across the United Kingdom.
4 ILW is defined as waste in which radioactivity levels exceed the upper boundaries for LLW, but which does not require its heat-generating properties to be taken into account in the design of storage or disposal facilities.
5 In addition to the terms LLW and ILW, there are also some solid wastes that are potentially radioactive but which can be shown to contain radioactivity at levels below the relevant exemption level specified under the Environmental Authorisations (Scotland) Regulations 2018, such that they become out of scope of the regulations and therefore are

4.3.6 Radioactive waste management comes under the Environmental Authorisations (Scotland) Regulations (EASR) 18 permit[6] and must demonstrate Best Available Techniques (BAT) (Best Practicable Means (BPM) in Scotland) have been followed for onward management of radioactive waste. Radioactive wastes may be sent off-site for further treatment or compacted to minimise the volume of waste that requires disposal or long-term storage where this can be demonstrated to be the BPM for that waste.

4.3.7 Nuclear power stations such as HNB also generate gaseous and aqueous radioactive wastes that are discharged to the environment under authorisation from the SEPA. The aqueous wastes that are permitted to be discharged at HNB currently discharge into the CW Outlet Tunnel at the Syphon Seal adjacent to the Cooling Water Seal Pit and are subsequently discharged at the CW Outfall utilising the throughflow of cooling water.

4.3.8 A new Active Effluent Discharge Line (AEDL) will be installed from the Seal Pit to the Outfall in the Firth of Clyde by placing a new pipe within the CW Outlet Tunnel prior to decommissioning the CW System. This will enable the discharges of active effluent from the Site during the decommissioning phase in the absence of cooling water flow through the CW System so that the CW System can be decommissioned. This will necessitate the variation of HNB's existing EASR 18 permit regulated by SEPA. It is assumed that these works would be implemented through the use of dive teams working from anchored pontoons around the CW Outfall to minimise sediment disturbance. HNA Active effluent and HNB Sewage will also be required to either have new pipes installed or tie into the new HNB AEDL pipe from the CW Outlet Land Shaft to carry these effluents to the existing CW Outfall in the Firth of Clyde.

suitable for disposal as non-radioactive waste. In respect of their radioactive content these wastes are often described as being 'below regulatory concern'. Such wastes can be and are (as soon as possible after they arise) re-used, recycled or disposed of by whatever routes are appropriate, taking account of their non-radioactive characteristics and the Waste Hierarchy.

6 UK Government (2018). *Environmental Authorisations (Scotland) Regulations (2018).* (Online) Available at: https://www.legislation.gov.uk/sdsi/2018/9780111039014/contents (Accessed November 2023).

5. Environmental requirements

5.1 Embedded measures

5.1.1 The Environmental Statement submitted as part of the application for consent to decommission HNB outlined potential impacts of the Proposed Works and key embedded measures were identified for the three phases of decommissioning.

5.1.2 The following tables list the embedded measures for each phase of the Proposed Works as outlined in the ES. Further development of these measures, where appropriate will be outlined in italics in later iterations of the detailed EMP.

Table 5.1 Embedded measures identified across the Proposed Works

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 6: Air Quality **Chapter 7: Climate Change** **Chapter 8: Terrestrial Biodiversity and Ornithology** **Chapter 12: Soils, Geology and Hydrogeology** **Chapter 16: Traffic and Transport**	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	A Dust Management Plan will be produced for the Proposed Works, in accordance with IAQM guidance[7] on the Assessment of Dust from Demolition and Construction.
Chapter 7: Climate Change	All phases	Release of Greenhouse Gas (GHG) emissions arising from activities during	Due to the length of the Proposed Works, opportunities to mitigate GHG emissions are likely to develop throughout the decommissioning lifecycle. Within the works there should be periodic reviews of the works which highlight these opportunities and enable the introduction of carbon reducing measures at relevant stages in the decommissioning process. These

[7] IAQM (2023). *IAQM Guidance on the assessment of dust from demolition and construction* (Online). Available at: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-dust-2023-BG-v6-amendments.pdf (Accessed November 2023).

Aspect	Phases	Nature of impact	Embedded measures identified
		the Proposed Works	measures should be aligned to The Nuclear Decommissioning Authority Group Sustainability Strategy[8].
Chapter 7: Climate Change	Preparations for Quiescence	Embodied GHG emissions	Embodied Carbon: There are embodied GHG emissions associated with the raw materials used to construct the Safestore. Where possible, choice of local sourcing of construction materials should be encouraged. Circular economy principles will be considered and deployed where possible. Carbon measuring and reporting would be undertaken
Chapter 8: Terrestrial Biodiversity and Ornithology	Preparations for Quiescence and Final Site Clearance	Potential degradation of habitats and biodiversity conservation sites	Site works will be routinely monitored by an Ecologist (Clerk of Works), also referred to as 'ECoW', by way of regular site inspections, with an appropriate frequency to be agreed with the Principal Contractor. Habitats (coast, woodland, grassland) within and immediately adjacent to the Works Area are to be demarcated within exclusion zones. There shall be no entry into these areas, with all works, plant, materials, equipment and personnel remaining within the Works Area. An exception to this being routine habitat management/maintenance under the direction of an Ecologist. Trees are to be protected in accordance with the advice of a suitably qualified/experienced arboriculture consultant and in accordance with good practice (BS 5837:2012 - Trees in relation to design, demolition and construction). Any unavoidable tree loss to facilitate works is to be compensated through planting of at least two trees for each one that is removed within the wider Hunterston area

[8] Nuclear Decommissioning Authority (2022), *The NDA group Sustainability Strategy 2022*. (Online) Available at: https://www.gov.uk/government/publications/the-nda-group-sustainability-strategy-2022 (Accessed November 2023).

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 8: Terrestrial Biodiversity and Ornithology	Preparations for Quiescence and Final Site Clearance	Potential disturbance of mammals and other fauna (general measures)	In advance of site works (including preparatory investigations/enabling works), the ECoW will brief the Principal Contractor on the sensitive ecological features that are on/near the Site and the Principal Contractor will ensure all site staff/personnel are aware of the precautionary working practices. In the event personnel/contractors observe a protected species (e.g. otter, badger, bat, nesting bird etc) or suspect such species to be present within or adjacent to Works Areas all work shall cease and the advice of the ECoW will be sought immediately. Where practicable, within constraints associated with the Proposed Works, excavations are to be backfilled or covered and securely sealed or will have a means of escape for any entrapped fauna, for example gradually sloping sides, or ramps extending from the base of the excavation up to the ground surface. Where this is impracticable during the works, voids will be monitored and any entrapment of fauna will be reported to the ECoW who will recommend additional working practices as appropriate. Gates to compound areas are to be designed to prevent mammals from gaining access and would be closed at night. Any temporarily exposed pipes would be capped when contractors are off site to prevent mammals from gaining access. Construction/demolition materials are to be stored in predetermined parts of the Works Area, over 30 m from adjacent habitats and wherever practicable elevated off the ground (e.g. on pallets), or stored within skips prior to their removal, unless otherwise agreed by the ECoW. Storage and handling of materials should minimise the risk of creating refuge for, or harming, mammals. As far as practicable, any areas/mounds of spoil and/or earth are to be fully compacted, removing cracks/crevices that could create wildlife refuges;

Aspect	Phases	Nature of impact	Embedded measures identified
			No litter or waste materials are to be discarded in Works Areas as they could create temporary refuges for wildlife. Any mammal paths are to be cleared of materials and/or equipment at the end of each working day; All personnel/contractors are to remain vigilant and aware of the risk of encountering mammals (e.g. hedgehog, otter and badger) when driving to and from the Site. A low maximum speed limit will be implemented within the Works Area, in accordance HNB's established safety procedures relating to vehicle movements. Statutory speed limits will be adhered to on approach to the Works Area via surrounding routes. This will limit the risk of animal mortality due to traffic collisions.
Chapter 8: Terrestrial Biodiversity and Ornithology	Preparations for Quiescence and Final Site Clearance	Potential disturbance of Otter	Prior to commencement of activities that are within 200 m of the coast, an updated otter survey will be undertaken, covering a 200 m perimeter around these elements. Where necessary, potential otter refuges and resting sites will be monitored using camera traps to assess the use of these features by otter. Where reasonably practicable, likely measures will include: • An ECoW will monitor the Proposed Works and ensure that all environmental measures relevant to otter are delivered and ensure compliance with the relevant legislation. • Exclusion zones of 30 m (radius) around otter holts/shelters, extended to 200 m around natal holts/shelters. In the event a natal den is established within 200 m of the Proposed Works the ECoW would advise on additional precautions, such as a widening of the exclusion zone or delaying elements of the Proposed Works until the young otters are fully mobile. • Wherever practicable, works and/or artificial lighting within 50 m of the coast will be avoided during the hours of darkness, taken to be 30

Aspect	Phases	Nature of impact	Embedded measures identified
			minutes before sunset to 30 minutes after sunrise. In the event that use of artificial light within 50 m of the coast is unavoidable, for example in the afternoon or morning in winter months, this will be kept to the practicable minimum and will not be left on overnight. • Any lighting used during the Proposed Works will be directed into the Works Area to minimise light spill onto adjacent habitats, including coastal habitats. • Strict speed limits (5 mph) will apply within the Works Area and 'otter crossing' signs will be deployed on access tracks that run parallel/adjacent to the coast. • The ECoW would, where necessary, monitor otter activity along the coast using camera traps and may halt site activities at any time should they consider that the works are having a detrimental effect on otter. The works would resume once appropriate additional working practices had been put in place. • Dispersal routes along the coast will not be blocked/severed, a clear route around the works will be available to otter at all times, which will be periodically monitored/checked by the ECoW. • An emergency procedure would be implemented by site workers if an otter is encountered. All works within 30 m would cease as soon as it is safe to do so, and the ECoW would inspect the Site and define appropriate measures as required. • Should construction activities take place at more than one coastal location at any one time, this would be subject to ECoW approval, to avoid any cumulative effects on otter activity. This includes any works taking place within 30 m of the coast. In the event the survey update concludes that any element of the Proposed Work is likely to disturb an otter's place of shelter/rest, the work would be

Aspect	Phases	Nature of impact	Embedded measures identified
			undertaken under a European Protected Species (EPS) licence to ensure compliance with the legal protection of otter, with the following additional measures in place: • An ECoW would provide supervision during the works and would set up a 10 m exclusion zone around the shelter/resting location in advance of works commencing; • A tool-box talk would be provided to all site construction workers to raise awareness of potential disturbance effects to otters; • Where necessary construction works on the coast could be limited to daytime hours (avoiding early morning and early evening; and • Surveys would be undertaken prior to, during and following works to assess the status of the shelter/rest site.
Chapter 8: Terrestrial Biodiversity and Ornithology	Preparations for Quiescence and Final Site Clearance	Potential disturbance of bats	Prior to demolition or conversion/modification of buildings or structures, bat surveys of the affected area will be updated (typically in the spring/summer period prior to demolition), including preliminary roost assessment and any follow-up surveys that are necessary to determine the status of roosting bats. In the event a bat roost is discovered it will be removed under an EPS licence to ensure compliance with the legal protection of bats. The mitigation will be confirmed through the licensing process and is expected to include one or a combination of measures: • A Clerk of Works (Ecologist) will monitor the Proposed Works and ensure all environmental measures relevant to bats are delivered and ensure compliance with the relevant legislation; • Exclusion or displacement of bats from the roost feature;

Aspect	Phases	Nature of impact	Embedded measures identified
			• Cautious removal of the roost feature ('soft strip') under the direction and supervision of the ecologist named on the licence (or an accredited agent); and • Compensatory habitat creation, for example bat boxes deployed in secluded and less disturbed areas around the Site and Site perimeter. Wherever practicable within the constraints of site security and safety requirements, the lighting scheme employed throughout the Proposed Works will minimise light trespass onto adjacent habitat and is to be designed based on good practice principles (Bat Conservation Trust & Institute of Lighting professionals 2023[9]).
Chapter 8: Terrestrial Biodiversity and Ornithology	Preparations for Quiescence and Final Site Clearance	Potential disturbance of badger	Badger has not been recorded however it is a mobile species and as a precaution, prior to mobilisation of the Proposed Works, the badger survey will be updated, covering the Works Area and a 50 m perimeter. Where necessary, any potential badger setts will be monitored using camera traps to assess the use of these features by badger. In the event badgers are recorded, additional precautions/working practices will be incorporated into the EMP to limit the risk of adverse effect on this species.
Chapter 8: Terrestrial Biodiversity and Ornithology	Preparations for Quiescence and Final Site Clearance	Potential disturbance of hedgehog	There are no records of hedgehog within 3 km of the Works Area within the past 10 years. Site staff and contractors will however remain alert to the possible presence of hedgehog. Any hedgehog encountered during the Proposed Works will be removed from the Works Area and released into suitable habitat that will remain undisturbed.

[9] Bat Conservation Trust (BCT) & Institute of Lighting Professionals (2023). *Guidance Note GN08/23: Bats and Artificial Lighting at Night*. Institute of Lighting Professionals; Rugby, Warwickshire.

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 8: Terrestrial Biodiversity and Ornithology	Preparations for Quiescence and Final Site Clearance	Spreading of non-native species	Prior to mobilisation of the Proposed Works an invasive non-native species (INNS) survey will be completed, covering the Site, the Works Area and a 10 m perimeter. In the event that any stands of non-native species are discovered they will be demarcated within a 10 m exclusion (no disturbance) zone and will be removed and managed in accordance with good practice[10] to be incorporated into biosecurity measures that will form part of the detailed EMP. Additional measures to limit the risk of importing INNS to the Site on footwear/clothing and machinery will be implemented: • a vehicle/plant wash/disinfectant facility to wash the lower exterior and wheels of vehicles/plant as well as footwells, using buckets, brushes and scrapers. • Silts washed off vehicles/plant will be cleaned out of the wheel wash and removed from the Site. • Clothing/footwear of site personnel is to be clean prior to entering Site, with boots brushed and washed. • Waste water that is potentially contaminated with INNS will be disposed of in accordance with good practice[10].

[10] SEPA (n.d). *Biosecurity and management of invasive non-native species for construction sites and Controlled Activities*. (Online) Available at: https://www.sepa.org.uk/media/163480/biosecurity-and-management-of-invasive-non-native-species-construction-sites.pdf (Accessed November 2023)

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 9: Marine Biodiversity	Preparations for Quiescence	Potential disturbance of marine mammals and other fauna (general measures)	Appropriate scheduling of works: Through consideration of sensitive species, and general timings of the Proposed Works, potential effects can be minimised.
Chapter 9: Marine Biodiversity	Preparations for Quiescence	Potential damage and disturbance of habitat	Where safe and achievable, the majority of the jetty decommissioning activities will be undertaken from the shore, using the existing access road (Power Station Road), and, where necessary, the intertidal zone, noting the need to avoid damage to intertidal and benthic habitats in the vicinity.
Chapter 9: Marine Biodiversity	Preparations for Quiescence	Disturbance of marine mammals and other fauna and deterioration of flora	The use of conventional methods: The deck and surrounding piles of the cooling water intake structure will be removed using conventional methods, and not using explosives, which may include: use of (for example) diamond-wire cutting machines, vibro-piling to remove piles from the seabed, presence of jack-up vessels/ floating cranes/ guard vessels during the works.
Chapter 9: Marine Biodiversity **Chapter 10: Coastal Management and Water Quality**	Preparations for Quiescence	Deterioration of water quality	Limited use of anti-fouling materials: The use of anti-fouling material may remain in areas which will be operational after the initial decommissioning activities, such as the Active Effluent Discharge Line (AEDL), which is expected to protrude from the end of the existing outfall infrastructure, but use will be minimised to reduce the amount of harmful chemicals / biocides.

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 9: Marine Biodiversity **Chapter 10: Coastal Management and Water Quality**	Preparations for Quiescence	Disturbance of marine mammals and other fauna and deterioration of flora Deterioration of water quality	Minimising subtidal working: Regarding the dismantling of the jetty, as much work as possible will be carried out from the shore, including work in the intertidal zone, where working 'in the dry' will minimise sediment mobilisation and facilitate avoidance of disturbance of sensitive features.
Chapter 10: Coastal Management and Water Quality	Preparations for Quiescence	Deterioration of water quality	The use of methods which minimise mobilisation of sediments: The piles of the jetty will be removed either by cutting off piles at or just below the seabed surface or by using vibropiling techniques. There will be no use of explosives. These approaches will minimise sediment mobilisation arising from works during the Preparations for Quiescence phase.
Chapter 10: Coastal Management and Water Quality	Preparations for Quiescence	Deterioration of water quality	Draining down cooling system – control of biocide discharge: Water drained from the cooling water system will be tested before discharge and only discharged if biocide concentrations are less than the EQS for sea water of 0.01 mg/l of total residual oxidant (TRO). This will avoid adverse impacts arising from works during the Preparations for Quiescence phase.
Chapter 10: Coastal Management and Water Quality **Chapter 11: Surface Water and Flood Risk**	Preparations for Quiescence, Quiescence and Final Site Clearance	Coastal Protection and Flood Risk Adaptation Measures	The existing coastal flood defences are currently designed to protect the operational HNB power station, and they will continue to protect the Site during the Proposed Works (taking into account current climate change allowances). A range of organisations have an interest in the management of the coastline in the vicinity of HNB. These include: North Ayrshire Council has responsibilities and powers to undertake and maintain coastal protection works and sea defences in accordance with their

Aspect	Phases	Nature of impact	Embedded measures identified
			'advance the line' policies for the short (0-20 years), medium (20-50 years) and long term (50-100 years) in their Shoreline Management Plan (SMP) for cell SB2.1. This could consist of a combination of hard and soft engineering approaches as set out in their SMP; SEPA has responsibilities as the statutory consultee on flood risk related land use matters and are Scotland's strategic flood management authority; and The licensees for HNB and HNA (EDF, and Magnox Ltd respectively) have responsibilities as operators of a nuclear site to protect them from the sea to an adequate standard under its Safety Cases. Flooding is a concern during the Proposed Works as outlined in the Post-Defueling Safety Case Climate Change Management Strategy[11]. Further modelling is being undertaken in 2024 to investigate the impact of sea level rise, erosion, groundwater and precipitation on site safety, to support the development of the PDSC. Any differences identified to the future baseline presented in Section 11.5 will be considered as to their potential to change the conclusions of the EIADR assessment. The specification of an adequate standard of protection of HNB power station from the sea and/or surface water arises from the Safety Case process required by the nuclear site licence conditions. The EDF HNB Safety Case will continue to appraise the risks associated with external hazards. The HNB Safety Case will be updated to account for hazards on site and periodically reviewed to take account of any new data such as future updates to information on any flood defence work in the area or future updates to climate change allowances. Should changes in coastal protection be required for nuclear safety reasons then the HNB Safety Case process will ensure their timely identification.

[11] EDF (2023). *Post-Defueling Safety Case Climate Change Management Strategy (ND/REP/TAD/0028/AGR/23)*. EDF; London.

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 10: Coastal Management and Water Quality **Chapter 11: Surface Water and Flood Risk**	Preparations for Quiescence, Quiescence and Final Site Clearance	Coastal Protection and Flood Risk Adaptation Measures	Emergency Plan The Site's emergency plan will ensure that appointed contractors understand the procedures in the event of potential or actual flooding from either extreme surface water or tidal flooding on site. The plan will outline arrangements for egress and safe refuge. It should be noted that whilst the majority of HNB including the Safestore is on elevated land, much of the low area along the coastal frontage (including the area for site access/egress) is at risk of extreme tidal flooding.
Chapter 10: Coastal Management and Water Quality **Chapter 11: Surface Water and Flood Risk** **Chapter 12: Soils, Geology and Hydrogeology**	Preparations for Quiescence, Quiescence and Final Site Clearance	Surface water flooding	Drainage Plan Where the Proposed Works have the potential to affect Site drainage inputs or change the permeability of the ground surface, the suitability of existing drainage systems, and potential requirement for alternative drainage arrangements or repairs, will be assessed, and suitable drainage systems defined in the plan prior to the relevant activity commencing.

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 10: Coastal Management and Water Quality **Chapter 11: Surface Water and Flood Risk** **Chapter 12: Soils, Geology and Hydrogeology**	Preparations for Quiescence, Quiescence and Final Site Clearance	Surface water flooding	Drainage Surveys Drainage surveys will be completed on a prioritised basis, as required throughout the Proposed Works, and including during Preparation for Quiescence. Drainage investigation work will include confirming drainage condition and direction of flow and discharge points to offsite drains or surface water. Surveys may include CCTV camera inspections, dye tracing, confirming drain invert levels and / or sampling from drains. The findings will be used to inform the drainage planning for the Proposed Works. Liaison with the neighbouring HNA licensee will be undertaken as needed due to the connectivity of some drainage features between HNA and the Site.
Chapter 10: Coastal Management and Water Quality **Chapter 11: Surface Water and Flood Risk**	Preparations for Quiescence, Quiescence and Final Site Clearance	Surface water contamination	Site Water Management Measures Site runoff will be managed within the Works Area, with turbid water collected and treated appropriately. This will include requirements with respect to discharge to the existing site drainage system, or potentially off-site disposal depending on contamination levels. Wheel washes will be used to avoid silt loads being spread away from the Works Area by vehicles. The existing drainage system includes elements to capture and treat silt. Measures will consider changes to Site drainage inputs during the Proposed Works, such as changes to water quantity , potential for silty runoff / contaminated runoff / leaching from stockpiled materials and potential for increased rainwater infiltration if hard surfaces are removed. This will include the appropriate drainage of voids that are left in situ. The potential for dewatering to be required will be considered in advance of excavation work, and if dewatering is anticipated to be needed, an assessment will be carried out in advance to identify suitable environmental

Aspect	Phases	Nature of impact	Embedded measures identified
			measures to minimise the potential for contaminant mobilisation and to protect the water environment. Existing Controlled Activities (Scotland) Regulations (CAR) conditions will be addressed with regards to silt levels permitted in discharge of surface water via the existing outfall into the Firth of Clyde, and the ditch 110 m to the north of the Site.
Chapter 10: Coastal Management and Water Quality **Chapter 11: Surface Water and Flood Risk** **Chapter 12: Soils, Geology and Hydrogeology** **Chapter 8: Terrestrial Biodiversity and Ornithology**	Preparations for Quiescence, Quiescence and Final Site Clearance	Surface water and groundwater contamination	Good Industry Pollution Prevention Practices The Proposed Works will follow good industry practices as set out in CIRIA C532, C74 and Netregs guidance. In addition, the appointed contractors will be required to adhere to pollution prevention measures identified in an Environmental Management Plan which will include the following: Bunding of new chemical and fuel stores to 110% of capacity. The bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage; Vehicle maintenance and refuelling of machinery will be undertaken within designated areas where spillages can be easily contained, and machinery will be routinely checked to ensure it is in good working condition; Those areas at risk of spillage or containing hazardous materials, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) will comply with industry good practice, be bunded, have appropriate containment and segregation, and will be risk assessed and carefully sited to minimise the risk of hazardous substances entering the drainage system, local ditches, or sensitive land-based receptors; and Pollution incidence response planning will deal with any accidental spillages or leaks. Measures to manage pollution risk and pollution controls will be set out in a Pollution Prevention Plan (PPP) and Pollution Incident Response Plan (PIRP), which will draw on SEPA's Guidance for Pollution Prevention (GPP)

Aspect	Phases	Nature of impact	Embedded measures identified
			and Pollution Prevention and Control Guidelines (PPGs)[12] and will be implemented as part of the detailed EMP. This will include information on the storage of any fuels, oils and other chemicals and pollution incidence response planning. Fuels for plant and equipment and all other chemicals should be managed in accordance with best practice to avoid spills, pollution events or ground contamination.
Chapter 11: Surface Water and Flood Risk **Chapter 12: Soils, Geology and Hydrogeology**	Preparations for Quiescence, Quiescence and Final Site Clearance	Surface water and groundwater contamination	Site Protection and Monitoring Programme (SPMP) The SPMP groundwater monitoring and offsite surface water monitoring will continue for as long as required to support ongoing Pollution Prevention and Control (PPC) Permit compliance and PPC Permit Surrender. The scope of the SPMP monitoring will continue to be reviewed and any necessary changes implemented e.g., in response to changes to operations covered under the Permit or observed / suspected changes in site condition. If the SPMP monitoring indicates a deterioration in groundwater quality, appropriate measures will be undertaken to investigate, and if necessary, remediate the land, prior to PPC Permit Surrender. Records will continue to be kept of all associated monitoring, investigations and remediation. The same principles will apply to monitoring wells used to collect samples for radiological (and other non-radiological) testing (outside the scope of PPC 2012) to help support the licensee's ultimate release from RSR.

[12] SEPA is replacing the PPGs with updated versions known as GPPs on the NetRegs website: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/ (Accessed November 2023).

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 11: Surface Water and Flood Risk **Chapter 12: Soils, Geology and Hydrogeology**	Preparations for Quiescence, Quiescence and Final Site Clearance	Surface water and groundwater contamination	Surface Water Monitoring Surface water sampling will be carried out during the Proposed Works to help build upon the existing SPMP monitoring programme and to ensure appropriate monitoring takes place outside of the Site. This will include monitoring of authorised drainage discharges to the marine environment, and sampling of surface water from the drainage ditch approximately 110 m north of the Site. Testing will continue to include radioactive isotopes and non-radiological contaminants, in line with current regular environmental monitoring protocols. This is to provide verification that the Proposed Works are not significantly impacting on surface water quality. The timing and frequency of monitoring will be risk based, and relative to the level of works activity and the level of risk of releases to ground or to the surface drainage system. It is anticipated that the monitoring frequency and scope will be addressed via the further development of the decommissioning proposals as required by the Environmental Management Plan.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence and Final Site Clearance	Ground, surface water and groundwater contamination	At the point of full or partial PPC Permit Surrender, assessment of land condition for the PPC permitted areas of the Site will be undertaken in accordance with SEPA's PPC guidance for site reports and permit surrender. The proposed scope of investigations to determine the Site condition, including collection of soil and groundwater data, and details of proposed remediation measures (if these are needed) to restore the Site to a satisfactory state will be provided to SEPA for comment in advance of undertaking the work.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence	Ground, surface water and groundwater contamination	The site characterisation and assessment of land contamination risks to update and implement the Waste Management Plan (WMP) and site-wide environmental safety case (SWESC) during the Proposed Works (except for areas of the Site where specific requirements for the assessment of site

Aspect	Phases	Nature of impact	Embedded measures identified
	and Final Site Clearance		condition apply, such as PPC 2012), will be in accordance with the phased approach set out in LCRM (and CLR11). This will inform the design of work needed to achieve the site reference state, and to validate its achievement. This characterisation work will consider potential legacy radioactive and non-radioactive contamination associated with the historical use of the Site as well as the current status. Groundwater risk assessment to inform site characterisation will be undertaken in accordance with SEPA's Position Statement (WAT-PS-10-01) Assigning Groundwater Assessment, Criteria for Pollutant Inputs (v3.0 Aug, 2014, or as amended).
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence and Final Site Clearance	Ground, surface water and groundwater contamination	In accordance with LCRM, consideration will be given to climate change effects in land contamination risk assessment completed during the Proposed Works. Assessments will give regard, as appropriate, to available relevant industry guidance, such as SoBRA (2022) Guidance on Assessing Risk to Controlled Waters from UK Land Contamination Under Conditions of Future Climate Change.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence and Final Site Clearance	Groundwater contamination	Design and construction of new groundwater monitoring wells for site characterisation or other environmental purposes will be in accordance with industry guidance such as Environment Agency Science Report SCO20093, and BS 10175, to avoid the creation of new preferential migration pathways.

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence and Final Site Clearance	Groundwater contamination	Available existing groundwater monitoring wells that can be retained without compromising the Proposed Works will be sampled as needed during all phases of the Proposed Works e.g., to assess for impacts on groundwater quality on the Site, to inform design of further investigation or remedial measures, and to provide verification of remediation work. If wells cannot be retained for ongoing environmental monitoring purposes, or are no longer required, these will be decommissioned in accordance with SEPA guidance for decommissioning redundant boreholes and wells. Wells that become unexpectedly damaged or unusable will be subject to assessment to confirm whether they need to be replaced.
Chapter 12: Soils, Geology and Hydrogeology **Chapter 7: Climate Change**	Preparations for Quiescence, Quiescence and Final Site Clearance	Ground, surface water and groundwater contamination	Potential risks to soil, groundwater and surface water will be considered when generating suitability for use criteria for the potential re-use of waste materials on site, particularly for any void filling below the water table, and with regard to climate change effects.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence and Final Site Clearance	Ground, surface water and groundwater contamination	The licensee has an existing system for the management of land condition data for the Site. Site characterisation work undertaken during the Proposed Works will be added to this system with the aim of producing a high quality land quality management file, using systems such as Geographical Information System (GIS) to improve data access.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence	Ground, surface water and groundwater contamination	During the Proposed Works, construction strategies will be implemented that will seek to maximise the reuse of excavated materials or demolition derived materials that are suitable for the intended re-use in the context of the future site use. Waste management planning and reuse of material will be

Aspect	Phases	Nature of impact	Embedded measures identified
	and Final Site Clearance		completed in accordance with SEPA guidance and the HNB WMP and SWESC. The WMP will set out how stockpiles will be managed and segregated to avoid cross-contamination, and will include the anticipated programme for storage of materials. Where it is identified that materials cannot be re-used on the Site, these will be suitably contained to prevent uncontrolled releases to the environment, and an off-site disposal option at a suitably licensed facility by a licensed waste carrier will be identified and collection arranged at the earliest opportunity.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence and Final Site Clearance	Ground, surface water and groundwater contamination	Decommissioning plans for the Proposed Works will reflect that delicensing and surrender of the RSR permit are distinct regulatory processes with different requirements. Specifically, the plans will note that the programme of validation monitoring required to demonstrate that the Site reference state has been achieved may differ from the clearance survey required for delicensing. The Site end state description will continue to be clarified as the plans are developed during the Proposed Works, and the plans updated as and when required.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence	Contamination risk to human health	All aspects of the Proposed Works will be in accordance with the Health and Safety at Work etc Act (1974)[13] and regulations made under the Act, and the Construction (Design and Management) Regulations 2015[14]. Potential risks to human health from any unexpected ground contamination will be avoided by the use of PPE and by adopting appropriate working practices. These

[13] UK Government (1974). *Health and Safety at Work etc. Act 1974* (online). Available at: http://www.legislation.gov.uk/ukpga/1974/37 (Accessed November 2023).
[14] UK Government (2015). *The Construction Design and Management Regulations 2015* (online). Available at: http://www.legislation.gov.uk/uksi/2015/51/contents/made (Accessed November 2023).

Aspect	Phases	Nature of impact	Embedded measures identified
	and Final Site Clearance		could include the use of field monitoring equipment if potential for vapours is anticipated, to minimise potential for personnel to come into direct contact with contaminants, and protocols for suspect materials encountered during groundworks to be characterised through sampling and testing to identify appropriate further actions.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence and Final Site Clearance	Contamination risk to human health Ground, surface water and groundwater contamination	All construction work associated with the Proposed Works will be completed in accordance with the Control of Asbestos Regulations 2012 (CAR 2012[15]). With regard to asbestos containing materials or asbestos fibres encountered on or within the ground during ground works, CAR 2012 requires that measures are taken to prevent fibre release and to prevent the spread of asbestos, the location where asbestos is suspected or confirmed must be recorded and control measures put in place to prevent exposure.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence and Final Site Clearance	Ground, surface water and groundwater contamination	The potential for dewatering to be required during all stages of the Proposed Works will be considered in advance of excavation activities, and if dewatering is anticipated to be needed, an assessment will be carried out in advance to identify suitable environmental measures to minimise the potential for contaminant mobilisation and to protect the water environment and ensure compliance with water environment legislation.
Chapter 12: Soils, Geology and Hydrogeology	Preparations for Quiescence, Quiescence	Ground, surface water and groundwater contamination	The 2021 Tier 1 – Preliminary Risk Assessment does not currently include land adjacent to the Jetty including a compound and sodium hypochlorite plant. Contaminated land risk assessment in accordance with land contamination risk management (LCRM) will be completed for these areas

[15] UK Government (2012). *The Control of Asbestos Regulations 2012* (online). Available at: http://www.legislation.gov.uk/uksi/2012/632/contents/made (Accessed November 2023).

Aspect	Phases	Nature of impact	Embedded measures identified
	and Final Site Clearance		prior to the use of these areas or any disturbance to them (such as their being accessed by vehicles or personnel) as part of the Proposed Works.
Chapter 13: Historic Environment	Preparations for Quiescence	Loss of historic assets	A written scheme of building recording works for the Preparations for Quiescence phase, to be agreed with the West of Scotland Archaeology Service (WoSAS) Archaeologist. This scheme would allow for the identification and recording of buildings within the Site prior to Preparations for Quiescence phase, providing mitigation for adverse effects resulting from the loss of buildings with historic interest.
Chapter 13: Historic Environment	Preparations for Quiescence	Loss of / disturbance of historic assets	A Protocol for Archaeological Discovery (PAD) is to be in place during the Proposed Works in the marine environment, to set out the approach to the reporting and subsequent treatment of unexpected archaeological discoveries.
Chapter 14: Landscape and Visual Impact Assessment	Preparations for Quiescence, Quiescence, and Final Site Clearance	Deterioration of landscape character and visual amenity	Utilisation of an Interim Landscape Management Plan (ILMP) to enhances the landscape features and visual amenity for visual receptors accessing the Ayrshire Coastal Path.
Chapter 15: Noise and Vibration	Preparations for Quiescence	Disturbance to residents arising from noisy works	Continuous boundary noise monitoring will be undertaken during the periods of the Preparations for Quiescence phase with the greatest intensity of simultaneous works, anticipated to occur in the years 2029 and 2037.

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 15: Noise and Vibration	Preparations for Quiescence	Disturbance to residents arising from noisy works	In the event of receipt of a complaint relating to noise from the Proposed Works, attended monitoring should also be undertaken at a location representative of the complainant's property. Additional mitigation measures may be specified where monitoring demonstrates that noise from the works may be giving rise to significant impacts.
Chapter 16: Traffic and Transport	Preparations for Quiescence and Final Site Clearance	Construction Traffic	Production of a CTMP which recognises the requirement to manage construction traffic movements. An outline CTMP is provided in **Appendix 16A** of the ES.
Chapter 17: People and Communities	Preparations for Quiescence	Potential impacts on HNB Workers	The Applicant as part of its resource planning for decommissioning will: • Undertake career aspirational discussions with staff; • Offer enhanced redundancy packages; • Assist workers with necessary retraining to facilitate suitability for decommissioning at HNB roles or alternative roles within the Applicant organisation; • Work with third-parties to advertise new opportunities for staff; and • Continue to support staff with post employment references for alternative posts.
Chapter 17: People and Communities	Preparations for Quiescence	Potential impacts on HNB Workers	The NDA and Magnox Ltd operate socio-economic programmes at each of their sites. As part of this programme, Magnox Ltd operates a good neighbour scheme where individual projects up to £2,000 can be supported. In addition, there are the Magnox Ltd and NDA socio-economic schemes for more transformational projects which can see significant multi-year funding

Aspect	Phases	Nature of impact	Embedded measures identified
			made available. A local example was the financial assistance provided to North Ayrshire college for the construction of a new centre to support students in learning construction trades. This was an NDA supported scheme administered by Magnox Ltd. These arrangements will continue and cover Hunterston B when the Site transfers to NDA ownership.
Chapter 18: Conventional Waste	Preparations for Quiescence and Final Site Clearance	Waste generation	A Site Waste Management Plan (SWMP) will be developed for the Proposed Works, which seeks to re-enforce the principles of the waste management hierarchy i.e. reduce the amount of waste generated where possible; maximise the reuse and recycling of waste; and then only send waste for final disposal if all other alternatives have been exhausted.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence, and Final Site Clearance	Risk of major accidents and disasters	The Site is currently a Lower Tier establishment maintaining a Major Accident Prevention Policy (MAPP) and will move out of scope of COMAH during the Preparations for Quiescence phase due to a significant reduction in fuels and chemicals, but the Safety and Environmental Management System (SEMS) will be maintained to an equivalent standard by the Site Licensee for the full duration of the Proposed Works.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence, and Final Site Clearance	Risk of major accidents and disasters	The Works Area will remain a licensed nuclear site throughout the Proposed Works until the completion of the Final Site Clearance phase, and the licensing requirements include maintaining a suitable Safety Case in accordance with the Nuclear Installations Act[10] and approved Security Plan in accordance with Nuclear Industries Security Regulations[14.]

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence, and Final Site Clearance	Risk of major accidents and disasters	The Site Licensee will ensure through its contractual arrangements that any contractor appointed to deliver the Proposed Works has suitable management systems in place to ensure compliance with all regulatory requirements.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence, and Final Site Clearance	Risk of major accidents and disasters	The Site Licensee will adapt the current arrangement systems and processes in place for the avoidance, prevention, control and mitigation of major accidents and disasters from the operational site conditions in respect of the Proposed Works, and revise these as necessary for the duration of the Proposed Works.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence, and Final Site Clearance	Risk of major accidents and disasters	The decommissioning of the surface water drainage, bunding and containment, and any other safeguards will be assessed against the ongoing risk of major accidents, and the residual risk will be maintained at a level that is ALARP, throughout the duration of the Proposed Works.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence, and Final Site Clearance	Risk from releases of hazardous materials	Emergency response procedures will consider the potential for releases of hazardous materials and will define the actions to be taken to minimize the risk arising from potential releases.

Aspect	Phases	Nature of impact	Embedded measures identified
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence, and Final Site Clearance	Risk of major accidents and disasters	Hazardous works such as some of those within active area deplanting and in areas with volumes of flammable substances be undertaken by appropriately SQEP and trained operators will ensure that risks are minimised.

5.2 Good practice measures

5.2.1 In addition to embedded measures, the ES also identified a series of good practice measures. These are actions that would occur with or without input from the EIA, and would be undertaken to meet other existing legislative requirements or actions that are considered to be standard practice used to manage commonly occurring environmental effects.

5.2.2 The following tables list the good practice measures for each phase of the Proposed Works.

Table 5.2 Good practice measures identified for the Proposed Works

Aspect	Phases	Nature of impact	Good Practice measures identified
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Communication:** Develop and implement a stakeholder communication plan that includes community engagement before work commences on site. Display the name and contact details of person(s) accountable for air quality and dust issues on the Works Area boundary. This may be the environment manager/ engineer or the Project Manager. Display the head or regional office contact information.
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Dust management:** Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or emissions, either on- or off-site and the action taken to resolve the situation in the log book.
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Monitoring** Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. Increase the frequency of site inspections by the person accountable for air quality and dust issues on-site, when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Aspect	Phases	Nature of impact	Good Practice measures identified
			Undertake on-site and off-site inspections around high potential activities, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary. Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with local authorities. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences.
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Preparing and maintaining site** Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible. Erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on site. Where possible, fully enclose site or specific operations where there is a high potential for dust production and the Site is active for an extensive period. Avoid site runoff of water or mud. Keep hoarding, barriers and scaffolding clean using wet methods.

Aspect	Phases	Nature of impact	Good Practice measures identified
			Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. Where appropriate, cover, seed or fence stockpiles to prevent wind whipping.
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Operating vehicles/ machinery** Ensure all vehicles switch off engines when stationary and not operating – no idling vehicles. Impose and signpost a maximum-speed-limit of 10 mph on surfaced and 10 mph on un-surfaced haul roads and work areas. Lower maximum speed limits will be considered further. Avoid the use of diesel- or petrol-powered generators and use low-carbon alternative equipment where practicable. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Operations** Where possible, only use cutting, grinding or sawing equipment fitted, or in conjunction, with suitable dust suppression techniques such as water sprays or local extraction e.g. suitable local exhaust ventilation systems. This will be aligned with HSE policy. Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.

Aspect	Phases	Nature of impact	Good Practice measures identified
			Use enclosed chutes and conveyors and covered skips where practicable. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment, wherever appropriate. Ensure equipment readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event, using wet cleaning methods.
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Waste management** Avoid burning of waste materials on Site.
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Earthworks** Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Stockpiles of topsoil which remain present for six months or longer will be used (e.g. through seeding) to encourage stabilisation, minimise soil erosion and prevent infestation by nuisance weeds. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. This will depend on conditions and season. Only remove the cover in small areas during work and not all at once.

Aspect	Phases	Nature of impact	Good Practice measures identified
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Construction** Avoid scabbling if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Chapter 6: Air Quality	Preparations for Quiescence and Final Site Clearance	Dust emissions generated through the Proposed Works	**Trackout** Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site. This may require the sweeper being continuously in use. At compound and access points, wheel wash or dust sweepers will be used. Avoid dry sweeping of large areas, where possible. Refer to the Dust Management Plan. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.

Aspect	Phases	Nature of impact	Good Practice measures identified
			Record all inspections of haul routes and any subsequent action in a site log book. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable). Where possible, ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever site size and layout permits. Access gates to be located at least 10 m from receptors where possible. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned during activities with a high potential for creating dust.
Chapter 7: Climate Change	Preparations for Quiescence and Final Site Clearance	Release of GHG emissions from fuel and energy consumption.	Fuel and energy consumption: Energy efficient and well-maintained plant equipment should be used, as should mains electricity, if available, rather than diesel-fuelled portable generators. This will reduce GHG emissions from fuel and energy consumption.
Chapter 7: Climate Change	Preparations for Quiescence and Final Site Clearance	Release of GHG emissions from deconstruction	There are GHG emissions from deconstruction and construction traffic. Deliveries and the transportation of waste will be consolidated where possible and there should be ‘no idling’ vehicles. Sustainable modes of travel for the construction workforce will be encouraged. This will reduce GHG emissions from construction traffic.

Aspect	Phases	Nature of impact	Good Practice measures identified
		and construction traffic.	
Chapter 9: Marine biodiversity	Preparations for Quiescence	Deterioration of water quality	Adherence to standard pollution control measures All vessels and plant involved in the Proposed Works would be required to adhere to standard pollution control measures, such as those established under the International Convention for the Prevention of Pollution from Ships (MARPOL)[16] and the Ballast Water Convention[17]. This includes implementation of a Shipboard Oil Pollution Emergency Plan (SOPEP)[18]. The International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention) should also be adhered to for all vessels involved in the Proposed Works.[19]

[16] International Maritime Organization (1997). *International Convention for the Prevention of Pollution from Ships (MARPOL)*. (Online) Available at: https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx (Accessed November 2023)

[17] International Maritime Organization (2004). *International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM).* (Online). Available at: https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-(BWM).aspx (Accessed November 2023).

[18] International Maritime Organization (undated). *International Convention for the Prevention of Pollution from Ships (MARPOL), Shipboard Marine Pollution Emergency Plans*. (Online) Available at: https://www.imo.org/en/OurWork/Environment/Pages/Shipboard-Marine-Pollution-Emergency-Plans.aspx

[19] International Maritime Organization (2023). *Anti-fouling systems* (Online) Available at: https://www.imo.org/en/OurWork/Environment/Pages/Anti-fouling.aspx (Accessed November 2023).

Chapter 10: Coastal Management and Water Quality **Chapter 11: Surface Water and Flood Risk** **Chapter 12: Soils, Geology and Hydrogeology** **Chapter 8: Terrestrial Biodiversity and Ornithology**	Preparations for Quiescence, Quiescence and Final Site Clearance	Surface water and groundwater contamination	**Good Industry Pollution Prevention Practices** The Proposed Works will follow good industry practices as set out in CIRIA C532, C74 and Netregs guidance. In addition, the appointed contractors will be required to adhere to pollution prevention measures identified in an Environmental Management Plan which will include the following: • Bunding of new chemical and fuel stores to 110% of capacity. The bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage; • Vehicle maintenance and refuelling of machinery will be undertaken within designated areas where spillages can be easily contained, and machinery will be routinely checked to ensure it is in good working condition; • Those areas at risk of spillage or containing hazardous materials, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) will comply with industry good practice, be bunded, have appropriate containment and segregation, and will be risk assessed and carefully sited to minimise the risk of hazardous substances entering the drainage system, local ditches, or sensitive land-based receptors; and Pollution incidence response planning will deal with any accidental spillages or leaks. • Measures to manage pollution risk and pollution controls will be set out in a Pollution Prevention Plan (PPP) and Pollution Incident Response Plan (PIRP), which will draw on SEPA's Guidance for Pollution Prevention (GPP) and Pollution Prevention and Control Guidelines (PPGs)[20] and will be implemented as part of the detailed

Aspect	Phases	Nature of impact	Good Practice measures identified
			EMP. This will include information on the storage of any fuels, oils and other chemicals and pollution incidence response planning. Fuels for plant and equipment and all other chemicals should be managed in accordance with best practice to avoid spills, pollution events or ground contamination.
Chapter 15: Noise and Vibration	Preparations for Quiescence and Final Site Clearance	Disturbance to residents arising from noisy works Disturbance to mammals, birds, bats and other fauna	Undertaking the Proposed Works in accordance with good practice. All noisy activities to be undertaken within hours for noisy activities for construction provided by North Ayrshire Council, except where works need to be undertaken continuously (e.g. for any concrete pours that may be required) or in case of emergencies. Where the potential for significant effects arises, applying Best Practicable Means in accordance with the recommendations in BS 5228:1-2009+A1:2014.
Chapter 15: Noise and Vibration **Chapter 8: Terrestrial Biodiversity and Ornithology**	Preparations for Quiescence and Final Site Clearance	Disturbance to mammals, birds, bats and other fauna	Noise emissions control: selection of plant, and engineered noise control, where required, to control any noise emissions in accordance with good practice.

[20] SEPA is replacing the PPGs with updated versions known as GPPs on the NetRegs website: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/ (Accessed November 2023).

Aspect	Phases	Nature of impact	Good Practice measures identified
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence and Final Site Clearance	Risk of major accidents and disasters	The design standard of built structures enabling the structures to withstand external loads, such as wind or precipitation and will be maintained up to the point of decommissioning that structure, considering any foreseeable changes to design loads.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence and Final Site Clearance	Risk of major accidents and disasters	The Site Licensee will ensure that all activities are subject to a suitable and sufficient risk assessment and with full consideration of the hierarchy of controls, ensure that the residual risk arising from all major accidents and disasters is reduced to As Low As Reasonably Practicable.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence and Final Site Clearance	Risk of major accidents and disasters	A structural survey will be undertaken before commencement of dismantling operations. Furthermore, the dismantling has been designed to minimise the risks associated with structural failure (e.g., of support systems).
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence and Final Site Clearance	Risk of major accidents and disasters	The Site Licensee will provide access to reliable meteorological forecasting services to inform work planning and controls to prevent undertaking works in inappropriate conditions such as heavy crane lifts in high winds.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence and Final Site Clearance	Risk of major accidents and disasters	The Site Licensee will review all planning applications in the vicinity of the Proposed Works and object to any proposed development which would lead to a significant increase in risk at the Works Area.
Chapter 19: Major Accidents and Disasters	Preparations for Quiescence, Quiescence and Final Site Clearance	Risk of major accidents and disasters to other businesses	The Site Licensee will liaise with other local businesses and the local authorities to identify any potential hazards which arise over the course of the Proposed Works.

6. Implementation of the Environmental Management Plan

6.1.1 It will become a requirement of the conditions attached to the EIADR consent to implement the embedded design and good practice site management (measures) and describe their effectiveness. This section of the Outline EMP identifies how the measures identified in **Section 5** could be incorporated into site working practices, and how the effectiveness of these measures could be assessed.

Process for implementation of mitigation measures

6.1.2 The Proposed Works will be carried out in accordance with the measures set out in the detailed EMP submitted for approval to ONR after the approval of the EIADR.

6.1.3 Decommissioning projects and modifications to plant will be assessed to ensure compliance with EIADR as part of the engineering change process. Post transfer to Magnox Ltd, EIADR compliance will be managed in line with the process outlined in **Appendix 5C** of the Environmental Statement.

6.1.4 In addition, there are a number of other tools to ensure that all environmental impacts will be minimised. The Site will have an Integrated Management System which covers the requirements of ISO 9001 (Quality Assurance), ISO 14001 (Environmental Management Systems) and OHSAS 18001 (Occupational Health and Safety Management System). Where there is the potential for an activity to produce significant discharges or disposals, either radioactive or non-radioactive, the Site will undertake Best Available Techniques (BAT) studies to demonstrate that impacts are minimised.

Process for determining effectiveness of mitigation measures

6.1.5 The Site will continually monitor the effectiveness of measures to prevent and reduce effects over time. Where measures are not sufficiently effective, they will be reviewed and amended as necessary to ensure success in minimising significant adverse environmental effects. A key part of this process is the close interaction between the Project and Environment Teams, ensuring that measures will be considered, applied and, where relevant, reviewed throughout the lifespan of the Proposed Works. The effectiveness of the measures will be monitored in a variety of ways including:

- Environmental performance monitoring:
  - The Site Licensee will establish a programme of environmental performance monitoring on the basis of requirements identified within **Section 5** and **Section 7** of this Outline EMP;

- This monitoring will allow an assessment of environmental impacts post implementation of environmental measures (and their effectiveness) in addition to being of use for determining evolving baseline conditions.

- Visual Evidence:
  - Inspections of the project work area both prior to, during and after project works will be used to assess the requirements for mitigation, on-going suitability of the mitigations and overall success in minimising significant adverse impacts.
  - Where it is deemed appropriate, photographic evidence can be gathered to support the assessment of effectiveness.
- Review of regulatory action, complaints and internal event reporting:
  - Regulatory actions, complaints and internal events including near misses will be reported and investigated.
  - Such investigations may provide recommendations for improvements where mitigation measures have not been effective or where further mitigations will be required.

6.1.6 Further detail is provided in **Section 7** of this Outline EMP, including details of the likely monitoring requirements.

7. Monitoring the effectiveness of environmental requirements

7.1 Monitoring

7.1.1 Scheduled monitoring or environmental performance and formal compliance auditing will be undertaken throughout the Proposed Works.

7.1.2 This will enable the overall effectiveness of established environmental measures, and compliance procedures, to be assessed and allow for corrective actions to be taken to strengthen environmental safeguards or improve outcomes as required.

7.1.3 Whilst monitoring requirements will be adaptable depending on the scope of works at any given time, specific monitoring requirements as identified in the ES are presented in **Table 7.1** below.

Table 7.1 Monitoring requirements

ES Chapter	Phase	Monitoring Requirement
Chapter 6: Air quality	Preparations for Quiescence Final Site Clearance	A Dust Management Plan will be prepared in advance of work commencing. This will include details of any monitoring requirements such as: • The regularity of site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on-site, when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Undertake on-site and off-site inspections around high potential activities, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary. • Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with local authorities. Where possible commence

ES Chapter	Phase	Monitoring Requirement
		baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences.
Chapter 7: Climate Change	Preparations for Quiescence Final Site Clearance	Monitoring and recording of greenhouse gas emissions associated with the decommissioning phase, including achieved reductions as a result of adopting low carbon and sustainable solutions and alternatives.
Chapter 8: Terrestrial Biodiversity and Ornithology	Preparations for Quiescence Final Site Clearance	An EcoW will be present during the Preparations for Quiescence and Final Site Clearance phases as appropriate to oversee implementation of impact avoidance commitments (as set out in Section 5 of this Outline EMP and within ES Chapter 8: Terrestrial Biodiversity and Ornithology. This would include the monitoring of: • The baseline conditions on site to identify if suitability for Protected Species has changed and whether species specific surveys therefore necessitate update. • Otter activity along the coast using camera traps and ongoing consideration of site works for their potential detrimental effect on otter And appropriate site actions undertaken as necessary. • Where necessary, any potential badger setts will be monitored using camera traps to assess the use of these features by badger to identify the need for any environmental measures to manage the impact of the works on badger. The biodiversity baseline will be subject to periodic update and review, informed by routine biodiversity monitoring to be incorporated into the detailed EMP.
Chapter 10: Coastal Management and Water Quality	Preparations for Quiescence Final Site Clearance	The Site Protection and Monitoring Programme (SPMP) will continue to monitor fine sediment and water runoff. This will be used to identify whether further measures are required to manage the works on-site and the scope of this monitoring may be iteratively updated as the Proposed Works develop.

ES Chapter	Phase	Monitoring Requirement
Chapter 11: Surface Water and Flood Risk	Preparations for Quiescence Final Site Clearance	The specification of an adequate standard of protection of HNB power station from the tidal or surface water flooding arises from the Safety Case process required by condition of the Nuclear Site Licence. The HNB Safety Case will be updated to account for hazards on site and periodically reviewed to take account of any new data such as future updates to information on any flood defence work in the area or future updates to climate change allowances. During the Preparations for Quiescence and Final Site Clearance phases, the Contractor would monitor weather forecasts on a monthly, weekly and daily basis, and plan works accordingly.
	All	Results of drainage surveys, completed on a prioritised basis required throughout the Proposed Works, will be reviewed to monitor effectiveness of drainage within the Site. The existing SPMP groundwater monitoring and offsite surface water monitoring will continue for as long as required to support ongoing PPC Permit compliance and Pollution Prevention and Control (PPC) Permit Surrender. The scope of the SPMP monitoring will continue to be reviewed and any necessary changes implemented e.g., in response to changes to operations covered under the Permit or observed / suspected changes in site condition. Records will continue to be kept of all associated monitoring, investigations and remediation. The same principles will apply to monitoring wells used to collect samples for radiological (and other non-radiological) testing (outside the scope of PPC 2012) to help support the licensee's ultimate release from its EASR 18 permit. Surface water sampling will be carried out during the Proposed Works to help build upon the existing SPMP monitoring programme and to ensure appropriate monitoring takes place outside of the Site. This will include monitoring of authorised drainage discharges to the marine environment, and sampling of surface water from the drainage ditch approximately 110 m north of the Site. This is to provide verification that the Proposed Works are not significantly impacting on surface water quality. The timing and frequency of monitoring will be risk

ES Chapter	Phase	Monitoring Requirement
		based, and relative to the level of works activity and the level of risk of releases to ground or to the surface drainage system.
Chapter 12: Soils, Geology and Hydrogeology	All	The SPMP groundwater monitoring and offsite surface water monitoring will continue for as long as required to support ongoing Pollution Prevention and Control (PPC) Permit compliance and PPC Permit Surrender. The scope of the SPMP monitoring will continue to be reviewed and any necessary changes implemented e.g., in response to changes to operations covered under the Permit or observed / suspected changes in site condition. If the SPMP monitoring indicates a deterioration in groundwater quality, appropriate measures will be undertaken to investigate, and if necessary, remediate the land, prior to PPC Permit Surrender. Records will continue to be kept of all associated monitoring, investigations and remediation. Potential risks to human health from any unexpected ground contamination will be avoided by the use of PPE and by adopting appropriate working practices. These could include the use of field monitoring equipment if potential for vapours is anticipated, to minimise potential for personnel to come into direct contact with contaminants, and protocols for suspect materials encountered during groundworks to be characterised through sampling and testing to identify appropriate further actions.
	Final Site Clearance	Decommissioning plans for the Proposed Works will reflect that delicensing and surrender of the RSR permit are distinct regulatory processes with different requirements. Specifically, the plans will note that the programme of validation monitoring required to demonstrate that the site reference state has been achieved may differ from the clearance survey required for delicensing. The site end state description will continue to be clarified as the plans are developed during the Proposed Works, and the plans updated as and when required.

ES Chapter	Phase	Monitoring Requirement
Chapter 14: Landscape and Visual Impact Assessment	Quiescence and Final Site Clearance phases	Monitoring the health and survival of planting undertaken as part of the implemented Interim State Landscape Plan and its effectiveness to soften the impact of views on users on the Ayrshire Coastal Path.
Chapter 15: Noise and Vibration	Preparations for Quiescence and Final Site Clearance phases	Recommendation of continuous boundary noise monitoring during periods of simultaneous demolition activities during the Proposed Works. The Preparations for Quiescence phase is anticipated to have the greatest intensity of simultaneous works, anticipated to occur in the years 2029 and 2037. In the event of receipt of a complaint relating to noise from the Proposed Works, attended monitoring should also be undertaken at a location representative of the complainant's property. Additional mitigation measures may be specified where monitoring demonstrates that noise from the works may be giving rise to significant impacts.
	Final Site Clearance	The requirement for monitoring during Final Site Clearance shall be determined once a detailed methodology for the Final Site Clearance phase is available.
Chapter 16: Traffic and Transport	Preparations for Quiescence and Final Site Clearance phases	Monitoring of the effectiveness of transport control measures outlined in the Outline CTMP, will be defined in the detailed CTMP implemented on the Site.
Chapter 18: Conventional Waste	Preparations for Quiescence Final Site Clearance	A Site Waste Management Plan (SWMP) will be developed for the Proposed Works, which seeks to re-enforce the principles of the waste management hierarchy i.e. reduce the amount of waste generated where possible; maximise the reuse and recycling of waste; and then only send waste for final disposal if all other alternatives have been exhausted. This will include details of any monitoring which should be adhered to.
Chapter 19: Major Accidents and Disasters	All	Safety Case and Emergency Planning arrangements will be routinely reviewed and updated throughout the Proposed Works to account for changes in the baseline environment and level of hazard on Site.

7.1.4 A designated Environmental Site Officer will manage the monitoring process on-site who will be present on Site throughout the Preparations for Quiescence and Final Site Clearance phases.

7.1.5 The Environmental Site Officer will observe site activities and report notable deviations from the detailed EMP in a logbook, along with the action taken and general conditions at the time. The Environmental Site Officer would also be the point of contact with the relevant environmental bodies.

7.1.6 The Project Manager will arrange regular formal inspections to ensure the requirements of the detailed EMP are being met. After completion of the works, the Environmental Site Officer will conduct a final review.

7.2 Records

7.2.1 The Environmental Site Officer will retain records of environmental monitoring and implementation of the detailed EMP. This will allow provision of evidence that the detailed EMP is being implemented effectively for future updates of the document.

7.2.2 These records will include:

- Register and schedule of environmental actions;
- Licences, permits and approvals;
- Results of inspections by Project Manager/ Environmental Site Officer; and
- Other environmental surveys and investigations.

8. Stakeholder engagement and community relations

8.1.1 The Site Licensee will continue to be committed to engaging with stakeholders at all phases in the decommissioning process, focusing on those who may be affected by the decommissioning works. The Site Licensee will develop and implement a stakeholder communications plan that includes community engagement before works that may cause disturbance commence in the Works Area. This will include the appointment of a site contact to whom complaints and queries about the works can be directed. Any complaints will be investigated and action taken where appropriate.

8.1.2 In addition, the existing quarterly Site Stakeholder Group (SSG) meetings will continue to be utilised to provide an update on current site activities throughout the Preparations for Quiescence phase.

9. Review and update to Environmental Management Plan

9.1.1 Regular reviews[21] of the EMP will be undertaken and an updated EMP submitted to ONR. Updates will include:

- A record of environmental measures implemented to date;
- Description of any changes made to environmental measures, giving reasons for such changes; and
- Description of the effectiveness of implemented environmental measures, including how the measures were assessed, monitored and recorded.
- A summary of any updates to Environmental Impact Assessment Baseline. The updated EMP will highlight where there have been changes in the baseline environment and summarise environmental measures required or corrective action to be taken to reduce or prevent significant environmental effects not outlined within the ES.

9.1.2 The detailed EMP will also be subject to further updates should there be a formal change or extension of the decommissioning consent under Regulation 13 of the EIADR.

[21] These reviews will be undertaken on a pre-determined timeframe agreed with the ONR in respect of the phase and activities of work being progressed.

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