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## APPENDIX 1-C SCOPING REPORT 2013



Aberdeen Harbour Development

# ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

JULY 2013



# **Aberdeen Harbour Development Environmental Impact Assessment Scoping Report**

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**RPS**  
Ocean Point One  
4<sup>th</sup> Floor  
94 Ocean Drive  
Edinburgh  
EH6 6JH

**Tel:** 0131 555 5011  
**Fax:** 0131 555 4911  
**Email:** alan.pollock@rpsgroup.com

# QUALITY MANAGEMENT

Prepared by:	Name:	<b>Michael Kelly</b>	Title:	<b>EIA Director</b>
	Signature:			
Authorised by:	Name:	<b>Alan Pollock</b>	Title:	<b>Planning Director</b>
	Signature:			
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**FIGURES**

# 1 INTRODUCTION

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## Background

### Need for the Development

- 1.1 Contributing upwards of £510 million to the economy annually, imports and exports of around 4.76 million tonnes, and supporting in excess of 11,000 full time equivalent (FTE) jobs, Aberdeen Harbour plays a critical role in the economy of Aberdeen and Scotland as a whole. Its sustained activity and growth are therefore essential to the maintenance of the local and national economy.
- 1.2 Under the control of the Aberdeen Harbour Board (AHB), the harbour has experienced rapid growth as a result of the development of the offshore oil and gas industry since the mid 1960s and is now operating all existing facilities near to capacity with no viable option in terms of expansion. Notwithstanding the recent deepening and improvement of Torry Quay and dredging of the access channel to the port to improve navigation, the lack of space for new berths and lack of suitable back-up areas is now restricting the future potential for growth of the port.
- 1.3 Such growth is being engendered by both current and emerging demands including, but not limited to, the following:
- Specialised vessels being too big for the harbour;
  - Tidal restrictions on certain deeper drafted offshore support vessels;
  - Demands for berths for 'off hire' or maintenance requirements;
  - Increased cargo vessel size;
  - Growth in cargo sectors;
  - Anticipated growth in decommissioning work from the Oil and Gas industry;
  - Size of offshore wind farm deployment vessels;
  - Future increased size of ferries;
  - The size of cruise vessels in a growing European market.
- 1.4 In order to accommodate such growth and thus maintain the success of the harbour, AHB identified the need to expand facilities. Having identified this need AHB undertook to consider a number of alternatives for the proposed expansion which are discussed below.

### Alternatives and Preferred Option

- 1.5 Responding to the recognised need for the expansion of the Aberdeen Harbour facilities, AHB commissioned a feasibility study in order to test the broad options available in meeting this need.
- 1.6 The feasibility study, which commenced in September 2012 assessed the viability of potential expansion options for a new or improved harbour facility with three potential locations ultimately considered, namely (see Figure 1):
- The existing harbour facility;
  - North Beach, immediately to the north of the existing harbour; and
  - Nigg Bay, immediately to the south of the harbour.
- 1.7 Following a pre-feasibility exercise, the three options were subject to appraisal against the following criteria:
- Deliverability;
  - Accessibility;
  - Economic implications;
  - Proximity to the existing port;
  - Potential community benefits;
  - Potential environmental impacts; and

- Potential landscape and visual impacts.

- 1.8 To inform the appraisal process further, AHB undertook to complete extensive consultation with Aberdeen City Council and other stakeholders, including Aberdeen and the Shire Strategic Development Authority, Marine Scotland, Scottish Natural Heritage (SNH), Scottish Environment Protection (SEPA), and Transport Scotland amongst others. The consultations took the form of three separate workshops which focussed on discussions themed primarily around transportation, planning and environmental considerations.
- 1.9 Whilst the feasibility of the options remains under review, conclusions from the appraisal and consultations indicate that the Nigg Bay option provides the most feasible option based on current evidence. Key advantages of this option are the lesser environmental and traffic impacts anticipated compared to the other options, little to no impacts upon existing harbour operations and opportunities for regeneration of nearby communities and industrial/commercial areas.
- 1.10 AHB accordingly propose that the Nigg Bay option be taken forwards and be subject to further investigation, development and assessment. To that end, as a design is developed for this site option, it is proposed that an Environmental Impact Assessment (EIA) is completed in order to assess its potential impacts and also to inform the design in an iterative way. The Nigg Bay option is thus the subject of this scoping report and a description of the proposed development is provided in Section 2.
- 1.11 It should be noted that the other expansion options are not discussed in detail herein but are outlined in greater detail within the “Direction for Growth” (2012) document produced by AHB.

### **Aberdeen Harbour Board**

- 1.12 The harbour undertaking at Aberdeen is vested in AHB as a corporate body. The powers and constitution of the Board are laid down in the Aberdeen Harbour Order Confirmation Act 1960, as amended, although the port has a recorded history dating back to 1136 AD.
- 1.13 Trust ports are statutory authorities operating in a commercial environment.

### **Purpose of the Scoping Report**

- 1.14 This report sets out the proposed scope of the EIA, the findings of which will be presented in the Environmental Statement (ES) that will accompany any subsequent application for consent for the proposed harbour extension. Aberdeen City Council, Marine Scotland and consultees are invited to make comments and suggestions on this scope and to highlight any pertinent information that they hold and can make available to AHB for the assessment.

### **Document Structure**

- 1.15 This scoping report has been broken down into eight chapters, as follows:
- Introduction – introducing the need for the proposals, work completed thus far and purpose of the scoping report;
  - The Proposed development – providing an overview of the proposed development which will be subject to the EIA;
  - Legislative and regulatory requirements – outlining the key legislative requirement relating to the proposed development with an emphasis on EIA requirements;
  - General approach to the EIA – outlining the overarching approach to be taken to the EIA for the proposed development;
  - Environmental Aspects – providing a preliminary baseline overview, identification of potential impacts and methods of assessment proposed for the EIA;
  - Issues to be scoped out of the EIA – identifying aspects and issues that AHB consider do not merit consideration as part of the EIA;
  - Determining the significance of environmental effects – outlining the criteria to be used in order to determine the significant of effects;
  - Next Steps – outlining the next stages of the project and where to submit response to the scoping report to.

## 2 THE PROPOSED DEVELOPMENT

### Outline Description

- 2.1 The proposed Aberdeen Harbour Development (AHD) would occupy a large proportion of Nigg Bay, comprising approximately 1400m of new quays (13-14 new berths). The indicative site boundary of the AHD, including for the extent of plant and associated operational areas, is illustrated in Figures 3. A separate indicative footprint plan for the AHD site is provided in Figure 4.
- 2.2 The facility will be designed to accommodate the following:
- Offshore construction/decommissioning/dive support vessels of up to 145m in length;
  - Platform support vessels in excess of 90m in length;
  - Cruise vessels;
  - Passenger and vehicle ferries – new generation ferries;
  - Liquid bulk vessels – primarily small product carriers of fuels up to 10,000 dwt;
  - General cargo vessels.
- 2.3 A detailed description of the development is provided below including a summary of the structures to be constructed (see Figure 4). It should be noted that a phased approach to constructing the quays is likely to be taken in order to facilitate growth of the facility in meeting future demands at Aberdeen Harbour. However, the detail and order of the phasing will be progressed through emerging designs during the EIA process and has not been determined at this stage.

### Detailed Description

- 2.4 The following activities constitute the main components of the proposed AHD:
- Enabling works to structures, outfalls (e.g. Scottish Water's Girdleness discharge point) or other elements (e.g. Marine Scotland's Aquarium intake) requiring diversion or relocation to accommodate the development;
  - Development of temporary compound(s) for materials storage, fabrication and worker accommodation;
  - Breakwater construction (north and south);
  - Nigg Bay dredged to accommodate development and dredging arisings stockpiled as necessary for 'fill' in the proposed development and surplus disposed of in a suitable manner (e.g. to an authorised sea-disposal site or sold as aggregate);
  - Initial development of quays primarily for offshore support vessels, cargo and possible larger ferries (target berth length 560m); fuel tanks; new buildings (office, workshop and welfare);
  - Internal access roads and road access connecting between Greyhope Road and gate house;
  - Ancillary works and facilities.

- 2.5 The activities associated with key structures of the facility are described in more detail below:

#### **Breakwaters**

- 2.6 A northern breakwater and a southern breakwater will be constructed to limit wave overtopping so as not to be a hazard to construction equipment and vehicles driving at low speed and to trained staff working on the breakwater crest. They will also be constructed in order to ensure that during operation, they:
- Provide A safe mooring area for the design vessels;
  - Limit wave overtopping so as not to be a hazard to trained staff working on the breakwater crest during maintenance and inspection;

- Limit wave overtopping so as not to be a hazard to operations on the quay in the lee of the northern breakwater;
  - Limit structural damage to the breakwater due to wave overtopping and wave impacts.
- 2.7 High security fencing and gates will also be constructed to port authority standards in order to prevent unauthorised access. Navigation lights will also be installed on the breakwaters
- 2.8 The breakwater arms will be approximately 625m (northern) and 450m (southern) in length and an outer access channel with a width of approximately 100m in Phase 1 and maintained depth of -10.5m Chart Datum (CD), will be dredged (see 'dredging' below).
- 2.9 It is currently anticipated that the breakwaters will be constructed from, and by, back-dumping core material (part of which may be heavy grade) from trucks, trimming by excavators, and placement of an underlayer and armour by crane operating from the placed material. The distance between advancing fronts of core, underlayer and armour will be kept to a minimum to reduce the risk of damage to the partially completed structure due to wave action.
- 2.10 The core elevation of both breakwaters will be designed in such a manner that the 50:1 year return period wave conditions and water level at mean sea level (MSL), crest of the core in relation to the highest astronomical tide level (HAT), and climate change related sea level rises will all be taken into account.
- 2.11 Alternatives for the structure have been appraised and a rubble mound breakwater is currently favoured as the most technically viable option. A variety of rock and concrete armour are available and these options will be considered as the design evolves. It is currently anticipated that concrete armour will need to be fabricated as near to the point of use as possible, and could require as much as 18,000m<sup>2</sup> space split between yards near the landward end of each breakwater (see Temporary Construction Areas below).
- 2.12 Following further geotechnical, geophysical and topographical investigations, and physical 3D modelling, optimisation of the breakwater design will be conducted.

### **Dredging and Bed Improvements**

- 2.13 It is anticipated that dredging works will be undertaken during the early stages of construction. However, conditions and circumstances may dictate that some will occur in later in the construction programme and so options for phasing of these works will be clarified for the purposes of the EIA.
- 2.14 The outer access channel will be dredged to a width of 130m and maintained to a depth of 10.5m Chart Datum (CD), with the harbour basin and berths dredged and maintained to a depth of -9.0mCD. The method of dredging will be influenced by the particular contractor's chosen methods of working (together with any conditions attached to the marine licence for these works), but is likely to be by a combination of the following means:
- Trailer Suction Hopper Dredger (TSHD);
  - Backhoe Dredger;
  - Rock pre-treatment using blasting (where no other viable or practical solution is evident);
  - Cutter Suction Dredging.
- 2.15 It is currently proposed that TSHD will be used to dredge the top layer of material from the seabed. A TSHD is a self-propelled sea going vessel that is installed with one or two suction pipes that are lowered and hoisted into position, at the end of the suction pipe(s) is a draghead. A vacuum is produced within the draghead by a centrifugal pump on board of the vessel. The material is then sucked from the seabed up the suction pipe and through the pump into an open storage space on board the vessel called the hopper. The size of the hopper varies depending on the overall size and power of the vessel. Plate 2.1 shows an example of a TSHD pumping material through a pipeline for disposal.



Plate 2.1 Example TSHD discharging via a pipeline from the bow

- 2.16 Following this a Backhoe Dredger (BHD) (Plate 2.2) will be used to dredge harder material, where required. The lower bed material is currently assumed to have a relatively high strength and, as such, a suitably large BHD will be mobilised, being capable of removing such material, where required. The material removed from the seabed will be placed into dumb barges (not self-propelled) for sea disposal, if it has been shown there is no way of beneficially reusing the material elsewhere in the project.
- 2.17 It is envisaged that looser material will be dredged directly from the seafloor by the BHD, whereas harder (rock) will need to be subjected to pre-treatment in the form of drilling and blasting (D&B) prior to removal by the BHD. The plant associated with the D&B activities will include a tug and either a jack-up barge or a drilling pontoon onto which multiple drilling rigs may be installed.



Plate 2.2 Example of a BHD, filling a dumb barge with assisting tug, (photograph courtesy of GLNG)

- 2.18 An alternative method of dredging will also be considered for areas where the existing water depths are limited to the extent that TSHD in particular could not be used. The alternative proposed is Cutter Suction Dredging (CSD) which is a stationary dredger that consists of a pontoon which is positioned using spud poles and anchors (see Plate 2.3). Using this method, material will be excavated mechanically by a rotating cutter head mounted on to the end of a

cutter ladder that will be attached to the main hull of the dredger. Once cut, the material will be hydraulically removed using centrifugal dredge pumps.



Plate 2.3 Cutter Suction Dredger with floating pipeline connect, (photograph courtesy of GLNG)

- 2.19 Overall, the bay will be dredged to a considerably greater depth than at present. This will result in the generation of a large amount of material, currently estimated at approximately 2,000,000 m<sup>3</sup>. Whether this material is beneficially re-used or disposed of will be considered as the design and EIA evolve. At present it is considered that a large amount of fill will be required for reclamation in the northern part of the bay in order to enable development work. Where disposal is required, it is considered likely that bottom door dumping at an identified offshore spoil ground will be adopted, subject to the necessary consents and agreements but contactors could opt to retain some of this material for sale as aggregate to terrestrial developers

### **Quays and Berths**

- 2.20 It is proposed to provide new quays and ancillary areas with a minimum 30m working strip behind quays. As indicated above, quays of approximately 1400m in total length shall be constructed, capable of accommodating commercial vessels. The quays shall be fitted with 80t twin horn 'Bean' bollards at 15m centres. Heavy lift pads will be located centrally to each berth, capable of supporting a 1,000t SWL crane and outriggers.
- 2.21 The quays will be constructed after most, or all, of the breakwater has been constructed as this will be required to provide the level of shelter for quay construction. The quays will primarily provide/consist of:
- Berths for offshore support activities with potential for open/covered storage, mud/cement silos and fuel in an operation area of around 70,000 sq.m;
  - Support buildings and security gate house;
  - Internal access road – nominal 12m carriageway;
  - Quay apron 20m wide;
  - An option for covered storage (nominal size 30m x 60m);
  - Provision of space for fuel storage and associated accommodation and equipment;
  - Enabling works for a future ferry ramp.

- 2.22 The nominal water depth required at the berths is -9.0mCD. However, early within the construction phase the channel, turning basin and one berth at the entrance quay will be dredged to accommodate vessels of 10m draft.
- 2.23 Three quay wall options have been evaluated to date based on compatibility with surrounding conditions, ease of construction, long term durability and capacity for wave absorption. The options are as follows:
- Vertical gravity structures, including blockwork, caissons and cellular piled structures;
  - Vertical (embedded) quay walls with anchors, including simple sheet piled, combi-wall systems (using a combination of sheet and tubular piles) and diaphragm walls; and
  - Open quay structure with a suspended concrete desk, supported using either tubular steel or concrete piles.
- 2.24 The current preferred option is an open quay structure using tubular steel piles with modular construction precast concrete deck. This may be subject to review after the completion of appropriate site investigations (SI) and further by the main works contractor prior to construction but the EIA will be conducted to ensure that all viable options are appropriately assessed.

### **Access**

- 2.25 Access to the site will require construction of a 12m nominal width carriageway from the proposed AHD Gate House Entrance to Greyhope Road. The optimum location for the connection between the existing Greyhope Road and AHD entrance is not currently known and will be developed as part of the design evolution and considered by the EIA. In addition to the carriageway linking the AHD entrance to the main road network, internal roads will be constructed within the main landholding of the new harbour. The location of these roads will again be developed as part of the design evolution and considered by the EIA.
- 2.26 In the instance where phasing of construction is adopted (as indicated above), where a section of road is installed within the harbour outwith the initial development phase, it will be prepared and finished in such a way that it can be used in a safe and appropriate manner with vehicles, cyclists and pedestrians alike but also readily incorporated within the subsequent phases e.g. have sacrificial kerbing and pedestrian footpath provision.
- 2.27 Construction activities will be those normally associated with roads construction, namely:
- Groundworks, excavations and filling;
  - Placement and compaction of sub-base;
  - Placement and rolling of bituminous surfacing;
  - Ancillary lighting, drainage and other services.
- 2.28 The internal roads with the port shall be 12m wide and constructed to accommodate heavy articulated vehicles. The internal roads will be furnished with appropriate road markings and signage, including speed limit signage. Car parking facilities shall also be provided sufficient to service the specific requirements of each phase of development as they progress. A cycle shelter shall also be provided on site.
- 2.29 Pedestrian walkways will also be provided along defined routes, with suitable vehicle barrier protection installed and surface markings and signage. Separate pedestrian access gates shall be provided (to vehicular) in order to facilitate safe passage. Pedestrian gates will be fitted with access control systems compatible with and capable of connection to Aberdeen Harbour's existing system.
- 2.30 At the main point of access to the harbour a security cabin will be established with associated traffic barriers installed across access and egress roads. A weighbridge office shall be incorporated within the security building (automatic weighbridge) and additional space provided to accommodate weighbridge equipment and working space/worktop.

### **Site Drainage**

- 2.31 The drainage strategy will be developed and will be outlined in sufficient detail to allow an assessment to be made as part of the EIA. It is anticipated that the drainage design to the AHD will adopt the principles of Sustainable Urban Drainage Systems (SUDS), where required.

### **Ancillary Requirements**

- 2.32 In addition to the main structures to be constructed as the focus of the project, additional ancillary works and facilities will be required. These will include:
- Distribution pipework to all berths for the transportation of marine gas oil fuel and designed and installed to the perimeter of the development site;
  - A water storage tank for the provision of potable water of a suitable capacity to service all vessels within the full proposed development;
  - The provision of column mounted floodlights to provide a general coverage of working areas;
  - Additional external lighting to cover the guardhouse and main gates weighbridge, welfare accommodation, car/vehicle parks, and main port signage;
  - CCTV installations;
  - A welfare block including toilets, mess room, office, and garage/store;
  - Provision of space for fuel storage and associated accommodation and equipment to supply bunkers to vessels using the development.
- 2.33 In addition to the above, a designated site with associated utilities services established shall be provided for a fabrication shed to be constructed by others.

### **Temporary Construction Areas**

- 2.34 The description above relates primarily to works required within the proposed site boundary, as shown in Figure 4. It is currently proposed that additional areas of land take, in the form of temporary construction areas, will also be required to facilitate construction. The precise location, extent of these areas is not known at present but are indicated on Figure 4. It is anticipated that these areas will be needed for the following functions:
- Storage of Dredging arisings (offshore);
  - Parking facilities;
  - Materials laydown;
  - Fabrication;
  - Materials storage;
  - Site compounds and welfare facilities.
- 2.35 It is proposed that these areas will be subject to a separate application for consent at which time, specific details will be provided as part of the related application.

## 3 LEGISLATIVE AND REGULATORY REQUIREMENTS

### Requirement for Environmental Impact Assessment

- 3.1 As works for the Aberdeen Harbour Expansion (AHD) will require works above and below water level, a range of legislation covers the consenting process, and therefore the need for environmental impact assessment (EIA).
- 3.2 The AHD will require to be licensed under:
- The Harbours Act 1964– this will be determined by Transport Scotland to grant a Harbour Empowerment or Revision Order to empower Aberdeen Harbour Board to undertake works or vary its existing harbour powers;
  - The Town and Country Planning (Scotland) Act 1997, as amended by the Planning etc (Scotland) Act 2006 – for works on land and to the mean low water mark. An application for Planning Permission will be determined by Aberdeen City Council;
  - The Marine (Scotland) Act 2010 (Marine Licences) – to be consented by Marine Scotland for the deposit or removal of a substance or object below the mean high water springs mark.
- 3.3 Other consents will also be required, as indicated at the end of this chapter.
- 3.4 Each of these licensing regimes will require an EIA if the development will create any project categorised under the Environmental Impact Assessment Directive (85/337/EEC -subsequently amended by Directive 97/11/EC and 2011/92/EU) on the assessment of the effects of certain projects on the environment.
- 3.5 The Directive categorises works projects under Annex I and Annex II. Annex I lists projects for which an EIA is mandatory. Annex II lists projects which will require an EIA only if their effects on the environment are likely to be significant.
- 3.6 Class 8 (2) of Annex 1 allows for:
- Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes.*
- 3.7 Therefore, it is considered that the AHD will require an EIA.
- 3.8 Directive 2011/92/EU has been transposed into UK and Scottish Regulation under the provisions of:
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 – for onshore development above the mean low water mark;
  - The Marine Works (Environmental Impact Assessment) Regulations 2007 as amended by The Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2011 – for works below the mean low water mark. The amendments allow for the enactment of the Marine Scotland Act 2010 which largely replaces the previous marine licensing and consent controls. These regulations also include harbour works previously covered by the Harbour Works (Environmental Impact Assessment) Regulations 1999 (as amended).
- 3.9 Under both sets of regulations, the EIA process requires the identification of 'likely significant environmental effects' arising from a proposed development or activity, both adverse and beneficial.
- 3.10 The systematic approach to EIA enables development designs to respond in an iterative manner to its receiving environment. All practical measures should be taken to avoid, reduce, and where possible, offset any potentially significant adverse environmental effects. Furthermore, the EIA process aims to ensure that the potentially beneficial effects of the development proposals are optimised.

- 3.11 It is intended that both the marine and onshore works associated with the AHD will be included within a single EIA, so the ES will therefore be submitted with the planning application, marine licence application, and to support the application for the Harbour Order. It is understood that Aberdeen City Council, Marine Scotland and Transport Scotland will therefore work together (as the Aberdeen Harbour Advisory Group) to ensure a streamlined approach to determination. This is described further in Section 4 below.

### **Marine Policy Statement 2011**

- 3.12 The UK Marine Policy Statement of March 2011 (MPS 2011) sets out the framework for preparing Marine Plans and taking decisions affecting the marine environment. The MPS 2011 identifies potential impacts on the marine environment resulting from coastal/ marine development projects including Port Development (MPS2011 s3.49, 3.410) and Marine Dredging and Disposal (MPS 2011 s3.63-3.66), both of which are relevant to the scoping of impacts from the proposed development.

### **National Marine Plan (Scotland)**

- 3.13 The National Marine Plan - pre-consultation Draft was launched in 2011. The pre-consultation Draft is being revised in response to comments made during the pre-consultation. Consultation on the Draft National Marine Plan and Sustainability Appraisal will follow in summer 2013. The final adoption of the plan is programmed for 2014.
- 3.14 The National Marine Plan will be guided by the UK Marine Policy Statement described above. It will also sit alongside and interact with existing planning regimes and will be consistent with strategic priorities set out in the National Planning Framework (NPF – currently NPF2 as described below). The National Marine Plan area will physically overlap with terrestrial planning boundaries to ensure marine and terrestrial planning will address the whole of the marine and terrestrial environments together. The current draft contains objectives that are directly relevant to the proposed development with “Section 4 – Marine Transport” being the most relevant and identifying the key impacts associated with such activities. As with the MPS, the National Marine Plan is relevant to the scoping of impacts from the proposed AHD.

### **National Planning Framework**

- 3.15 The NPF is a strategy for the long-term development of Scotland's towns, cities and countryside over the next 20 years. The NPF identifies key strategic infrastructure needs to ensure that each part of the country can develop to its full potential.
- 3.16 NPF2 was published in June 2009 and sets the spatial strategy for Scotland's development to 2030, and designates 14 national developments of strategic importance to Scotland. NPF2 is supported by an Action Programme setting out how and by whom the national developments and other key elements of the NPF strategy will be implemented, and a monitoring report (March 2012) reporting on progress in delivering the strategy.
- 3.17 NPF2 recognises the significance of Aberdeen Harbour stating (Paragraph 205, Page 81) that “Aberdeen Harbour provides essential support services for the offshore oil and gas industry and the tonnage of vessels and cargo handled continues to grow. It is the principal mainland port for freight, passenger, vehicle and livestock services to Orkney and Shetland.”
- 3.18 Planning authorities are required under the Planning etc. (Scotland) Act 2006 to take NPF2 into account in development plans and development management decisions.
- 3.19 Planning legislation requires Scottish Ministers to revise the NPF within 5 years of publication. Therefore work on NPF3 has commenced, as described below.

### **NPF3**

- 3.20 A Participation Statement (October 2012) setting out the consultation strategy for NPF3 was the start of the formal preparation process of the revision. In addition, a call for “National Developments” to be included was ended in December 2012. These developments are required

to be of more than regional significance and make a significant contribution to one or more of 8 “strategic” targets.

3.21 A proposal was made to include AHD within NPF3 as a National Development. This referenced AHB’s “Case for Growth” paper detailing the significance of Aberdeen Harbour to Scotland’s economy and links with the rest of the world. Its growth will offer the potential for Scotland to grow new and existing streams of business, including servicing for the marine energy industry, the north European cruise market, African oil industry, decommissioning and passenger transport. As such it would significantly contribute to the following targets required for a National Development:

- Skills development, reducing unemployment and job creation;
- Strengthening Scotland’s links with the rest of the world;
- Improving our digital, transport, utilities or green infrastructure networks;
- Adapting to or mitigating the effects of climate change;
- Improving the quality of the built or natural environment.

3.22 A Strategic Environmental Assessment (SEA) of NPF3 and the Scottish Planning Policy (SPP – which is also being revised), as required by the Environmental Assessment (Scotland) Act 2005 is currently being undertaken. The findings of the assessment will be set out in an Environmental Report, which will be published for public consultation alongside the Main Issues Report for NPF3 and the Draft SPP. At the time of writing, the Main issues Report and Draft Framework for the NPF3 has been released for consultation. The report confirms the inclusion of the AHD, stating:

*“We consider that the proposed expansion of Aberdeen Harbour merits designation as a National Development, partly due to its contribution to the renewables sector, but also in recognition of its wider role in supporting international trade, links for Orkney and Shetland, and the importance of its contribution to the economy of the North East and Scotland as a whole.”*

## **National Policy**

### **Scottish Planning Policy**

3.23 SPP is a statement of Scottish Government policy on nationally important land use matters. SPP was published in February 2010 and is currently being reviewed. The review will update policy, focus it on sustainable economic growth and emphasise the importance of “place making” – including making connections and understanding linkages.

3.24 It is intended to publish the draft SPP in April 2013, to be followed by a 12-week period of public consultation. A revised Participation Statement will be published at the same time, which will set out opportunities for stakeholders to get involved in the next stage of the process. These timescales align with the review of the NPF. This will allow the two documents to link the location of development (as outlined in the NPF) with how this will be delivered (in the SPP).

3.25 In addition to SPP, various advice on different subjects is provided to support National Policy, including Planning Advice Notes (PANs), Guides, Letters from the Chief Planner, Design Guidance and Specific Advice Documents . Those potentially relevant to the proposed AHD include:

- PAN 47 Community Councils and Planning;
- PAN 51 Planning, Environmental Protection and Regulation (Revised 2006);
- PAN 58 Environmental Impact Assessments;
- PAN 60 Planning for Natural Heritage;
- PAN 65 Planning and Open Space;
- PAN 66 Best Practice in Handling Planning Applications Affecting Trunk Roads;
- PAN 68 Design Statements;
- PAN 69 Planning and Building Standards Advice on Flooding;
- PAN 75 Planning for Transport;

- PAN 78 Inclusive Design;
- PAN 82 Local Authority Interest Developments;
- PAN 83 Masterplanning;
- PAN 3/2010 - Community Engagement;
- PAN 1/2011- Planning and Noise;
- PAN 2/2011- Planning and Archaeology;
- Guide - Transport Assessment and Implementation;
- Letter from Chief Planner - Air Quality and noise: Review of EIA Consultation arrangements;
- Specific Advice - Air Quality and Land Use Planning.

## Regional and Local Policy

### Current Development Plan

- 3.26 The purpose of the Development Plan is to set the framework for new developments, and planning applications are assessed against the provisions (land allocations and policies) of the development plan.
- 3.27 The current development plan in the Aberdeen City Council area comprises:
- The Aberdeen City and Shire Structure Plan (2009) (ACSSP);
  - The Aberdeen Local Development Plan(2012) (ALDP);
  - The development plan also includes a range of supplementary guidance adopted by the council – the most relevant of which is the Aberdeen Harbour Development Framework (January 2012).
- 3.28 The ACSSP (2009) was approved in August 2009. It encompasses the areas covered by Aberdeen and Aberdeenshire Councils excluding the Cairngorms National Park and sets out the strategy for the growth of north-east Scotland over the next 25 years. The main aims of the ACSSP are to:
- Grow and diversify the regional economy;
  - Tackle climate change;
  - Ensure the area has enough people, homes and jobs to support the level of services and facilities needed to maintain and improve the quality of life;
  - Protect valuable resources including the built and natural environment;
  - Create sustainable communities;
  - Make most efficient use of the transport network.
- 3.29 The ACSSP promotes three growth areas which will be the focus for development over the period up to 2030. These growth areas are Aberdeen City, the Huntly-Aberdeen-Laurencekirk transport corridor, and the Aberdeen – Peterhead transport corridor.
- 3.30 The ACSSP does not mention Aberdeen harbour specifically, but recognises the importance of the offshore oil and gas industry to the north-east, and the potential of the area to build on its strengths to grow and diversify the economy.
- 3.31 The ALDP was adopted in February 2012 and replaced the Aberdeen Local Plan (2008). It provides a land use framework until 2030 and identifies the detailed policies and sites required to deliver the current ACCSP. The ALDP recognises the importance of Aberdeen Harbour and the importance of safeguarding land in “strategic locations” including beside the Harbour – including land suitable for harbour related uses. The harbour is described as (a)“*vital hub... (providing)...a service for the region as a whole*”.
- 3.32 Policy B14 - Aberdeen Airport and Aberdeen Harbour states “Within the operational land applying to Aberdeen Airport and Aberdeen Harbour there will be a presumption in favour of uses associated with the airport and harbour respectively.... Due regard will be paid to the safety, amenity impacts on and efficiency of uses in the vicinity of the Airport and Harbour.”

- 3.33 The ALDP notes that the Harbour Board Operational Area will be subject to a Masterplan which will provide detailed guidance in respect of land uses, policies, proposals, access and connectivity within it and the adjoining areas. This was undertaken as part of the Aberdeen Harbour Development Framework (January 2012) which comprises supplementary guidance also forming part of the Development Plan. This Development Framework outlines the connections between the Harbour and the City, and considers how these connections can be improved so that the Harbour can continue to complement and support Aberdeen's economic and cultural growth. It also provides guidance to ensure that the objective for a greater mix of uses at the Harbour can be delivered without impacting on the operation of the port. It includes guidance on how to avoid adverse effects upon qualifying interests of the River Dee SAC which runs through the harbour, and also upon Bottlenose dolphins, which frequently occur in the outer harbour and mouth, and are a qualifying feature of the Moray Firth SAC and a European Protected Species.

### **Emerging Policy**

#### ***Strategic Development Plan***

- 3.34 The current Structure Plan is being replaced by the Strategic Development Plan (SDP) for Aberdeen City and Shire to guide development over the next 25 years. The Strategic Development Planning Authority (SDPA) is a partnership between Aberdeen City and Aberdeenshire Councils.
- 3.35 The importance of Aberdeen Harbour and the need to secure its future contributions to national and regional economies are expected to be recognised in this publication.
- 3.36 The Draft SDP recognises (Paragraph 3.20) that:

*“Aberdeen Harbour is a vital gateway for the regional economy and provides important passenger and freight links to the Northern Isles. The harbour has been identified as a key port in the National Renewables Infrastructure Plan. Work will be needed to set out in more detail the likely implications of this (building on ‘The Case for Growth’) and how the growth of the harbour can be accommodated to inform the next local development plan. Given its city-centre location, this work should take into account the wider city-centre regeneration as part of the current City Centre Development Framework and the competing demands for land.”*

- 3.37 Paragraph 4.45 notes:

*“Improving access to the North East is also essential to developing a strong economy and providing better links. The spatial strategy promotes opportunities at harbours and the airport as well as helping to promote accessibility by making sure that future development also allows for improvements in the rail and road networks. This will help to improve bus and train services and encourage people to use them.*

- 3.38 Consultation on the Draft SDP (Aberdeen City and Shire Strategic Development Plan Proposed Plan -February 2013) will end in April 2013. Following this, and analysis of the responses received, it is intended to deposit the proposed SDP with the Scottish Ministers in June 2013, followed by examination and approval in Spring 2014.

#### ***Local Development Plan***

- 3.39 Although the ALDP was adopted in 2012, Development Plans are required to be reviewed every five years. Therefore the adopted ALDP is currently being reviewed to work toward the publication of the next Plan. This will be prepared in the context of the emerging SDP which is scheduled for adoption in 2014 and will replace the adopted Structure Plan.
- 3.40 The approved Development Plan Scheme - January 2013 sets out the programme for preparing and reviewing the new Plan. The key stages identified in the Development Plan Scheme are:
- Main Issues Report to be published in January 2014;
  - Proposed Local Development Plan to be published in February 2015;

- Local Plan Examination to start in November 2015;
- Adoption of the 2016 Local Development Plan in November/December 2016.

3.41 The review of the Plan will start with a non-statutory consultation period running from April –June 2013. This consultation exercise will assist in preparation of the Main Issues Report and associated supporting documents such as the Strategic Environmental Assessment will also be prepared.

3.42 Therefore, this preparation is at a very early stage, and detail regarding its content is unknown. However, it is intended to ensure that the proposed AHD is included within the sites allocated and supported by policy.

### **EIA Scoping**

3.43 This Scoping Report outlines the proposed scope and methodology of the EIA, to be reported within the ES, and submitted as part of the planning application for the AHD.

3.44 This Scoping Report has been submitted to request formal Scoping Opinions from Aberdeen City Council, Marine Scotland and Transport Scotland in accordance with Regulation 14 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 and the equivalent requirements set out in Regulation 13 and Schedule 4 of the Marine Works EIA Regulations 2007 (amended 2011) and The Harbours Act 1964. As part of the Aberdeen Harbour Advisory Group, it is intended that these bodies will work together with Transport Scotland (under their remit in the Harbours Act 1964) to coordinate their scoping response and consultations.

3.45 This EIA Scoping Report sets out the following information in order to assist the Advisory Group in forming their Scoping Opinion(s):

- Site location plan and description, including the indicative extent of dredging and other regulated activities within the bay bed (below the Mean High Water Springs (MHWS) level) and on land;
- Brief description of the nature and purpose of the development, and its possible effects on the environment;
- The environmental features (receptors) likely to be affected by different stages or activities associated with the development;
- The proposed approach to and methodology of the EIA, including the technical studies, surveys and other assessments feeding into the EIA;
- Consultations to be undertaken as part of the EIA;
- The intended structure of the ES.

3.46 Whilst no formal scoping opinions have been sought to date, it should be noted that various meetings and other forms of consultation have been held over the past 6 months between the Applicant's consultant team, the Advisory Group (Aberdeen City Council, Marine Scotland, Transport Scotland) and other consultees. This consultation has helped inform in the scope and extent of the various baseline surveys, some of which are now in progress.

3.47 A list of organisations consulted as part of the feasibility studies is provided in Section 4.

### **Other Consents and Licences**

3.48 In addition to the consents required under The Harbours Act 1964 (Harbour Empowerment or Revision Order), The Town and Country Planning (Scotland) Act 1997, as amended by the Planning etc (Scotland) Act 2006 (Planning Permission) and The Marine (Scotland) Act 2010 (Marine Licences) a range of other consents will be required under other legislation. Although not directly relating to the EIA, and therefore not falling under the scope of this Scoping Report, these are indicated below.

- 3.49 Natural heritage interests will require to be considered under:
- European Habitats Directive 92/43/EEC updated and consolidated 2007;
  - European Birds Directive 2009/147/EC and UK Implementation Regulations;
  - Conservation Natural Habitats, & c.) Regulations 2010 (as amended).
- 3.50 These are implemented through wildlife licences issued under the Wildlife and Countryside Act 1981 and related acts.
- 3.51 Due to the proximity of the AHD to the River Dee SAC (a site of international wildlife importance), the project may in due course be subject to an Habitat Regulation Assessment (HRA) and 'Appropriate Assessment' under the Conservation of Habitats and Species Regulations 2010 (commonly referred to as the Habitats Regulations). This Appropriate Assessment must be completed by the "competent authority", who in this case is likely to be Aberdeen City council. However, in discharging this duty, the Council will be advised by both SNH and Marine Scotland. The ES will be accompanied by an Appropriate Assessment "signposting document" to identify where information is provided in the ES. This document will serve two functions:
- To assist the Competent Authority by making it easier to undertake and consult on an Appropriate Assessment;
  - To act as confirmatory checklist that can be used to ensure that the relevant information needed for an Appropriate Assessment is contained in the ES.
- 3.52 Hydrological interests will require to be considered under:
- Water Framework Directive 2000/60/EC;
  - Water Environment and Water Services Act 2003;
  - Water Environment (Controlled Activities) (Scotland) Regulations 2011.
- 3.53 Dependant upon the types and quantities of substances to be stored within AHD, Hazardous Substances Consent (HSC) may be required under the Planning (Hazardous Substances) (Scotland) Act 1997, both as amended. Aberdeen City Council acting as the Hazardous Substances Authority (HSA) would be responsible for granting any HSC. The Health and Safety Executive (HSE) would be consulted on the application before the HSA make a decision.
- 3.54 Other consents and licences that may be required to implement and operate the AHD project include:
- Landowner consent;
  - Drainage consents;
  - Roads construction consent for the proposed junction (roundabout) with Greyhope Road;
  - Consents under Health and Safety Act 1974 – HSE;
  - Utilities Consents/Licences – Water companies and power providers.
- 3.55 The above list should not be treated as definitive and will be subject to further discussions with the statutory authorities. The EIA will apply an integrated approach to the effects assessment, thus ensuring that the accumulation of different types of effects on certain receptors within the jurisdiction of individual regulatory authorities is not overlooked. Equally, the 'mitigation' introduced by these statutory environmental controls will be taken account of in the ES.

## 4 GENERAL APPROACH TO THE EIA

### Background

- 4.1 The ES will be prepared in compliance with the EIA Regulations which implement Council Directive No 85/337/EEC as amended by the Council Directive No. 97/11/EC. Reference will also be made to current EIA good practice guidance including:
- Planning Advice Note (PAN) 58 - Environmental Impact Assessment, October 1998;
  - Scottish Planning Circular; The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (3/2011);
  - Scottish Natural Heritage: Environmental Assessment Handbook: Guidance on the Environmental Impact Assessment Process, 3rd Ed, 2009;
  - Environmental Impact Assessment - A Guide to Procedures, Department of the Environment, Transport and Regions (DETR), 2000;
  - Preparation of Environmental Statements for Planning Projects that require Environmental Impact Assessment - A Good Practice Guide, Department of the Environment (DoE) (1995);
  - Institute of Environmental Management and Assessment (IEMA) Update to Guidelines for Environmental Impact Assessment (2006);
  - Topic specific guidance as referred to in the assessment sections where appropriate.
- 4.2 The EIA will give due consideration to relevant EIA case law and the formal Scoping Opinion(s) received from Aberdeen City Council, Transport Scotland and Marine Scotland.
- 4.3 The EIA will consider the likely significant environmental effects of the development, utilising current knowledge of the site and the surrounding environment. Based on the findings of the studies undertaken as part of the EIA, methods of preventing, reducing, or offsetting significant adverse effects (collectively known as 'mitigation measures'), and methods to enhance any beneficial effects, will be set out in each relevant technical chapter of the ES.
- 4.4 The content of the ES will be informed by the EIA regulations and relevant best practice guidelines which set out the information required for inclusion within an ES (as above). In accordance with the Town and Country Planning EIA Regulations (Schedule 4, Part 1 and 2) the ES will provide:
- A description of the development for which a planning consent is being sought, including in particular:
    - a description of the physical characteristics of the whole development and land-use requirements during construction and operational phases of the AHD;
    - a description of the main characteristics of the production processes, including the nature and quality of materials used; and
    - an estimate, by type and quantity, of the expected residues and emissions (water, air and soil pollution, noise, vibration, light etc.) resulting from the operation of the AHD;
  - A description of the aspects of the environment likely to be affected by the proposed development including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets and landscape, and the inter-relationship between these factors;
  - A description of the likely significant effects of the development on the environment, including direct, indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects;
  - A description of the forecasting methods used to assess the effects on the environment;
  - A description of the measures envisaged to avoid, reduce and where possible offset any significant environmental effects associated with the development (i.e. mitigation measures);
  - An outline of the main site selection and design alternatives considered by the Applicant and the reasons for the selection of the preferred option, taking into account environmental effects;
  - A description of any technical difficulties, lack of data or other uncertainties associated with the EIA;

- A Non-Technical Summary (NTS) summarising, in non-technical language, the key findings of the EIA.

4.5 Additionally, in accordance with Schedule 3 of the Marine Works EIA Regulations, as amended in 2011, the following information will be required:

- The quantity, nature and source of the materials to be used in the course of the project and the regulated activity;
- The quantity, nature and source of any items or materials to be deposited in the sea in the course of the project and the regulated activity;
- The working methods to be used in the course of the project and regulated activity.

## **Structure of the Technical Chapters**

4.6 Each environmental aspect 'scoped in' to EIA (described later in this Scoping Report) will be addressed in a separate technical chapter of the ES. Within each of these technical chapters, the assessment will be structured in the following way:

### **Introduction**

4.7 The introduction will provide a brief summary of what is considered in the chapter and will state the author and/or relevant technical contributor. Where appropriate, it will describe the assumptions and limitations related to the assessment of that topic and any constraints to undertaking the assessment.

### **Summary of Planning Policy and Legislative Context**

4.8 This section will summarise the legislation and planning policy (at national, regional and local level) that are relevant to the assessment of environmental effects for to the technical topic.

### **Description of Assessment Methodology**

4.9 The assessment methodology section in each chapter will provide an explanation of methods used in undertaking the technical assessment and the prediction of effects. Reference will be made to any published methodological standards, professional guidelines and best practice that are particular to the topic.

4.10 This section will also describe any topic-specific significance criteria applied in the assessment, particularly where these differ from common or generic criteria applied elsewhere in the ES (e.g. those provided in the Institute of Ecology and Environmental Management (IEEM) guidance on ecological impact assessment, (2006)). However, wherever possible, a common scale and language for assessing impacts will be applied.

### **Description of Baseline Conditions**

4.11 This section will describe the environmental conditions that exist in the absence of the development both the present day and, where relevant, those that are projected to exist in the future. The results of baseline surveys and desktop research will be summarised in this section.

4.12 Relevant receptors to the specific topic-based effects (e.g. noise, air quality, visual effects etc.) will be described, together with an indication of their relative sensitivity of these receptors to such effects.

### **Assessment of Potential Effects**

4.13 This section will present the assessment of potential effects/ impacts that are predicted to occur during the construction, operation and (where relevant) decommissioning of the AHD facility. Potential impacts will be considered on the basis of their magnitude, duration and reversibility. The assessment will include:

- The activities and physical elements of the development that are likely to give rise to particular effects, together with a more detailed description of such activities or elements where this would aid the reader's understanding of the assessment;
- Any specific mitigation measures that have already been incorporated/embedded into the design of the AHD in order to avoid or minimise the environmental effects (i.e. 'design mitigation');
- Any proposed additional project specific mitigation measures, to be secured through planning condition or other mechanism, in order to avoid, reduce, off-set or compensate for the identified impacts;
- The likely magnitude, spatial extent and duration of the 'residual impacts' taking account of the proposed mitigation measures;
- A statement of the significance of each residual impact and, where relevant, a statement of the significance of the total sum of such impacts.

### **Summary of Mitigation and Residual Effects**

- 4.14 This section will summarise the mitigation measures proposed to avoid, reduced or otherwise offset or compensate for any significant adverse environmental effects identified through the EIA process, together with the measures that will be taken by the Applicant to enhance the beneficial effects of the scheme as they apply to the assessment topic. The potential mechanisms by which the proposed mitigation measures will be implemented (e.g. planning conditions/ obligations or conditions attached to the marine licence) will be specified.
- 4.15 A tabulated summary of the impacts at different stages and activities of the AHD development will be provided at the end of each technical chapter.

### **Cumulative and Combined Effects**

- 4.16 The cumulative and combined effects of the AHD development itself, and with other planned or committed development in the local area, will be addressed on a topic-by-topic basis and reported in a subsection of each technical chapter.
- 4.17 'Combined effects' (sometimes referred to as Type 1 cumulative effects) occur when two or more different environmental effects from the proposed development (e.g. dust, noise, traffic etc.) act together to produce a different level of effect/ impact experienced by a particular receptor. These combined effects can be additive or synergistic such that the sum of the impacts can be less or more than the individual impacts (i.e. because they may exacerbate or neutralise one another).
- 4.18 'Cumulative' effects (or Type 2 effects) are those that accrue over time and space from a number of different development activities and projects in geographical proximity to one another. The EIA will consider all cumulative effects arising from developments which are (a) of a type, duration and scale that have the potential to cause significant environmental effects in their own right and (b) are reasonably foreseeable in terms of delivery (i.e. committed developments which have planning consent). The cumulative schemes to be considered through this process will be agreed through consultation with the Council and Marine Scotland with particular attention paid to the following developments/ventures as far as they will remain relevant within the lifetime of the AHD proposal:
- European Offshore Wind Deployment Centre (EOWDC);
  - Forth and Tay Developers' Group (FATDOG) related developments;
  - MORL Wind Farm;
  - Harbour related developments related to the Tay, Forth and Moray Firths;
  - Relevant onshore developments with the potential for cumulative impacts with the AHD.
- 4.19 The list of relevant cumulative projects will be developed and updated throughout the EIA process and agreed with the relevant authorities prior to submission of the application for the AHD.

## **Principal Matters to be Addressed by the EIA**

### **Introduction**

- 4.20 With respect to identifying the likely significant environmental effects associated with the development, this EIA Scoping Report gives initial consideration to a range of potential effects associated with the proposed AHD development, both beneficial and adverse, which could be deemed to be 'significant' on the basis of:
- The value/importance of the resources and receptors that could be affected by the construction and operation of the development;
  - The predicted magnitude of environmental change and/or impact experienced by these resources and receptors, accounting for their size, duration and spatial extent;
  - Options for avoiding, reducing, offsetting or compensating for any potentially significant adverse effects and the likely effectiveness of such mitigation measures.
- 4.21 Subsequent sections of this EIA Scoping Report set out the range of aspects and related issues which are proposed to be considered in the EIA, whilst the principal / common considerations of the EIA are described below.

### **Alternatives**

- 4.22 In accordance with Schedule 3(8) of the Marine Works EIA Regulations, and Schedule 4 (Parts 1 and 2) under the Town and Country Planning EIA Regulations, the ES will provide a description of the main alternatives studied by the applicant including for an indication of the main reasons for the applicant's choice. This will take into account the environmental effects of those alternatives and the project as proposed.
- 4.23 The options appraisal in terms of spatial considerations is largely outlined in Section 1 above and will form the basis of the consideration of alternative site options within the ES, including for detailed environmental considerations. Technical, design and engineering alternatives that have been considered during the evolution of the project, including alternative layouts of the AHD facility will also be described within the ES, again, taking account of detailed environmental considerations.
- 4.24 The Alternatives chapter of the ES will also include an assessment of the 'do nothing' scenario (i.e. the future existence of the bay in the absence of the AHD).
- 4.25 In summary, the ES will include a description of:
- Alternative locations for the AHD development;
  - The 'do nothing' scenario;
  - Alternative designs, summarising the progression of the design work and how environmental considerations have influenced the overall design process. A summary of the main alternatives considered, such as alternative plan form layouts, building heights and massing (where relevant) will be presented, together with the justification for the selection of the final design.

### **Development Description**

- 4.26 In accordance with the Town and Country Planning EIA Regulations, the ES will include a description of the proposed development as defined by a set of planning application drawings, engineering designs and other documents submitted for approval. The planning application will also be supported by a Design and Access Statement (DAS) which will provide further information on the AHD proposals. This will provide the basis off the impact assessment within the ES.

### **Development Programme and Construction**

- 4.27 The ES will outline the main activities associated with the proposed construction programme and phasing, together with the likely duration of each activity. The commencement of the

construction of the AHD Facility and associated works is not currently known but will be indicated within the ES. The ES will consider potential environmental effects associated with the construction works and these are discussed further in Section 5 below.

- 4.28 The ES will also set out the principles for a site specific Construction Environmental Management Plan (CEMP) to be prepared to regulate construction activities and minimise environmental impacts where possible. This CEMP will incorporate 'good practice' measures and construction guidance, and will provide the 'vehicle' through which most of the construction mitigation measures will be transposed from the ES to implementation on site.

#### **Baseline and Assessment Years**

- 4.29 For the purposes of the EIA, the Baseline Year will be established as the basis of assessment for the EIA, which is the period for which the most up to date environmental baseline information is available for the site and surrounding environs.
- 4.30 Construction impacts will be assessed for key phases and activities over an identified period which will also be clarified within the ES.
- 4.31 The operational impacts of the AHD will be assessed for an appropriate time when it is predicted that the operation will have reached full operational capability, with the potential for maximum production throughput. This is to ensure that the full nature of impacts is completely understood.

#### **Technical Chapters**

- 4.32 The following comprise the list of technical disciplines that will be assessed in detail in the Environmental Statement. The proposed scope and methodology for each technical discipline is outlined in the following Sections of this Scoping Report:

- Socio-economics;
- Hydro-dynamics, sediments and coastal processes;
- Flood risk and surface water effects;
- Marine ecology – general;
- Marine ecology – fish and shellfish;
- Marine ecology – benthic intertidal and sub-tidal;
- Marine ecology – marine mammals;
- Terrestrial ecology;
- Archaeology and cultural heritage;
- Landscape and visual effects;
- Traffic and transport (including Navigation);
- Air quality;
- Noise and vibration;
- Ground conditions and contamination;
- Waste.

#### **Consultation**

- 4.33 In the lead up to the planning application and throughout the development design, a programme of consultation has and will continue to be undertaken with statutory and non-statutory consultees and with members of the public. Organisations that have been consulted with thus far include:

- Aberdeen City Council;
- Aberdeen City and Shire Strategic Development Planning Authority;
- Scottish Natural Heritage;
- Scottish Environmental Protection Agency;
- Marine Scotland;
- Transport Scotland;
- First Bus;
- NESTrans;

- ARR Craib;
- Scottish Water;
- RSPB;
- Scottish Dolphin Centre.

4.34

As the EIA progresses additional organisations will be identified and consulted. A summary of relevant consultation will be presented in the introductory sections of the ES. This will provide details of any environmental issues raised and provide an audit trail of how the EIA process has responded. Consultation that is specific to a particular EIA discipline will be reported in detail where relevant within the technical chapters of the ES.

## 5 ENVIRONMENTAL IMPACTS

### Introduction

- 5.1 This section addresses each of the environmental aspects which are proposed to be formally included within the EIA. In each case, the key issues/baseline overview is initially established. Taking account of the project description provided in Section 4, the potential effects of the AHD are then identified. It should be noted that this section purely identifies the character of the potential effects and is not an assessment of those impacts. Informed by the key issues/baseline overview and identification of the potential effects, the proposed methodology to be adopted for the purposes of the EIA is then outlined for each.

### Socio-economics

#### Key Issues/Baseline Overview

#### *Population*

- 5.2 The site of the proposed AHD falls within the Torry 2003 Census Area Statistic (CAS) ward which lies within Aberdeen City local authority.
- 5.3 According to the 2001 census, Torry CAS Ward has a total population of 4,555. This represents approximately 2% of the total population of Aberdeen City Council area. Although the 2011 statistics are being released in a phased approach as the time of writing, there are no reliable estimates for this ward area since the 2001 census figures.
- 5.4 According to the 2001 census, Torry CAS Ward has a population density of 0.04 persons per hectare. The figure for Aberdeen City is 0.09 persons per hectare and for Scotland is 1.54 persons per hectare.
- 5.5 Table 15.4 highlights the age structure of Torry and places it in the context of Aberdeen City and Scotland. The age structure of Torry is broadly similar to the Scottish population as a whole. In Torry, persons aged 65 and over made up 13 % of the total population compared to 15 % for Aberdeen City and 16 % for Scotland. With 72% up to the age of 49 in Torry, compared to that of 67% in Aberdeen City and 66% in Scotland, this reflects that Torry has a relatively young population, providing more young people who are in the age bracket to have children.

Age Group	Torry	Aberdeen City	Scotland
0-15	12 %	15 %	19 %
16-19	4 %	5 %	5 %
20-34	32 %	25 %	20 %
35-49	24 %	22 %	22 %
50-59	11 %	12 %	13 %
60-64	4 %	5 %	5 %
65-74	8 %	8 %	9 %
75 and over	5 %	7 %	7 %
Total	4,555	212,125	5,062,011

**Source:**

GROS, 2001 Census of Population, Table UV04 Age

#### *Employment and Economic Activity*

- 5.6 Table 15.5 shows the employment and unemployment figures from 16 to 64 years in Torry, Aberdeen City and Britain in the 2001 Census.

<b>TABLE 5.2 EMPLOYMENT AND UNEMPLOYMENT (2001)</b>				
<b>Category</b>	<b>Torry (numbers)</b>	<b>Torry (%)</b>	<b>Aberdeen City (%)</b>	<b>Great Britain (%)</b>
Economically Active	2,619	77.8	75.7	74.0
In Employment:	2,459	73.1	71.9	69.8
Employees	2,352	69.9	66.3	61.0
Self Employed	107	3.2	5.6	8.8
Unemployed	160	6.1	5.0	5.7

**Source:**

GROS, 2001 Census of Population, Table CAS028 – Sex and age by Economic Activity

**Note:**

Percentages are based on population aged 16-64, except unemployed which is based on economically active

- 5.7 As can be seen from Table 5.2, whilst having a higher percentage of its population as economically active, Torry has a higher percentage of unemployment, notably and significantly above that of Aberdeen City as a whole. It is also notable from Table 5.3 below that, of those people in Torry that are active and in employment there are significantly fewer within management, senior and professional occupations when compared to Aberdeen City.

<b>TABLE 5.3 EMPLOYMENT BY OCCUPATION</b>				
<b>Category</b>	<b>Torry (numbers)</b>	<b>Torry (%)</b>	<b>Aberdeen City (%)</b>	<b>Great Britain (%)</b>
Managers and senior officials	178	7.2	11.2	14.8
Professional	166	6.8	13.9	11.1
Associate professional & technical	342	13.9	14.6	13.9
Administrative & secretarial	368	15.0	12.9	13.3
Skilled trades	329	13.4	10.4	11.6
Personal services	189	7.7	6.6	7.0
Sales and customer services	207	8.4	8.3	7.8
Process plant and machine operatives	258	10.5	8.8	8.6
Elementary occupations	422	17.2	13.3	11.9

**Source:**

GROS, 2001 Census of Population, Table CAS033 – Sex and Occupation by Age

**Note:**

Percentages are for persons aged 16-64 by Soc 2000 major groups. Percentages are based on all persons in employment

### **Socio-Economic Indicators**

- 5.8 The Scottish Index of Multiple Deprivation (SIMD) is a composite measure of deprivation based on a range of indicators including employment, income, health and education. The local area geography adopted by the Scottish Government for this measure is data zones. These zones are based on groups of census output areas and have populations of between 500 and 1,000 household residents. There are 6,505 data zones in Scotland.
- 5.9 The SIMD provides a relative ranking of the 6,505 data zones across Scotland from the most deprived (ranked 1) to the least deprived (ranked 6,505). The site of the AHD falls within/adjacent to data zone S01000082. In 2012, this data zone had an overall rank of 1063. This rank places data zone S01006296 within the 1<sup>st</sup> quintile, which is generally the accepted range of “deprived” areas of the worst 20%. Closer examination of the individual domain rankings shows that the area is particularly disadvantaged in terms of health, education, and crime.

### **Tourism, Recreation and Land Use**

- 5.10 Whilst there are no specific attractions that would necessarily be classed as national attractions from a tourism/recreational perspective, there are a number of local and regional attractions associated with the Nigg Bay and Torry area. These range from footpaths and guided trails to open space and watersports. They are outlined as follows.
- 5.11 Greyhope Road which runs alongside Nigg Bay is part of European, National and local networks for cycling and recreation:
- EuroVelo 12 route (known as the North Sea Cycle Route);
  - North Sea Trail (NAVE Nortrail Project, partly funded by the EU);

- National Cycle Network, Route 1;
- Core Path 78 (and Core Path 104 which joins Greyhope Road along St Fittick's Road).

- 5.12 Core Path 78 runs from the existing Aberdeen Harbour south towards Nigg Bay, following the route of Greyhope Road as it skirts around Nigg Bay, and eventually following the coastline along the southern extent of Nigg Bay and onwards to the south. This route connects to the wider core path network including routes locally along St. Fittick's Road (104) and at the back of the Water Treatment Plant at the edge of Nigg Bay.
- 5.13 It is important to note that there are a number of 'guided' walks associated with Torry, as follows: Torry Churches Trail; Torry Coastal Trail; Torry Industrial & Maritime Trail; Torry urban Trail. The Coastal Trail in particular follows the route of Core Path 78 with key features of interest including the Inner South Breakwater, Rocket House, Torry Point battery, Breakwater and Goliath, 'Torry Coo' Foghorn and Lighthouse. Figure 5b shows the key attractions and features of the Torry Coastal and Industrial and Maritime trails which are considered the most relevant to the proposed AHD.
- 5.14 Nigg Bay is also within the Aberdeen Green Space Network (according to the Aberdeen Local Development Plan 2012, cited in the Aberdeen Open Space Strategy 2011-2016).
- 5.15 Policy NE1 – Green Space Network states:
- “The City Council will protect, promote and enhance the wildlife, recreational, landscape and access value of the Green Space Network. Proposals for development that are likely to destroy or erode the character or function of the Green Space Network will not be permitted. Where major infrastructure projects or other developments necessitate crossing the Green Space Network, such developments shall take into account the coherence of the network. In doing so measures shall be taken to allow access across roads for wildlife and for access and outdoor recreation purposes.*
- Masterplanning of new developments should determine the location and extent of the Green Space Network within these areas.....”*
- 5.16 Nigg Bay has therefore been classed as having a high recreational value by Aberdeen City Council. The EIA will consider mitigation for areas of lost Green Space Network, and/or enhancement of existing areas of green Space Network that is of poorer quality.
- 5.17 In the Aberdeen Local Development Plan 2012, Nigg Bay is classed as a District Wildlife Site and 'coastal management – coastal area undeveloped'. Nigg Bay, Girdle Ness and Greg Ness are popular sites for wildlife watching of birds and sea life. This recreational activity can also be classed as an education activity and therefore falls under statutory access rights.
- 5.18 In addition to recreational pursuits linked to open space and core path networks, Nigg Bay support interest in surfing. Whilst it does not have a locally dedicated club the bay is believed to hold regular interest for surfers, with Aberdeen University Surf Club being the closest known club. A further local attractions/interest is the Nigg Bay Golf Club to the north west of the proposed AHD.
- 5.19 Discussions with Aberdeen City council have also highlighted the need to consider all other plans and projects in the near and immediate vicinity of the AHD and not just ones involving recreation and access. It has been highlighted that there are environmental improvement projects occurring in the area and these will also be taken account of within the EIA.
- 5.20 There are no specific 'land uses' that are directly associated with the ownership of the land within the defined boundary of the proposed AHD. However, activities during construction and operation (including the facilities overall footprint) will need to take into account possible commercial uses primarily related to the marine environment. Of particular note, associated with the former fishing station (see archaeological sites below), crab and lobster fishing has historically been known to occur within the bay. Consultation will therefore be required with Marine Scotland and the Fisheries Management and Conservation Group (FMAC) in order to ascertain the extent and currency of such activity as part of the EIA.

## **Potential Effects**

- 5.21 Taking account of the key issues and baseline overview above, the following are considered to be the key potential effects of the AHD:
- Effects upon the community of Torry and wider Aberdeen City including:
    - visual and recreational amenity (additional to those identified below)
    - traffic disruption, accessibility, severance and distraction
    - potential nuisance relating to noise and air emissions
    - community infrastructure impacts relating to the capacities of schools, nurseries, local authority services (waste, benefits, police, etc), and GPs and hospitals to accommodate the development
    - population effects linking the job numbers created by the project with the labour market and housing provision, where relevant;
  - Effects upon the local, regional and national economy, including:
    - direct and indirect employment effects (including supply chain implications)
    - expenditure through the supply chain (including during construction)
    - direct and indirect effects upon the activities of other business and operations (including land take and displacement implications)
    - community investment and benefits;
  - Effects upon tourism and recreational activities, including the direct and indirect effects upon:
    - use of the recreational routes and open spaces identified above
    - recreational users of the beach e.g. surfers walkers, sightseers
    - use of the Nigg Bay Golf Course
    - marine recreational activities including yachting, canoeing, surfers, etc.

## **Approach and Methodology**

- 5.22 There is no prescribed methodology or standard guidance for assessing socioeconomic and related effects in EIA. The method to be adopted will therefore be one of determining the existing circumstances (the baseline conditions) through desk based analysis (including attraction visitor numbers), and field observations/surveys where necessary. The potential effects of the AHD on this baseline will then be identified and, where relevant, mitigation measures proposed. Professional judgement will be applied to determine the significance of any predicted residual effects. The assessment will focus on the potential impacts as identified above and will be predominantly qualitative in nature.
- 5.23 It is noted that the effects upon land use, tourism, recreation and outdoor access are not just focussed on the disruption of those activities but may also have wider effects on the economy and employment related to such activities and this will also be taken into account within the assessment.

### ***Effects upon the Community of Torry and Wider Aberdeen City***

- 5.24 Effects relating to community amenity, traffic impacts and nuisance will be assessed based upon the respective findings of the assessment under other aspects of the EIA, namely Landscape and Visual Amenity, Traffic and Transportation, Noise, and Air Quality. As detailed under the methodology for Landscape and Visual Impact Assessment (LVIA), a residential amenity study will be completed for Torry community which will provide a focussed assessment of the potential visual amenity impacts resulting from the AHD. This will also be used as the basis for this assessment.
- 5.25 With respect to community infrastructure, effects on resources such as schools, nurseries, local authority services (waste, benefits, police, etc), and GPs and hospitals will be assessed if found to be required during the evolution of the development. This task will draw on a socio-economic baseline analysis, which will show what infrastructure is available at present, what is planned by the local authorities, and whether this is sufficient to accommodate the future needs related to all phases of development.

5.26 With respect to population effects and housing provision, impacts are not considered likely to be significant. However, if found to be required during the evolution of the development, the assessment will link the job numbers created by the project with the labour market at the local and regional levels and will assess whether the existing housing provision is sufficient based on this information

### ***Effects upon the Local, Regional and National Economy***

5.27 Effect upon the economy will be assessed via the following means.

5.28 Employment generated by the AHD will be allocated according to the following categories:

- Direct employment: this will be based on quantity and type of employment in the construction and operation of the facility. The jobs at the harbour would be calculated from standard floor space density ratios in the absence of more detailed information;
- Indirect employment: the employment created by the suppliers as a result of the new activity generated by the AHD;
- Induced and multiplier impacts: those generated in addition to the impacts identified above. These occur as suppliers to, and users of, the harbour create further turnover and employment in the local economy via their spending on local goods and services. In order to calculate these effects, appropriate economic multipliers will be used, and the size of the induced effects will depend on the salaries that these employees are expected to earn as higher paid employees can be expected to spend more in the local economy.

5.29 This assessment will also determine which proportion of these gross impacts is going to remain in the district. This will be done by applying a leakage factor as not all jobs will go to residents of the district and a displacement factor as a proportion of the jobs/residents will merely relocate from other parts of the area.

5.30 Beyond the estimates of job numbers, the EIA will undertake a qualitative analysis of the impact of the development on the local labour market i.e. what type of jobs will be created during the construction and the operation phases; the balance between the local labour supply and the potential labour demand in terms of skills and likely expected salary ranges; occupations; likely training needs and local opportunities.

5.31 The assessment will also explore the extent to which there is potential for transferring any job losses predicted (if any) to the new jobs being created by the AHD, and the extent to which training provision is required to achieve this.

### ***Tourism and Recreation Impacts***

5.32 The baseline relating tourist and recreational attractions and features will be established, building on the baseline outlined within this scoping report. Sources of information will include Visit Scotland, local tourist information facilities and Aberdeen City Council's recreation and access department. A site visit will be undertaken to verify attractions and to identify any further potential interests that may not be directly recorded. Consideration will also be given to dedicated field surveys/observations where it is felt that such baseline work is warranted e.g. use of Nigg Bay by the public, including surfing interests. Consultations will be held with relevant interest and recreational groups in order to ensure that all relevant concerns are taken in to account.

5.33 Impacts will be assessed taking account of the sensitivity, popularity, and status of the attractions and facilities affected by the AHD. The assessment will also take account of the magnitude of the impact of the AHD on each individual attraction/facility. Where significant impacts are identified, then mitigation measures will be developed and discussed with the relevant interest groups and authorities. This may take the form of design based mitigation or, where not practical or likely to be effective, additional scheme specific measures.

5.34 Overall, the socio-economic assessment will be guided by HM Treasury's 'Green Book', which sets out the standard approach to economic impact assessments. As indicated above, due to the inextricable link to other human related impacts, the assessment will also take into account

the findings of the LVIA, Cultural Heritage, Traffic and Transportation, Noise, Air Quality and, where relevant, Natural Heritage assessments within the EIA.

### **Summary of Required Studies**

- Desk based collation of economic, recreational, tourism, and land/marine use data;
- Consultation with key recreational stakeholders including local recreational interest groups and community councils;
- Where consultations dictate, visitor/usage surveys to be completed for attractions/facilities directly affected by the proposed AHD.

### **Hydro-dynamics, Sediments and Coastal Processes**

- 5.35 This chapter would cover the impact of the proposed development on hydrodynamics, coastal processes and sediment disturbance.

### **Baseline Environment**

#### ***Geological Setting and Bathymetry***

- 5.36 Nigg Bay is a former channel of the River Dee, which has been partially infilled with glacial tills and sediments associated with the last Ice Age. The channel is carved into underlying bedrock and reported to descend to up to 40 m below sea level.
- 5.37 The bedrock which encircles the bay comprises of Dalradian Psammites and Semiphites, originally formed in shallow areas as sedimentary rocks and transformed by low grade metamorphism. Igneous intrusions have subsequently altered the sequence. The igneous rock is estimated as Archaean to Silurian in period.
- 5.38 The beach at Nigg Bay consists of coarse fine sands, with a lot of large cobbles and pebbles. The present bathymetry has a slope of about 1:12. This is the natural slope for the present wave climate for this specific beach material.
- 5.39 A seabed investigation in Nigg Bay for an outfall pipe indicated a uniform cover of sandy gravels and gravel and sand seaward of approximately 500m from the beach. Seabed samples were mostly described as brown fine sand with traces of medium sand. In places there were traces of broken shell. This overlies soft, silty and sandy clays. The sediments in the nearshore zone, deepening to -40mOD, were predominately sandy. Beyond this the sediments become progressively more gravelly, up to approximately 30% gravel. There was a low mud content of less than 10%. Within the sand fraction there was a low carbonate content of less than 10% by weight and was generally of a gravel grade.
- 5.40 In relation to the neighbouring coastline, both Greg and Girdle Ness are rocky with patches of stones (pebbles and cobbles) in front of them, while the foreshore is sandy. This pattern continues to the south with a rocky shore with patches of pebbles and cobbles in front of them and a sandy foreshore.
- 5.41 North of Girdle Ness is the entrance of the River Dee and Aberdeen port. The alluvial sediments are described as gravel and sand capped by silty sandy clay deposits.
- 5.42 North of the river Dee, a straight stretch of coast is found with beach stretches, regularly defended by groins along southern stretches near Aberdeen. Further north, the beaches are undefended and appear to be stable.

#### ***The Existing Flow Regime and Littoral Drift***

- 5.43 During the ebb tide period, while flow is exiting from the existing Aberdeen harbour into the sea, the flow in the sea outside the existing harbour is towards the NW. South of Nigg Bay the current runs parallel to the coast towards the NE, so the flow turns towards the NW near to Girdle Ness. This in turn means that the tidal stream is crossing the mouth of Nigg Bay during the ebb tide

period and is considered likely to be causing a weak anti-clockwise flow within Nigg Bay during this phase of the tide.

- 5.44 At low water the flow crosses the mouth of the Bay going northward and a weak circulation would still be expected in the bay, although it is very shallow.
- 5.45 As the tide begins to rise from low water, the northward flow stops and reverses. The flood flow then starts with water going SE across the entrance to Aberdeen Harbour and some of it enters the harbour to raise the water level in that location. During the south-going flow a race is formed off Girdle Ness. This implies very strong current speeds during the south going flow off Girdle Ness.
- 5.46 South of Greg Ness the flow turns to follow the coastline running towards the SW. Between Girdle and Greg Nesses the tidal race turns from SE to SW. It is not clear where this would happen as the race could head rather offshore of Greg Ness leaving a larger area of slow moving water inland of it. It is considered more likely the race would turn and the flow would rejoin the coastline at Greg Ness. In either case the generally southbound flow during the flood tide is likely to create a slow moving clockwise gyre inside Nigg Bay during this period. At high water the flow runs southward and turns northward again shortly after high water.
- 5.47 As identified within the Aberdeen Bay Coastal Protection Study (1998), Aberdeen Bay is a dynamic sediment system. Offshore, sediment drift along the Aberdeen coast is generally north to south. However, the direction of littoral (shoreline) drift is known to split around the rockhead groynes on Aberdeen Beach (groyne 16). To the north of the groynes, littoral drift is predominantly south to north in direction, and to the south predominantly north to south in direction. Overall there is a net northerly drift of sediment within Aberdeen Bay.
- 5.48 With respect to Nigg Bay, littoral drift is affected by the dynamics of the Dee. The Dee will either import it to deposit in the dredging areas or push it offshore along Girdle Ness to deep water. In either case the sediment is lost to the coastal system. This explains the presence of the groins along the Aberdeen beaches just north of the Dee. These intercept the littoral drift southward and prevent the loss of sediment to the Dee. As a result, only limited amounts of sediment are expected to reach Nigg Bay by littoral drift. Within that context, Nigg Bay is considered to be a relatively self contained cove between headlands (Girdle and Greg Ness respectively), with a small northerly drift of sediment therein.

### ***Designated Sites***

- 5.49 The proposed development is immediately adjacent to the Nigg Bay Site of Special Scientific Interest (SSSI). The site is designated as a SSSI for its geological importance for its Quaternary stratigraphy associated with glacial deposition. The cliff section shows six distinct horizons of material ranging from basal sands and gravels, bands of red and grey till, and further layers of sands and gravels. With the exception of the basal sands and gravels which are believed to have been deposited during an earlier glacial event, all of the deposits are believed to relate to the Late Devensian period. Since the 19<sup>th</sup> century Nigg Bay has been recognised as a key reference site for interpreting glacial history and ice movement in north-east Scotland.
- 5.50 The condition of the Nigg Bay SSSI was last assessed by Scottish Natural Heritage (SNH) in 1999 and was deemed to be in an unfavourable recovering state because part of the feature was obscured by tipping that was carried out as part of previous coastal protection measures undertaken in 1984. These tipping works have created a platform along the extent of the cliffs which has effectively halted erosion of the cliff face and also enabled vegetation to grow which has further covered the deposits.
- 5.51 A report on managing coastal erosion in Aberdeen by Halcrow in 1999 recommended that there be no active intervention at Nigg Bay, thereby allowing coastal processes to continue to act on the beach and the cliff and resulting in the SSSI deposits becoming re-exposed in the longer term. An inspection by SNH in 2010 confirmed that coastal erosion is breaking down the platform and identified that it is considered likely that the southern section of the SSSI will be re-exposed within a few years.

## **Potential Effects**

- 5.52 The proposed development involves capital dredging, land reclamation and construction of breakwaters, all of which have the potential to alter the hydrodynamic and sedimentary regime. The potential effects of the changes on the receiving environment are discussed below.

### ***Coastal Impact within Nigg Bay***

- 5.53 Preliminary desk assessments suggest that the waves will try to straighten the beach out by pushing sediment from south to north. This could lead to some erosion on the southern side of the beach (below the SSSI) and minor depositions on the northern part of the remaining beach.

### ***Coastal Impact on Neighbouring Coastline***

- 5.54 The southern breakwater of the proposed development will be constructed in water depths of around 10 metres below Chart Datum. In this location it is not going to affect the transport of non-cohesive sediments along the foreshore and the shoreface due to the action of the breaking waves and the longshore current.
- 5.55 The proposed breakwater would intercept sediment being driven from north to south by the tidal currents during the flood phase. This could potentially result in some lowering of the foreshore to the south of the proposed harbour. However, given that the coastline south of Nigg Bay is already depleted of sediments (consisting of rocky cliffs rather than beaches) and that tidal driven transport is expected to be low, it is considered that the minor reduction in sediment supply development to the foreshore will not affect the coast to the south of the proposed development.
- 5.56 The proposed southern breakwater would create a shadow zone for waves from the north. Consequently there may be some sedimentation just south of the breakwater during periods of calm weather. However, this effect would be localised in the direct vicinity of the breakwater. Furthermore, it is expected that such deposits would only be temporal as the more easterly and south-easterly waves during storms would transport this sediment offshore.
- 5.57 Any material being transported north along Nigg Bay is likely to be deflected offshore by the proposed breakwaters rather than becoming trapped. These deflections would be very similar to the present deflections by Girdle Ness and Greg Ness as the foot of the proposed breakwater is intended to be at a similar depth as the foot of both Nesses. Furthermore, the changes in the sediment transport due to the proposed harbour would be orders of magnitude smaller than the amounts of sediments flowing in and out of the Dee with the tides. Consequently it is concluded that the offshore deflection of sand by the proposed breakwaters would have no measurable effect on the stability of the beaches to the north of the Dee.
- 5.58 There is the potential for sediment transport just outside Nigg Bay as a result of the proposed development. The seabed there consists of fine to coarse sand. Such sediment transport could lead to significant sedimentation resulting in turn in a significant corresponding loss of channel depth in the entrance to the proposed harbour.

### ***Impact on Designated Sites***

- 5.59 Although no permanent structures will be located within the SSSI, it is noted that structures and capital dredging are proposed in close proximity to the site, both of which have the potential to affect coastal processes. In addition, there is the potential for direct disturbance of the site during temporary construction works. The assessment will seek to establish if activities associated with the AHD (including temporary construction works, permanent new works, capital and maintenance dredging, vessel movements and management activities) would result in the destabilisation of the cliff or significantly influence the current pattern of coastal erosion at Nigg Bay SSSI
- 5.60 SNH has set two management objectives for the Nigg Bay SSSI:
- Maintain the visibility of the exposures. Vegetation growth has obscured some of the exposures. The vegetation stabilises the slope and is relatively easy to clear, so SNH

recommends that it only needs to be removed if suitable research projects arise. SNH will continue to monitor the extent of vegetation and may seek a clearing programme if cover increases and reduces the extent of the exposures;

- Maintain access to the site and to the exposures.

5.61 It is not considered that the proposed development will adversely impact directly upon the first management objective as there will be no direct disturbance of the cliff face. However, there is the potential for the development to alter the current erosive processes occurring at the base of the cliff and hence a hydrodynamic study will be undertaken to investigate this issue.

### **Approach and Methodology**

5.62 The preparation of this ES Chapter will require undertaking a hydrodynamic modelling study to demonstrate the extent of any potential impacts. The study will be undertaken in the following steps:

- (1) **Data collection and analysis.**
- (2) **Simulation of existing coastal process:**
  - Waves
  - Tides
  - Littoral Currents
  - Sediment Transport
- (3) **Coastal processes with proposed development in place:**
  - Waves
  - Tides
  - Littoral Currents
  - Sediment Transport
- (4) **Assessment of the impact of proposed development on:**
  - Coastal processes within Nigg Bay and on the neighbouring coastline
  - Water circulation
  - The distribution of sediments around Nigg Bay
  - The designated features of Nigg Bay SSSI
- (5) **Refinement of the proposed harbour and breakwater layout to maximise the benefit and minimize and adverse impact of the proposed development.**

5.63 The study will be undertaken using coastal process computational model software and the assessment will align with the following steps.

#### ***Step 1: Baseline Data Collection and Analysis***

5.64 In order to undertake the assessment, existing data and reports will be collected and reviewed by the EIA project team. There is a large amount of data available from previous studies which will be taken into account to establish the baseline situation. Once the baseline situation has been established it will be discussed with the regulators and relevant statutory bodies to ensure that agreement on the current situation is reached.

#### *Water Level Data*

5.65 The boundary conditions for the tidal modelling will be provided from output from the model. The time series of tidal elevation along the boundaries of the model will be generated using a global tidal model. This will be based on the prediction of tidal elevations using semidiurnal and diurnal tidal constants. The calibration of the model in terms of tidal level will be checked against a number of tide gauge stations and predicted tidal elevations.

#### *Offshore Wave and Wind Data*

5.66 Recorded (historical) wave and offshore wind data for the waters around the UK will be analysed to provide a profile of the wave climate offshore of the site. Specific conditions, such as extreme events, will be transformed to the site to assess the exposure and potential change in exposure due to the proposed development. In addition, more 'typical' conditions will be identified in order to inform the modelling of the longer term sediment transport regime.

### *Bathymetry*

- 5.67 The bathymetry for the study will be taken from the most recent Bathymetry survey of Nigg Bay at the time of assessment. Where necessary, additional information about the shoreline will be gathered during the site visit which will be undertaken by as part of the assessment process.

### *Sediment Data*

- 5.68 The sediment data for the study will be derived from a combination of sources. This will include existing survey data and from visual inspection of the site and shoreline, but will largely be reliant on a scheme of extensive geo-technical ground investigations which will be completed for the site in order to assess the structural bearing capacity of the underlying substrata, provide information of sediment type and inform the final designs and construction methods.

## **Step 2: Simulation of the Existing Coastal Process**

### *Wave Climate*

- 5.69 A detailed wave model of Nigg Bay and the surrounding study area will be developed. The data from the modelling will be used to establish the range of typical wave events that will be required as input into the assessment of the impact of the proposed development on Nigg Bay.

### *Tidal and Littoral Currents*

- 5.70 A flow model will be set up for Nigg Bay and the adjoining coastline to simulate the tidal flow and wave driven currents which results from wave action along the shoreline.

### *Sediment Transport*

- 5.71 The waves, littoral currents and the nature of the seabed sediments govern the sediment transport around the area. A range of these significant events will then be simulated using the relevant model taking account of the waves, littoral currents and variation in the seabed sediments to simulate the movement and deposition of sediment under the various hydrodynamic events. These simulations will be used as a base for assessing the changes induced by the proposed development.

## **Step 3: Coastal Processes with the Proposed Development in Place**

### *Wave Climate*

- 5.72 The wave climate around the area with the AHD in place will be simulated taking account of the wave diffraction around the ends of the proposed breakwater. The model will be run for the wave events previously identified as significant during the simulation of the existing coastal processes so that the wave data will be available for the simulation of the littoral currents and sediment transport regime.
- 5.73 If the studies indicate that the proposed development is likely to result in a significant impact on the coastal regime, then the wave models will be rerun with various breakwater layouts so as to provide data for any mitigation measures proposed in the ES.

### *Tidal and Littoral Currents*

- 5.74 The breakwaters and harbour structures together with any dredging will be placed in the littoral current flow model and the models run for the same range of conditions simulated in the models for the existing coastal processes.

### *Sediment Transport*

- 5.75 The sediment transport model set up for the simulations of the existing sediment transport regime will be altered to include the proposed AHD. The sediment transport regime with the structures in place will then be simulated using the wave and littoral current regimes as noted in

the previous paragraphs of this section. Any amendments in the causeway orientation or construction consider necessary to mitigate any impact will also be simulated in the models.

#### ***Stage 4: Assessment of Impact***

- 5.76 The results of the modelling studies will be used to prepare a chapter for inclusion in the Environmental Statement. The ES chapter will:
- Describe the existing baseline conditions in terms of tidal flows and wave conditions;
  - Identify the potential impacts on the local tidal flows, wave conditions, sediment transport regime and suspended sediments arising from the proposed development;
  - Make a comparison of the tidal currents, wave conditions and sediment transport regime using the pre-construction bathymetry and the bathymetry post construction.
- 5.77 Further studies will also be undertaken to determine the fate of the sediments put into suspension during the dredging process. An assessment will be subsequently made of the magnitude and significance of these impacts, in terms of direct, indirect and cumulative effects.
- 5.78 Where the impact assessment identifies potential impacts which can be reduced or eliminated through mitigation, such measures will be suggested in consultation with the regulators and relevant statutory bodies. Where necessary, monitoring programmes may also be incorporated as mitigation, to confirm compliance with any environmental requirements (which may be imposed through conditions attached to the marine licence) and, generally, to minimise the impact of the works in accordance with 'best practice' principles.

#### **Summary of Required Studies**

- Baseline data collation relating to water level, wind, wave, bathymetry, and sediment;
- Model simulation of wave climate, tidal and littoral currents and sediment transport without the development;
- Model effects with respect to coastal process predicting impacts from the proposed AHD.

### **Flood Risk and Surface Water Effects**

#### **Key Issues/Baseline Overview**

- 5.79 The AHD will be located within Nigg Bay straddling the terrestrial, intertidal and marine environments. The nearest watercourse terminates in Nigg Bay at its western shore. This watercourse first appears to the north of Tullos Wood and then takes a course north east towards the water treatment works to the west of Nigg Bay. Moving eastwards and to the north of the water treatment works the watercourse is then culverted below the adjacent Greyhope (Coast) Road before it terminates at the western shore of the bay. The River Dee running through Aberdeen and the existing harbour facility in the city is the largest watercourse in proximity to Nigg Bay but lies approximately 1km to the north west. Neither of these two watercourses is considered to present a flood risk according to the SEPA Flood Map (taken from the National Flood Risk Assessment data).
- 5.80 Notwithstanding this, as might be expected due to its location, Nigg Bay, its beach and the area in the northern half of the Bay up to Greyhope Road are in the 'areas at risk of flooding from the sea' category.

#### **Potential Effects**

- 5.81 This chapter of the ES will examine the potential effects on the land-side hydrological regimes, including surface water quality, drainage and the risk of flooding to the Nigg Bay area and other nearby land areas.
- 5.82 The proposed AHD has the potential to result in the following effects, all of which will be considered in the EIA:
- Changes to the risk of flooding to the site and surrounding land;
  - Changes to the risk of pollution of the River Dee and coastal waters;

- Changes to the local drainage regime and subsequent capacity implications;
- Net changes in surface run-off due to the establishment of hardstanding associated with the facility.

5.83 Secondary effects upon the biodiversity of the River Dee and coastal waters will also be considered although more likely to be assessed as part of the natural heritage assessment process.

### **Approach and Methodology**

5.84 The surface hydrological regime at the AHD will be investigated in detail by way of the baseline data gathering and initial discussions with the EA and others.

5.85 Impacts to surface hydrology (including water quality and drainage) will be identified and assessed in accordance with:

- Relevant provisions of the Water Framework Directive;
- Relevant objectives of the Dee Catchment Management Plan 2007;
- The Environmental Objectives (Groundwater) Regulations 2010 (S.I. 9 of 2010).

5.86 The site drainage will be taken into account (pre/post development), alongside any sustainability measures proposed to attenuate run off. The assessment will also examine the potential for construction activities to result in sediment and contaminant release to surface waters and comment on the effectiveness of the measures contained in the proposed Construction Environmental Management Plan (CEMP) to avoid or minimise such occurrences.

5.87 A Flood Risk Assessment (FRA) will be carried out in accordance with the Scottish Planning Policy (SPP) and the results of this will inform the relevant aspects of the EIA and scheme design. The FRA will be appended to the Environmental Statement.

5.88 Ongoing consultation with SEPA will be carried out in order to establish the appropriate rainfall event level and attenuation targets that should be achieved by the AHD design, including freeboard levels for buildings and infrastructure.

### **Summary of Required Studies**

- Desk based baseline data collation relating to key surface water features, groundwater regimes, abstractions and discharges, and flood risk;
- Site visit to 'truth' the data collated for the desk based assessment and identify any other key environmental receptors not identified during the desk based study;
- Run flood risk assessment for the AHD proposal.

## **Nature Conservation**

### **Key Issues/Baseline Overview**

5.89 Recognising that the potential effects of the AHD proposal on marine and terrestrial ecology are some of the more complex and important areas of the EIA, the Environmental Statement (ES) will present separate chapters on:

- Fish and Shellfish;
- Benthic Intertidal and Sub-tidal Ecology;
- Marine Mammals;
- Terrestrial Ecology;

5.90 The proposed scope and content of these chapters is described in the following sections of this Scoping Report. However, in order to avoid repetition, this section describes the principal nature conservation designations and potential effects of development which are shared considerations for the different ecological assessments. A fuller account of marine and terrestrial designations,

recorded species in proximity to the AHD, and survey methodologies will be provided in the ES chapters.

### European Designations

- 5.91 Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) form part of the Natura 2000 network of protected areas in the European Union. The Natura 2000 network is the EU contribution to the “Emerald Network” of Areas of Special Conservation Interest (ASCIs) set up under the Bern Convention on the conservation of European wildlife and natural habitats. SACs are designated under the Habitats Directive 92/43/EEC (Conservation of Natural Habitats and of Wild Fauna and Flora), whereas SPAs are designated for their bird interest under the EC Birds Directive 2009/147/EC (the codified version of Council Directive 79/409/EEC).
- 5.92 The SAC, SPA and Ramsar designations in proximity to the AHD (within 20km) will be considered in the EIA, as identified in Table 5.4, and Figure 5.

### Local and National Designations

- 5.93 Under the Wildlife and Countryside Act 1981 (as amended), the UK designates any land which is of special interest for any of its flora, fauna, geological or physiographic features as Sites of Special Scientific Interest (SSSIs). In addition, the National Parks and Countryside Act 1949 and the Wildlife and Countryside Act 1981 (as amended) requires SNH to designate National Nature Reserves (NNRs) for the best examples of a particular habitat, and Local Authorities to designate Local Nature Reserves (LNRs) for areas of local wildlife interest and importance. Local authorities can also designate areas of local conservation interest, known in Local Nature Conservation Site's (LNCS).

Site	Area (ha)	Distance from Development	Conservation Interests and Status
River Dee SAC	2446.82	0.6 km	Designated for otter ( <i>Lutra lutra</i> ), Atlantic salmon ( <i>Salmo salar</i> ) and freshwater pearl mussel ( <i>Margaritifera margaritifera</i> ). The status of otter and Atlantic salmon are 'favourable maintained' and freshwater pearl mussel is 'unfavourable no change'.
Red Moss of Netherley SAC	92.52	14.5 km	Designated for active raised bog and degraded raised bog. The status for both features is 'unfavourable no change'.
Garron Point SAC	15.58	17.1 km	Designated for narrow-mouthes whorl snail ( <i>Vertigo angustior</i> ).
Sands of Forvie SAC	734.05	18.9 km	Designated for embryonic sand dunes, shifting sand dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes'), decalcified fixed dunes with <i>Empetrum nigrum</i> , and humid dune slacks.
Loch of Skene Ramsar	120.89	17.5 km	Designated for non-breeding greylag goose ( <i>Anser anser</i> ). Its status is 'unfavourable declining'.
Ythan Estuary and Meikle Loch Ramsar	314.17	18.8 km	Designated for sandwich tern ( <i>Sterna sandvicensis</i> ) (breeding), pink-footed goose ( <i>Anser brachyrhynchus</i> ) (non-breeding) and waterfowl assemblage (non-breeding). The status of the features are 'favourable maintained'.
Loch of Skene SPA	120.89	17.5 km	Designated for non-breeding greylag goose ( <i>Anser anser</i> ). Its status is 'unfavourable declining'.
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	1016.24	18.8 km	Designated for aggregations of breeding birds: little tern ( <i>Sternula albifrons</i> ), sandwich tern ( <i>Sterna sandvicensis</i> ) and common tern ( <i>Sterna hirundo</i> ); and non-breeding birds: lapwing ( <i>Vanellus vanellus</i> ), eider ( <i>Somateria mollissima</i> ), redshank ( <i>Tringa tetanus</i> ), pink-footed goose ( <i>Anser brachyrhynchus</i> ), and 'waterfowl assemblage'. The status of common tern is 'unfavourable declining'; the status of all other features is 'favourable maintained'.
Nigg Bay SSSI	4.47	0 km	Designated for quaternary of Scotland geology and geomorphology. The status is 'unfavourable recovering'.
Cove SSSI	15.01	3.5 km	Designated for supralittoral rock – maritime cliff and Dickie's bladder-fern ( <i>Cystopteris dickieana</i> ) (vascular plant). Status of feature is 'favourable maintained'.
Scotstown Moor SSSI	12.49	6.9 km	Designated for springs (including flushes). The status of this feature is 'unfavourable declining'.
Findon Moor SSSI	25.58	7.0 km	Designated for lowland dry heath and lowland wet heath habitats.

TABLE 5.4 NATURE CONSERVATION DESIGNATIONS WITHIN 20KM OF AHD			
Site	Area (ha)	Distance from Development	Conservation Interests and Status
Corby, Lily and Bishops Lochs SSSI	35.17	10.1 km	Designated for the following habitats: hydromorphological mire range, open water transition fen, eutrophic loch, mesotrophic loch. The status of mesotrophic loch is 'unfavourable declining'.
Balmedie Quarry SSSI	6.73	13.0 km	Designated for Caledonian igneous petrology. The status of the feature is 'favourable maintained'.
Red Moss of Netherley SSSI	93.17	14.5 km	Designated for raised bog habitat. Its status is 'unfavourable no change'.
Foveran Links SSSI	203.72	15.7 km	Designated for coastal geomorphology of Scotland and sand dunes. Status of features are 'favourable maintained'.
Old Wood of Drum SSSI	45.63	17.3 km	Designated for upland oak woodland.
Loch of Skene SSSI	121.76	17.5 km	Designated for non-breeding birds: greylag goose ( <i>Anser anser</i> ), common gull ( <i>Larus canus</i> ), goldeneye ( <i>Bucephala clangula</i> ), pink-footed goose ( <i>Anser brachyrhynchus</i> ). The status of goldeneye and common gull are 'favourable maintained' and greylag goose is 'unfavourable declining'.
Sands of Forvie and Ythan Estuary SSSI	992.78	18.8 km	Designated for vascular plant assemblage, sand dunes, saltmarsh, coastal geomorphology of Scotland, non-breeding birds: pink-footed goose ( <i>Anser brachyrhynchus</i> ) and eider ( <i>Somateria mollissima</i> ); and breeding birds: eider ( <i>Somateria mollissima</i> ), common tern ( <i>Sterna hirundo</i> ), arctic tern ( <i>Sterna paradisaea</i> ), little tern ( <i>Sternula albifrons</i> ), sandwich tern ( <i>Sterna sandvicensis</i> ) and 'breeding bird assemblage'. The status of sand dunes, pink-footed goose and common tern are 'unfavourable declining'. The status of coastal geomorphology of Scotland, sandwich tern, eider and the 'breeding bird assemblage' is 'favourable maintained'.
Forvie NNR		18.8 km	Mobile, fixed and dune heath habitats stretch along the coastline. The estuary is a feeding ground for wintering waders and wildfowl and breeding terns and eiders.
Kincorth Hill LNR	41	2.6 km	Animals such as roe deer, foxes, rabbits, voles and shrews are regularly seen, plus meadow brown, red admiral and painted lady butterflies.
Donmouth LNR	36	4.2 km	Large assemblages of birds use the site for feeding and roosting. Grey seals are also seen in the river estuary.
Scotstown Moor LNR	34	7.0 km	Habitats found on the site include bog, nutrient rich flushes, marsh grassland, plantation woodland and two ponds. 250 species of flowering plants have been recorded on site, along with many birds, mammals and invertebrates,
Den of Maidencraig LNR	15	7.3 km	Habitats include ancient and new woodland, marshy grassland, a pond and burn. There is a variety of birds as well as foxes and roe deer.
Arnhall Moss LNR	9.6	13.1 km	Raised bog is a key feature, alongside species such as wood sorrel ( <i>Oxalis acetosella</i> ) and chickweed wintergreen ( <i>Trientalis europaea</i> ). Common woodland and wetland birds are also found here as well as pipistrelle bats, roe deer, foxes and stoats.

5.94 Other locally important sites that will also be considered in the EIA include Ancient and Long Established Woodland, country parks, semi-natural woodland, gardens and designed landscapes, and Local Nature Conservation Sites (LNCS).

5.95 Below is a list of LNCS that will be considered in the EIA (NB, this list is not exhaustive):

- Balnagask to Cove;
- Tullos Hill;
- Kincorth Hill;
- Loirston Loch;
- River Dee corridor;
- Den of Leggart;
- River Don Corridor.

### **Marine Protection Areas**

5.96 The Marine and Coastal Access Act (2009) introduced a framework to create a new type of Marine Protected Areas (MPAs) called Marine Conservation Zones (MCZs). There are no

current or proposed MCZ designations in the vicinity of Aberdeen or off the coast of Aberdeenshire, Kincardineshire or Angus, however the identification and formal designation of such site is in progress and this position will be reviewed as the EIA progresses.

### ***Biodiversity Action Plan (BAP) Habitats and Species***

Coastal areas are highlighted in the North East Scotland Local Biodiversity Action Plan (LBAP) (2000), within which the Marine Habitats Action Plan details important habitats and a number of at risk species dependant on marine habitats. These are detailed in the relevant sections below.

### **Potential Effects**

- 5.97 Potential environmental effects of the AHD development on the different marine and terrestrial ecology receptors are described in the following topic-specific sections. However, some common effects of Harbour related developments are summarised below, with reference to EC Guidelines on the Implementation of the Birds and Habitats Directive in Relation to Port Developments (European Commission, 2011), EIA guidance, and the experience of the project team.
- 5.98 Potential impacts from the construction and operational phases could include:
- Dredging can have implications for sediment transport, which can in turn affect marine wildlife, and on potential remobilisation of toxic substances and nutrients, increased suspended solids, reduced visibility and reduction in dissolved oxygen;
  - Cargo handling and storage, which may cause run-off, spills, or leakages to the marine environment. Water pollution and bottom contamination resulting from these effluents may lead to deterioration of aquatic biota and fishery resources;
  - Discharge of ships' ballast water resulting in the possible introduction of non-native species;
  - Noise and vibration, which can have impacts on bird, fish and aquatic mammalian behaviour patterns;
  - Increased levels of artificial light, which can disturb birds and other wildlife and alter or hinder the migration of fish through estuaries;
  - Direct loss of habitats from within the footprint of the proposed dredging works and placement of additional structures;
  - Temporary increases in suspended sediment (SS) concentrations from dredging and construction works (plume effects), which may have direct effects (e.g. physical disturbance, smothering), or indirect effects (e.g. water quality impacts due to remobilisation of toxic substances and nutrients and reduction in dissolved oxygen) on intertidal and sub-tidal habitats and species;
  - Changes to the hydrodynamic regime and sediment transport leading to impacts on habitats such as abrasion and scour effects;
  - Colonisation of structures leading to a change in the intertidal and sub-tidal ecology and/or an increase in biodiversity;
  - Introduction of chlorination/biocidal products used to prevent fouling of ship hulls;
  - Accidental introduction of marine and terrestrial non-native species to the area during construction or operation/maintenance e.g. from discharges such as ballast waters and on hard surfaces such as new piled platforms and quays.

### **Approach and Methodology**

- 5.99 The approach and methodologies for the specific marine and terrestrial ecology topics are described in the relevant sections below.

### **Summary of Required Studies**

- 5.100 See below.

## Marine Ecology – Fish and Shellfish

### Key Issues/Baseline Overview

- 5.101 A number of fish and shellfish species are listed in the North East Scotland Biodiversity Action Plan may be present in the Nigg Bay area, including:
- UK Priority Species: Freshwater pearl mussel\* (FWPM) (*Margaritifera margaritifera*) fan mussel\* (*Atrina fragilis*) and horse mussel (*Modiolus modiolus*);
  - UK Species of Conservation Concern: river lamprey\* (*Lampetra fluviatilis*), sea lamprey\* (*Petromyzon marinus*) and Atlantic salmon\* (*Salmo salar*).
- 5.102 Other species that are likely to be in the area include European eel (*Anguilla anguilla*) and sea trout (*Salmo Trutta*); these species along with those marked with an asterisk (\*) above are classed as Priority Species in the UK BAP. Other marine species are likely to be present in the area and there is a distinct possibility that species use the shallows of Nigg Bay for foraging, spawning and nursery grounds, e.g. by sandeels *sps*. There is anecdotal evidence of basking sharks in the area. Sandeels are known to be an important food source for sea birds which will be taken into account when assessing the impacts to both sandeels and sea birds in the EIA.
- 5.103 The River Dee SAC is designated for Atlantic salmon, otter (*Lutra lutra*) and FWPM. As part of the EIA further consultation and surveys will be undertaken to determine presence and abundance of this species in the area and how they may be impacted by the development.

### Potential Effects

- 5.104 A list of potential environmental impacts that could have an effect on the fish and shellfish ecology are summarised below.
- 5.105 During the construction phase of the development possible issues and impacts include:
- Potential effect on migratory and non-migratory fish from construction activities including noise and vibration caused by dredging, piling, shipping movement disturbance and lights which may alter fish movement and behaviour;
  - Potential effect on the migratory movements on salmonids up the coast line;
  - Disturbance to sediments resulting in the increased mobilisation of contaminants associated with bottom sediments which may produce avoidance reactions in migratory fish and cause a loss of habitat for juvenile fish which use the region in the vicinity of AHD as a nursery;
  - Introduction of non-native species from discharges such as ballast waters;
  - Short-term changes in dissolved oxygen linked to disturbance of bottom sediments;
  - Disturbance to commercial and recreational fisheries by increased shipping movements, dredging, piling and noise pollution.
- 5.106 Potential fishery issues associated with the operation phase include:
- Change in benthic prey species as a result of a change in hydrodynamic regime as well as the colonisation of hard structures;
  - Potential change in species abundance and composition due to change in light levels from the AHD; operations.
  - Introduction of chlorination/ biocidal products used to prevent fouling of ship hulls. Biocides are toxic and may cause avoidance reactions in migratory fish and salmon in particular.
- 5.107 Due to the relationship between salmonids and FWPM, potential secondary effects on FWPM associated with the River Dee SAC will also be considered.
- 5.108 In terms of geographic scope, the assessment will consider the area potentially affected by the dredging works. Particular attention will be given to fish and shellfish species within, and in the immediate vicinity of, the development footprint where direct habitat losses and a range of other effects (e.g. changes in hydrodynamic regime, disturbance etc) will be assessed.

## **Approach and Methodology**

- 5.109 A comprehensive desk study will be undertaken to provide information on local fish and shellfish ecology. Areas of consideration will include:
- Fish assemblage;
  - Spawning and nursery grounds;
  - Migratory species;
  - Sharks, skates and rays;
  - Species of commercial interest;
  - Shellfish assemblage.
- 5.110 Results of the desk study will inform the requirements of further surveys that may be required to establish fish and shellfish species abundance and their use of Nigg Bay and the surrounding area that may be affected by the development. Surveys may include:
- Otter trawls - Sampling to collect information, primarily on the distribution, abundance, size, structure and biomass of the demersal fish populations in the study area;
  - Seine Netting - Sampling to collect information on demersal fish (primarily small and juvenile fish) including the distribution, abundance, size, structure and biomass of the fish populations in the study area.
- 5.111 Data is currently being collected to monitor the effect of on-going construction activities in the existing harbour on Atlantic salmon and will also be used to inform the EIA, where relevant.

## **Summary of Required Studies**

- Comprehensive desk based baseline data collation relating to key fish and shellfish (inclusive of consultations with key stakeholders);
- Where desk based studies and consultations with key stakeholders indicate the need for surveys, they will be agreed with Marine Scotland prior to commencement. Possible surveys are considered to be otter trawl and seine netting and this will be clarified further during the EIA;
- Field data from the ongoing monitoring of the existing harbour will be used to supplement surveys.

## **Marine Ecology – Benthic Intertidal and Sub-tidal**

### **Key Issues/Baseline Overview**

- 5.112 No benthic records for Nigg Bay have been found during the desk study search.

### **Potential Effects**

- 5.113 Potential effects that could be realised at sensitive benthic and sub-tidal habitats and species include:
- 5.114 During the construction phase of the development:
- Direct loss of habitats from within the footprint of the proposed dredging works and placement of additional structures;
  - Temporary increases in suspended sediment (SS) concentrations from dredging and construction (plume effects), which may have direct or indirect effects on intertidal and sub-tidal habitats and species;
  - Temporary increases in sediment deposition from SS plumes, which may lead to smothering of susceptible habitats and species;
  - Introduction of non-native species from discharges such as ballast waters and on hard surfaces such as new piled platforms and quays;
  - Release of contaminants bound in sediments during construction and dredging works;
  - Visual, noise and light disturbance to intertidal and sub-tidal species during construction.

- 5.115 During the operation phase of the development, possible issues and impacts include:
- Introduction of chlorination/biocidal products used to prevent fouling of ship hulls;
  - Change in hydrodynamic regime and sediment transport leading to changes in habitats such as scour effects; and
  - Colonisation of structures leading to a change in the intertidal and sub-tidal ecology and/or an increase in biodiversity.

5.116 Particular consideration will be given to intertidal and sub-tidal resources within and in the immediate vicinity of the potential development footprint area and those within the tidal excursion.

#### **Approach and Methodology**

5.117 In order to provide a complete baseline understanding for the purposes of the EIA, the following benthic (intertidal and sub-tidal) surveys are recommended. The scope and methodologies of the surveys will be agreed in consultation with Marine Scotland.

5.118 Benthic Sub-tidal Surveys:

- A detailed desktop review of existing sub-tidal benthic ecological data for the area surrounding the site to provide context for the site-specific surveys;
- Benthic sub-tidal grabs - grab sampling for benthic faunal and sediment granulometry analysis;
- Visual survey – TV / still photography survey to supplement the grab survey in determining sub-tidal habitat characteristics.

5.119 Benthic Intertidal Surveys:

- A detailed desktop review of existing intertidal benthic ecological data for the area surrounding the site to provide context for the site-specific surveys;
- Intertidal Phase 1 Survey - to determine shore type, wave exposure and sediments/substrates present. This will provide general descriptions of species/biotopes present across the wider area together with the spatial relationships between these;
- Intertidal Phase 2 Survey - Split level cores should be taken for sediment granulometry and biological analysis (benthic infauna) in order to quantify the species present at selected sites within proximity to the development site.

5.120 Desktop reviews will include liaison with organisations, such as Aberdeen University, local biological records office, Marine Scotland and SNH.

#### **Summary of Required Studies**

- With no established baseline data for the bay identified from preliminary studies, two key field surveys will be undertaken – benthic sub-tidal surveys and benthic intertidal surveys;
- For sub-tidal surveys detailed consultations will be held with relevant stakeholders to provide context to, and inform, survey methods. Both grab sampling and visual survey will be used to establish the baseline;
- For intertidal surveys a phase 1 survey will be completed to provide general descriptions of the species and biotypes present. This will be followed by a phase 2 survey focussed on split level cores.

### **Marine Ecology – Marine Mammals**

#### **Key Issues/Baseline Overview**

5.121 The North East Scotland LBAP and the UK BAP lists harbour porpoise (*Phocoena phocoena*) and bottlenose dolphin (*Tursiops truncatus*) as UK priority species. Other species known to occur in the area and are also listed on the UK BAP include:

- Common dolphin (*Delphinus delphis*);
- Risso's dolphin (*Grampus griseus*);
- White-beaked dolphin (*Lagenorhynchus albirostris*);
- Humpback whale (*Megaptera novaeangliae*);
- Long-finned pilot whale (*Globicephala melas*);
- Minke whale (*Balaenoptera acutorostrata*);
- Grey seal (*Halichoerus grypus*);
- Common seal (*Phoca vitulina*).

5.122 Further, current baseline data on marine mammals will be gathered during the EIA process by means of a more detailed Marine Mammal Desktop Study.

### **Potential Effects**

5.123 The EIA will assess potential impacts arising from the proposed AHD development, including potential effects on marine mammals during the construction and operational phases of the scheme. A list of potential environmental impacts that could have an effect on marine mammals are summarised below, with reference to the NPS for Ports (DFT, 2012) and other guidance documents listed in Section 4 above.

5.124 During the construction/decommissioning phase of the development possible issues and impacts include:

- Submarine acoustic noise disturbance to marine mammals, in particular during the piling activity;
- Noise and visual disturbance to seals on intertidal haul out sites;
- Physical disturbance to marine mammals due to vessel activity in the area;
- Effect of increased sedimentation on the behaviour of marine mammals during dredging works;
- Indirect effects of prey availability due to changes in the fish and shellfish resources as a result of the proposed construction works.

5.125 During the operational phase of the development possible issues and impacts may include:

- Disturbance to marine mammals from potential increase in the numbers of vessels, as well as an increased risk of collision;
- Change in prey species (i.e. benthic, fish and shellfish species) as a result of change in light levels from the development, change in hydrodynamic regime, colonisation of structures and change in the number of vessels in the area.

5.126 In terms of geographic scope, the assessment will consider the area potentially impacted by the dredging at the extent of the tidal excursion.

5.127 Noise effects are described further below.

### **Approach and Methodology**

5.128 A thorough desktop review will be conducted of all known literature and data sets for marine mammals in the local area and also in a wider context for the east coast of Scotland to help establish possible connectivity with designated sites (e.g. the Firth of Tay and Eden Estuary SAC for seals and the Moray Firth SAC for bottlenose dolphins). This will involve consultation with the Sea Mammal Research Unit (SMRU), St Andrews who are, for example, conducting harbour and grey seal telemetry studies; and the University of St Andrews and University of Aberdeen who are conducting bottlenose dolphin studies.

5.129 Surveys to determine presence/absence, abundance and other behavioural aspects of marine mammals using the Nigg Bay area will be conducted. These surveys will be conducted for at least 1 year to establish seasonal variations. The scope and methodologies of the surveys will be agreed in consultation with SNH and Marine Scotland.

- 5.130 Shore based observations will be used to determine whether marine mammals are entering Nigg Bay. These could be conducted in conjunction with the shore based sea bird surveys.
- 5.131 Other targeted surveys could include static Passive Acoustic Modelling (PAM) for cetaceans (whales and dolphins) and active sonar or telemetry for pinnipeds (seals) and the need for such surveys will be discussed with SNH and Marine Scotland prior to commencing survey works.

### **Summary of Required Studies**

- A thorough desk based assessment will be completed including for known literature and data sets for marine mammals;
- Consultations will be held with the Sea Mammal Research Unit (SMRU) to obtain data from ongoing studies;
- Surveys will be agreed with SNH and Marine Scotland prior to commencement and conducted to establish presence/absence, abundance and behavioural data for species present. This will be completed over 1 year to establish seasonal variations;
- Where considered to be required in light of emerging detailed proposals for construction and operation of the AHD, Passive Acoustic Modelling (PAM) for cetaceans (whales and dolphins) and active sonar or telemetry for pinnipeds (seals) will be completed. The need for such surveys will be discussed with SNH and Marine Scotland prior to commencing survey works.

## **Terrestrial Ecology**

### **Key Issues/Baseline Overview**

- 5.132 A number of coastal habitats and terrestrial species identified in the North East Scotland LBAP as being locally and nationally important, including (but not limited to):
- Habitats (and associated vegetation): maritime cliff and slope, coastal scrub, coastal vegetated shingle, mudflats;
  - UK Priority Species: European otter (*Lutra lutra*), pipstrelle bat (*Pipistrellus pipistrellus*) and number of passerines and waders;
  - UK Species of Conservation Concern: Daubenton's bat (*Myotis daubentonii*) and number of passerines and waders.
- 5.133 It is noted that the sea pea (*Lathyrus japonicas*) is present in the Nigg Bay area. Sea pea is classed as 'locally important species' in the North East Scotland Local Biodiversity Action Plan. Nigg Bay is one of four remaining mainland sites for this plant in Scotland (although there have been recent projects to reintroduce the plant in Angus). AHB has also recently been advised of the potential presence of the oysterplant (*Mertensia maritima*) within the Bay. It is afforded a local status within the Estuarine and Intertidal Habitats Local Habitat Action Plan of the North East Scotland LBAP. Potential impacts from AHD on these species will be considered within the EIA and associated mitigation and enhancement actions will be identified and agreed with SNH

### **Designated Sites**

- 5.134 The designated sites detailed in the 'Overview of Nature Conservation Considerations' Section above will be considered in relation to terrestrial species and habitats and potential connectivity between the designated sites and the AHD site.
- 5.135 Otter (*Lutra lutra*) is a designated species for the River Dee SAC. Although otter is primarily associated with freshwater habitats, they are known to use shoreline habitats for foraging.
- 5.136 Nigg Bay has the potential to be used by breeding, wintering and passage birds associated with SPA's on the east coast of Scotland, and wider wintering populations of seaduck, divers and shorebirds. Designated species associated with the following SPA's that will be considered (as a minimum) in the EIA include:
- Buchan Ness to Collieston Coast SPA;

- Fowlsheugh SPA;
- Ythan Estuary, Sands of Forvie and Meikle Loch SPA;
- Montrose Basin SPA.

### **Potential Effects**

- 5.137 No direct land take of any ecologically designated areas is proposed as part of the AHD development.
- 5.138 The assessment of potential effects would take into account the specific characteristics of the project. In assessing the potential effects, consideration would be given to a number of parameters, including:
- Confidence in predictions;
  - Magnitude, extent and duration;
  - Reversibility;
  - Timing and frequency.
- 5.139 The potential impacts of the construction and operation of the AHD include:
- Direct sub-tidal habitat loss;
  - Habitat fragmentation;
  - Habitat deterioration;
  - Disturbance to species;
  - Introduction of new substrate/habitat;
  - Pollution of land and watercourses.
- 5.140 Impacts to wildlife beyond the immediate AHD boundary (noting that impacts potentially arising from changes to sediment movement and water flows are addressed in the previous marine ecology sections) are likely to include:
- Disturbance associated with lighting and human movements;
  - Disturbance associated with noise.

### **Approach and Methodology**

- 5.141 An important aspect of scoping is to determine the potential effects that should be assessed and the likely zone of influence of those effects arising from the project. Since it can be difficult at the scoping stage to accurately establish the extent of changes likely to be caused, it is important to take a precautionary approach to ensure that the study area incorporates all areas where significant effects could occur. The desk study will collate information from within the development search area plus appropriate buffers in order to identify key biodiversity features and ensure potential significant adverse effects can be fully assessed.
- 5.142 Information on sites of importance for nature conservation and records of protected and otherwise notable species will continue to be obtained from the local Biological Record Centre and other conservation groups, such as North East Scotland Bat Group, Scottish Badgers, Royal Society for the Protection of Birds (RSPB) and Amphibian and Reptile Group UK. Information on statutory sites of nature conservation importance and Biodiversity Action Plan Priority Habitats will be obtained from SNH, Aberdeen City Council and the National Biodiversity Network (NBN) Gateway.
- 5.143 An Extended Phase 1 Survey of the areas inland of the intertidal area will be conducted, plus an appropriate buffer of the development boundary to allow for consideration of species and habitats that may be disturbed by the development. This survey will consider legally protected species and habitats and those identified in the UK and Local Biodiversity Action Plans. The results of this survey will inform the requirement for further protected species specific surveys.
- 5.144 Ornithology surveys will be conducted covering bird usage of terrestrial and intertidal habitats, and the wider offshore Nigg Bay area. A minimum of one years bespoke shore-based surveys will be conducted to characterise the site and identify species presence and abundance using

the shore and Bay. Terrestrial breeding bird and winter walkover surveys will also be conducted to allow a comprehensive assessment of potential impacts to birds using inland areas.

### Summary of Required Studies

- Comprehensive desk based baseline data collation relating to key species and habitats known to be present on or near to the site will be completed (inclusive of consultations with key stakeholders including SNH, Aberdeen City Council, and RSPB);
- An extended Phase 1 habitat survey will be completed for the terrestrial habitats within and adjacent to the site, the extent of which will be agreed with SNH in light of the emerging design of the AHD;
- Where desk based studies and the extended Phase 1 habitat survey dictate, protected species surveys will be undertaken;
- In addition to the terrestrial surveys, ornithological surveys will also be completed, covering bird usage of terrestrial and intertidal habitats, and the wider offshore Nigg Bay area. It is envisaged that a minimum of 1 years bespoke shore based survey will be required to cover the shore and bay. Terrestrial breeding bird and winter walkover surveys will also be conducted over the same timescale.

## Archaeology and Cultural Heritage

### Key Issues/Baseline Overview

- 5.145 Consultations held with Transport Scotland to date (lead authority for consultation with respect to the AHD proposal) confirmed that there are no known historic sites within the proposed application boundary of the AHD. However, notwithstanding this advice, reference to the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) 'CANMORE' database shows that there are a number of known and recorded sites and features in and around the bay and these are listed below and shown on Figure 5c:
- City Of Aberdeen Main Drainage Work (Girdle Ness Sewage Works) – site number NJ90NE27 (RPS 01);
  - Girdle Ness Lighthouse Fog Siren – site number NJ90NE 8.1 (RPS 02);
  - Unknown 1720 / Galliot (Dutch vessel) – site number NJ90NE 8445 (RPS 03);
  - Girdle Ness Boundary Stone (Walker Park) – Site Number NJ90NE 93 (RPS 04);
  - Girdle Ness Coast Defence Battery (WWI) – site number NJ90NE 26 (RPS 05);
  - **Bay of Nigg building and slipway (former fishing station) – site number NJ90NE 42 (RPS 06);**
  - Girdle Ness Boundary Stone (Balnagask Golf Course) – site number NJ90NE 95 (RPS 07);
  - Nigg Bay boundary stone – site number NJ90SE 87 (RPS 08);
  - **Nigg Bay Anti-Tank Blocks (C<sup>20th</sup>) – site number NJ90SE 58 (RPS 09);**
  - Nigg bay boundary stone – site number NJ90SE 86 (RPS 10);
  - **Nigg Bay pillbox (C<sup>20th</sup>) - site number NJ90SE 57 (RPS 11);**
  - **St. Fittick's Well – site number NJ90SE 1 (RPS 12);**
  - Nig Bay boundary stone – site number NJ90SE 85 (RPS 13);
  - Balnagask Sewage Treatment Plant – site number NJ90SE 36 (RPS 14);
  - **Victoria North Sea - Schooner (C<sup>19th</sup>) – site number NJ90NE 8201 (RPS 15);**
  - **Unknown 1786 – possible craft (wreck) – site number NJ90SE 8043 (RPS 16);**
  - **Unknown 1819 – possible craft (wreck) – site number NJ90SE 8045 (RPS 17);**
  - **Sheepfold (possible C<sup>19th</sup> craft) – Bay of Nigg – site number NJ90SE 8023 (RPS 18);**
  - Ben Torc (steam trawler C<sup>20th</sup>) – site number NJ90SE 8008 (RPS 19);
  - DW Fitzgerald (steam trawler C<sup>20th</sup>) – site number NJ90NE 8171 (RPS).
- 5.146 Of those archaeological sites and features listed above, all those denoted in bold are located within the bay to the seaward side of Greyhope (coast) Road. Such sites are considered more likely to be at risk of experiencing direct effects from the AHD.

5.147 In addition to the immediate location of the site, there are a number of cultural heritage resources that are integral to the history of the wider community and area. Most notable of these are the following, which are designated in recognition of their importance (see Figure 5a):

- Girdle Ness Lighthouse A listed building;
- Torry Point Battery Scheduled Monument (SM);
- St. Fittick's Church SM and B listed building;
- Tullos, Crab's and Baron's Cairns SMs associated with Tullos Hill to the south west of the site.

5.148 It is noted that the importance of these features to the heritage of the area are also recognised by the dedicated 'guided' routes discussed under socio-economic effects above.

5.149 There are a number of conservation areas within the boundaries of Aberdeen City authority boundary. Of those, the two closest to the proposed AHD are at Footdee (Area 6 - to the immediate north of the exiting Aberdeen Harbour), and Cove Bay (Area 8 – to the south of the site).

### **Potential Effects**

5.150 Effects upon cultural heritage and archaeological assets will largely consist of the following:

- Direct disturbance and/or destruction of known archaeological remains within the Nigg Bay (both terrestrial and marine);
- Direct disturbance and/or destruction of buried and previously unrecorded archaeological remains within the Nigg Bay (both terrestrial and marine);
- Indirect effects of disturbance resulting from changes in the physical environment e.g. changes to sediment and hydrological regimes;
- Indirect effects upon features of cultural heritage importance (primarily in terms of their setting), specifically those identified within the baseline overview above.

### **Approach and Methodology**

5.151 Prior to commencing the assessment, a zone of influence will be established to reflect the spatial extent of impact of the AHD. This will take account of the potential effects upon the setting of cultural heritage assets as well as direct effects upon archaeological resources. With respect to the extent of the zone of influence, for potential effects upon settings, only those assets falling within the defined Zone of Theoretical Visibility (ZTV) would be assessed (see landscape and visual impacts below). Whilst there is no potential for direct effects on cultural heritage features outside the application site, it is considered that information from a wider study area than the site boundary may inform the assessment of the sensitivity of the application site and the archaeological resources within it.

### **Baseline Assessment**

5.152 The baseline assessment of archaeology and cultural heritage will be carried out in accordance with current best practice guidance issued by the Institute for Archaeologists (IfA) and the Institute of Environmental Assessment and Management (IEMA).

5.153 The work will involve the gathering of baseline data relating to the known and potential cultural heritage resources within a defined study area, centered on the site of the proposed development. Such resources would include nationally designated features such as Scheduled Monuments, listed buildings, Historic Gardens and Designed Landscapes, locally designated features (i.e. Conservation Areas, Areas of High Archaeological Potential, locally listed buildings etc.), archaeological sites and find-spots recorded on the relevant Historic Environment Record (HER). National guidance on archaeology and planning would be reviewed, along with relevant local and structure plan policies. The lead curator at Aberdeen City Council (based in the Aberdeen Maritime Museum) will also be consulted.

5.154 In addition, information on Scheduled Ancient Monuments, listed buildings and Gardens and Designed Landscapes would be obtained from Historic Scotland. A review of relevant

documentary and archival material held in libraries and archives would be undertaken. An iterative approach will be adopted during this process to determine the scope of the above consultations/searches. Existing and available geological and geotechnical information would be examined, along with the data obtained by third parties looking at other aspects of the proposed development. In this regard, and of critical importance to assessing potential impacts in the marine environment, geophysical scans of the seabed will be specified and subsequently analysed in order to identify any anomalies with archaeological potential. The current specification for this work is not currently known but will be agreed with Historic Scotland prior to the survey work being undertaken.

5.155 With respect to terrestrial resources, a site visit and field reconnaissance survey will be undertaken to establish the presence of previously unrecorded above ground archaeology, and/or to further assess the potential of recorded above ground archaeology. In addition, the field visit will assess the suitability of any further survey techniques and will also provide an indication of the likely effect of the proposed development on the settings of cultural heritage features.

5.156 The EIA chapter will include the following:

- An overview of relevant planning policy and guidance;
- A brief summary of the previously known historic and archaeological context of the site based on the desk-based assessment;
- A summary of the results of any archaeological fieldwork carried out as part of the assessment;
- A description of the methodology used for the assessment of effects on the settings of designated historic and archaeological resources;
- Appropriate illustrative materials;
- A site by site assessment of the effects of the proposal on the settings of designated historic and archaeological resources within the defined and agreed study areas;
- Proposed mitigation measures to avoid/reduce impacts on buried archaeological remains as agreed with the highland Archaeology Service;
- Summary of effects;
- The desk-based assessment will be presented as a technical appendix, as will the results of any archaeological evaluation that has been carried out.

5.157 The desk-based assessment and any archaeological field evaluation will be undertaken with reference to published guidance including:

- published guidelines from the Institute for Archaeologists;
- Scottish Planning Policy (February 2010 – currently being updated);
- The Scottish Historic Environment Policy (SHEP) 2011;
- Planning Advice Note 2/2011 Planning and Archaeology 2011.

5.158 The Archaeology and Cultural Heritage chapter will assess both the effects relating to the operation of the proposed development and also the effects associated with its construction. It will consider direct physical and indirect visual impacts. The simultaneous, successive and sequential cumulative impacts of other developments within an agreed radius of the site which are either operational, under construction, consented or the subject of a full planning application will also be assessed.

### **Summary of Required Studies**

- A formal archaeological desk based assessment (DBA) will be undertaken at the commencement of the EIA. Comprehensive consultation with the historical records held by both Aberdeen City Council and Historic Scotland will be made, inclusive of all relevant marine records;
- A field reconnaissance survey will also be completed for the terrestrial aspects of the development in order to truth the desk based collated data and identify any additional, as yet recorded features (and/or potential for remains);
- Geophysical scans of the seabed will also be specified in order to establish the marine baseline environment, and subsequently analysed in order to identify any anomalies with

archaeological potential. The current specification for this work is not currently known but will be agreed with Historic Scotland prior to the survey work being undertaken.

## **Landscape and Visual Effects**

### **Key Issues/Baseline Overview**

- 5.159 The site is not within any national (e.g. National Scenic Areas) or local (e.g. Special Landscape Area) designations with respect to landscape and/or the visual environment. The location of the site is with a 'Coast' landscape character type (see Figure 6). This is described within the Landscape Character Assessment of Aberdeen as a highly distinctive linear, and relatively narrow landscape character type, ranging from smooth sandy beaches and dunes around Aberdeen Bay, to the rocky cliffs to the south of Girdle Ness. Closer to the built-up area the character type has a recreational emphasis.
- 5.160 Girdle Ness/Nigg Bay landscape character area includes the exposed and elevated headland of Girdle Ness at the mouth of the River Dee, and the shallow depression of Nigg Bay and its hinterland. The area is bounded to the south by the hummocky form of Tullos Hill and there is little tree cover within the area, most of which is devoted to recreational uses as public open space and a golf course.
- 5.161 Buildings within the landscape area are restricted to the Old Torry Battery, Girdle Ness Lighthouse, the ruins of St Fittick's Church, and the long sea sewage outfall treatment works. The western edge of the landscape area is dominated by the adjoining urban developments of Torry and Balnagask. Views from the area are varied and localised, ranging from the urban area and Tullos Hill, to views of the sea eastward of Nigg Bay. Key views to the proposed AHD will therefore be from the eastern edge of the urban areas, elevated land associated with Tullos Hill and Girdle Ness headland, and from sea.

### **Potential Effects**

- 5.162 Landscape effects include the direct and indirect effects of the development on individual landscape elements and features, in addition to any effect upon the general landscape character and quality of the surrounding area.
- 5.163 With respect to effects on visual amenity, being a new build development located on previously undisturbed land, the harbour as a whole will provide a new and prominent feature in the landscape. Key features in terms of effects on visual amenity will be harbour buildings and quayside cranes with potential effects on the following receptors:
- Residential properties within Torry and Balnagask;
  - Recreational activities such as walking, guided walks, and wildlife watching;
  - Road users;
  - Rail users;
  - Marine activities.
- 5.164 Potential impacts to landscape character are expected to be most relevant to the immediate area around the proposed AHD, although consideration will need to be given to any impact to landscape character across the wider study area, together with the cumulative effects of other committed developments.
- 5.165 Overall, potential landscape and visual effects to be addressed by the EIA will include:
- Temporary visual intrusion during construction works;
  - Changes to the character, context and quality of the site and local landscape and townscape;
  - Effects upon local and distant views.

## **Approach and Methodology**

5.166 The Landscape and Visual Impact Assessment (LVIA) will be undertaken adhering to the following:

- Landscape Institute and Institute of Environmental Management and Assessment (2002) Guidelines for Landscape and Visual Impact Assessment 2nd Edition;
- Countryside Agency and Scottish Natural Heritage (2002) Landscape Character Assessment – Guidance for England and Scotland;
- Landscape Institute, Advice Note 01/11 Photography and Photomontage in Landscape and Visual Impact Assessment.

5.167 In addition, due regard will be paid to the Landscape character assessment of Aberdeen 1996 - Ian Nicol, Anne Johnston, Laura Campbell (SNH). The assessment will be completed as follows.

### ***Desk-top Research***

5.168 As desk-top study will be completed, comprising research and review of the relevant landscape designations, landscape character assessments and the cumulative situation with other relevant developments within which are operational, under construction and in the planning system for cumulative effects. Consultation will be undertaken with SNH to confirm the scope and suitability of work, and other issues as required.

### ***Zone of Theoretical Visibility and Selection of Viewpoints***

5.169 In order to assess impacts upon visual amenity, a study area and the extent of Zone of Theoretical Visibility (ZTV) off the AHD will be established and agreed with Aberdeen City Council and SNH. Due to the likely extent of most ZTVs it is not possible to assess the visual impact on every individual visual receptor within the ZTV of the development. Consequently, key viewpoints looking towards the proposals will be selected and will be representative of sensitive residential and recreational receptors situated within the study area at different distances and directions from the scheme. The representative viewpoints will be used to assess the potential visual effects of the proposals in the different range of views towards the site.

5.170 The exact number of viewpoints that will be used will not be determined until further baseline studies and consultation has been undertaken and the siting of viewpoints will balance the likely significance of impacts and how typical or representative the view is. A location plan will be generated for each viewpoint location and these will be supported by visualisations of the proposed AHD in the form of photomontages. The photomontages will be developed from a 3D model produced by the scheme architects and will be used as a reference tool for demonstrating the visual appearance (mass and scale) of the AHD, including the buildings and storage areas as defined by parameter plans, together with fixed plant such as cranes.

### ***Fieldwork/Surveys***

5.171 A field survey will then be undertaken, guided by the findings of the desk study and definition of ZTV and associated viewpoints. The field survey will facilitate an appreciation of the scale, extent, prominence and distance from the proposed AHD to be experienced.

### ***Assessment***

5.172 Once the desk and field based baseline data gathering has been completed the effects of the AHD on visual amenity and landscape character will be assessed. The assessment will review and describe the existing landscape character of the site and surrounding area, and its sensitivity to change, including reference to any existing published landscape assessments and designations. A review of the impact of the proposed development to landscape planning policies will be included.

5.173 The landscape resource and the visual resource are separate but interconnected. Established guidance makes a distinction between landscape effects and visual effects, the latter being

considered a specific subset of the former. By assembling and presenting information in a systematic and comprehensive manner, the assessment provides an understanding of the individual landscape and visual effects of the proposal, and gives an insight into the overall effects from the proposed development.

5.174 For the purpose of assessment, it is proposed that the potential effects on the landscape and visual resource will be grouped into four categories:

- Physical effects;
- Effects on landscape character;
- Effects on views;
- Effects on residential visual amenity;
- Cumulative effects.

5.175 Physical effects: physical effects are restricted to the area within the site boundary, and are the direct effects on the fabric of the site, such as the removal or addition of trees and alteration to ground cover. This category of effects is made up of landscape elements, which are the components of the landscape such as vegetation that may be physically affected by the development of the site.

5.176 Effects on landscape character: landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and the way that this pattern is perceived. Effects on landscape character arise either through the introduction of new elements, or removal of existing elements, that physically alter this pattern of elements, or through visibility of the development, which may alter the way in which the pattern of elements is perceived.

5.177 Effects on views: the assessment of effects on views is an assessment of how the introduction of the proposed AHD will affect views throughout the study area. The assessment of effects on views will be carried out in two parts:

- An assessment of the effects that the proposed AHD will have on views from principal visual receptors such as settlements and routes found throughout the study area (as ascertained through the baseline study, described subsequently in this section);
- An assessment of the effects that the AHD will have on a series of viewpoints that are selected to represent visibility from around the study area.

5.178 Effects on Residential Visual Amenity: a measure of the visual quality of a site or area experienced by residents, workers or visitors. Due to the proximity of Balnagask and Torry an assessment of impacts on visual amenity will be undertaken for these settlements. The scope of this study will be agreed with Aberdeen City Council and SNH and will focus on providing a balanced assessment of potential visual effects upon the settlements as a whole, with a particular focus on residential amenity.

5.179 Cumulative effects: cumulative effects arise where the study areas for two or more developments overlap so that both of the developments are experienced at proximity where they may have a greater incremental effect. This means that the addition of the development to a situation where other developments are proposed/apparent may result in a greater effect than where the development is seen in isolation.

5.180 The assessment of visual impact will take into consideration the sensitivity of receptors and the nature or magnitude of change. This will determine the significance of the impact which will be defined in terms of criteria contained in a stated methodology following the recommendations of the guidelines identified above.

### **Summary of Required Studies**

- A thorough desk based assessment will be completed, focussing on the establishment of the baseline environment including for designated landscapes, landscape character areas, landscape features, and key visual receptors relevant to the AHD site;

- The desk based assessment will be aided by the generation of a zone of theoretical visibility (ZTV) (based upon the AHD design) in order to identify key receptors likely to be affected by the proposed development;
- Field studies will subsequently be completed in order to truth the collated baseline data and to identify and additional key issues. Photography will be captured from key visual receptors in order that visualisations can be produced to aid assessment and interpretation;
- A specific residential amenity study will also be completed in order to assess the specific impacts upon the Torry and Balnagask communities. The methodology to be followed for this study will be agreed with Aberdeen City Council prior to commencement.

## **Traffic and Transport (incl. Navigation)**

### **Key Issues/Baseline Overview**

- 5.181 It is proposed that the existing road network will be used to access the proposed port AHD. To that end, the principal trunk road accessible to the proposed AHD is the A956. It is envisaged that traffic could access the A956 via the coastal road and then on Hareness Road. It is considered that the planned Western Peripheral Route encircling the western side of Aberdeen would link the A956 to the main highway routes north and south of Aberdeen.
- 5.182 The rail line from Aberdeen runs south along the east coast via Kirkcaldy, Dundee and Arbroath to Edinburgh Waverley and links to the high speed East Coast Mainline at Edinburgh. The Aberdeen – Edinburgh line runs from the centre of Aberdeen, crossing the Dee by bridge and then through Balnagask, to the southern edge of Nigg Bay and south along the top of the cliffs. There is no intention to establish a direct link to the rail network within the current development project, however, effects upon and resulting from rail network provisions will be taken into account within the EIA.
- 5.183 Existing operations at Aberdeen Harbour mean that the area around Nigg Bay (primarily to the North) represents an area with significant volumes of existing marine traffic. Current vessel activity in the existing harbour equates to approximately 8000 vessel arrivals per annum.

### **Potential Effects**

- 5.184 The following are considered to be the key potential effects with respect to traffic and transport:
- Effects upon the road network resulting in delays and disruption to traffic flows, taking into account the influence and effects of the construction and opening of the Aberdeen Western Peripheral Route (AWPR);
  - Effects upon the levels of traffic experienced at the existing harbour;
  - Effects upon the condition/structure of the road network;
  - Environmental effects resulting from associated noise, vibration, and air pollution impacts;
  - Effects upon pedestrians and other similar users in terms of delays and severance/amenity impacts (due to physical barriers or the effects of increased traffic flows);
  - Road safety and the potential for accidents;
  - The effects of abnormal loads on the road network;
  - Effects upon and use of public transport;
  - Ensuring the safe operation of the harbour with particular respect to existing marine traffic during harbour operation.
- 5.185 With respect to marine traffic, during construction there is the potential for incidents to occur as a result of the presence of dredging and other construction plant in the water. As with all construction works taking place in the marine environment, standard measures will need to be put in place to reduce the navigation risk to other vessels; for example, the construction works would need to be appropriately marked, construction plant be appropriately lit, and notices to Mariners issued, etc.
- 5.186 During the operational phase, the potential for navigation incidents will be associated with the increase in vessel traffic generated by the AHD facilities (e.g. cruise ships, wind turbine delivery and installation vessels, etc). It is expected for the operational phase that, for all new features

including the quays, breakwaters, dredged channels, etc, AHB will install appropriate navigation marks in accordance with advice from Trinity House and IALA requirements. New features and marked will be updated on Admiralty Charts and advised via Notices to Mariners.

### **Approach and Methodology**

- 5.187 Current guidance for assessing the environmental effects of road traffic is set out in '*Guidelines for the Environmental Assessment of Road Traffic, Guidance Note No. 1*', published by the Institute of Environmental Management and Assessment (IEMA). The guidelines are based on the forecast increase in traffic on a link resulting from proposed development and sets out thresholds upon which more detailed assessments should be undertaken.
- 5.188 The guidelines suggest that more detailed assessments should be undertaken for links where traffic flows, or the number of HGVs are predicted to increase by more than 30% as a result of proposed development. The guidelines also recommend that in sensitive locations a 10% threshold for traffic flows should be used as a basis for undertaking assessments in more detail. The environmental effect of road traffic resulting from the proposals will be assessed upon the local and wider highway network in accordance with the above IEMA guidelines, in particular the A956 corridor. Assessments will be undertaken across a typical working day and each hour will be considered together with 12 hour (0700-1900) and 24 hour (0000-2400) traffic flows. AHB has commenced traffic surveys for the key network links which may be affected by the proposed AHD and these will provide the baseline upon which the potential effects of the development will be assessed.
- 5.189 The specific approach taken to each of the construction and operation phases of the AHD are outlined below.

### ***Construction Assessment***

- 5.190 Given the nature (size and character) of the proposed AHD, it is probable that the construction phase will generate considerable numbers of HGV and other vehicle movements which would require assessment.
- 5.191 Construction traffic movements resulting from the works will be estimated using the construction programme and the predicted number of construction workers on site at any one time. The estimated number of vehicles throughout the working day will be assigned onto the adjacent highway network and be assessed in accordance with the IEMA guidelines. Where any increase in excess of the 30% threshold is predicted, a more detailed environmental assessment will be undertaken, as set out above. If significant effects are identified then suitable mitigation measures will be identified to reduce or moderate these traffic flows and related effects.
- 5.192 As there is a significant amount of marine/shipping activity associate with Aberdeen Harbour work will be required to ensure the activity required during construction is carried out in a safe manner to manage the associated risks, which have the potential to result in fatality, pollution or asset damage to the vessel or shore development. The AHD project will therefore be reviewed by a relevant expert in marine risk consultancy to carry out a preliminary identification and assessment of the risks. This will form a baseline for the project. A technical report will be prepared to outline the findings of this initial safety review.
- 5.193 A hazard workshop will be carried out with the harbour and other marine users in the area to take on board and identify any comments and concerns to ensure all parties are represented within the program of works. This will consider the mitigation of any risks identified to demonstrate they are ALARP. A report will be prepared detailing the findings of the works. This process will be applied to both phases of the development (construction and operation) and so is not discussed further below.

### ***Operational Assessment***

- 5.194 The likely net change in traffic movements to and from the AHD, as a result of the operation of the facility will be estimated and assessed within a formal Transport Assessment (TA) in line with Transport Scotland guidance.

5.195 The assessment will take account of the hours of operation of the AHD, taking account of any 24 hour operations required at the harbour. All trips likely to be associated with the facility will be taken into account with the greatest number considered likely to be freight transport to and from the AHD. To that end, HGV traffic movements to and from the AHD will provide the key focus for the assessment, with particular attention paid to potential abnormal loads. Other vehicle movements will include visitors to the site, office supplies, catering and general deliveries.

5.196 A separate Transport Assessment (TA) and Travel Plan will be submitted with the AHD planning application, the content of which will be discussed and agreed with the relevant statutory bodies including Aberdeen City Council and Transport Scotland. The ES will present a summary of this separate assessment in an appropriate format. The ES chapter on traffic and transport will focus on the potential environmental effects associated with predicted changes in traffic resulting from the AHD development, during both construction and operation.

### **Summary of Required Studies**

- Traffic flow data will be acquired either via direct traffic counts measurements along key transport links likely to be affected by the AHD, or through consultation with Aberdeen City where such records exist and are considered sufficient for assessment purposes;
- Data relating to public transport timetables and patronage will also be obtained in addition to an assessment of the accessibility of the site to pedestrians and cyclists;
- Safety data for the key links considered likely to be affected by the AHD will also be obtained from Aberdeen City Council (and Transport Scotland where required);
- This will form the basis of the assessment and allow impacts to be assessed and the TA to be completed.

### **Air Quality**

#### **Key Issues/Baseline Overview**

5.197 Aberdeen City Council has designated the following three Air Quality Management Areas (AQMAs) due to high concentrations of nitrogen dioxide (NO<sub>2</sub>) and particles (PM<sub>10</sub>) attributable to emissions from road traffic:

- Aberdeen City Centre – primarily associated with Union Street, King Street, and Market Street;
- Anderson Drive/Haudagain roundabout/Auchmill Road corridor;
- Wellington Road (Queen Elizabeth II Bridge-Balnagask Road).

5.198 Nigg Bay is not located within a designated AQMA. Furthermore, significant air pollutant concentrations are not expected in and around the proposed AHD, partly on account of its open, coastal setting with high levels of wind dispersal. A desk-top assessment of existing baseline air quality conditions will be undertaken to obtain any recent records of local air quality monitoring near to the site and to identify any potentially sensitive receptors to emissions.

#### **Potential Effects**

5.199 As with all significant construction projects, there is the potential for nuisance dust effects to arise during various activities and stages of the works (e.g. pneumatic breaking and crushing of concrete, and excavations) particularly during periods of dry and windy conditions. However, these sources of dust will typically be controlled or avoided by the implementation of best practice measures and procedures set out in a Construction Environmental Management Plan (CEMP).

5.200 In addition to construction emission of dust, during the construction and operational phases, there is also the potential for air quality effects from emissions associated with changes in the traffic flow characteristics on the local road network, within the city centre, and also emissions from marine vessels. This is considered likely to have the greatest implication for air quality for the proposed AHD and will provide the key focus of the assessment.

5.201 The proposed uses and operations on the harbour are not known at this juncture. Whilst it is considered that operations that eventually establish are unlikely to result in significant effects, account will be taken in the EIA of possible effects as far as is practicable. Cumulative effect with other committed development will also be considered during the EIA.

### **Approach and Methodology**

5.202 For the construction phase, a risk assessment of nuisance dust will be undertaken using a source-pathway-receptor conceptual model. Mitigation measures, informed by the Best Practice Guidance will be specified in order that they can be transposed into the CEMP for construction purposes.

5.203 Potential dust generating activities will be qualitatively reviewed to establish the likely magnitude of temporary and residual dust emissions, taking into account the duration and frequency of the activity and the likely effectiveness of available dust control measures.

5.204 For the operational phase, odour generating activities will be qualitatively reviewed to establish the likely magnitude of fugitive and residual odour emissions taking into account the design of the facility, its proximity to sensitive receptors, and the likely duration and frequency of such emissions. The assessment will review the likely effectiveness of available odour control measures as well as the expected requirements of any environmental permits/ pollution controls with which the facility would need to comply.

5.205 The traffic generated by the operational phase activities will be reviewed and compared with the criteria set out in the Environmental Protection UK (EPUK) Development Control: Planning for Air Quality (Update 2010) document. If the criteria are exceeded, a screening level assessment of the vehicle-related emissions will be undertaken.

### **Summary of Required Studies**

- Baseline air quality data will be obtained from Aberdeen City Council in order to provide an environmental baseline for the project (i.e. either that which is directly relevant to the site and/or surrounds or potential proxy sites where measurements have been completed by the city council);
- No field survey or measurements are considered likely to be needed;
- Air emissions generated primarily by vehicles (with a focus on operational movements) will be assessed against relevant criteria and, where exceeded a screening level assessment will be completed to determine whether further detailed assessment (modelling) will be required.

## **Noise and Vibration**

### **Key Issues/Baseline Overview**

5.206 The closest properties to the proposed AHD lie no greater than 130m to the north of the proposed development at Girdle Ness Light House Cottages. Aside from these properties the majority of remaining noise sensitive receptors lie approximately 500m to the west of the AHD. These properties reflect the easternmost edge of the settlements of Balnagask and Torry. The setting between the proposed AHD and settlements is one of urban fringe with the site located at the coast. The noise climate is primarily characterised by road traffic noise, with the wash of the waves in the bay dominating noise at the proposed site, giving way to more urban noise elements closer to the settlements. Whilst no baseline data is currently available for specific receptors in this area, the recording and establishment of such will form the basis of assessment, as discussed below.

5.207 In terms of vibration, in addition to the properties identified above there are a number of receptors that will require consideration including the Balnagask Waste Water Treatment Plant and transport links (i.e. the coast road and rail line). Potential effects arising from activities on site will be considered as an integral part of the assessment.

5.208 Whilst not statutorily protected, the site does lie within the Balnagask to Cove Bay Local Nature Conservation Site (LNCS). In addition, the site also lies in an area that is popular for wildlife watching, marine mammals and birds in particular. Effects on species will therefore be an important consideration and field surveys will be undertaken to establish the ecological baseline for the purposes of the EIA and this will in turn allow key sensitive species to be identified with respect to noise, where relevant.

### **Potential Effects**

#### ***Human Effects***

5.209 Potential noise and vibration effects, of different intensity and tonal nature, could arise during different stages of the development depending on the type of activities taking place. The greatest potential for noise and vibration is likely to occur during the site preparation, piling, blasting (if required) and quay construction works as well as other activities involving heavy plant, percussive activities and peaks in construction HGV traffic movements.

5.210 Operational noise effects could derive from fixed and mobile plant associated with the AHD buildings (e.g. external heating and air conditioning plant, dust extraction, electricity sub-stations etc) together with internal site transport systems, the movement of marine vessels, travelling cranes, and HGV's both within and outside of the site.

#### ***Effects on Terrestrial Ecology***

5.211 Potential effects on animal species are anticipated to include:

- Construction Effects: Infrequent, short, sharp 'percussive' noises have the potential to cause the greatest disturbance to wildlife. Such noises are considered most likely to be generated during the construction phase, and be a comparatively uncommon event during the operation of the proposed AHD facility;
- Operational Effects: The effects of plant noise and ongoing AHD activities on noise sensitive receptors. It is generally thought that birds may habituate to continual noise so long as there is no large-amplitude 'startling' component.

5.212 It is proposed that the assessment of the significance of noise effects on wildlife will be reported in the Terrestrial Ecology Chapter of the ES.

#### ***Effects on Marine Mammals and Fish***

5.213 Potential effects on marine animal species are anticipated to include:

- Noise generated by vessels during construction and maintenance;
- Noise generated by piling operations to fix the structures to the seabed;
- Noise generated by dredging (including for potential blasting activities, if required).

5.214 It is proposed that the assessment of the significance of noise effects on wildlife will be reported in the Marine Ecology Chapter of the ES.

### **Approach and Methodology**

#### ***Humans and Terrestrial Ecology***

5.215 The noise and vibration assessment will adhere to the following steps:

- Identification of potentially sensitive noise and vibration receptors;
- Undertaking comprehensive baseline noise surveys at appropriate locations, including nearby sensitive wildlife habitat, where required;
- Preliminary assessment of noise and vibration levels during the construction works with reference to British Standard BS5228 'Noise and Vibration Control on Construction and Open Sites'; BS7385 'Evaluation and Measurement for Vibration in Buildings'; and, BS6472 'Guide to Evaluation of Human Exposure to Vibration in Buildings';

- Evaluation of noise effects resulting from the operation of new building services plant, with reference to BS4142 'Method for rating industrial noise affecting mixed residential and industrial areas',
- Assessment of noise generated by active ground floor uses;
- Identification and assessment of potential vibration effects;
- Formulation of appropriate noise and vibration mitigation measures with reference to, BS8233 'Sound insulation and Noise Reduction for Buildings - Code of Practice', and the World Health Organisation 'Guidelines for Community Noise';
- Modelling of noise levels and propagation to sensitive habitat using Datakustik CadnaA software (where required).

5.216 While not solely limited to comparison against published standards, significant effects will, at a minimum, be identified where the likely breach of any British Standard is identified during the assessment. The magnitude (in terms of sound amplitude and the temporal nature) of the impact will be taken into account when considering the level of significance (minor, moderate, substantial) of the identified effects.

### **Marine Mammals and Fish**

5.217 Where construction techniques and operational activities of the proposed AHD dictate, potential noise impacts upon marine mammals and fish will be assessed. Marine mammals and fish use underwater noise in a wide variety of ways, to gather information about their environment, and to communicate with other individuals of their own species. Many species of both groups are able both to detect underwater noises.

5.218 However, there is a considerable body of literature studying the different threshold levels for different species and it is clear from the evidence that the effects of underwater noise on marine mammals and fish vary depending on the received noise level, and from species to species. Five different levels of response are typically described in this regard, as follows:

- A detection level – the noise level that the species would normally be able to detect in a quiet sea state;
- An avoidance level – the noise level at which the species would start to exhibit active avoidance behaviour, such as swimming away, in order to avoid the noise level that it was experiencing;
- A temporary hearing damage level – the noise level that would cause a temporary but reversible shift in the individual's hearing sensitivity;
- A permanent hearing shift level – the noise level that would cause a permanent shift in the individual's hearing sensitivity;
- A physical damage level – the noise level or pressure level that would result in gross physical damage to the organism's auditory system, other organs or tissues.

5.219 The hearing ability of marine organisms is commonly expressed by means of an audiogram. Which is a plot of the species' threshold hearing level for different frequencies.

5.220 The method of assessment of noise impacts upon marine mammals and fish will be agreed with SNH and Marine Scotland prior to commencement and will be aimed at determining the noise levels that might be found in the water column at different distances from the AHD. Predictions will be made by modelling the propagation of sound in water. An appropriate model will also be agreed with SNH and Marine Scotland prior to commencing the assessment.

5.221 The results of the modelling will then be compared to the respective audiograms of the key species identified through field surveys, with specific reference to the threshold value at the peak frequency i.e. the frequency at which their hearing is most acute. The assessment will focus on determining which activities might produce noises loud enough to result in an animal displaying a "strong avoidance reaction". This is the lowest level at which overt behavioural changes occur in the animals which might be exposed to underwater noise. In this way, it is therefore considered a suitably precautionary physical threshold will be used and thus precautionary assessment.

## **Summary of Required Studies**

- Key human noise receptors for the AHD will be identified sufficient to represent the likely noise sensitive receptors (NSR) in and around the site. Noise monitoring will then be undertaken for each location. It is currently anticipated that 1 week of monitoring would be required for the proposed AHD;
- An appropriate model will then be used to predict the likely propagation of noise from the AHD;
- For key marine receptors, the assessment will be informed by ecological field studies in terms of focussing on the species of key concern. No baseline monitoring would be proposed and predictions will be made by modelling the propagation of sound in water. An appropriate model will be agreed with SNH and Marine Scotland prior to commencing the assessment.

## **Ground Conditions and Contamination**

### **Key Issues/Baseline Overview**

- 5.222 This chapter of the EIA would assess the impacts on geology, soils and any ground contamination resulting from construction and operation of the AHD. Whilst the site has not been subject to significant development historically, there are a number of facilities that operate in and around the bay that have historically discharged effluent to sea. The first of these remains active and is the Water Treatment Works Outfall at Balnagask which is shown on the Admiralty chart. It is believed that the sewerage flows from the works to the outfall offshore via a tunnel under the headland. A second outfall is also shown on the Admiralty chart associated with Girdle Ness and remains periodically operational, as a combined sewer overflow (CSO), during high precipitation events or during approved shutdowns at Balnagask WWTP. An additional consideration is the presence of a Marine Scotland abstraction point located within the bay. This abstraction point is believed to serve Marine Scotland's aquarium.
- 5.223 A Marine Licence application has been submitted for extensive geo-technical ground investigations on the site in order to assess the structural bearing capacity of the underlying substrata, provide information of sediment type and inform the final designs and construction methods. An exercise to gather chemical data on a limited number of the collected samples will accompany this, to give early indicative information on the likely presence, extent and nature of contaminated ground within the footprint of the AHD. This will need to be supported by a more detailed investigation during the EIA.

### **Potential Effects**

- 5.224 Potential effects relating to ground conditions and contamination are as follows:
- Mobilisation of contaminated sediments and water during dredging and other construction activities;
  - Related pollution events to mobilisation of such sediment (including implications for the water environment and wildlife);
  - Interference with (damage to) existing outfalls within and around the bay;
  - Effects on construction workers from mobilised contaminants;
  - Effects on human health;
  - Effects on the Marine Scotland abstraction point;
  - Disposal of contaminated materials;
  - Construction derived risks of contamination and their control.

### **Approach and Methodology**

- 5.225 The Ground Conditions and Contamination chapter of the ES will identify whether any environmental effects could derive from the exposure, excavation, mobilisation and disposal or treatment of contamination encountered on site, based on the following:
- Interpretation of site investigation data;

- Derivation of site specific screening criteria;
- Comparison of soil and groundwater data with appropriate screening criteria;
- Construction of a refined conceptual model based on site specific data;
- Generic quantitative risk assessment for the site to establish the risk posed by any identified;
- Contamination risk to human health and controlled waters.

5.226 The environmental assessment will include an evaluation of ground conditions and the nature of any contamination present. A conceptual model for the site will be constructed and a generic quantitative risk assessment undertaken based on the data in line with the guidance presented in CLR 11. An assessment will be made as to whether the site should be classified as “Contaminated Land” under Part 2A of the Environmental Protection Act. The assessment will also incorporate a review of data obtained from the Geotechnical Investigation.

5.227 Investigations will also be undertaken to ensure that the alignment of the outfalls are suitably mapped and the development design in order to avoid disturbance to these structure (or suitable arrangements for realignment made where necessary). The same principle will be applied to the Marine Scotland abstraction point.

### **Summary of Required Studies**

- A Phase 1 contamination assessment will be completed for the site of the AHD. This will include consideration of all historic land uses and existing activities in and around the Nigg Bay (including for outfall related discharges). A site visit will also be completed as a key part of this exercise;
- Extensive geo-technical ground investigations will also be completed and will be scoped to include the capture of chemical data on a limited number of the collected samples, to give early indicative information on the likely presence, extent and nature of contaminated ground within the footprint of the AHD;
- Where indicated as required from the Phase 1 assessment and preliminary chemical analyses, this will be supported by a more detailed investigation during the EIA.

## **Waste**

### **Key Issues/Baseline Overview**

5.228 The proposed AHD will include various import, export, storage and processing businesses which will generate various domestic, commercial and industrial wastes. The construction process will also create waste that will require careful management.

### **Potential Effects**

5.229 The EIA will consider the waste anticipated to be generated from construction and operation of the AHD facility including quantity and type. Consideration will be given to:

- Ability for existing waste infrastructure to accommodate any change in construction and operational waste materials leaving the facility;
- Specific waste handling, storage and recycling facilities to be incorporated into the AHD facility;
- Capacity of existing waste disposal facilities to receive waste from the AHD (according to type and regulatory requirements).

### **Approach and Methodology**

5.230 The EIA will assess the effects of waste generated during construction and operation (as far as anticipated operations can be defined). The ES will identify and quantify all waste streams arising and identify appropriate mitigation by way of waste reduction, re-use and recycling where feasible.

5.231 The implementation of operational management manage and reduce waste disposal will be assessed. The assessment will comprise:

- Identification and quantification of all waste streams produced at the facility;
- Review of activities likely to be undertaken at the facility specific to waste generation, to identify the potential for waste reduction;
- An outline of the Site Waste Management Plan (SWMP) required for the construction phases;
- Assessment of waste legal compliance (including Duty of Care) requirements for the facility.

5.232

The assessment will consider all major waste-generating activities during the planned construction and operation of the AHD. In addition, reference will be made to the national, regional and local waste policies and hierarchy and an assessment will be made of the AHD's compliance with such policies.

#### **Summary of Required Studies**

- No specific studies are required for the purposes of this environmental aspect other than to establish the waste streams likely to evolve from the construction and operation of the AHD and the availability of capacity to deal with such waste as part of the impact assessment process.

## 6 ISSUES TO BE SCOPED OUT OF THE EIA

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### **Introduction**

- 6.1 In consideration of the EIA Regulations which require that the Environmental Statement must identify only the “likely significant environmental effects” of a development, the following topic areas are considered to be ‘non-significant’ issues and therefore are not intended to be assessed in detail through the EIA process.

### **Microclimate (includes Daylight, Sunlight and Overshadowing and Wind)**

- 6.2 The nearest residential buildings to the AHD are 500m away at their closest points. It is not considered likely that the construction and operation of the new facility will have an effect on the lighting and wind conditions at any of these residential locations.

### **Electromagnetic Fields**

- 6.3 Electrical connection to the Local Transmission/ distribution network will be achieved through the installation of a substation and associated cabling at the AHD. The substations will be located on industrial land, and not adjacent to any commercial or residential buildings where the potential for electrical interference might otherwise be realised.
- 6.4 All new electrical plant will be designed in accordance with current British Standards (e.g. BS EN 62041:2010), which set specific limits for electro magnetic fields. Accordingly, this issue will not be considered any further within the EIA.

# 7 DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL EFFECTS

7.1 The determination and classification of the significance of environmental effects is intended to aid the relevant Planning Authorities (in this case Aberdeen City Council and Marine Scotland) in identifying:

- The likely environmental effects of a development;
- The relative weight that each identified environmental effect should be given in the decision making process.

7.2 Both are useful informants to the determination of any planning application where EIA has been deemed necessary. For each environmental topic area assessed as part of the EIA, professional judgement will be applied in relation to the relative significance of the environmental effects identified. This will be undertaken with reference to definitive standards and legislation where applicable. Where it is not possible to quantify the magnitude and scale of impacts, then qualitative assessments will be made based on available information and the professional opinion of the consultant team.

7.3 The significance of the likely significant effects will be determined with reference to generic assessment criteria or subject-specific criteria for each environmental topic being considered, as described in the preceding sections of this report. These criteria will apply a common EIA approach of classifying whether the likely significant effects are substantial/ major, moderate or minor, as well as adverse, negligible or beneficial.

7.4 Specific criteria for each issue will be developed, giving due regard to the following:

- Extent and magnitude of impacts;
- Duration of the impacts (short, medium or long term);
- Permanence of the impacts (temporary or permanent);
- Nature of impacts (whether direct or indirect, reversible or irreversible);
- Whether the impact occurs in isolation, is cumulative or interactive;
- Performance against any relevant environmental quality standards;
- Value, importance and sensitivity of the receptor;
- Compatibility with environmental policies.

7.5 In order to provide a consistent approach in reporting the outcomes of the various studies undertaken as part of the EIA, the terminology in Table 7.1 will be used throughout the ES to describe the relative likely significance of identified effects.

TABLE 7.1 EFFECT TERMINOLOGY AND EXPLANATIONS		
Significant adverse	Negligible	Significant beneficial
Detrimental or negative effect to an environmental resource or receptor that constitutes a material consideration.	The effect can be beneficial or adverse. However, depending on the magnitude/scale of the impact and/ or the sensitivity/ importance of any receptors, the effect may not be deemed significant. The effect is therefore considered be 'negligible' and should not constitute a material consideration in the decision making process.	Advantageous or positive effect to an environmental resource or receptor that should form a material consideration in the decision making process.

7.6 Where significant adverse or beneficial effects are identified it is considered good practice to identify the degree of significance of the effect. It is therefore proposed that where adverse or beneficial effects have been identified, they will be assessed as being of:

- Minor significant effect (either beneficial or adverse);
- Moderate significant effect (either beneficial or adverse);
- Substantial significant effect (either beneficial or adverse).

7.7 Generally, the determination of significance is a function of the magnitude or scale of the impact(s) and the value or importance of the affected receptor. For example the complete destruction (large magnitude) of an internationally recognised feature (high value) would constitute a substantial (or unacceptable) adverse significant effect. Table 7.2 provides a basic matrix-based approach to the categorisation of environment effects. Those effects identified as “significant” are shown in the highlighted cells.

<b>TABLE 7.2 SIGNIFICANCE OF IMPACT</b>					
		<b>Magnitude/ scale of Impact</b>			
		<b>High/ Large</b>	<b>Medium</b>	<b>Low/ Small</b>	<b>Very small/Negligible</b>
<b>Value of receptor</b>	<b>High</b>	Substantial (unacceptable)	Substantial	Moderate	Minor
	<b>Medium</b>	Substantial	Moderate	Minor	Negligible
	<b>Low</b>	Moderate	Minor	Negligible	Negligible
	<b>None/ Little</b>	Minor	Negligible	Negligible	Negligible

7.8 Each of the technical chapters constituting the ES will provide the specific criteria, including the sources and justifications for quantifying the different levels of effect.

## 8 NEXT STEPS

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- 8.1 This scoping report has been submitted in support of a scoping opinion being requested by AHB. It has been issued to Aberdeen City Council, Marine Scotland and Transport Scotland in order for formal responses to be provided as to the expected scope of the EIA. It is understood that the following consultees will be contacted in order to inform the formal scoping opinion:

### **Marine Scotland**

- Scottish Environment Protection Agency (SEPA);
- Scottish Natural Heritage (SNH);
- Maritime and Coastguard Agency (MCA);
- Northern Lighthouse Board (NLB);
- Dee District Salmon Fisheries Board (DDSF);
- Aberdeen City Council;
- Crown Estate;
- Royal Yachting Association (RYA);
- Royal Society for the Protection of Birds (RSPB);
- The Whale and Dolphin Conservation Society (WDCS);
- Marine Scotland Compliance;
- Marine Scotland Policy;
- Marine Scotland Science;
- Scottish Government - Ports and Harbours;
- Any other local organisations as appropriate.

### **Aberdeen City Council**

- SNH;
- Scottish Water;
- SEPA;
- The Scottish Ministers;
- Aberdeenshire Council.

### **Transport Scotland**

- SNH
- SEPA
- Aberdeen City Council
- Maritime and Coastguard Agency
- Northern Lighthouse Board
- Marine Scotland (Marine Licensing team)
- Transport Scotland (road/rail impacts)
- Crown Estate
- Local communities and neighbours

- 8.2 AHB duly invite all recipients of the scoping report and request to provide their comments and opinions such that they can be taken into account as the EIA progresses. To that end, all responses should either be returned to Aberdeen City Council, Transport Scotland or Marine Scotland, as applicable.

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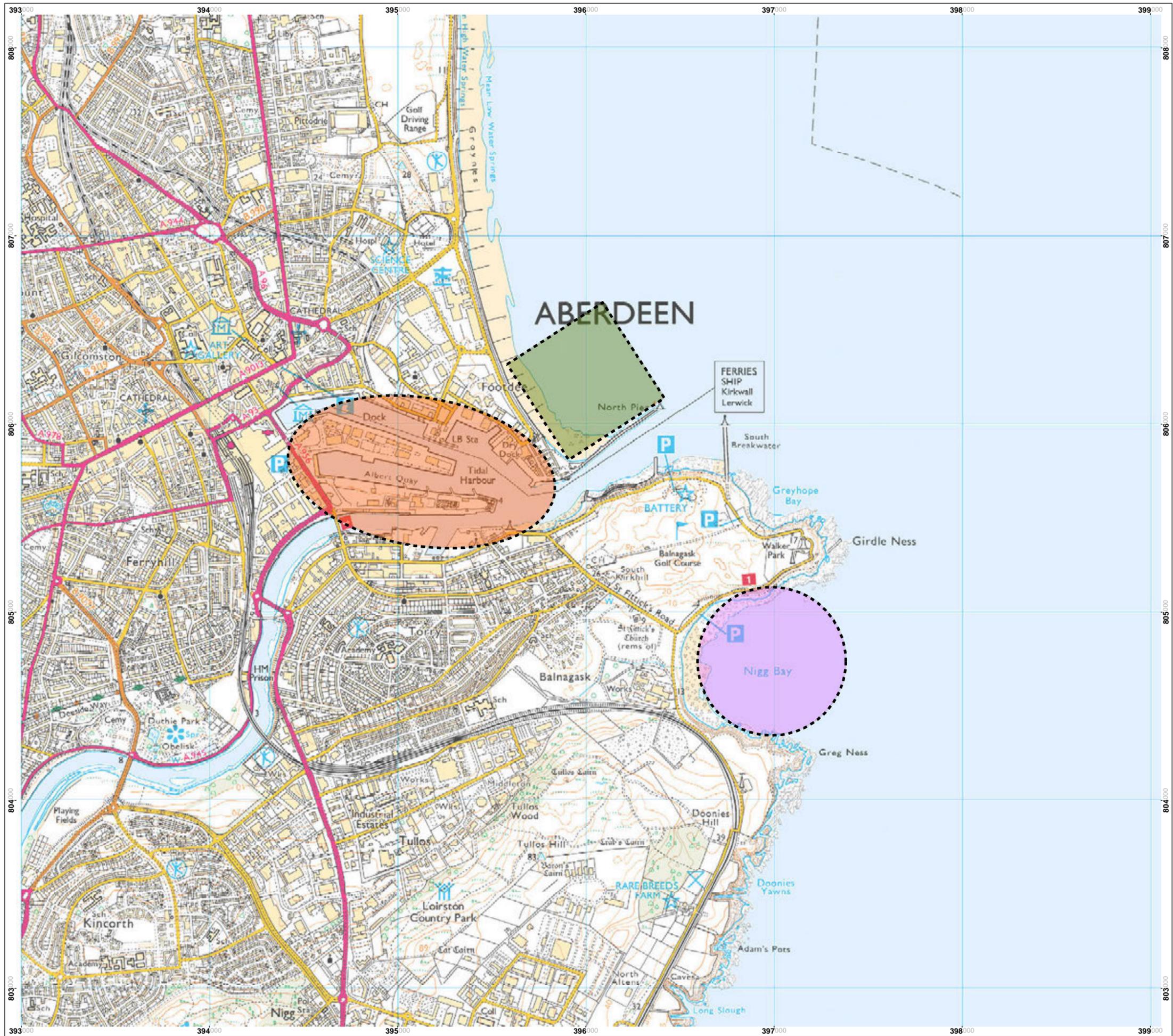
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# FIGURES

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## List of Figures:

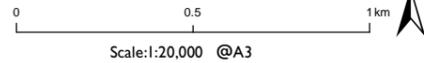
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- Figure 2 – Site Location Plan
- Figure 3 – Site Boundary
- Figure 4 – Phases of Development
- Figure 5a – Constraints Plan
- Figure 5b – Core Paths and Local Recreational Trails
- Figure 5c – Cultural Heritage Records
- Figure 6 – Landscape Character Areas



**Legend**

**Harbour Expansion Options**

- The Existing Harbour
- North Beach
- Nigg Bay



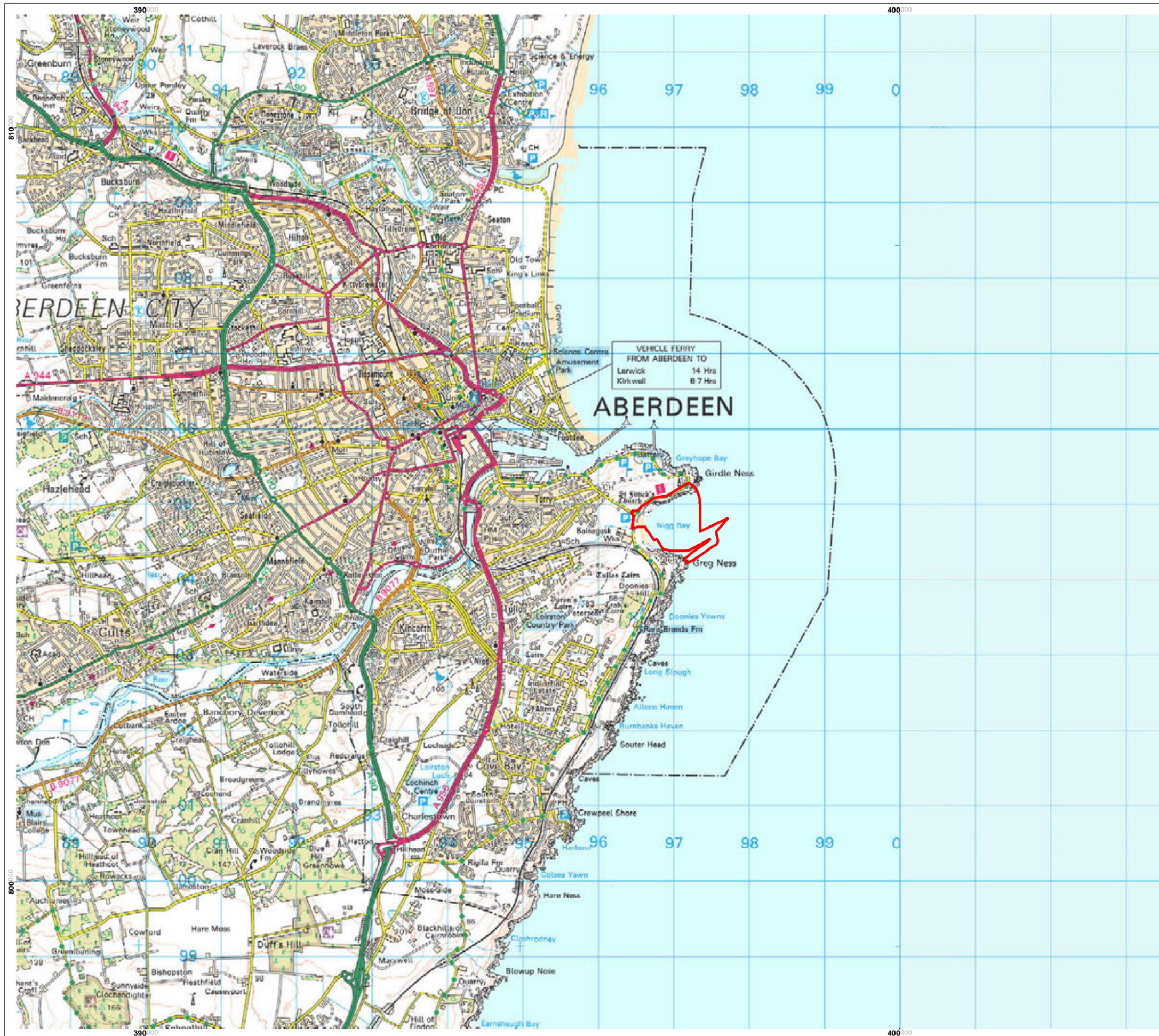
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**Harbour Expansion Options**

Figure No. 1

**Aberdeen Harbour Expansion - Scoping Report**

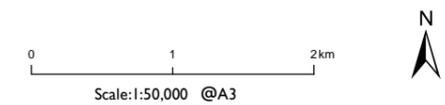


**Legend**

Site location



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**Site Location Plan**

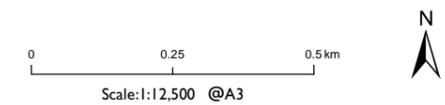
Figure No. 2

**Aberdeen Harbour Expansion - Scoping Report**



**Legend**

Site boundary



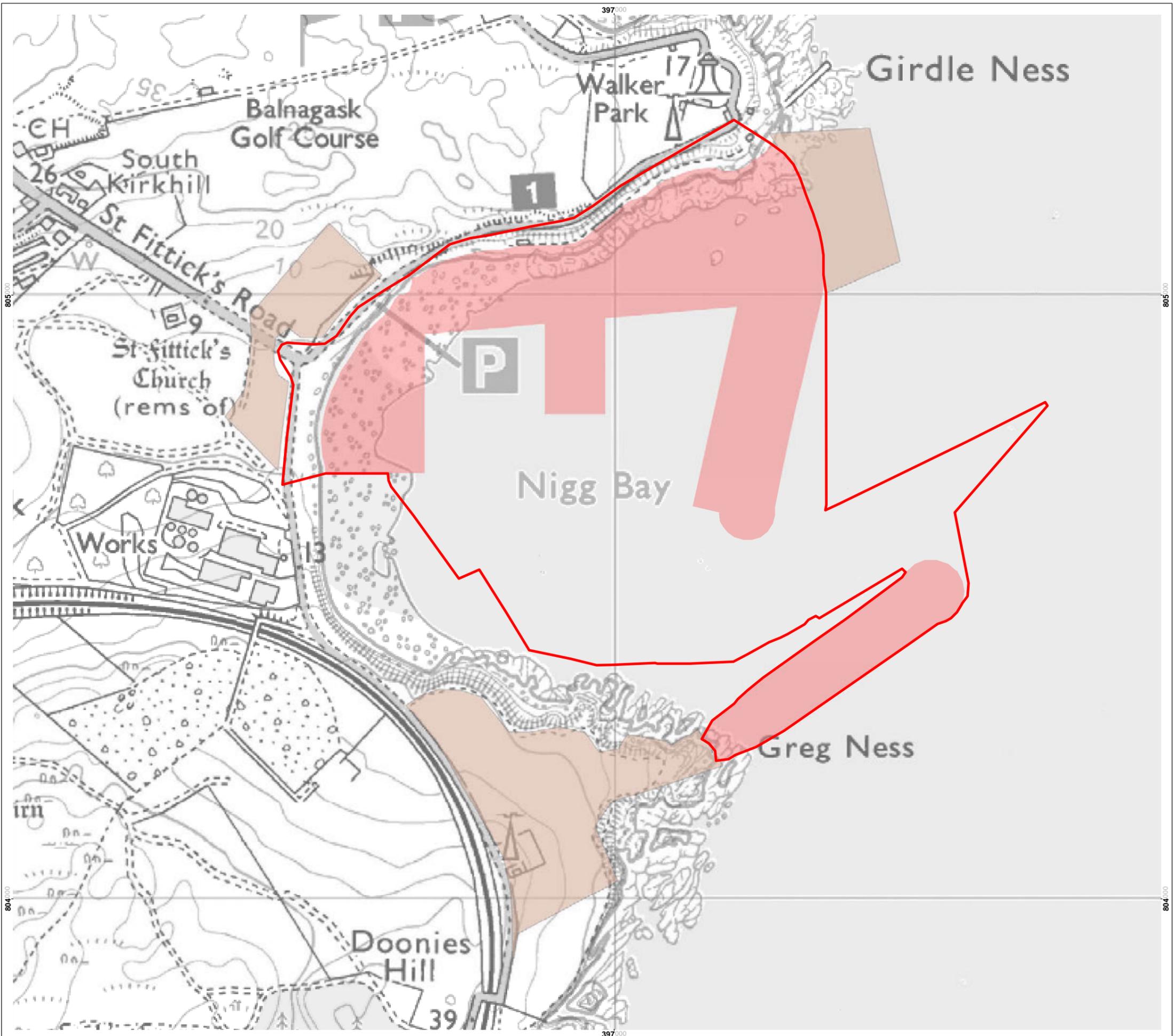
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**Site Boundary**

Figure No. 3

**Aberdeen Harbour Expansion - Scoping Report**



**Legend**

-  Site boundary
-  Proposed development footprint
-  Indicative temporary construction works / laydown areas



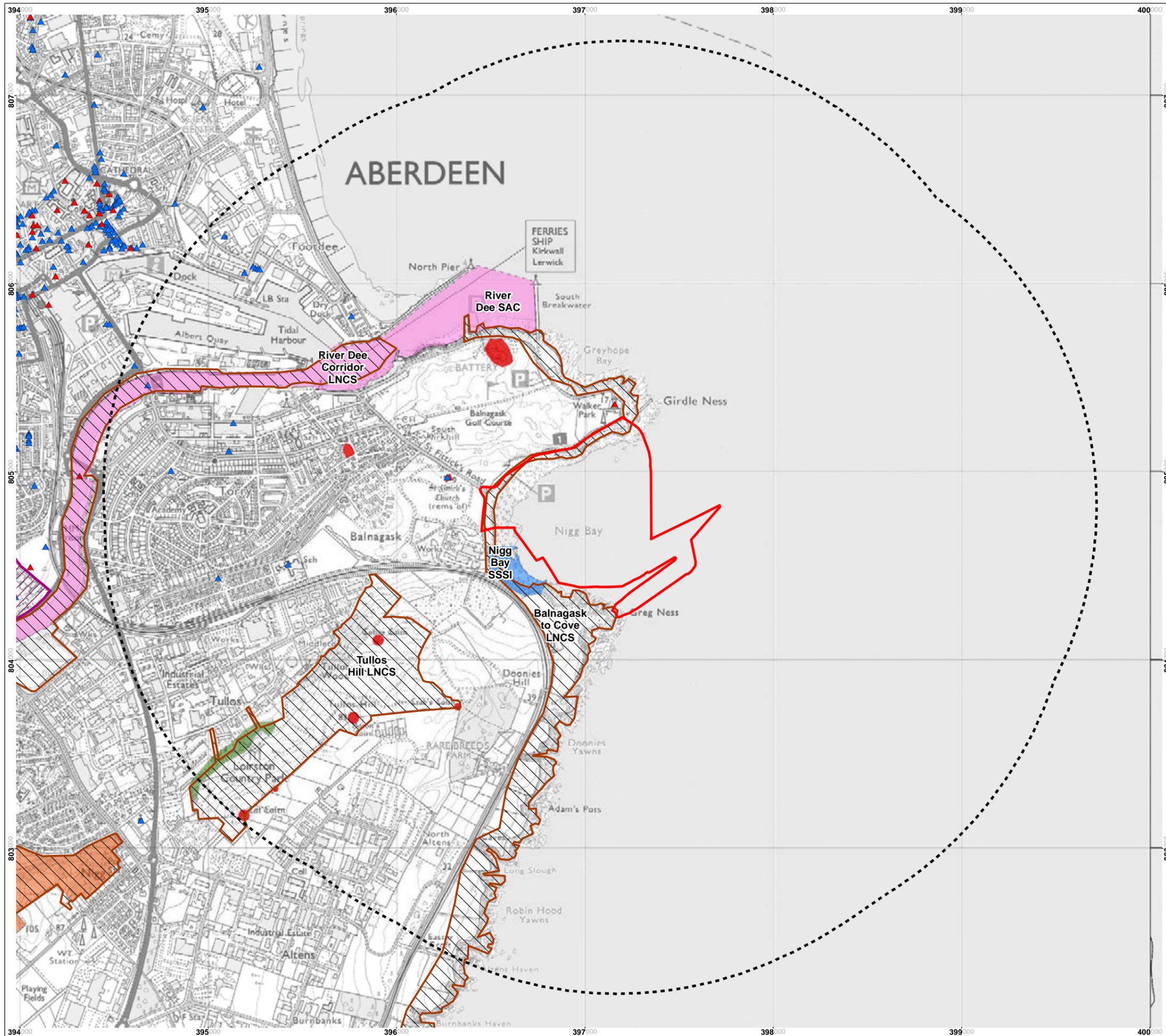
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**Proposed Development Footprint**

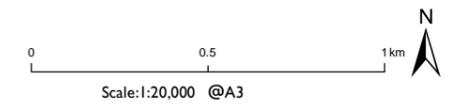
Figure No. 4

**Aberdeen Harbour Expansion - Scoping Report**



**Legend**

- Site boundary
- Study Area (2km)
- Scheduled Monuments
- Gardens & Designed Landscape
- ▲ Category A listed building
- ▲ Category B listed building
- ▲ Category C(S) listed building
- Special Area of Conservation
- Sites of Special Scientific Interest
- Local Nature Reserve
- Ancient & Long-established Woodland
- Local Nature Conservation Sites

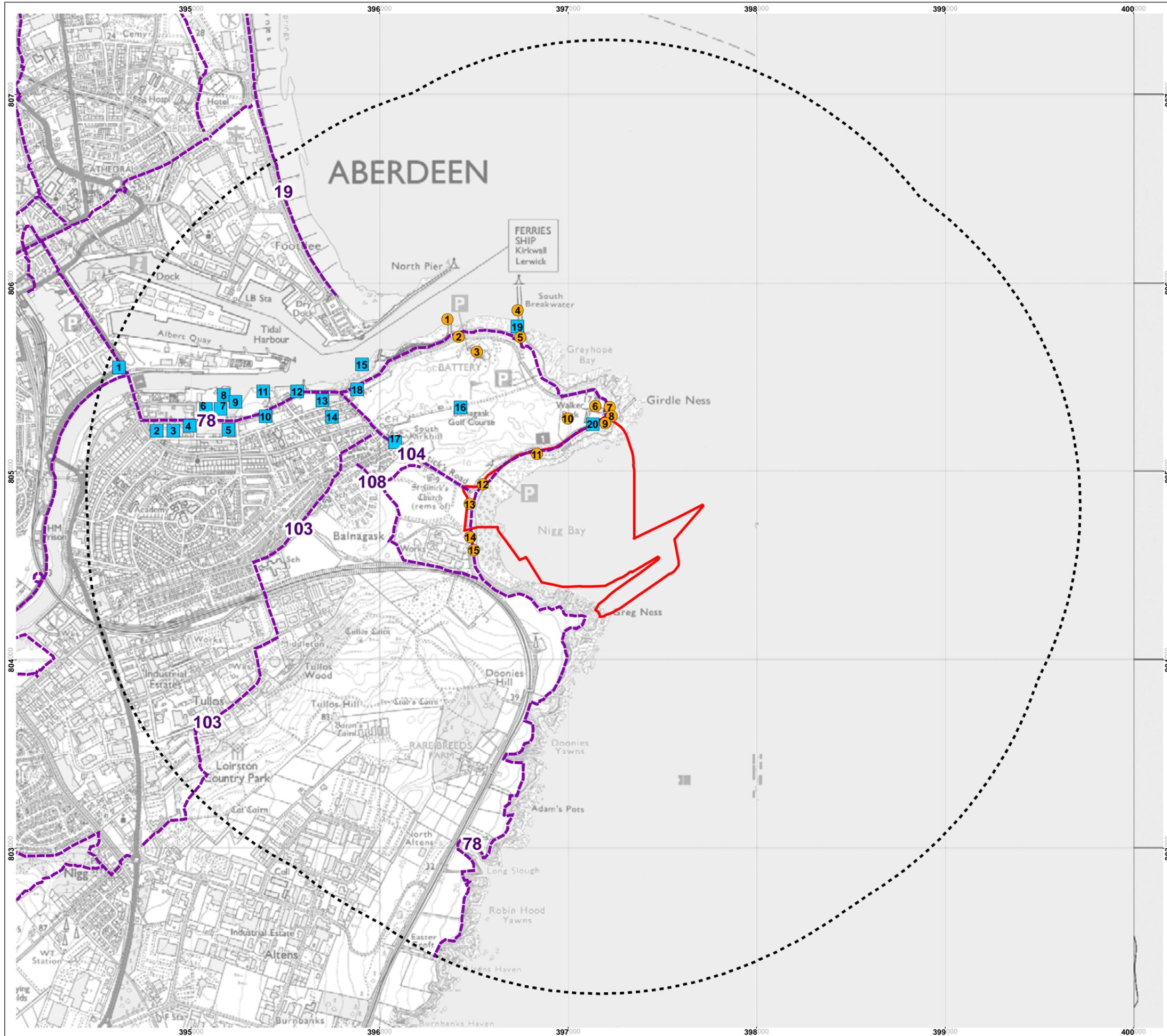


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 Job No: SAE7556    Drawn: KAG    Checked: MK  
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**Constraints Plan**

Figure No. 5a

**Aberdeen Harbour Expansion - Scoping Report**

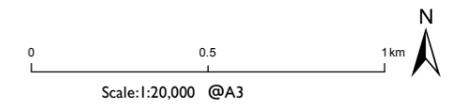


**Legend**

- Site boundary
- Study Area (2km)
- Core Paths
- Torry Coastal Trail
- Torry Industrial & Maritime Trail

Ref	Torry Coastal Trail
1	Inner South Breakwater
2	Rocket House
3	Torry Point Battery
4	Breakwater and Goliath
5	Anti-Tank Cubes-World War Tworemains
6	Lighthouse
7	Foghorn
8	Girdleness Battery
9	Sewage Valve House
10	Torry Park/Girdleness Park/Walker Park
11	Fishing Station
12	Salt Pans
13	Rifle Range
14	Kelp Works
15	St Fittick's Well

Ref	Torry Industrial & Maritime Trail
1	Tram Depot
2	Torry Brick and Tile Works
3	Cordiner and Sons Limited, Sinclair Road
4	Fiddes Saw Mills
5	Ross's Smoke House, Sinclair Road
6	John Lewis & Sons Ltd. Shipbuilders 1907-1976
7	Wood Group
8	Site of Dee Ferry Boat
9	River Dee Dock
10	Leading Lights
11	Torry Syphon House (Sewage Outflows)
12	John Duthie Torry Shipbuilding Co. Ltd.
13	Torry Research Station
14	Marine Laboratory
15	Torry Pier
16	Rig & Furrow on Balnagask Golf Course
17	Rig & Furrow on Balnagask Golf Course
18	Rig & Furrow on Balnagask Golf Course
19	Quarries
20	Sewage Valve House



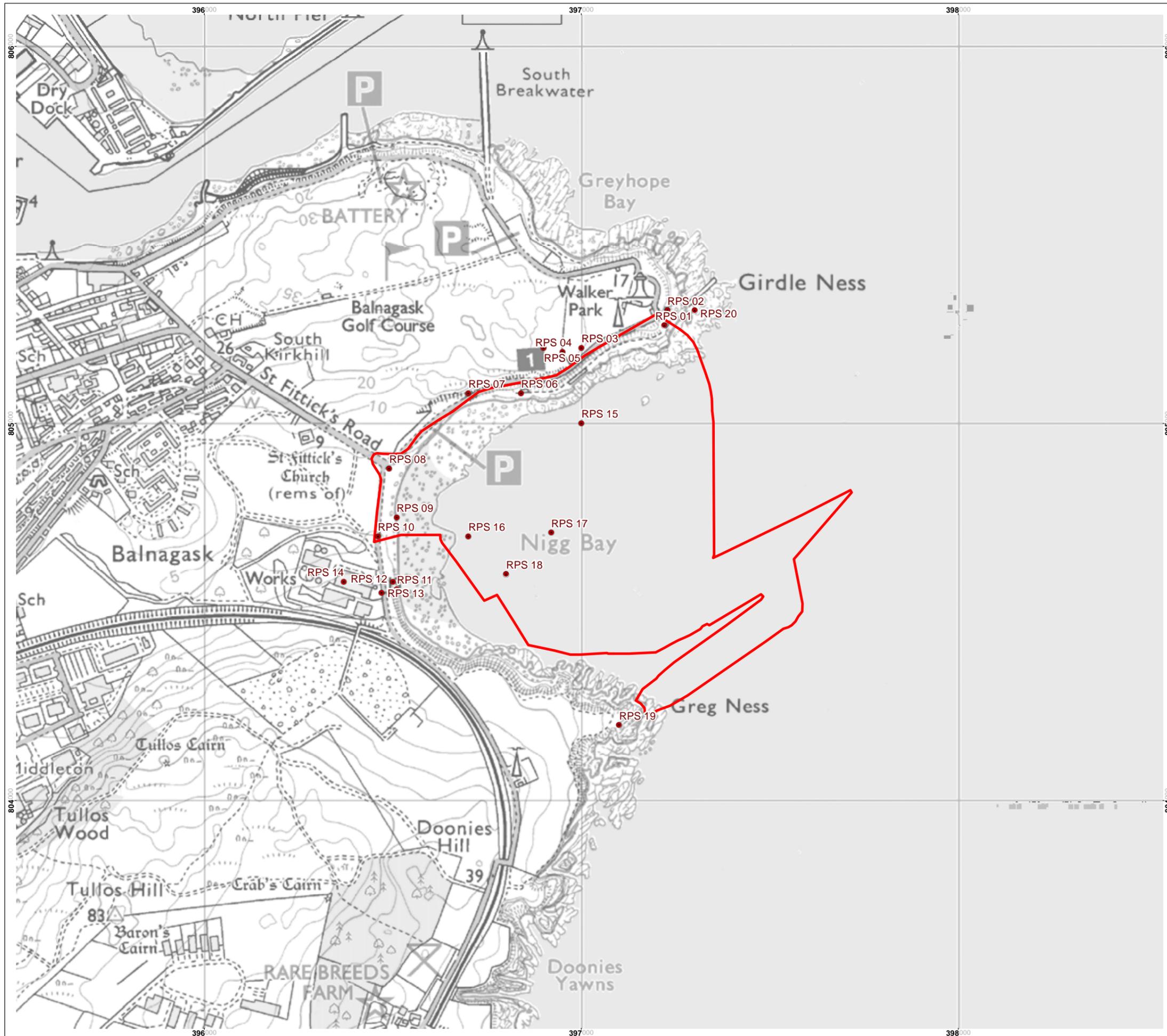
Date: 08.05.13	Scale: 1:20,000	Rev:
Job No: SAE7556	Drawn: KAG	Checked: MK

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**Core Paths & Local Recreational Trails**

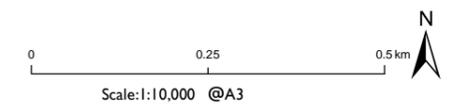
Figure No. 5b

**Aberdeen Harbour Expansion - Scoping Report**



Legend

- Site boundary
- Cultural heritage records



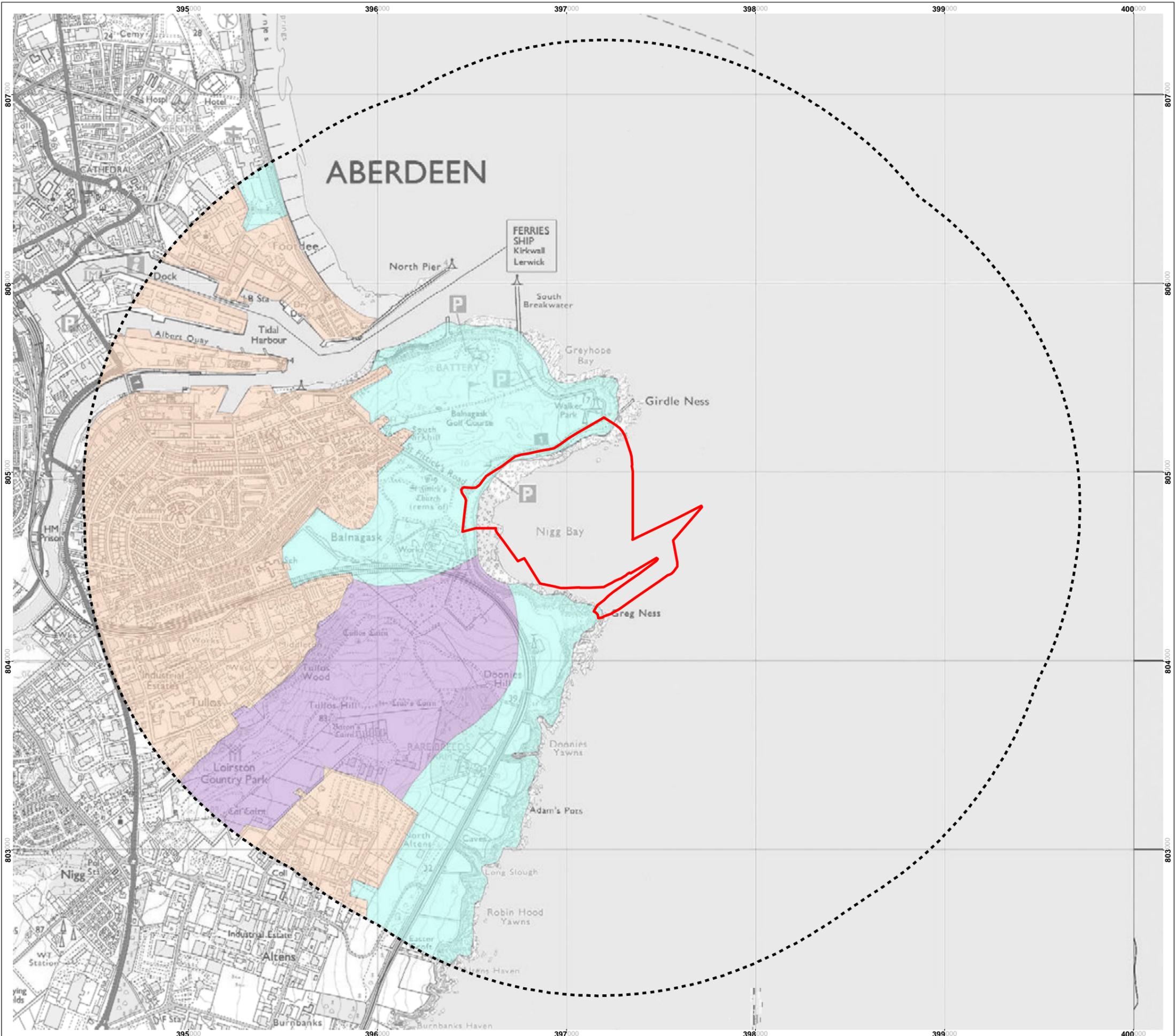
Date: 08.05.13	Scale: 1:10,000	Rev:
Job No: SAE7556	Drawn: KAG	Checked: MK

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Cultural Heritage Records

Figure No. 5c

Aberdeen Harbour Expansion - Scoping Report



**Legend**

Site boundary

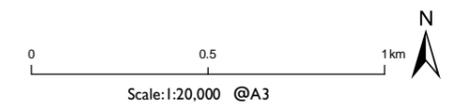
Study Area (2km)

**Landscape Character Areas (SNH)**

Coast

Hills

Urban



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**Landscape Character Areas**

Figure No. 6

**Aberdeen Harbour Expansion - Scoping Report**

