## EDF Energy Nuclear Generation Ltd

# Decommissioning of Hunterston B Nuclear Power Station

## Environmental Statement

## Volume IV Non-Technical Summary

**November 2023**

Public

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## Report for

EDF Energy Nuclear Generation Limited (EDF)

## Main contributors

WSP
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## WSP

3rd Floor
11 Westferry Circus
Canary Wharf
London E14 4HD
United Kingdom
Tel +44 (0)20 3215 1610

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# Contents

# 1. Introduction

## 1.1 Overview

1.1.1 EDF Energy Nuclear Generation Limited (EDF, also referred to as the 'Applicant') has prepared an Environmental Statement (ES) to support an application submitted to the Office for Nuclear Regulation (ONR) for approval to dismantle and decommission Hunterston B Nuclear Power Station (also referred to as HNB) under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) [1] (hereafter termed 'EIADR').

1.1.2 These works, referred to as the 'Proposed Works', include the dismantling and deconstruction of buildings and structures in areas within and outside the Nuclear Site Licence[2] boundary, that are part of the power station.

1.1.3 This document is the non-technical summary of the ES and broadly follows the same structure as the main volume of the ES (Volume I) to enable the reader to locate additional detail, if required.

1.1.4 This non-technical summary is required by and satisfies regulation 5(1) of the EIADR.

## 1.2 What is decommissioning?

1.2.1 Nuclear decommissioning is the process leading to the complete or partial closure of a nuclear facility, including its nuclear reactor. The process is managed according to a decommissioning plan, which includes the whole or partial dismantling and decontamination of the facility, and restoration of the land to enable future use.

1.2.2 The objective of decommissioning is to ensure long-term protection of the public and the environment, and reduce the levels of radioactive contamination in materials and facilities on HNB Nuclear Site Licence Boundary (hereafter referred to as "the Site"), so that they can be safely recycled, reused, or disposed of as conventional or radioactive waste.

[1] UK Government (1999). *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)* (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed November 2023).
[2] 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.

1.2.3 HNB ceased generating in January 2022 after 46 years of operation and as result the station and associated infrastructure, and the land within the Nuclear Site Licence boundary (the 'Site') need to be decommissioned safely and in compliance with UK regulations. Currently, the power station is undertaking defueling, which is the activity of removing all the nuclear fuel from the Site, and an activity which falls outside of the scope of this EIADR application.

## 1.3 What are the roles of EDF, the Office of Nuclear Regulation (ONR) and the Nuclear Decommissioning Authority (NDA)?

1.3.1 EDF, the Applicant, is the current Licensee and holds the Nuclear Site Licence for HNB, granted under the Nuclear Installations Act 1965 (as amended). It is a condition of the Nuclear Site Licence, that the applicant must apply to the regulator for the nuclear industry in the United Kingdom (the ONR), for approval to decommission HNB. This EIADR application includes the submission of an ES which reports the outcome of an Environmental Impact Assessment (EIA) of the Proposed Works.

1.3.2 Following the end of generation and the subsequent defueling of the Site, the Nuclear Decommissioning Authority (NDA) and Magnox Ltd (a subsidiary of the NDA) will become the responsible party for implementing decommissioning at HNB.

## 1.4 What is an Environmental Impact Assessment?

1.4.1 An EIA is an environmental assessment process to ensure that the approval of the Proposed Works by decision makers is made with knowledge of the likely significant environmental effects that may arise as a result of the Proposed Works.

1.4.2 The objective of the EIA is to identify any likely significant effects which may arise from the Proposed Works and identify measures to prevent, reduce or offset any adverse effects and to enhance any beneficial effects.

1.4.3 During the EIA process, opportunities and management measures are identified and incorporated within the proposals to prevent or reduce any adverse effects and to enable sustainable design and construction principles to be embedded within the proposals. The outcome of the EIA process is reported within the ES.

1.4.4 The ES comprises:

- Non-Technical Summary (NTS) – This document – which provides a standalone summary of the Proposed Works and the findings of the ES in non-technical language;
- Volume I: ES Main Chapters – This presents the main body of the EIA, including the description of the Site and the Proposed Works; a review of reasonable alternatives; an outline of the EIA process; and the EIA assessment which is divided into a number of environmental aspect chapters;
- Volume II: ES Figures – Figures to illustrate the Proposed Works and any assumptions, or to support the environmental aspect chapters;

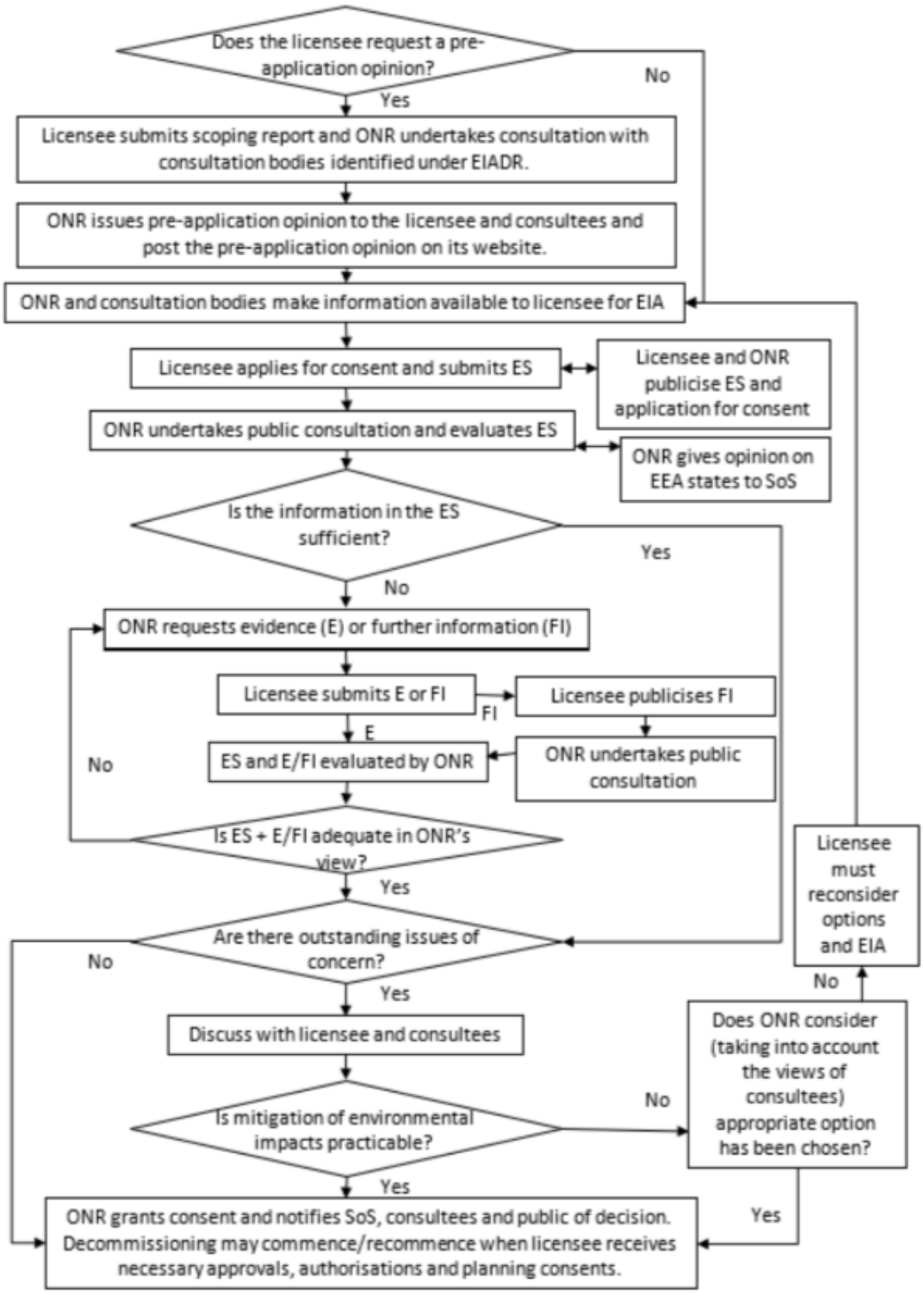
- Volume III: ES Technical Appendices – Additional reports and survey data which provide further detail on the environmental aspect assessments undertaken and information used to inform the assessments presented in Volume I.

## 1.5 Consenting process

1.5.1 The nature of Proposed Works means that the Applicant is required to apply to the ONR (as the competent authority) to gain consent to carry them out under the requirements of the EIADR. As illustrated in **Graphic 1.1**, once an application is submitted, the ONR will inspect and assesses the application documents to judge the suitability of the arrangements made and the adequacy of their implementation. It does this in part through consultation a minimum 90-day consultation with environmental bodies and other stakeholders. Under the EIADR, the ONR has the duty to assess the adequacy of an ES and determine if consent should be granted for a decommissioning project.

1.5.2 During determination or assessment, if insufficient or inadequate evidence has been provided to enable a determination or decision to be made, the Inspector can request further information. The ONR also has responsibility for determining whether an EIA is required for a proposed change or extension to a project which has already been previously given consent.

## Graphic 1.1 EIADR process flowchart[3]




[3] ONR (2023) *Guidance on the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations*. (Online). Available at: onr-nlr-gd-001.docx (live.com)

# 2. The Proposed Works

## 2.1 Hunterston B Nuclear Power Station and the surrounding environment

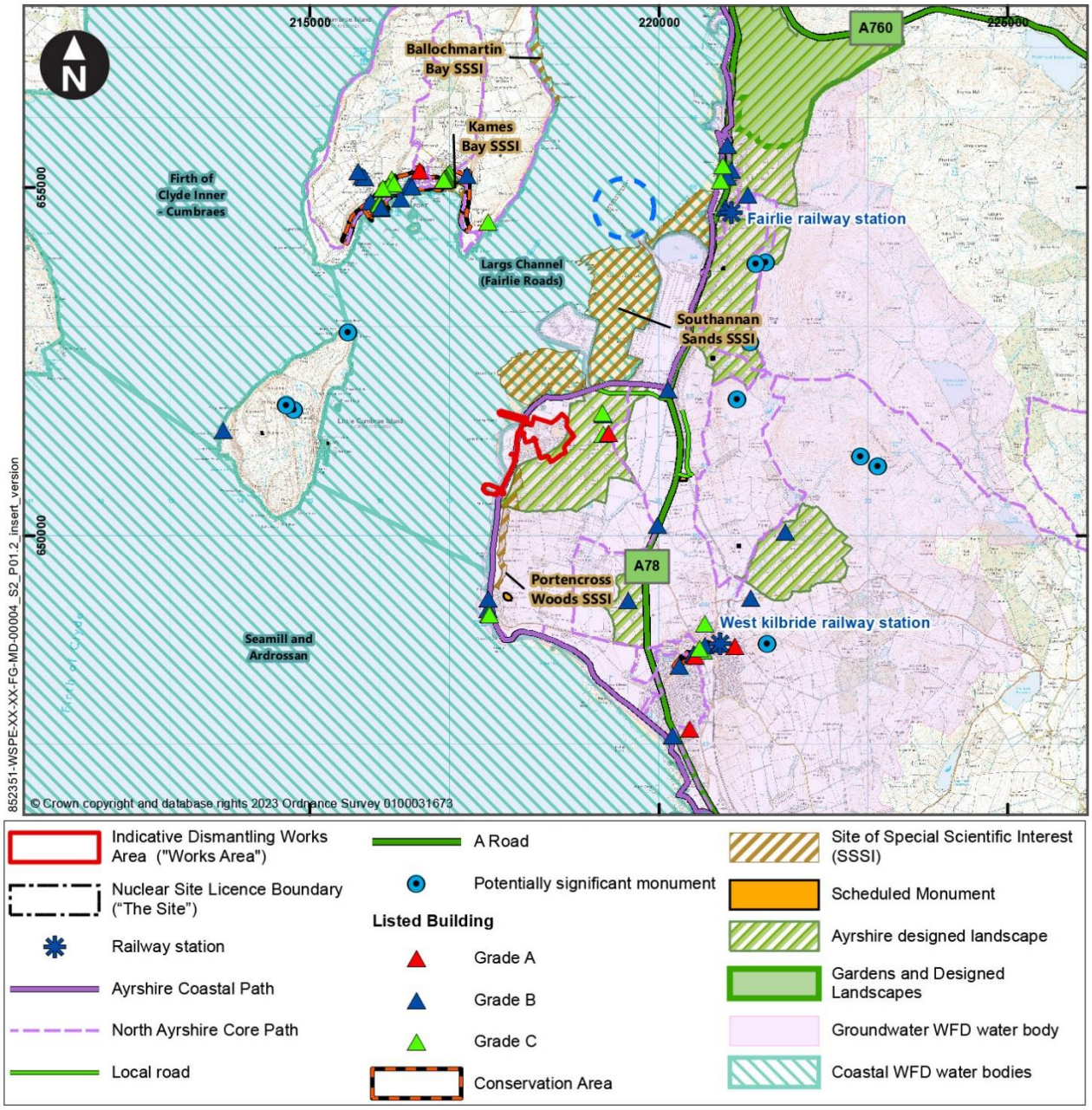
2.1.1 Hunterston B Nuclear Power Station is located on the west coast of Scotland on the Firth of Clyde (see **Graphic 2.1**), opposite the islands of Great and Little Cumbrae. It is approximately 7 km south/south-west of the seaside town of Largs, approximately 3.5 km to the north-west of West Kilbride and within the jurisdiction of North Ayrshire Council.

2.1.2 It neighbours the Hunterston A nuclear power station (HNA) which ceased electricity generation in 1990 and is currently being decommissioned. Both stations are surrounded by land largely in agricultural use with fields divided by drainage ditches, hedges and coastal habitats.

2.1.3 Land around both stations has historic and ecological value: it formed part of the Hunterston estate dating from around the 12$^{th}$ Century and features Southannan Sands Site of Special Scientific Interest (SSSI), (200 m to the north) and Portencross Woods SSSI, (500 m to the east). In addition, the Ayrshire Coastal Path follows the coast from the south, between the stations and the sea and continues along the coast to the north.

2.1.4 To the north-west lies Hunterston Port and Resource Centre (Hunterston PARC), a site for enterprise and industry based around the deep-water port and former coal terminal.

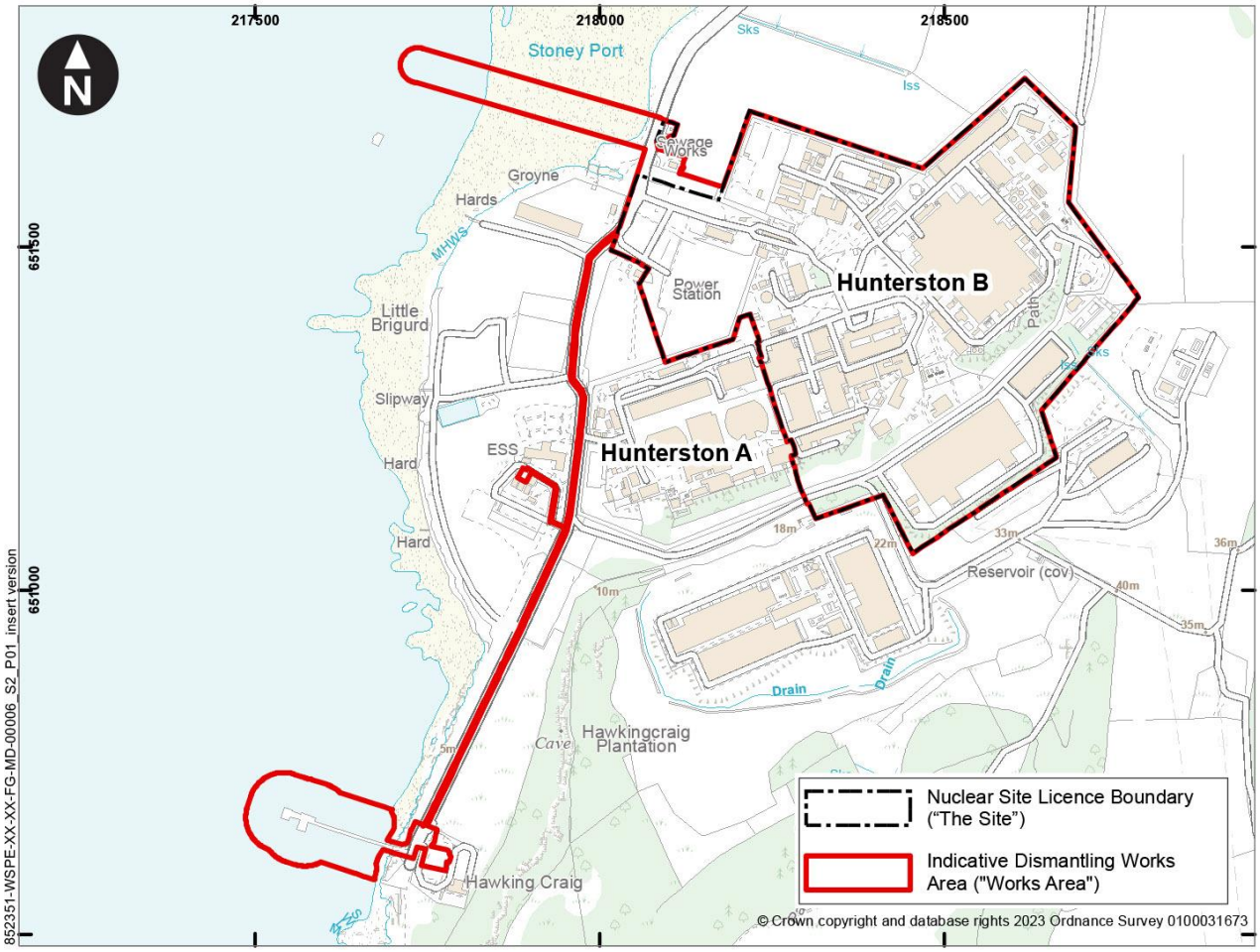
**Graphic 2.1 Site Location / Environmental context surrounding Hunterston B Nuclear Power Station**




## 2.2 The Site and Works Area

2.2.1 The Proposed Works involve dismantling and deconstructing parts of the power station, in areas within and outside of the Site. An Indicative Dismantling Works Area (hereafter referred to as the 'Works Area') is illustrated in **Graphic 2.2** and is used to guide the scope of assessment.

## Graphic 2.2 The Site and Works Area




2.2.2 A simple breakdown of the areas within the station is provided in **Graphic 2.2**. The area of the Site is approximately 30 hectares while the Works Area extends beyond to 34 hectares; both are located within the administrative area of North Ayrshire Council.

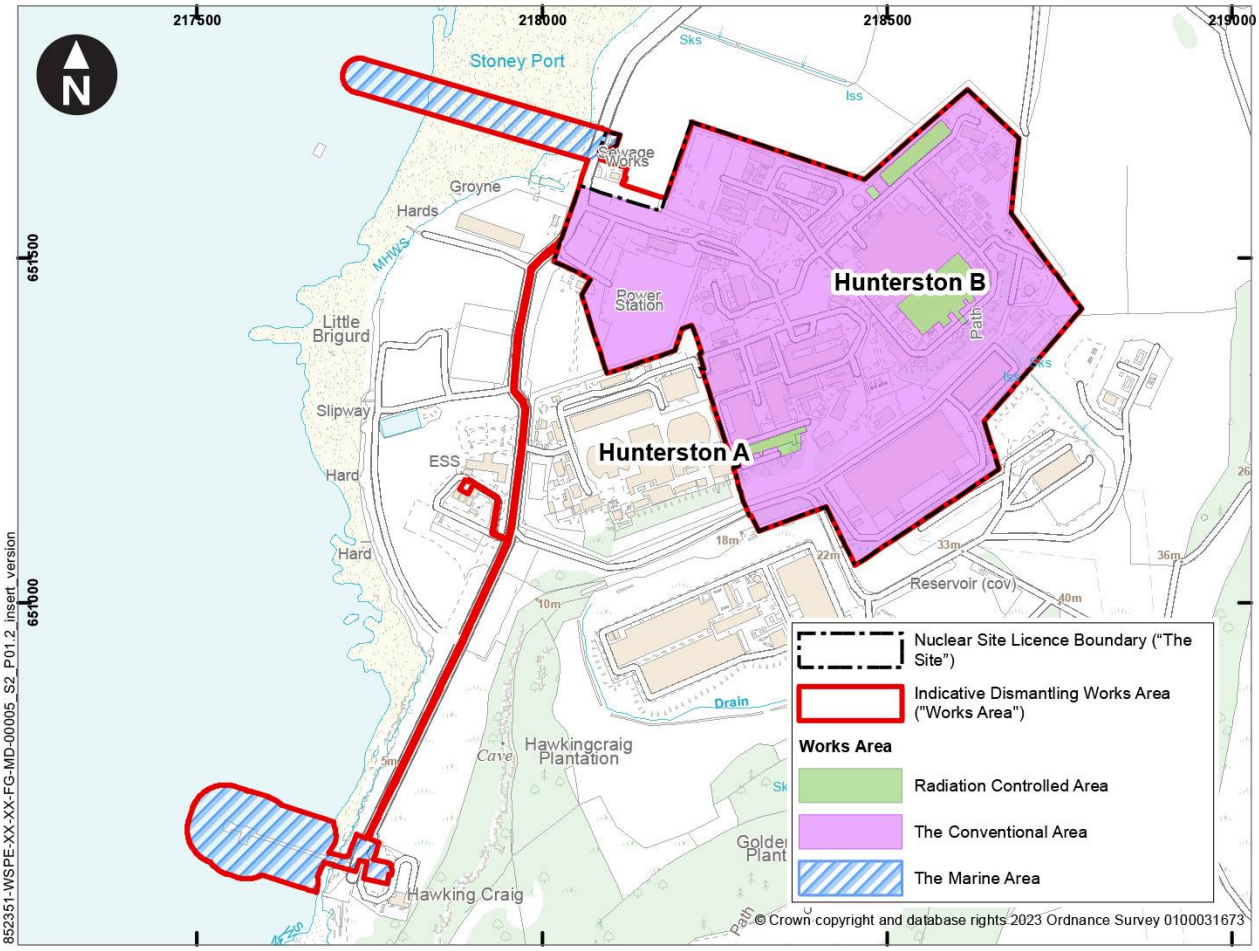
Graphic **2.3** Location**s** of notable **Site** areas


2.2.3 The A78 provides primary access for vehicles from the north and south to the Site via Power Station Road. The Ayrshire Coastal Path joins the Power Station Road Access from south of the Site at the HNB Jetty and is routed through the Works Area, between the Site and the Firth of Clyde.

2.2.4 Three key areas in the Works Area (see **Graphic 2.4**) are:

- The Radiation Controlled Area (RCA) – this is made up of the reactor building and other radioactive infrastructure.
- The Conventional Area – any infrastructure outside of the RCA and outside of the security fence surrounding the Site that require removal.
- The Marine Works Area – infrastructure associated with the water intake and outfall, and the HNB Jetty, which are not within the Site itself.

### Graphic 2.4 The Works Area




## 2.3 Phases of the Proposed Works

2.3.1 The Applicant's decommissioning strategy for HNB is to achieve an 'Early Safestore'. his would enclose the two nuclear reactors and other radioactive plant in a built structure, known as a Safestore. This approach will enable simpler dismantling of these structures at a later date, after a period of radioactive decay has occurred.

2.3.2 The Proposed Works have therefore been split up into three phases:

- Preparations for Quiescence phase – This phase includes the dismantling and deconstruction of all plant and buildings not included within the Safestore structure on-site, and the management of wastes generated from these activities. This would include dismantling and decommissioning of structures associated with electricity generation such as the cooling water[4] infrastructure. In addition, this phase includes the modification of the existing reactor building to create the Safestore structure.

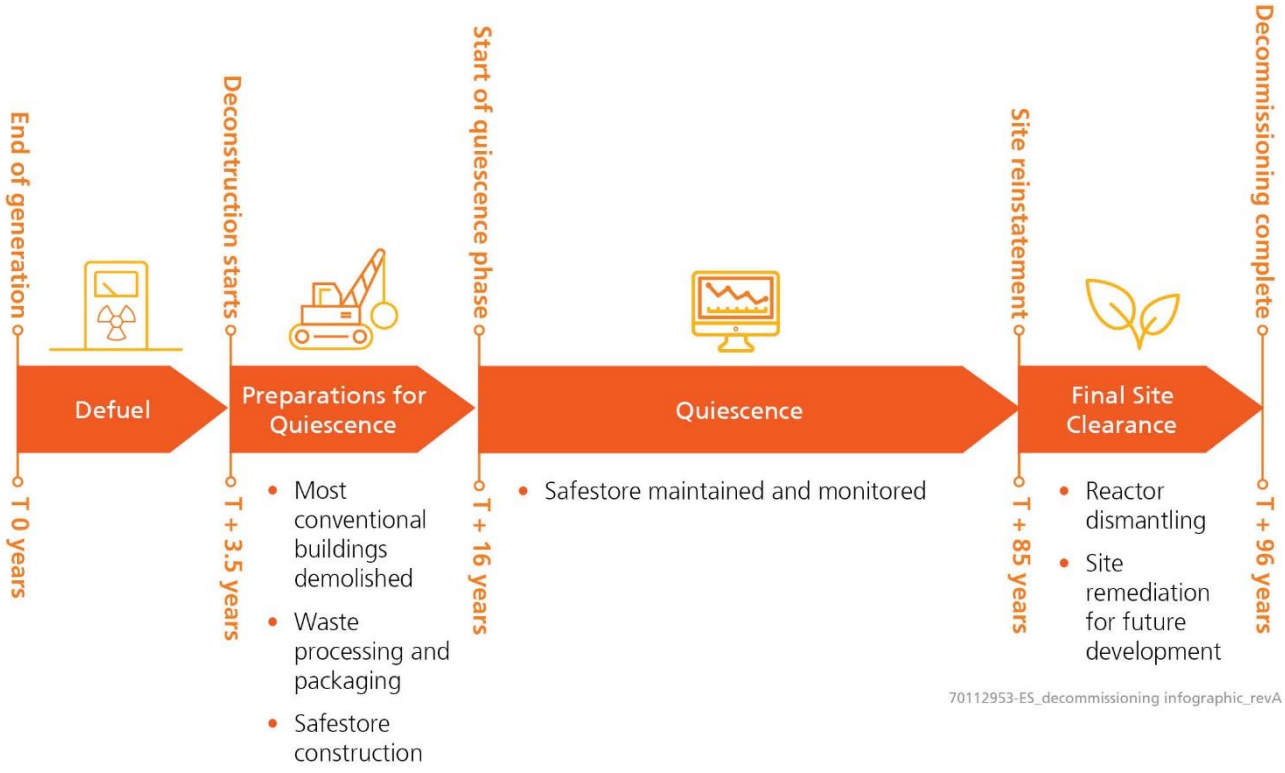
[4] Due to the large amount of heat generated in the nuclear reactor core during the electricity generating process, a cooling system is required to remove the heat generated. This requires a large volume of water that is pumped around the reactors.

- Quiescence phase – An almost 70-year period of relative inactivity with minimal management to allow further radioactive decay of materials within the Safestore. This would involve continuous monitoring and surveillance, with periodic care and maintenance interventions as required.
- Final Site Clearance – This will involve the dismantling and decommissioning of the Reactors, High Activity Debris Vaults and other plant retained within the Safestore and its subsequent removal from the Site. The Safestore structure will also be removed. Following this, works will focus on works needed to facilitate the delicensing of the Site to allow the land to be released for future re-use.

## Dismantling and deconstruction works and management

2.3.3 An indicative decommissioning timeline is presented in **Graphic 2.5**. It represents the current understanding for the 'best case scenario' for the completion of works.

### Graphic 2.5 The decommissioning programme




2.3.4 Hunterston B Nuclear Power Station has operated 24-hours a day, seven days a week through operations and subsequently defueling. During the Preparations for Quiescence phase working hours will change to represent the different types and nature of activities on the Site. Whilst some works may require 24-hour working, the majority of the Proposed Works will be limited to normal working hours between 07:30 and 18:00 hours Monday to Friday. In addition, security will remain 24 hours a day, seven days a week using shift arrangements.

2.3.5 During the Quiescence phase, works on the Site will be infrequent, with site monitoring or maintenance works mainly expected to take place within normal working hours. During Final Site Clearance, it is likely the majority of works would be focused during normal working hours similar to the Preparations for Quiescence phase, although some shift working may be required.

2.3.6 It is expected that additional minimal lighting may be needed in the Preparations for Quiescence phase at the start and end of days during winter. The existing security lighting will be retained through the Preparations for Quiescence phase. Lighting is likely to reduce during the Quiescence phase before increasing during Final Site Clearance similar to the Preparations for Quiescence phase.

2.3.7 The workforce during the Preparations for Quiescence phase is expected to vary between 220-300 staff, supplemented by up to 250 additional contractors depending on the works on-site at any given time.

2.3.8 Some buildings still contain accessible asbestos, and this will be removed during the Preparations for Quiescence phase, with any asbestos that is hard to access in the reactor building being removed at Final Site Clearance. This removal will be undertaken in-line with best practice and all legislation that governs working with asbestos, to maintain safety for workers and the local environment.

2.3.9 All materials and waste will be transported to the Site using the local road network. Radiological waste would be transported off-site as required, using working processes already embedded during HNB operation and in-line with specific regulations.

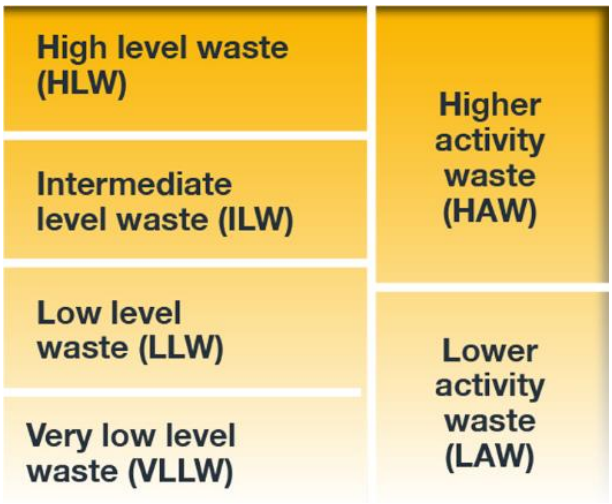
2.3.10 During the peak year for Heavy Goods Vehicle (HGV) movements during the Preparations for Quiescence phase, the Site is expected to average up to 24 HGV additional movements per day in total, across a working week (Monday - Friday). During the Quiescence phase there will be negligible traffic associated with the Site. During Final Site Clearance, vehicle movements are expected to be fewer than during the Preparations for Quiescence phase.

## 2.4 Waste and Materials management

2.4.1 All wastes will be handled in line with relevant waste legislation. Conventional wastes are material such as metals, glass, plastics and other mixed wastes relating to demolition. This will be managed in accordance Waste Hierarchy.

2.4.2 Radioactive waste is broken down into two main categories for management, Higher Activity Waste (HAW) and Lower Activity Waste (LAW), as illustrated in **Graphic 2.6**.

## Graphic 2.6 Radioactive waste classification types




2.4.3 During the Preparations for Quiescence phase, it is expected that ILW and LLW will be managed using the Operational Waste Processing Facility (OWPF) and the Decommissioning Waste Processing Facility (DWPF) respectively. These two facilities will be delivered on-site largely by re-using existing buildings. The DWPF will process primarily solid LLW through compaction, shredding and separating waste, to then send it off-site. The OWPF will process HAW which may include the washing of wastes and the encapsulation of this material in specialist waste containers. ILW from HNB requiring interim storage will be stored in the HNA ILW Store until a near surface facility in line with Scottish Government Policy is available. Both the DWPF and OWPF will be decommissioned at the end of the Preparations for Quiescence phase.

2.4.4 A Waste Management Centre will be constructed to process both HAW and LAW during the Final Site Clearence phase and consign it off-site to the relevant location.

2.4.5 Treated radioactive effluent discharges are already permitted and undertaken at the Site. Works are required at the beginning of the Preparations for Quiescence phase to modify the existing permitted discharge arrangements prior to the decommissioning of the Cooling Water System. This will require the modification of the existing permit for these discharges to the Firth of Clyde.

# 3. Consideration of alternatives

3.1.1 **Chapter 3: Alternatives** of the ES presents an overview of the alternatives considered in developing the preferred decommissioning strategy.

3.1.2 The preferred decommissioning strategy has been developed following appraisals of various decommissioning options. These options included:

- Prompt dismantling - Under this scenario, following defueling, decommissioning works on-site would happen immediately with the full decommissioning of the Site complete in a couple of decades.
- Continuous dismantling – Under this scenario, decommissioning works in the early period would likely be slower but continuous, with activities to remove the reactor being complete approximately 40 years after the End of Generation.
- Deferred reactor dismantling - Under these scenarios, various options were considered which essentially rely upon putting the Site into a safe, inactive state for varying periods of time to enable radioactive decay to take place prior to commencing reactor dismantling and associated tasks.

3.1.3 The options were appraised against the following objectives:

- To progressively reduce and remove the hazard on the Site while:
  - ensuring continued safety;
  - minimising the environmental impact as far as reasonably achievable;
  - decommissioning the station as soon as it is reasonably practicable to do so to release land from nuclear regulation for other use as appropriate; and
  - ensuring value for money in the expenditure of resources on decommissioning.

3.1.4 The review concluded that a ‘deferred dismantling’ strategy was most appropriate for the Site based on the following benefits:

- Lower radiation dose rates when dismantling the reactor.
- Makes a reduction in the quantity and level of radioactive waste arising from decommissioning which puts less pressure on existing and planned radioactive waste facilities.
- Allows time for disposal routes to be established.
- Funding provision for the whole decommissioning lifecycle is made more secure due to the quiescent period when fund recovery growth can take place.

3.1.5 Chapter 3 of the Environmental Statement also discusses the alternatives considered of other key project decisions bulleted below:

- Waste Management Facilities in the Preparations for Quiescence phase;
- Locations of the discharge pipeline;
- How to manage voids left from dismantling of buildings and structures; and
- Approach to the modification of the Safestore.

# 4. The Environmental Impact Assessment process

## 4.1 EIA scoping

4.1.1 The EIA assesses the environmental effects on resources (such as the water environment) and receptors (such as human beings) arising as a result of the Proposed Works.

4.1.2 Scoping forms one of the early stages of the EIA process, which sets out the potential environmental aspects that may be significantly impacted by the Proposed Works and which, therefore, would need to be assessed as part of the EIA.

4.1.3 An EIADR Scoping Report, outlining the proposed scope and assessment methodology for the environmental aspect studies to be undertaken as part of the EIA, was submitted to ONR on 03 August 2022. The Scoping Report was accompanied with a request for the ONR to provide its written opinion as to the scope and level of detail of information proposed to be provided within this ES, under Regulation 6(1) of EIADR. The ONR consulted with the 'Environmental bodies' (such as the Scottish Environmental Protection Agency (SEPA)) and other relevant consultation bodies, where it was deemed appropriate by the ONR.

4.1.4 In addition, the Applicant has undertaken early engagement with the public, to give local communities the opportunity to be involved in the development of the decommissioning programme. Whilst there is no provision under the EIADR regulations to consult on the decommissioning strategy, the Applicant is committed to undertaking consultation, which is derived from best practice and meaningfully informs the development of plans for decommissioning.

4.1.5 The EIA has been undertaken as a requirement of the EIADR to support the application for consent to decommission HNB, drawing on the ONR Pre-application Opinion, and feedback from stakeholder engagement with the public.

## 4.2 Assessment process

4.2.1 The environmental effects of the Proposed Works have been assessed in terms of changes to the existing (i.e. current) environment (the baseline). This has been determined by collecting information on existing environmental conditions through surveys, reviews of databases, records and mapping and consultation with stakeholders. This helps to identify sensitive receptors and resources that may be impacted by the Proposed Works.

4.2.2 The approach to the assessment considers the sensitivity, importance or value of an affected resource or receptor' and the predicted change to the environment (i.e. the 'magnitude' or severity of an effect) as a result of the Proposed Works. consideration is then given on whether the Proposed Works would have likely significant environmental effects (either positive or negative).

4.2.3 The aim of the EIA process is for 'significant' effects to be identified, with the goal of reducing any significant adverse effects through the design process or other measures. 'Significant' effects are considered to be those effects that represent key factors or material influences in the decision-making process.

4.2.4 The EIA takes into consideration all 'in-built' aspects (referred to as embedded measures) which may include design and management measures such as those set out within the Outline EMP to limit the extent of potential environmental effects.

4.2.5 If significant effects are still likely to occur, consideration has been given to whether any additional mitigation measures would avoid, offset or reduce the significance of effects.

4.2.6 A conclusion on whether an effect is considered to be significant or not is then given, taking into account all committed mitigation.

## 4.3 Reducing significant environmental effects via the design of the Proposed Works

4.3.1 Embedded environmental and good practice measures have been included as part of the Proposed Works to avoid, offset or reduce significant effects. These are outlined within the ES environmental aspect chapters **Volume I: Environmental Statement – Chapters 6-20**. Some of the embedded measures have been informed by consultation undertaken by the Applicant, or informed and influenced by policy guidance, best industry practice and regulation.

4.3.2 The Applicant has prepared a number of documents that will be submitted alongside the Environmental Statement. These documents include:

- HRA Screening Report;
- Consultation Report; and
- Outline Environmental Management Plan.

# 5. The Environmental Impact Assessment

## 5.1 Air Quality

5.1.1 **Chapter 6: Air Quality** of the ES has considered the potential for effects from emissions to air of pollutants and dust, from the Proposed Works on people and important ecological sites. The main pollutants of concern in the UK in relation to health effects are nitrogen dioxide ($NO_2$) and fine air particles, referred to as particulates (Particulate Matter – PM).

5.1.2 To assess the dust emissions released during dismantling, decommissioning and construction activities, a desk-based assessment was undertaken for the Preparations for Quiescence phase as this is considered a worst-case across the three phases of decommissioning). The assessment has been undertaken in-line with standard industry guidance provided by the Institute of Air Quality Management.

5.1.3 Due to the low levels of additional daily traffic expected to be generated from the Proposed Works, effects of air emissions from traffic were screened out from detailed assessment as significant effects were considered unlikely.

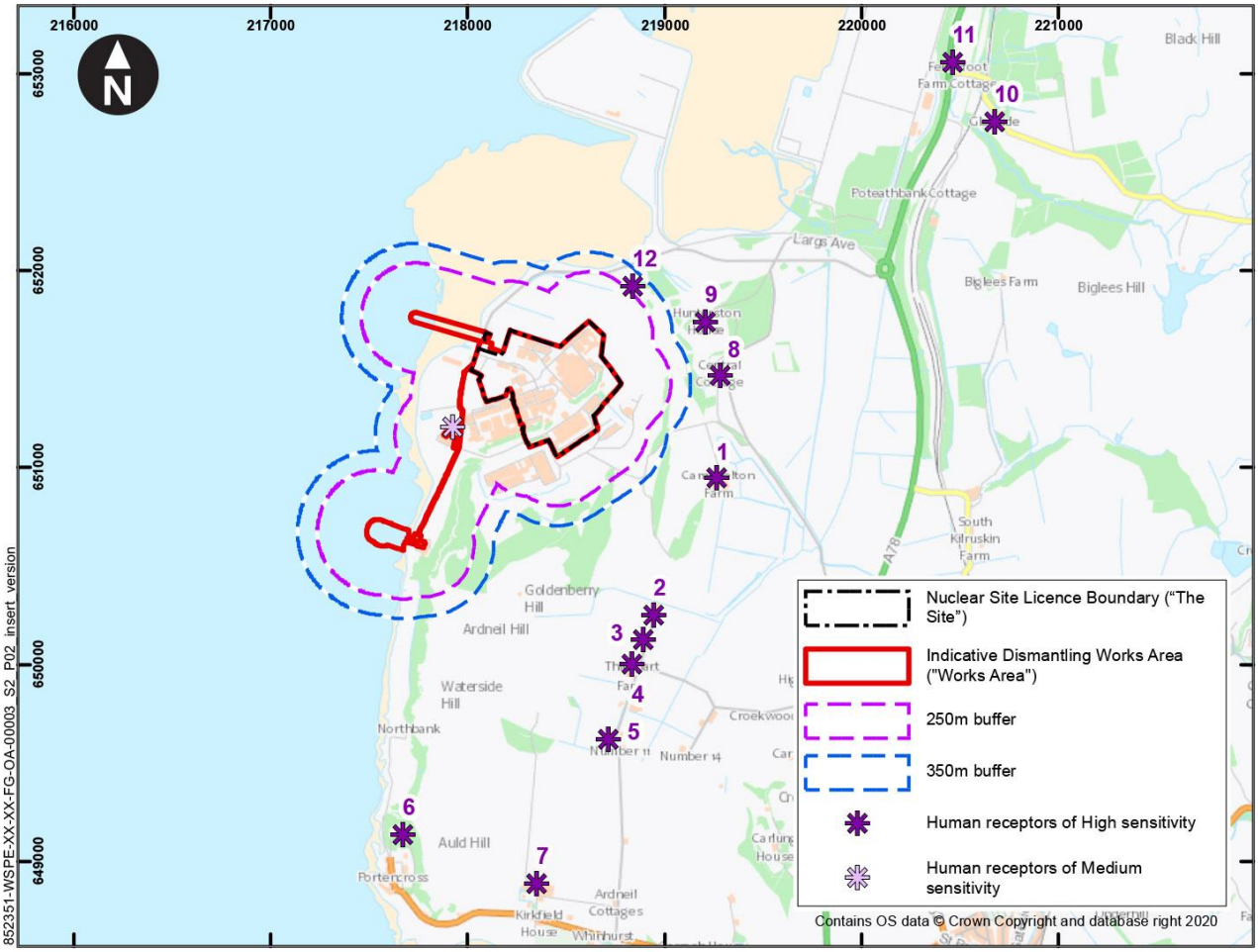
### Baseline

5.1.4 Air quality data was collected from a combination of desk-based research and monitoring stations. Current emissions originating from HNB comprise traffic emissions from the transportation of staff and consumables to the Site and emissions from plant and machinery sometimes required on the Site. The Site itself lies within a rural environment, and current pollutant levels are well below the relevant Air Quality Objectives (AQOs) established for the protection of human health.

5.1.5 Local authorities are required to assess air quality within their administrative area. They are required to declare an Air Quality Management Area (AQMA) where pollutant levels may exceed AQOs. There are no AQMAs within the administrative area for North Ayrshire Council (where the Works Area is located). However, Glasgow City Centre, where traffic associated with the Proposed Works may pass through, is an AQMA due to high levels of $NO_2$.

5.1.6 All potential residential receptors are located more than 250 m from the HNB Site. The closest human receptors include the workforce at HNB and workers at HNA. The human receptors considered in the assessment are shown on **Graphic 5.1** below.

**Graphic 5.1 (Figure 6.3 of the ES) Human receptors in the vicinity of the Proposed Works**




## Embedded measures

5.1.7 Appropriate embedded measures would be incorporated into the Proposed Works which will include the implementation of a Dust Management Plan that reflects guidance from the Institute of Air Quality Management. The Dust Management Plan will incorporate measures to minimise dust emissions during construction and deconstruction activities and define requirements for regular monitoring of the Site and at nearby receptors to ensure the reduction of impacts. Further details are included in the **Chapter 6: Air Quality** of the ES.

## Assessment of likely effects

5.1.8 During the Preparations for Quiescence phase, the Proposed Works are predicted to result in a maximum of a medium risk for dust soiling and subsequent impacts on human health and ecological receptors. Implementation of the measures set out in a Dust Management Plan, will however ensure dust effects on these receptors are negligible. Given that effects on air quality as a result of emissions from traffic were screened out from assessment, the overall effect on air quality arising from the Proposed Works would be **Not Significant**.

# 5.2 Climate Change

5.2.1 **Chapter 7: Climate Change** of the ES provides an assessment of the anticipated greenhouse gases (GHG) emissions which will be produced during the life cycle of the Proposed Works in line with industry guidance and relevant planning policy. It does this in the absence of a 'do nothing' scenario normally associated with these types of assessments as decommissioning is a requirement for the Site and thus a 'do nothing' scenario is not considered credible.

5.2.2 The vulnerability of the Proposed Works to climate change has also been analysed in the Environmental Statement and this is summarised in an appendix to the chapter (**Appendix 7B** of the ES). This appendix largely relies upon the other aspect assessments which investigate the possibility for the Proposed Works to be affected by changes as a result of climate change and considers how the Proposed Works will not be affected by these changes.

## Baseline

5.2.3 The GHG baseline is based on the fourth, fifth and sixth UK carbon budgets. These carbon budgets were set out by the UK Government in 2009 to outline the total permitted budget for 5-year periods to ultimately meet the requirement of the Climate Change Act 2008 to reduce its net GHG emissions by at least 100% below 1990 levels by 2050.

## Embedded measures

5.2.4 Appropriate embedded measures would be incorporated into the Proposed Works which will include (but not limited to):

- Ensuring plant equipment is well maintained to ensure efficiency of energy consumption;
- Consolidating deliveries where possible and encouraging sustainable transport for workforce and introducing other measures to drive fuel and therefore carbon efficiency ;
- Where possible, use of locally sourced construction materials, as well as using materials which share, lease, reuse, repair, refurbish and recycle; and
- Periodic reviews through the Proposed Works lifecycle to promote the identification of opportunities for reducing GHG emissions from the Proposed Works.

## Assessment of likely effects

5.2.5 Overall lifetime GHG emissions associated with all three phases of the Proposed Works are estimated to be 39.6 kilotonnes of carbon dioxide equivalent (ktCO2e). In relation to relevant UK carbon budgets, this would equate to 0.0002% of the UK's fourth carbon budget, or 0.001% of the UK's fifth carbon budget or 0.003% of the UK's sixth carbon budget. This contribution to the various existing carbon budgets would therefore be considered **Not Significant**.

# 5.3 Terrestrial Biodiversity and Ornithology

5.3.1 **Chapter 8: Terrestrial Biodiversity and Ornithology** assesses the effects of the Proposed Works on land-based biodiversity receptors. The assessment method is aligned with good practice defined by the Chartered Institute of Ecology and Environmental Management (CIEEM).

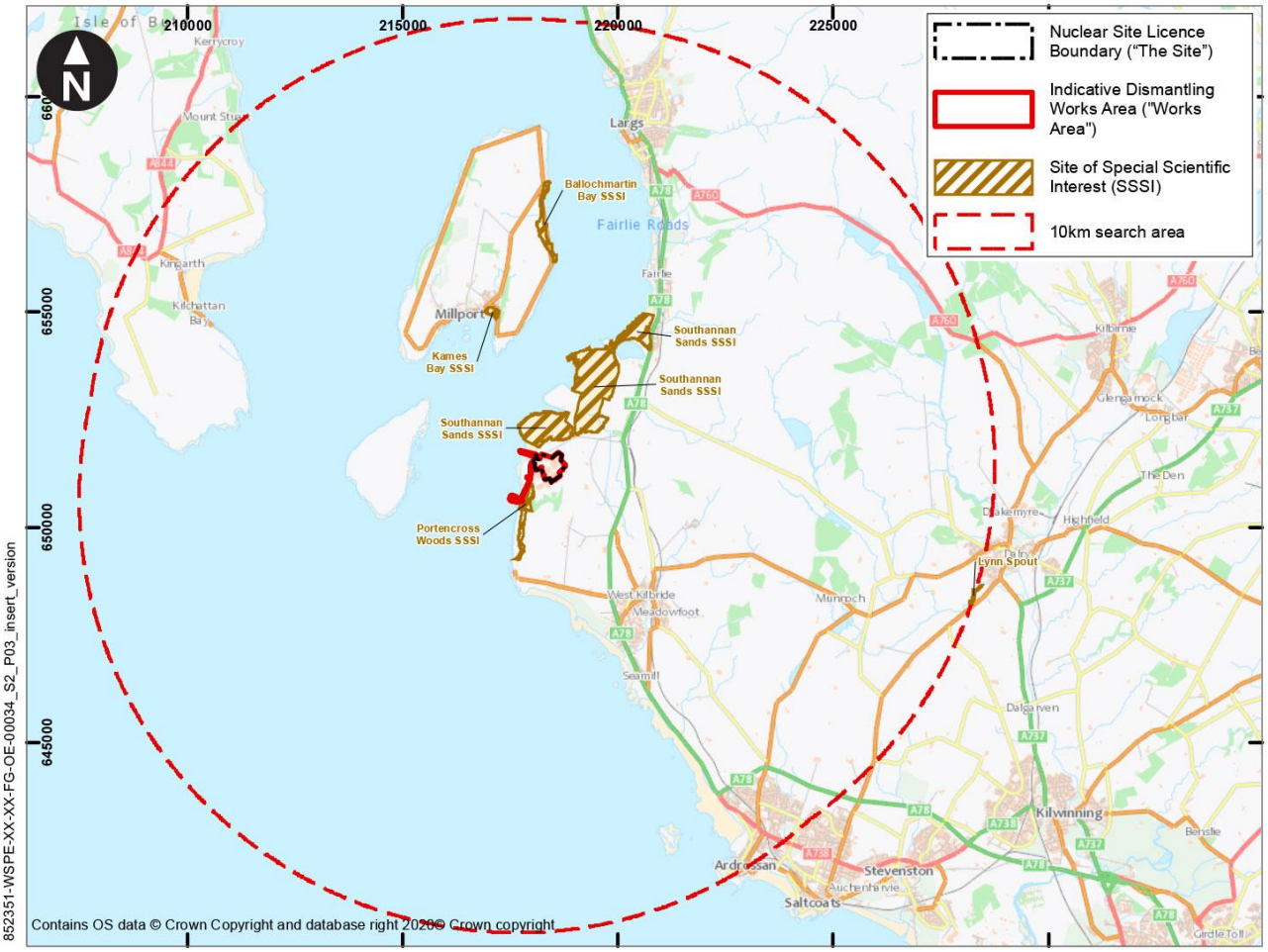
5.3.2 Effects on ecological features arising from the Preparations for Quiescence and Final Site Clearance phases are assessed. The Quiescence Phase, which will be predominantly maintenance activities, is likely to have no significant effects on ecological features and was scoped-out of the assessment at the EIA Scoping stage.

## Baseline

5.3.3 The Works Area is mainly hardstanding and buildings, with smaller areas of amenity grassland, plantation woodland and scattered trees. Beyond the Works Area boundary, there is predominantly farmland, hedgerows, industrial development and woodland.

5.3.4 There are four statutory biodiversity conservation sites within 10 km of the Works Area, the closest being Southannan Sands Site of Special Scientific Interest (SSSI) and Portencross Wood SSSI, both are within 500 m (as shown on Graphic 5.2). There are 15 non-statutory Local Nature Conservation Sites (LNCS) within 3 km, the closest is Goldenberry Hill LNCS, which is less than 100 m from the Works Area.

## Graphic 5.2 Statutory biodiversity conservation sites




5.3.5 Surveys of the Works Area recorded otter activity along the coast to the west of the power station and bat activity within the Works Area and perimeter areas. Bat activity was attributable to three common and widespread bat species but no bat roosts were identified on the Site.

5.3.6 Breeding bird surveys recorded common, widespread species that are typical of Ayrshire. Species of particular interest included dunnock, herring gull, house sparrow, linnet, reed bunting, mistle thrush and song thrush, which are national conservation priorities. These species were however recorded in low numbers. Seven breeding pairs of black guillemot were recorded however, representing around 5% of the Ayrshire breeding population.

5.3.7 At least 100 species of non-breeding birds occur within 1km of the Site, however the majority were not recorded regularly enough, or in sufficient numbers, to be considered assemblages of greater than local biodiversity conservation importance.

## Embedded measures

5.3.8 Embedded measures are incorporated into the Proposed Works to:

- Protect habitats and biodiversity conservation sites, such as restricting work as far as practicable to hardstanding;
- Protect mammals and other fauna, such as storing materials away from habitats and preventing mammals getting into the Works Area;
- Specific measures to protect otters, bats and birds;
- Specific measures to prevent the spread of invasive non-native species; and
- Periodic reviews and updates of the biodiversity baseline to identify any changes needed in the embedded measures to reduce impacts on receptors.

## Assessment of effects

### Biodiversity conservation sites

5.3.9 There will be no habitat loss within statutory and/or non-statutory biodiversity conservation sites. The Proposed Works incorporate measures to minimise dust deposition and there is likely to be negligible habitat degradation due to dust. The effect of habitat loss and dust deposition on biodiversity conservation sites is likely to be neutral and **Not Significant**.

5.3.10 A limited increase in demolition/construction traffic and any associated increase in vehicle emissions is likely to have a neutral effect on statutory and non-statutory biodiversity conservation sites. The effects of vehicle emissions on both statutory and non-statutory biodiversity conservation sites are therefore likely to be **Not Significant**.

### Habitat and Protected Species

5.3.11 The Proposed Works are mainly confined to hard standing. Any unavoidable habitat loss will be limited to small areas of habitat types that are common and widespread. This would have a neutral effect on these habitats, which is **Not Significant**.

5.3.12 The Proposed Works may result in limited displacement of otter, foraging bats and breeding/non-breeding birds including black guillemot. These fauna are however likely to be displaced into suitable surrounding habitats and effects on them are likely to be neutral, or of very low magnitude, and **Not Significant**.

## 5.4 Marine Biodiversity

5.4.1 **Chapter 9: Marine Biodiversity** of the ES has considered the impact of the Proposed Works on marine features and receptors. The assessment considers habitats, intertidal[5] and subtidal[6] species of flora, fauna, fish and mammals.

5.4.2 The assessment considers the potential effects that may potentially occur during the Proposed Works, specifically during the Preparations for Quiescence and Final Site Clearance phases, as this is where the impact pathways are most likely to occur.

### Baseline

5.4.3 The baseline assessment of marine biodiversity uses data gathered from field surveys, relevant published technical guidance and information, and professional knowledge.

5.4.4 The Works Area is located immediately to the east of the shoreline, which comprises a variety of coastal habitats, including shingle, grasslands and cobbled shores. The closest SSSI to the area is Southannan Sands SSSI, 200 m north of the Site.

5.4.5 There are also a total of 18 sites designated as Special Areas of Conservation (SAC) within the large Study Area up to 200 km from site. This study area is wide principally due to the far-ranging nature of marine mammals and fish that were identified as potential receptors rather than being based on the scale of the Proposed Works.

### Embedded measures

5.4.6 The methodologies for delivery of the Proposed Works outlined in **Chapter 2: The Decommissioning Process** of the ES, limit the disturbance of sediment. Further embedded measures which reduce the potential for effects include:

- Removal of structures in the marine environment using conventional and non-explosive methods;
- Minimising subtidal working where practicable;
- Appropriate scheduling of works to reduce impact in species; and
- Pollution control measures to prevent contaminant spillage.

[5] The area of a seashore which is covered at high tide and uncovered at low tide.
[6] The area of a seashore which is below the level of low tide, that is always underwater.

## Assessment of likely effects

5.4.7 The assessment of effects upon marine biodiversity as a result of activities during the Preparations for Quiescence and Final Site Clearance phases concluded that effects would be Minor (**Not Significant**) on intertidal habitats and species and Minor to Negligible on subtidal habitats and species (**Not Significant**). Effects on marine mammals and fish would also be Minor to Negligible (**Not Significant**), as a result of the current marine conditions, the limited scale and duration of the Proposed Works and the works being undertaken in-line with embedded measures that minimise disturbance of sediment and noise creation.

# 5.5 Coastal Management and Water Quality

5.5.1 **Chapter 10: Coastal Management and Water Quality** of the ES has considered the impact of the Proposed Works on coastal processes.

5.5.2 Most coastal processes are not in themselves receptors but are instead 'pathways'. However, changes to coastal processes have the potential to indirectly impact other environmental receptors such as marine biodiversity. The assessment considers changes to wave, tidal and sediment transport movements, and subsequent impacts on water quality.

5.5.3 The assessment considers the effects which would arise from all phases of the Proposed Works and is based on detailed desk study and marine water quality surveys at the Site.

## Baseline

5.5.4 The majority of the Works Area is located inland of the shoreline and the marine infrastructure associated extends approximately 300 m into the Firth of Clyde. The Site lies within the area covered by the Ayrshire Shoreline Management Plan (SMP) and is protected from coastal flooding by existing features such as sea defences.

5.5.5 The local coastline features differing types of sediments and the nearest coastal water bodies (the Largs Channel and the Seamill and Ardrossan coastal water body) are connected to the Study Area. There are two designated bathing waters within the Study Area which are classified as being in good condition.

5.5.6 Water quality sampling surveys showed the marine water quality was typical of a lower estuary site.

## Embedded measures

5.5.7 The methodologies for delivery of the Proposed Works outlined in **Chapter 2: The Decommissioning Process** of the ES, limit the disturbance of sediment. Further embedded measures which reduce the potential for effects include:

- Limiting the use of anti-fouling materials;
- Minimising subtidal working and the use of methods which reduce the disruption of sediments; and
- Water testing prior to release discharge to ensure it meets environmental standards.

## Assessment of likely significant effects

5.5.8 Effects relating to changes in currents, waves, sediment transport and coastal processes are considered to be **Not Significant**, as the removal of the HNB Jetty and HNB Intake would return the coastal processes to a more natural regime. Effects on the Ayrshire Shoreline Management Plan's policies are also considered to be **Not Significant,** as the Proposed Works do not involve the dismantling of any existing coastal defences. Very Low (**Not Significant**) effects are anticipated on water quality with embedded measures to prevent sediment disturbance and manage the discharge of pollutants to the coastal environment.

# 5.6 Surface Water and Flood Risk

5.6.1 **Chapter 11: Surface Water and Flood Risk** of the ES has considered the impact of the Proposed Works on the surface water environment as well as flood risk. It includes consideration of the onshore surface water catchment area of the Site as well as adjacent drainage ditches, sea defences and other water infrastructure.

5.6.2 The assessment has considered the effects arising from across all three phases of the decommissioning and is underpinned by numerous sources of publicly available information and past reports specific to HNB. Furthermore, a site walkover was conducted to gain further understanding of the baseline surface water environment within the Site and Study Area.

## Baseline

5.6.3 The Site lies generally in a low-lying area of the coast, which slopes down gradually towards the shoreline to the north and west. The average annual rainfall received in the area is above the UK average.

5.6.4 There are no main watercourses within the Study Area, however there are several drainage ditches in the fields to the north and south of the Works Area. The current drainage systems at the Site are part of the existing infrastructure, with the majority draining to the Firth of Clyde after passing through various drainage management systems such as oil interceptors. There is some drainage of the northern section of the Site that discharges to the Firth of Clyde via a drainage ditch.

5.6.5 The Site is not at risk of flooding from rivers or streams. The risk of surface water flooding ranges from low to high probability across the Site, however the Site is managed via on-site drainage and safety measures are in place for extreme rain.

5.6.6 Infrastructure at the Site was found to be unaffected by wave overtopping in extreme conditions and the Site itself is currently at low risk of coastal flooding. Groundwater flooding risk is low.

5.6.7 Future changes to the baseline will occur as a result of climate change and the extended nature of the decommissioning proposals, but tidal flooding risk, including flooding as a result of sea level rise, storm surge and wave overtopping, is very low. There is a future risk of flooding from extreme rainfall on the Site as a result of climate change, however existing studies indicate that the main buildings on the Site (including the reactor building) would not be affected.

## Embedded measures

5.6.8 Appropriate embedded measures would be incorporated into the Proposed Works including (but not limited to) measures such as:

- Preparation of an emergency plan to ensure that anyone on Site understands the procedures in the event of potential or actual flooding from either extreme surface water or tidal flooding on Site.
- Design and siting of the facilities required to undertake Final Site Clearance will be situated in areas not at risk of flooding as defined by the updated HNB Safety Case but also likely to be enforced through the planning system;
- Preparation of an evolving drainage plan to identify suitable drainage solutions on the Site throughout the Proposed Works;
- Undertaking drainage surveys throughout the Proposed Works to inform the evolving drainage plan;
- Implementation of good practice pollution prevention guidance at the Site;
- Maintaining site protection and monitoring for as long as required to ensure a good condition is maintained at the Site and offsite and to help identify any requirement for drainage system actions; and
- Undertaking surface water monitoring to ensure surface water quality is maintained.

## Assessment of likely significant effects

5.6.9 All phases of the Proposed Works were considered in the assessment of surface water and flood risk. Modelling studies supporting the HNB Safety Case indicate that even during extreme rainfall events, potential effects on surface water flood risk from external areas would not pose a threat towards any existing infrastructure or staff, particularly on the basis of existing operational site protocols for surface water management being carried out at both Hunterston A (HNA) and HNB. On the basis of the inclusion of embedded measures, it is considered that any potential surface water flood risk would be very low (**Not Significant**).

5.6.10 The decommissioning proposals for works in and adjacent to the marine environment will have a very low magnitude of change on tidal flood risk, and the assessment concludes a **Not Significant** effect.

5.6.11 The potential effects due to the influence of climate change on tidal flood risk are likely to be greatest during the latter stages (i.e. Quiescence phase and Final Site Clearance phase). Under the assumption that the existing level of sea defences have not increased, there is likely to be an increase in tidal flood risk, due primarily to climate change induced sea level rise by 2120, which would mean that some parts of the Site would be liable to flooding at the end of the Proposed Works during Final Site Clearance in very extreme weather. However, the key infrastructure of the Safestore would remain substantially above the flood level and therefore is considered to be at a negligible risk of tidal flooding. Subsequent siting of the Waste Management Centre would therefore remain outside of projected tidal levels throughout the Proposed Works and effects on off-site and on-site staff and infrastructure is likely to be Very Low, which therefore is considered **Not Significant**.

5.6.12 The potential effects on surface water quality are likely to be greatest during the Preparations for Quiescence phase as this is when most demolition and site clearance activities will be carried out. On the basis of the inclusion of embedded measures, including the drainage plan, drainage survey, utilising measures within the pollution prevention guidance and surface water monitoring, it is considered the likely effects associated with the Proposed Works would be low (**Not Significant**).

## 5.7 Soils, Geology and Hydrogeology

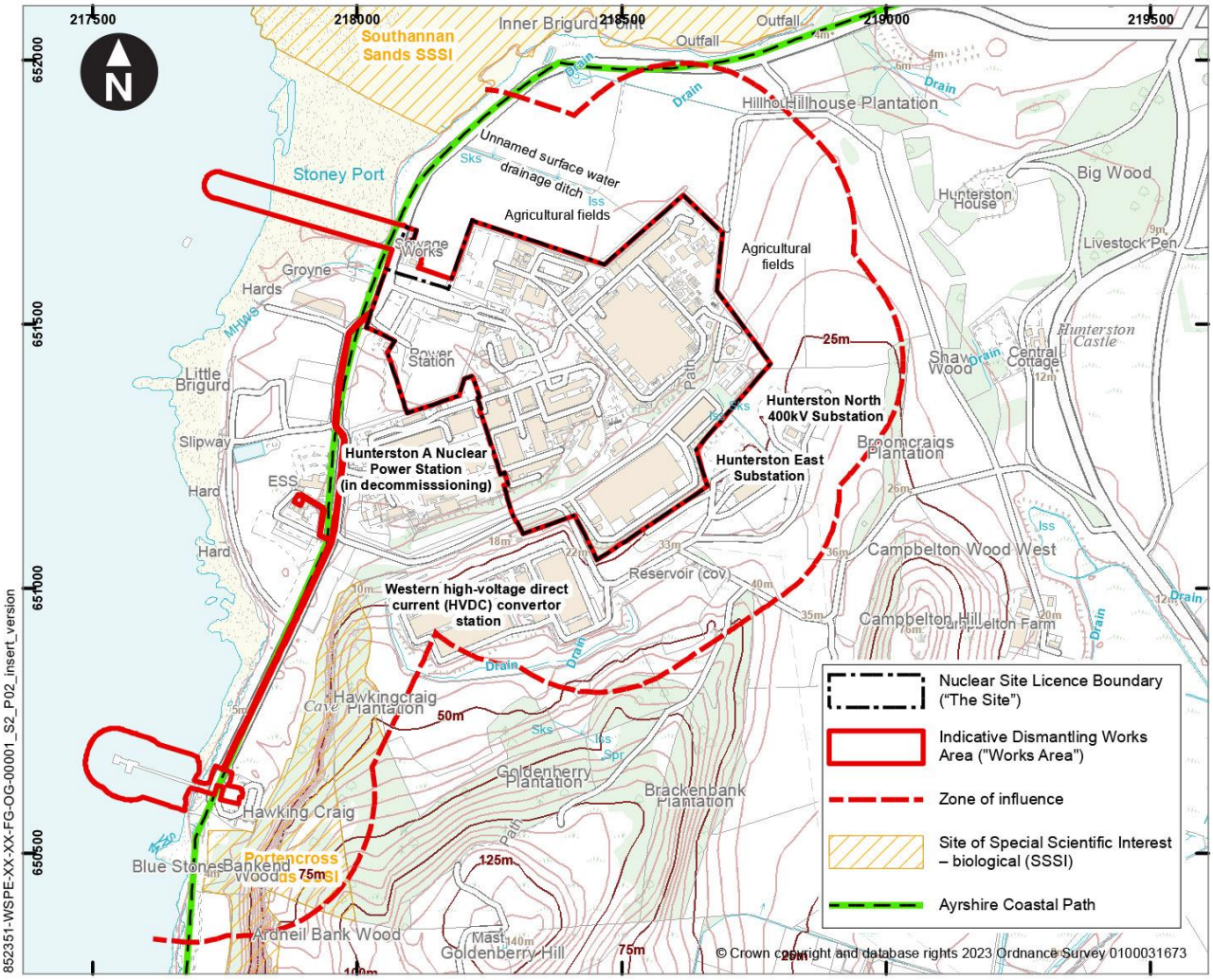
5.7.1 **Chapter 12: Soils, Geology and Hydrogeology** of the ES has considered the impact of the Proposed Works on soil resources, geology and land contamination receptors. The potential effects of some of the activities required during the Proposed Works include the exposure of current and future users of the Site or adjacent land to health impacts, and impacts to groundwater or surface water, due to contamination that may be encountered during intrusive works and its possible mobilisation to soil or the water environment.

5.7.2 The assessment has considered the entirety of the Proposed Works, as each stage has the potential to lead to effects on these receptors. This assessment is based on various publicly available data sources, ground investigation, and soil and groundwater monitoring at the Site and defines embedded measures to minimise the associated effects on environmental receptors.

### Baseline

5.7.3 The land within the Site remained in agricultural use until the development of the neighbouring HNA power station to the west, which was commissioned in 1960. It is likely within the Works Area that the majority of the naturally occurring soils were removed during construction of HNA and HNB. The land uses surrounding the Site is illustrated on **Graphic 5.3**.

## Graphic 5.3 Land use surrounding the Site




5.7.4 The geology that underlies the majority of Works Area comprises Raised Marine Deposits (clay, silt, sand and gravel) superficial deposits[7]. However, during construction of HNB, the Site itself was reportedly levelled, and excavations to bedrock were carried out. This means that natural deposits will have been removed within the Site and, in some instances replaced with imported fill materials. Additionally, land west of the Works Area is reported to have been reclaimed using excavated materials. Groundwater monitoring indicates that groundwater generally flows to the north-west beneath HNB, and ultimately discharges to sea.

5.7.5 The adjacent HNA ceased generation in 1990 and is currently being decommissioned. The HNA site is subject to the same regulatory controls as HNB in relation to radioactive and non-radioactive contaminants affecting land quality. Monitoring is undertaken at the boundary between the two sites as there is potential for the cross-boundary movement of contamination.

[7] Youngest geological deposits formed during the most recent period of geological time.

5.7.6 Site records and previous ground investigation reports record several occurrences of contaminants reaching ground at the Site during its period of operation since the 1970s. Whilst in each instance the contamination was investigated at the time and remediated if required, in some instances residual contamination will be present in the soil and groundwater underlying the Site. The Site is subject to routine monitoring to inform its understanding of land condition and to provide information to support compliance with various permits held by the Site. Areas of Potential Contamination (APCs) were identified by desk study of previous monitoring on the Site, however none are at a risk level that dictated they required immediate action to manage or remove the contamination.

## Embedded measures

5.7.7 Appropriate embedded measures would be incorporated into the Proposed Works including (but not limited to) measures such as:

- Ongoing monitoring of surface and groundwater for as long as required to support the permitting process and ensure potential existing contamination is managed;
- Implementation of a Waste Management Plan (WMP) and Site-wide Environmental Safety Case (SWESC);
- Design of any new monitoring wells in line with appropriate guidance and standards;
- Undertaking of drainage surveys on a prioritised basis; and
- Implementation of good practices on pollution control.

5.7.8 Further detail is provided within **Chapter 12: Soils, Geology and Hydrology** of the ES and the Outline EMP.

## Assessment of likely significant effects

5.7.9 The assessment considered the likely effects on soils, geology and hydrogeology as a result of the following activities:

- Land quality ground investigations (e.g. excavations/trial pits);
- Leaks/spills of fuels and oils from plant and storage tanks during construction work;
- Removal of foundations/ floor slabs, road surfaces;
- Backfilling below ground voids and reuse of site-won materials, and contamination from below ground structures;
- Laydown and storage, including soil and material stockpiles;
- Construction of below ground structures, concrete laying and movement of materials;
- Removal of drains, pumping and dewatering schemes; and

- Drilling.

5.7.10 With the relevant embedded measures in place, the risk to environmental receptors during the Proposed Works are considered to be negligible (**Not Significant**).

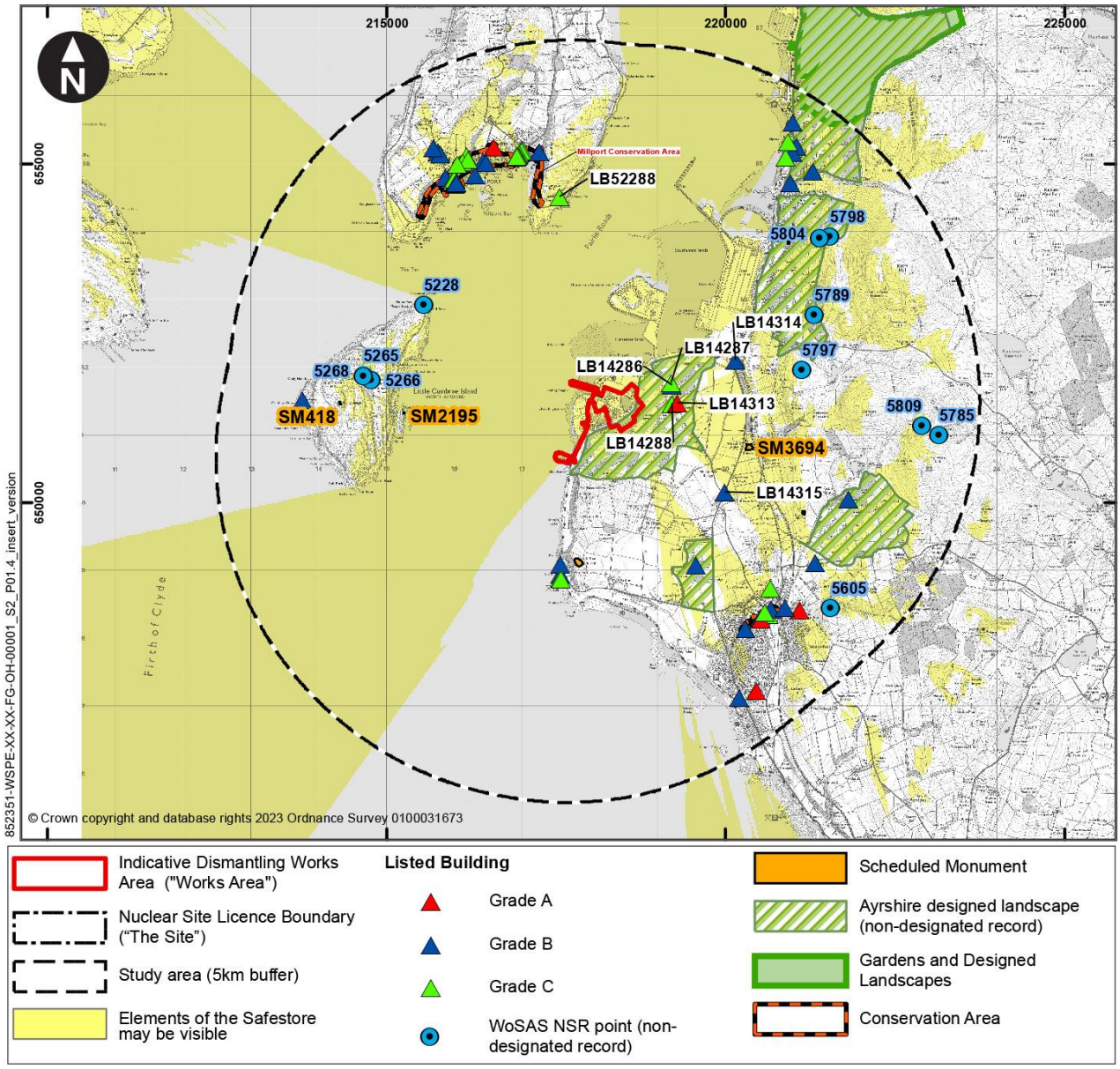
## 5.8 Historic Environment

5.8.1 **Chapter 13: Historic Environment** of the ES has considered the impact of the Proposed Works on local designated and non-designated heritage assets. Potential effects which have been assessed include direct effects (such as the loss or damage) and indirect effects (for example, change in the setting of a heritage feature) on heritage assets.

5.8.2 The assessment has been informed by a desk-based study, reviewing online data sources and analysing records of listed buildings, scheduled monuments, known archaeological assets, historical mapping, as well as site survey.

5.8.3 The Study Area for this assessment is a 5 km radius from the Works Area and has been determined in accordance with best practice, through the application of a Zone of Theoretical Visibility (see **Graphic 5.4**). All phases of the Proposed Works have been included in the assessment. The potential for the works to impact buried archaeology was ruled out at the scoping stage as any buried archaeology at HNB was considered very likely to have been lost or removed as part of the construction of the station in the 1970s. Likewise, the impact of the Proposed Works on Marine Heritage features was also scoped out prior to the submission of the Environmental Statement in response to a Pre-Application Opinion response from the ONR. Further justification of this is provided in **Appendix 5B**.

## Graphic 5.4 (Figure 13.1 of the ES) Historic environment Zone of Theoretical Visibility




# Baseline

5.8.4 Designated heritage assets are statutorily protected and include listed buildings, scheduled monuments, registered park and gardens and conservation areas. There are no designated heritage assets within the Site or Works Area. There are nine Scheduled Monuments, over 70 Listed Buildings and 2 Conservation Areas within the 5 km Study Area. However, most of these assets were scoped out as receptors of the assessment as there was deemed no pathway for indirect impacts through changes of setting.

5.8.5 Non-designated heritage assets can include artefacts, sites of archaeological interest or surviving structures and man-made features within the landscape that are of historic interest, but are not statutorily protected. Within the Works Area, there are seven non designated heritage records, with a further 18 non-designated heritage records located within a 500 m radius of the Works Area.

### Embedded measures

5.8.6 Appropriate embedded measures would be incorporated into the Proposed Works to ensure that there would be no significant effects on sensitive receptors. This includes the preparation of a written scheme of building recordings prior to the Preparations for Quiescence phase to allow for buildings within the Site to be recorded to preserve records of potential historic interest.

### Assessment of likely significant effects

5.8.7 All phases were considered in the assessment of historic environment. The loss of buildings from within the Site was considered to be Minor (**Not Significant**). The impact of the Proposed Works on the setting of designated historic assets were deemed **Not Significant** in all phases or had no effect.

## 5.9 Landscape and Visual

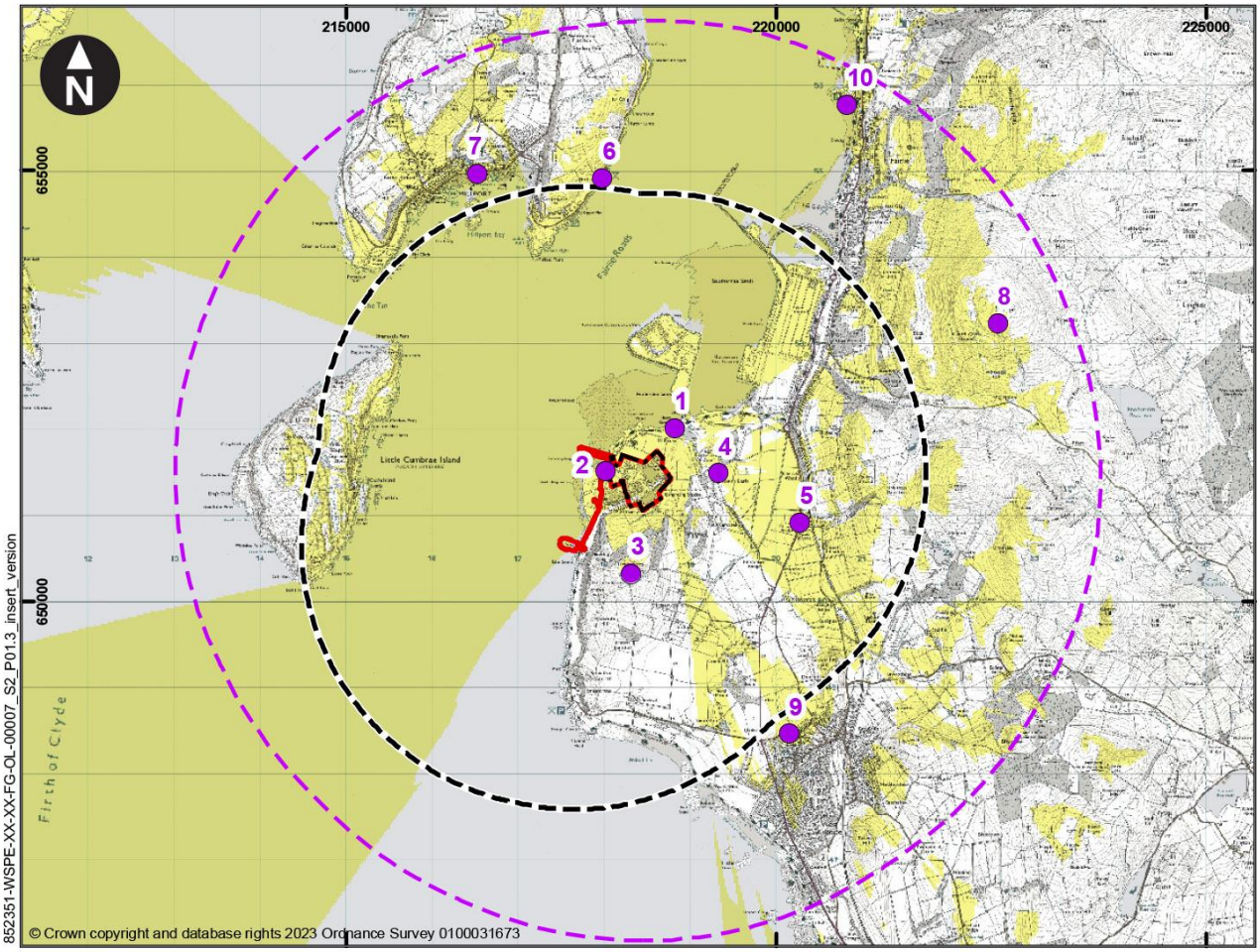
5.9.1 **Chapter 14: Landscape and Visual Impact Assessment (LVIA)** of the ES has considered the impact of the Proposed Works on landscape, seascape and visual amenity. The LVIA has been undertaken in accordance with best practice guidance and informed by national and local planning policy and engagement with North Ayrshire Council. The assessment uses a Study Area of 3 km, taken from the edge of the Works Area and considers all three phases of the Proposed Works.

5.9.2 The LVIA is informed by a desk study, undertaken with reference to numerous public data sources. The desk study informed relevant and representative viewpoint locations, which were photographed and provide the basis for assessment in this chapter.

5.9.3 Numerous maps and visualisations have been created to advise the assessment, these include:

- Computer-generated maps to show the surrounding areas where it may be possible to see the Proposed Works; and
- 10 viewpoints photographs.

## Graphic 5.5 (Figure 14.2ii of the ES) Zone of theoretical visibility and viewpoint locations




Nuclear Site Licence Boundary ("The Site")

Indicative Dismantling Works Area ("Works Area")

Landscape and Visual study area

Landscape and Visual Study Area (scoping)

Elements of the Safestore may be visible

Viewpoint locations

VP1 Ayrshire Coastal Path (approach from the east)

VP2 Ayrshire Coastal Path (approach from the west)

VP3 Goldenberry Hill

VP4 Core Path NC 36 near Hunterston Castle

VP5 A78 near junction with Kilrusken Toll

VP6 'The Lion', Great Cumbrae

VP7 Millport, Great Cumbrae

VP8 Kaim Hill

VP9 West Kilbride (Portencross Road)

VP10 Fairlie (Allenton Park Terrace)

Notes:
The ZTV does not take into account the screening effects of buildings.

Woodland exclusion zones have been created using OS Vectormap District boundary data and modelled at a generic height of 12m.

The ZTV has been modelled using OS Terrain 5 height data.

## Baseline

5.9.4 HNB is located on a gentle north facing slope, and predominantly features built form including the reactor building, and an expansive range of smaller ancillary buildings, warehouses and tanks.

5.9.5 The topography of the Site and surrounding area consists of a coastal foreshore to the immediate north and west, which beyond Southannan Sands, features predominantly industrial development. There are two low-lying hills to the south and east, which partially enclose the Site. Further inland, the landscape is characterised by pastural fields, with a limited coverage of woodland.

5.9.6 The small towns of West Kilbride and Fairlie are present within the Study Area, with Millport town present on the island of Great Cumbrae. The A78, along the coastline, is the primary transport route within the Study Area.

5.9.7 One of Scotland's Great Trails, the Ayrshire Coastal Path, follows the coastline in the Study Area, as well as a number of locally promoted routes, however there are no cycle routes within the Study Area.

5.9.8 There are no national landscape designations (National Parks and National Scenic Areas) or Wild Land Areas within the Study Area. However, the Clyde Muirshiel Regional Park, which covers 265 square kilometres lies approximately 2 km to the east of the Works Area.

## Embedded measures

5.9.9 Appropriate embedded measures would be incorporated into the Proposed Works including (but not limited to) the following measures:

- The Safestore cladding being darker greyscale/blue colour to reduce its visibility; and
- The implementation of an Interim State Landscape Plan prior to the start of the Quiescence phase to soften views of the Site from the Ayrshire Coastal Path.

## Assessment of likely significant effects

5.9.10 Throughout the Preparations for Quiescence, Quiescence and Final Site Clearance phases, several adverse and beneficial residual effects have been identified. With the exception of visual effects on views from Power Station Road / Oilrig Road and the Ayrshire Coastal Path, all residual effects arising from the Proposed Works are considered to be **Not Significant**.

5.9.11 **Significant** visual effects on views from Power Station Road / Oilrig Road and the Ayrshire Coastal Path during the Preparation for Quiescence and Final Site Clearance phases were identified due to the proximity to the Proposed Works. However, whilst significant effects are likely on views from these receptors, these effects are temporary in nature due to the phased approach to dismantling, deconstruction, decommissioning, and construction works. These effects would therefore reduce to not significant upon culmination of the works in each phase.

## 5.10 Noise and Vibration

5.10.1 **Chapter 15: Noise and Vibration** of the ES has considered the impact of noise and vibration generated from the Proposed Works on Site and from traffic movements.

5.10.2 The assessment has focussed up the Preparations for Quiescence phase, as this the phase which is expected to represent the worst-case scenario for noisy activities on the Site. This phase is also expected to represent the worst case in respect of the daily average traffic flow, which can then be assumed to have the highest impacts at properties adjacent to the transportation route for materials and wastes. Given this, worst-case assumption conclusions can be drawn on impacts during later phases of the Proposed Works.

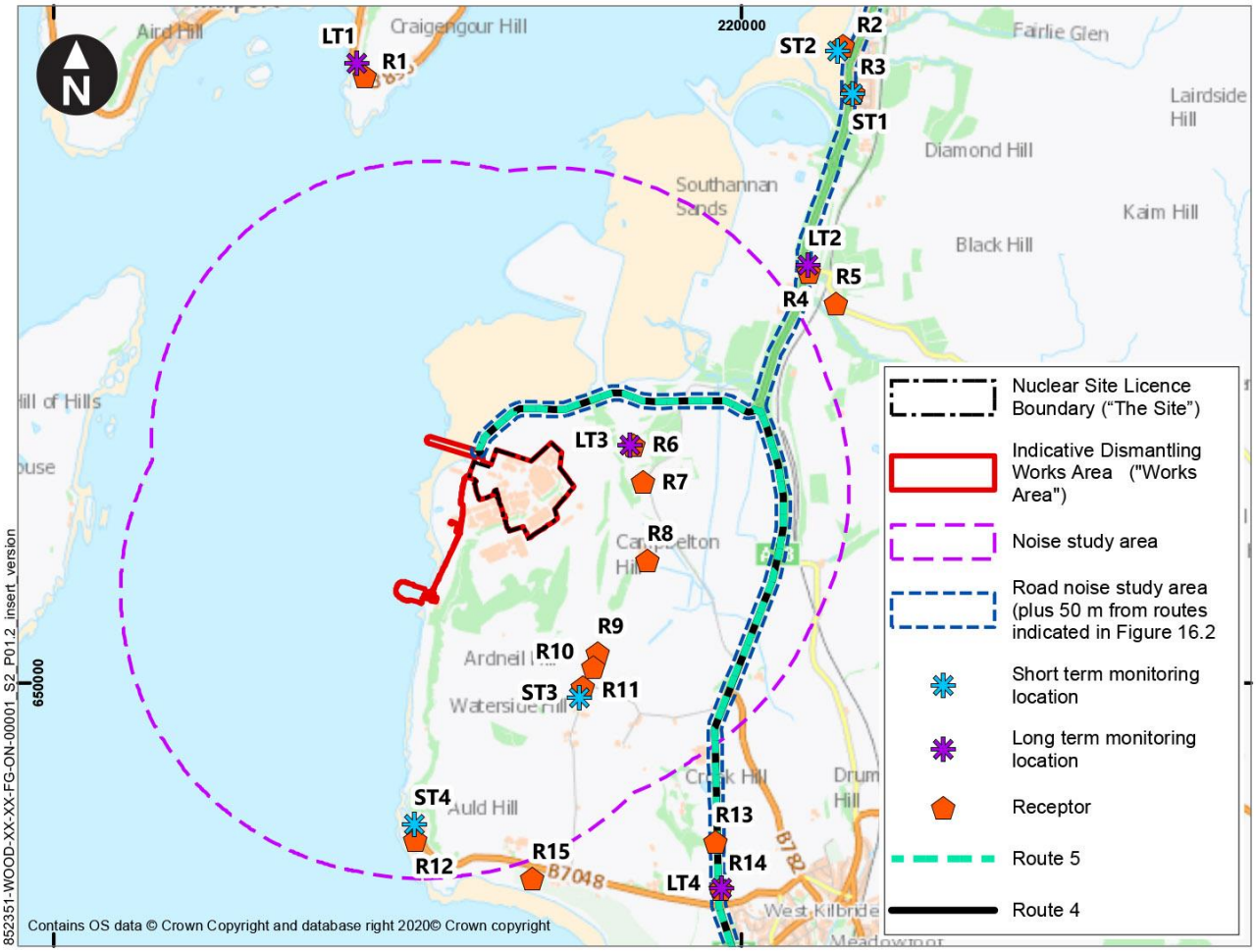
### Baseline

5.10.3 Noise monitoring was undertaken at 8 locations in 2022, in agreement with North Ayrshire Council, with respect to representative receptor locations and monitoring methodology, as shown on **Graphic 5.6**.

5.10.4 The measured sound levels from these surveys were generally considered to be typical of the locations where the monitoring data were acquired. At these locations, the sound levels tended to be dominated by transport noise and/or sound from the sea. Other noise sources were noted (local activity, animal sounds, wind in trees, etc.), however these did not affect the validity of the measurements.

5.10.5 The operation of HNB and decommissioning activities at HNA did not significantly influence the baseline at monitoring locations.

**Graphic 5.6 (Figure 15.1 of the ES) Baseline survey locations and noise sensitive receptors**




## Embedded measures

5.10.6 Measures to control noise levels during the Proposed Works will be included in the detailed Environmental Management Plan (EMP). This includes (but not limited to) measures such as:

- Conduct the Proposed Works using good practice for noise reduction;
- All noisy activities to be carried out in normal working hours; and
- Use of Best Practicable Means from industry standards to identify mitigation to prevent significant effects.

## Assessment of likely significant effects

5.10.7 Noise levels arising from decommissioning works in the Works Area and traffic associated with the Proposed Works are considered to have a minor adverse effect on receptors (**Not Significant**).

## 5.11 Traffic and Transport

5.11.1 **Chapter 16: Traffic and Transport** of the ES considers the anticipated change in traffic levels as a result of the Proposed Works against future predicted traffic flows within the Study Area.

5.11.2 The Study Area has been informed by discussion with North Ayrshire Council and Transport Scotland. The Proposed Works involve the transportation of waste and materials to and from the Site as well as site workers. It is assumed that all required transportation movements for the Proposed Works are undertaken utilising the highway network.

5.11.3 The Preparations for Quiescence phase is anticipated to be the worst-case for assessment of impacts on traffic and transport receptors. Approximately 2033 is identified as the peak year for traffic movements, and is anticipated to generate approximately 124 vehicle movements per day, comprising 24 additional Heavy Goods Vehicle (HGV) and 100 car/Light Goods Vehicle (LGV) movements. The HGV movements from the Proposed Works are caused by:

- Movement of Safestore construction materials to site;
- Movement of consumables, plant and equipment to site to undertake the Proposed Works;
- The removal of demolition and deconstruction wastes from the Site; and
- The movement of infill material to site to fill voids (should it be identified that it is not possible to retain these voids through the Quiescence phase).

### Baseline

5.11.4 The baseline assessment for the Study Area was developed using both survey data and a desk study. The desk study included the review of publicly available traffic data, and survey data was collected over two separate periods from multiple locations to develop a baseline flow.

5.11.5 The local road network consists of Power Station Road, which connects the Site to the A78. The strategic road network consists of the A78, A737, A71, A77, A75, and A76.

5.11.6 Whilst there is currently access to local railheads and the water access facilities at Hunterston Port, these are not anticipated to be utilised by the Proposed Works.

5.11.7 HNB power station itself provides two car parks, with the nearest train station located approximately 3.5 miles away in Fairlie. There are limited bus services around the Site, and there is no dedicated cycling infrastructure for the Site.

5.11.8 Accident data for the various options for transport routes were examined, identifying current accident hotspots in Beith, Kilwinning and Kilmarnock, which can affect the A737 and M77.

## Embedded measures

5.11.9 Appropriate embedded measures would be incorporated into the Proposed Works including (but not limited to) the following measures:

- Specific travel routes set out for deliveries to reduce impact on traffic flows;
- Road safety assessment to inform preferred route selection; and
- The use of the road works register when planning routes.

## Likely significant effects

5.11.10 As part of the assessment, trip generation for the entire Preparations for Quiescence phase was forecast and compared to a future baseline. The assessment used the 2033 worst-case traffic flows for the selected two routes (Route 4 via M77, A71, A78 and Route 5 via M6, A75, A76, A71, A78). It was demonstrated that the traffic flow changes on the local roads due to the Proposed Works traffic are below 10%, which is within the allowance for daily variation of traffic flows, for all roads excluding Power Station Road.

5.11.11 Due to the low traffic flows associated with the Proposed Works, effects on severance, non-motorised amenity, non-motorised user delay, fear and intimidation on and by road users would be limited and therefore these effects were assessed as negligible and scoped out of further assessment.

5.11.12 Effects on road safety, driver delay and hazardous loads were considered within the assessment, and it was concluded that effects would range from Minor to Negligible (**Not Significant**).

# 5.12 People and Communities

5.12.1 **Chapter 17: People and Communities** of this ES considers the socio-economic and health effects associated with the Proposed Works, on people, communities and the economy at spatial scales covering very local (post code districts in North Ayrshire), local (North Ayrshire), regional (wider Ayrshire region) and national (Scotland) level.

5.12.2 The assessment covers impacts on employment markets, workers at HNB, the local economy and business, and recreational users of the Ayrshire Coastal Path. The magnitude of change experienced by these receptors is expected to be proportional to the change in the number of employees working at the Site, over the period of the Proposed Works. As stated in Section 2.4 of this NTS, during the Preparations for Quiescence phase, the workforce is expected to be between 220-300 staff, with up to 250 additional contractors depending on the works on site at any given time.

5.12.3 The access for users of the Ayrshire Coastal Path will be maintained throughout the Proposed Works. While the decommissioning is intrinsic to the use of nuclear technology and a process for which operational sites make early plans, the reduction in workforce over the Preparations for Quiescence phase is estimated as a worst-case for the impacts over all phases of assessment.

## Baseline

5.12.4 In the national context, North Ayrshire features high levels of inequality and deprivation and at the very local level, Saltcoats, Ardrossan and Stevenston are in the highest category (top 10%) as defined by the Scottish Government's Index of Multiple Depravation (IMD). The IMD takes account of components including Income, Employment, Health, Education/Skills, Housing, Geographic Access and Crime.

5.12.5 HNB is one of the largest employers in North Ayrshire and as of 2023 employs 400 permanent staff, which represents 0.7% of all employment in North Ayrshire. HNB also employs approximately 140 permanent core contractors.

5.12.6 Hunterston is designated as a strategic growth area in the fourth National Planning Framework (NPF4) and is further designated in local policy as a key area for future industrial development. The Ayrshire Growth Deal is also designed to promote socio-economic growth in the region.

## Embedded measures

5.12.7 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.

5.12.8 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 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.

5.12.9 These arrangements will continue and cover Hunterston B when the Site transfers to NDA ownership.

## Likely significant effects

5.12.10 Throughout the Preparations for Quiescence, Quiescence and Final Site Clearance phases, several adverse and beneficial residual effects have been identified. With the exception of effects on the employment market at the very local level and effects on workers at HNB, all residual effects arising from the Proposed Works are considered to be **Not Significant**.

5.12.11 **Significant** effects on the employment market at the very local level during the Preparations for Quiescence phase were identified. This is due to concentrated effects on employment in the settlements of Ardrossan, Largs, Saltcoats and West Kilbride which have challenging socio-economic conditions and travel to work constraints. However, within wider local (North Ayrshire as a whole) and regional (Ayrshire) geographies, these effects are not likely to be noticeable. Positive impacts may also occur immediately prior to the Final Site Clearance phase, owing to new employment opportunities.

5.12.12 **Probably Significant** effects were identified in relation to workers at HNB, as workers may experience variable periods of unemployment and associated mental health impacts. However, workers have skills likely to be relevant to the existing job market, and also new employment that may arise as a result of re-development under the Ayrshire Growth Deal and they are therefore unlikely to experience an extended period without employment. In addition, the assessment does not incorporate the likelihood that the reduction of jobs from now to 2026 may be facilitated by people utilising the enhanced redundancy terms to take early retirement and or the likelihood that some staff may leave the local area to take up opportunities elsewhere in the nuclear industry.

## 5.13 Major accidents and disasters

5.13.1 **Chapter 18: Major Accidents and Disasters** of the ES considers the potential effects of major accidents and disasters that could arise throughout all phases of the Proposed Works.

5.13.2 A ‘major accident’ is defined as an unintended event caused by a man-made activity or asset that leads to serious damage to receptors, either immediate or delayed. The term ‘disaster’ is defined as a natural occurrence that leads to serious damage to receptors again either immediate or delayed. Major accidents or disasters can lead to the loss of life and injury in large numbers, and/or major and long-term damage to environmental or historic features of high importance.

5.13.3 The assessment has looked at all realistic ‘worst case’ hazards that may lead to a major accident or disaster. The assessment is risk-based as major accidents and disasters are infrequent events. Therefore, this assessment takes account of how likely the potential major accident or disaster is to occur, as well as the level of damage or casualty it can cause.

5.13.4 The assessment has identified potential major accident and disaster sources, the human and environmental receptors and infrastructure close to the Works Area, and the route or ‘pathways’ by which a source may affect each of these receptors. An assessment has then been made of the likelihood of it occurring, and the damage or injury it could cause, to understand which potential.

5.13.5 The approach taken in this assessment has been aligned to guidance created by the European Commission.

## Baseline

5.13.6 The baseline assessment has been undertaken by reviewing the internal infrastructure and contents of the Site, as well as the external manmade and natural environment conditions. The design of the power station and its locality allows it to withstand extreme weather conditions. This is assisted by numerous emergency response arrangements that are integrated with the local authority that help to prevent incidents affecting receptors. The site does not connect into any major watercourses with the majority of the Site drained by a designed drainage system, that discharges via oil interceptors into the Firth of Clyde. There is potential for ground-water flows that generally flow to the north-west.

5.13.7 In the future baseline, consideration has been given to climate change that could alter temperatures and coastal flooding risk and the potential changes in surrounding land use altering ecological baselines.

## Embedded measures

5.13.8 Appropriate embedded measures would be incorporated into the Proposed Works including (but not limited to) measures such as:

- Maintaining the Safety and Environmental Management System (SEMS) to an appropriate standard by the Site Licensee for the full duration of the Proposed Works.
- Maintaining the licensing requirements which include maintaining a suitable Safety Case in accordance with the Nuclear Installations Act and approved Security Plan in accordance with Nuclear Industries Security Regulations.
- Designing structures to withstand external loads, such as wind or precipitation, which will be maintained up to the point of decommissioning that structure, considering any foreseeable changes to design loads as a result of climate change.
- Ensuring 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.
- Adapting 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.
- Ensuring all activities are subject to a suitable and sufficient risk assessment and with full consideration of the hierarchy of controls to ensure that the residual risk arising from all major accidents and disasters is reduced to As Low As Reasonably Practicable.
- Ensuring the 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.

## Assessment of likely significant effects

5.13.9 When the embedded environmental measures to prevent, control and limit the potential for major accidents and disasters during the lifetime of Proposed Works are taken into account, the likelihood of a major accident and disaster occurring will be low enough that there are **No Significant Effects** arising from major accident and disasters. This a due to the measures in place, including safety systems, emergency plans, as well as the low frequency of fires, and separation from human populations.

# 5.14 Conventional Waste

5.14.1 **Chapter 19: Conventional Waste** of the ES considers the impacts of conventional waste (i.e. non-radiological waste) being generated by the Proposed Works on the ability and capacity of existing waste management infrastructure to accommodate this waste. Further detail on radioactive waste is provided in **Section 5.15: Radioactive waste and discharges** of this NTS. The Study Area used in this assessment is the administrative boundary for North Ayrshire Council.

5.14.2 The types of waste included in this assessment were excavation and demolition wastes, and waste generated by the decommissioning staff. These wastes are expected to be either non-hazardous or special/ hazardous.

5.14.3 The Preparations for Quiescence phase is the main focus of the assessment of conventional waste impacts, due to this phase generating the greatest quantity of waste that will need to be removed during the Proposed Works. Activities during the Quiescence phase are expected to generate minimal conventional waste and, whilst waste will be generated during the Final Site Clearance phase, it is anticipated to generate greatly reduced quantities of non-hazardous and hazardous materials that will require off-site management, in comparison to the Preparations for Quiescence phase. It is anticipated that some of the inert demolition material generated during the Preparations for Quiescence and Final Site Clearance phases will be suitable for use as infill material for voids.

## Baseline

5.14.4 Conventional waste information was obtained from publicly available information and from local planning authorities. Currently, all conventional waste is sent off site for reuse, recycling or final disposal; there are 49 operational waste facilities in North Ayrshire. North Ayrshire Council are required to meet projected waste targets and have the infrastructure in place to manage this.

## Embedded measures

5.14.5 Conventional waste will be managed in accordance with the waste hierarchy (as set out in **Section 2** of this NTS) to minimise the volume of waste generated by the Proposed Works.

5.14.6 Appropriate embedded measures would be incorporated into the Proposed Works including (but not limited to) the preparation of a Site Waste Management Plan (SWMP) in advance of the Proposed Works commencing which will set out the

approach to 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 options have been used up.

### Assessment of likely significant effects

5.14.7 It is anticipated that the Proposed Works during the Preparations for Quiescence phase would have minor to negligible effects on existing waste management infrastructure (**Not Significant**) as a result of the embedded measures and the anticipated waste quantities to be disposed of off-site being low. It therefore concludes that effects during the Quiescence and Final Site Clearance phases would similarly be not significant.

## 5.15 Radioactive Waste and Discharges

5.15.1 **Chapter 20: Radioactive Waste and Discharges** of the ES provides an overview of the baseline and the EIADR consenting requirements as they apply to the management of radiological waste and discharges.

5.15.2 Whilst radiological waste and discharges will be generated during the Proposed Works, the management of these wastes and discharges was scoped out of ES assessment at the EIA Scoping stage. The reasons for this are highlighted below:

- HNB's Permit, under the Environmental Authorisations (Scotland) Regulations (EASR) 2018, sets out limits and conditions relating to the disposal of radioactive wastes including those relating to wastes arising during decommissioning. To satisfy the conditions of this permit, waste will be managed utilising Best Available Techniques (BAT) in order to minimise the volume and activity of waste discharges to the environment. The permitting regime ensures that effects from radioactive discharges and disposals are tolerable and acceptable.
- Data on total volumes of waste and materials arising at HNB are provided to the UK Government sponsored Radioactive Waste & Materials Inventory (UKRWI), on a three yearly basis. The UKRWI helps the UK plan safe and efficient management routes for radioactive waste and is used to support the planning, operation and performance of supply chain waste management facilities. By providing data to the UKRWI, HNB helps to ensure that there is sufficient availability in the UK supply chain for its wastes. HNB will continue to forecast waste arisings from decommissioning and will provide data on its forecasted waste streams throughout the duration of the Proposed Works, thus ensuring its wastes are considered in the planning and operation of the UK's radioactive waste facilities.
- ILW is subject to an assessment process which helps minimise its impact on the capacity and function of the future Scottish near surface facility. The process requires a Letter of Compliance for each ILW stream at each site which confirms its acceptability for future management arrangements and allows Nuclear Waste Services to plan for sufficient capacity and timely availability for disposal.

- The NDA, the Applicant and Magnox Ltd have come to an agreement that ILW requiring long-term storage generated in the Preparations for Quiescence phase can be stored in the ILW Store at the HNA site utilising existing capacity.
- Relevant guidance[8] sets out the standards that must be met to release LAW from the Nuclear Site Licence and the associated conditions of its EASR permit. On-site disposal of LAW would only be considered should Best Available Techniques (BAT) assessments conclude it is safe to do so and is the preferred method of managing LAW disposal from the Proposed Works. However, this does not form part of the current proposals.
- In addition to the regulatory expectations and requirements discussed above, an Integrated Waste Strategy (IWS) will be prepared which will help to set out how waste will be managed in accordance with regulatory expectations. A Radioactive Waste Management Case (RWMC) will be used to demonstrate the longer-term safety and environmental performance of the planned management of specific waste(s) and provide a transparent demonstration of optimised radioactive waste management, compliance with regulatory requirements, policy, national and international standards and how waste management operations are integrated across the lifetime plans for the waste and/or Site as a whole.

## 5.16 Cumulative Effects Assessment

5.16.1 The Cumulative Effects Assessment is divided into two different components, the first is where potentially more than one environmental impact identified by the environmental aspect chapters affects a singular receptor (intra-project effects), and the second is when a receptor is affected by a combination of different projects and the Proposed Works (inter-project effects). The local planning authority has been consulted with to identify potential projects that may interact with the same receptors as HNB decommissioning. Full details of the Cumulative Effects assessment can be found in **Chapter 21: Cumulative Effects Assessment** of the ES.

### Baseline

5.16.2 The baseline identified for the intra-project cumulative effects is contained within the individual environmental aspect chapters already described.

5.16.3 For inter-project cumulative effects, a list of other promoted schemes and developments was collated via a review of other planning applications, planning permissions, and allocated sites within the local authority area across a defined geographical area. North Ayrshire Council was consulted on this list to ensure it did not miss any developments which may interact with the same receptors.

[8] SEPA, the Environment Agency and Natural Resources Wales (2018). The Management of Radioactive Waste from Decommissioning of Nuclear Sites: Guidance on Requirements for Release from Radioactive Substances Regulation. (Online) Available at: https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf (Accessed November 2023).

## Embedded measures

5.16.4 Embedded environmental measures are those identified within the individual environmental aspect chapters.

## Assessment of likely significant effects

5.16.5 Each environmental aspect chapter has considered the ‘intra’ and ‘inter’ project effects associated with that environmental aspect.

### Intra-project effects

5.16.6 The assessment considers the scenario where a single receptor is potentially affected by more than one environmental impact. A combination of impacts from changes to traffic and transport, air quality, noise and vibration, and employment during the Preparations for Quiescence phase were identified as having the potential to have significant cumulative impacts on workers of HNB and HNA power stations. However, these effects were identified as temporary and only short lived, with their impact likely being reduced with the use of embedded environmental and good practice measures utilised during the Proposed Works.

### Inter-project effects

5.16.7 Consideration was also given to the effects which could be created as a result of the Proposed Works cumulatively with other projects proposed in a 10 km search radius. Twenty-five other developments were identified within the 10 km radius where potential cumulative effects could occur. Significant cumulative effects were identified in **Section 5.9: Landscape ands visual** of this NTS, with respect to the Proposed Works in combination with future HNA decommissioning activities and the development of the Cable factory at Hunterston PARC. The methodology undertaken for cumulative assessment within LVIA does however make clear that these effects are primarily due to the other projects, and not as a result of HNB decommissioning. These effects were on receptors such as the local landscape character area, the local seascape and various visual receptors in the locality.

5.16.8 No significant effects in-combination with other projects are identified under any other environmental aspect chapters.

# 6. Conclusion

6.1.1 In summary, the EIA undertaken to evaluate the environmental effects of the HNB decommissioning works found that there are limited significant effects associated with the decommissioning proposals when the works are undertaken in accordance with embedded and good practice measures which will be implemented on site through the use of an Environmental Management Plan.

6.1.2 The limited significant environmental effects identified as a result of the Proposed Works are identified as temporary and localised in nature.

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