Hunterston Construction Yard
Environmental Review

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1 INTRODUCTION

Peel Ports own Hunterston Marine Construction Yard which is currently underutilised. It is therefore planned to amend Condition 1 of planning consent N/16/00268/PP to allow not only the construction but also the decommissioning/reverse engineering of large marine related structures. This will require improvements to the hammerhead quay (and associated dredging) and creation of dock gates to the existing dry dock.

1.1 Site Location

The existing Peel Ports Hunterston Marine Construction Yard, lies on the Firth of Clyde, north of the EDF Hunterston Power Stations and west of the Hunterston Coal Terminal (refer to Drawing No 168612-001). The site is adjacent to the Offshore Wind Turbine Test Facility operated by SSE, but is otherwise vacant at present, although maintenance is ongoing. The site is reclaimed land that has historically been used for industry and currently comprises an access road, service infrastructure, a deep void with a bund in place and a hammerhead quay.

1.2 Scope of This Document

This Environmental Review report provides a desk based study of the potential for the development to have effects on the site and surrounding environment. Walkovers by technical specialist (ecology, noise, air and water) were also carried out to inform the review. The review is based upon a large dataset and lengthy experience at the Hunterston Terminal and Construction Yard. The information prepared for the previously proposed power station application at the site provides a comprehensive set of survey data. This is enhanced by subsequent surveys carried out for the SSE turbine facility on the construction yard and proposals to upgrade the hammerhead quay in 2013.

1.3 Structure of the Environmental Review

The Environmental Review of the proposals has been structured as follows:

- Project Description;
- Water Environment and Coastal Processes;
- Ornithology;
- Terrestrial and Marine Ecology
- Landscape and Visual;
- Other Environmental Considerations; and
- Cumulative Impacts

1.4 Sources of Information

Primary sources of information have included:

- Study specific investigations and previous surveys;
- Literature review;
- Initial Consultation; and
- Engineering design studies.

Particular information sources are referenced throughout the document.

2 PROJECT DESCRIPTION

2.1 The Site

The site currently consists of a large scale dry dock with associated pumping infrastructure, laydown area/operational land and a hammerhead quay on the northern part of the construction yard as shown in Figure 2-1.

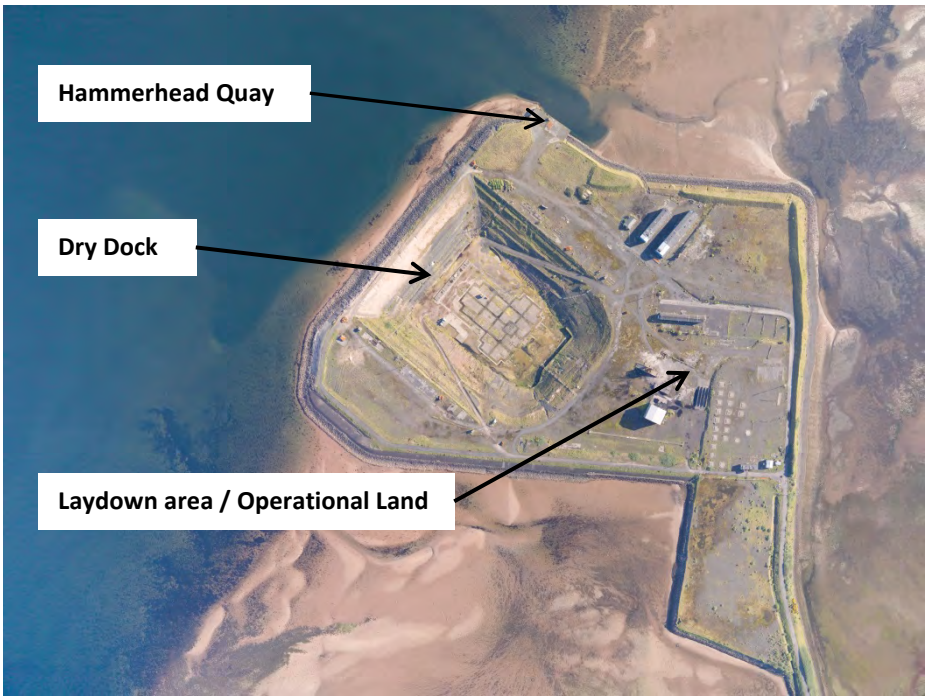

Figure 2-1: Hunterston Construction Yard

Previously to provide egress from the dry dock it was necessary to dredge out the northwest facing bund area and then replace it, also through dredging, to close off the dock again. This is shown in Figure 2-2 (Image from http://www.hunterston.eu/drydock).

Figure 2-2: Hunterston Construction Yard Dock Egress

The approach channel to the hammerhead quay has been maintained under a maintenance dredging license (Marine Scotland Code AF) to a dredged level of -3 CD. The nature of the dredged material is identified as being sands with an average insitu quantity of 2,250m^3 allowed to be removed under the current dredging license.

2.2 Environmental Setting

There are currently no known local designations in the surrounding area that have been identified.

The construction yard site is bounded on the landward side (to south, east and north) by the Southannan Sands Site of Special Scientific Interest (SSSI). The Southannan Sands SSSI is notified for the intertidal sandflat habitats which make up Fairlie Sands, Southannan Sands and Hunterston Sands. Eelgrass is also mentioned with the SSSI citation as an important component of the SSSI. There are no bird or protected species designations in the site or surrounding area.

The closest European designated site is the Renfrewshire Heights Special Protection Area (SPA) some 10km (six miles) to the northeast of Hunterston Marine Yard, which is designated for breeding hen harrier populations.

2.3 Site History

Hunterston Construction Yard is located on reclaimed coastline on the site of the former Poteath or Gull's Walk and Poteath Cottage. The Hunterston Construction Yard was constructed in the 1970s by infilling onto Hunterston and Southannan Sands. The yard was used to manufacture an oilrig base, dry dock and a gravity base tank prior to falling out of use in circa 1996.

2.4 Proposed Development

Currently the site is consented for:

> "*the use and enlargement of the existing building dock; use of the existing site, jetty and buildings; erection and use of other associated buildings and plant which would be located on the site in accordance with the operational demands of the work; and the use of the exiting site access and jetty; all for the purpose of the construction, repair and subsequent removal on completion of large marine related structures".*

The proposals are to amend the planning consent to allow decommissioning / reverse engineering of marine structures, oil industry structures, and obsolete vessels. Designs are currently being developed to provide a more functional facility and minimise/eliminate impacts on the site surrounds. This is anticipated to consist of a concrete caisson type structure to allow ready access and egress to the dry dock. In addition it is expected that the existing quay will require extending and strengthening. The berth will also be deepened to approximately -10m Chart Datum (CD). The approximate location of the proposed upgrading works is shown in Figure 2-3.

Figure 2-3: Approximate Locations of Proposed Development

It is proposed to construct the new dry dock gate (caissons) within the existing sand bund across the entry to the dry dock. Once the new dry dock gates are installed the sand forming the bund will be removed by a combination of land based excavation and dredging.

A capital dredge will be required to allow access to the new quay and gates. This is currently anticipated to be in the order of 150,000 to 200,000m^3 of sand. Drawing 105069/002 in Appendix A shows the extent of the dredge pocket for the upgraded hammerhead quay.

The shore based infrastructure requirement is also in development but is expected to include office accommodation, workshops, welfare facilities, waste storage areas, laydown areas and ancillary infrastructure. Such infrastructure is considered part of the existing consent with conditions on the existing consent in place to be discharged through NAC prior to erection of such infrastructure.

At this stage of the development process it is envisaged that marine structures will access the site from the sea for decommissioning / reverse engineering. Any products from this process will also leave the site by ship or from the existing railhead on the Hunterston Coal Terminal Site, for further processing. Access to the Coal Terminal railhead does not require traffic on public highways. As such no significant increase in road traffic on the A78 is expected over that already consented for construction activity.

2.5 Design Led Mitigation

The environmental team were appointed early in the development evolution. As a result there are a number of design decisions that have been informed by the awareness of the surrounding environment as follows:

New Gate Structure (Caissons)

- The new gate structure shall be built within the existing sand bund to minimise any potential impacts on the water environment;

Quay Upgrade

- The dredge pocket at the hammerhead quay is designed with a stable 1:6 dredge slope which avoids encroachment into the SSSI (see Drawing 105069/002 in Appendix A).

Dredging

- The material being dredged is currently intended to be brought to land. Dredging would only take place when caisson gates and quay upgrades were complete and ready for use. While in early development it is considered that the following steps could be followed for the dredging to minimise and avoid marine impacts:
    1. Use long reach excavators to take away rock armour and sand in front of the new entrance gates to an achievable level by excavator;
    2. Use this sand material to prepare a series of temporary lagoons on the construction yard to receive pumped sands from dredging;
    3. Prepare pipework from the temporary lagoons to the existing void on the marine yard;
    4. Pump dredged sand ashore to the lagoons and allow residual water to flow to the void area; and
    5. Allow this water to settle until suitably clear and then pump to sea through existing or new discharge network under appropriate consents from SEPA.

2.6 Planning Consent Process

There are two key aspects to delivering the development as proposed:

A. Application for variation of Condition No.1 of Planning Permission (N/16/00268/PP) from 'the construction, repair and subsequent removal on completion of large marine related structures' to include decommissioning/reverse engineering activity for such structures; and

B. Consent for improvements to quay and creation of dock gates.

It is noted that an application to Marine Scotland for consent to construct below Mean High Water Springs (MHWS) will also be required.

3 WATER ENVIRONMENT & COASTAL PROCESSES

3.1 Context

This part of the Environmental Review provides an appraisal of the implications of the proposed development on the water environment and coastal processes. The water environment is considered to encompass hydrology, hydrogeology and artificial drainage systems, whilst coastal processes are considered to encompass tides, waves and sediment transport processes.

The Water Framework Directive (WFD) (Council Directive 2000/60/EC) aims to protect and enhance water bodies within Europe and covers all estuarine and coastal waters out to 1 nautical mile. This requires that there is no deterioration in the quality of surface or groundwater bodies and aims to achieve good ecological status or potential. The implications of the WFD must be considered when assessing this project and the details provided of how compliance will be achieved.

The assessment will identify sensitive issues within the site by establishing the current baseline and examining the proposed development design within this context. A large amount of baseline data was collected for the Hunterston Clean Coal Power Station development (withdrawn) (Ayrshire Power Limited, 2010), and the subsequent Hunterston Quay Remedial Works Environmental Review (EnviroCentre, 2013). This recent baseline information has been drawn upon in this appraisal.

3.2 Baseline

3.2.1 General Site Description

The ground level of the Hunterston Marine Yard (HMY) is generally 5-6mAOD. There is a bund along part of the northwestern and northeastern boundary with the top of the bund being 8-9mAOD. The internal base of the construction yard sits at around -12.5m OD. The hammerhead quay berth is located on the north-eastern corner of the construction yard. The approach channel to the hammerhead quay berth has previously been maintained to a dredged level of -3m CD (Chart Datum). Whilst the approach to the construction yard has also been dredged previously (EnviroCentre, 2013). The Hunterston Channel between the site and Great Cumbrae reaches a maximum depth of around -30m OD.

There is existing planning permission (N/16/00268/PP) to use the site for 'the construction, repair and subsequent removal on completion of large marine related structures'. The removal of structures on completion currently involves pumping seawater into the dry dock using the existing pumping infrastructure. Then opening egress from the dry dock by means of dredging the north-western bund and removal of the structure. Subsequently the dredged material would be restored to isolate the dry dock, and the site pumped dry again using the existing pumping infrastructure.

As previously stated the hammerhead quay berth is dredged routinely to maintain access conditions. The area of the hammerhead quay berth is sheltered by the Construction Yard to the south and southwest, the spit of the Southannan Sands SSSI to the north and further afield by the Cumbraes to the west.

3.2.2 Surface and Groundwater

The site forms a small, well defined, self-contained catchment area for surface water runoff. Rainfall on the site shall either runoff to the shoreline, or into the construction area, depending on the location.

An active pumping system exists within the site, preventing accumulation of water within the yard. Two pipe outfalls discharge to the coast, one at the western corner of the construction yard, and the other at the northern corner.

3.2.3 Water Quality

SEPA's RBMP (River Basin Management Planning) water body classification in 2014 (SEPA, n.d.) shows that the Largs Channel (Fairlie Roads) coastal waterbody within the vicinity of the site has a water quality, physical condition and overall status of good.

There are two designated Bathing Waters close to the site – Pencil Beach, Largs (~6km) and Millport, Great Cumbrae (~3km). SEPA has monitored the water quality in these areas since 2000 due to their general recreational use.

Previous turbidity measurements at the Construction yard (EnviroCentre, 2013) showed the water locally to be clear with no suspended solids (<5mg/l) during the summer months, whilst occasional short bursts of increased turbidity appear to be associated with small amplitude wave action.

3.2.4 Tidal Levels

The closest tide table port to the site is at Millport, Great Cumbrae, <3km from the quay. The astronomical tidal range for Millport is shown in Table 3.1, where the highest astronomical tide is 3.9mCD which is equivalent to 2.3mAOD.

Table 3.1: Tidal range at Millport

Tide condition	Chart datum (mCD)*	Ordnance datum (mAOD)**
Highest astronomical tide	3.9	2.3
Mean high water spring	3.4	1.78
Mean high water neap	2.7	1.08
Mean level	1.99	-0.26
Mean low water neap	1.0	-0.62
Mean low water spring	0.4	-1.22
Chart datum	0	-1.62

** Admiralty Tide Tables*

*** Chart Datum correction for Ordnance Datum is -1.62m (relative to OD at Newlyn)*

Extreme water levels

The lower lying internal area of the marine yard is shown on the SEPA indicative flood map as being at risk of flooding from the sea (SEPA, 2014). SEPA's Extreme Sea Level datasets for Scotland indicate the 1 in 200 year and 1 in 1,000 year return period extreme still water level for Hunterston Construction Yard is 3.67mAOD and 4.03mAOD respectively, with a confidence interval of 0.5m and 0.7m respectively.

Wave run-up

Wave data has been recorded in 20m water depth offshore of Ardrossan, which is located 20km to the south of the construction yard. One-winter record showed significant wave heights commonly reaching 2-3m, and extreme waves >5m. The wave period was typically 5- 6 s. These wave conditions may be expected to prevail at 20m depths off the West corner of the construction yard, on the basis of similar exposure and fetch to peak wave conditions at Ardrossan. The nature of the boulder/cobble substrates here attests to strong wave action (Ayrshire Power Limited, 2010; EnviroCentre, 2013).

3.2.5 Tidal Currents and Waves

Tidal currents in this area are generally slow, with mid depth velocities in the development site not expected to exceed 0.3m/s^{-1}. Wave action in shallow water (<10m) can generate strong flows during storm conditions or

with an incoming swell. A combination of tidal currents and wave action will produce the highest energy conditions in the vicinity of the site, with the greatest potential for sediment transport. Under these conditions shoaling wave flow will tend to drive an onshore/north-eastward overall sediment flow (Ayrshire Power Limited, 2010; EnviroCentre, 2013).

3.2.6 Sediment Transport

In the Southannan and Hunterston Sands area there is a large thickness of Pleistocene deposits overlying rockhead. Boreholes from the Hunterston Terminal have shown these to be largely fluvio-glacial in origin, but there are areas where large boulders lie on the seabed, winnowed from Pleistocene deposits by recent marine action likely arising from ice-rafting from the retreating ice-fronts within the Late Devensian glacial lake that occupied this area (refer to Drawing No 161511J-007 and 008).

The margin between the side slope of the Hunterston Channel and the flat zone of Southannan and Hunterston sands is characterised by the extensive exposure of winnowed outcrop of these Pleistocene deposits. In waters both immediately shallower and deeper there are typically deposits of medium sand, probably derived from erosion of these outcrops and certainly transported by bedload processes under combined wave and tide action.

The deepening of the area north of the construction yard, both to provide access and fill for the marine yard opening, and to provide access to the supply (hammerhead) quay, is clearly evident in the available bathymetry and aerial photography. Since the dredging of this area, sampling exercises have shown that the deepest sites have slowly filled with fine and very fine sand, which accumulates from suspension processes. Bedload medium sand transport vectors appear generally to have been less effective sources of infill within this over-deepened area. This is an important observation which indicates that bedload sand transport processes in this zone are slow, and that therefore there is no strong feed of medium sand onto Southannan sands from around the north shore of the Construction Yard (Ayrshire Power Limited, 2010; EnviroCentre, 2013).

3.3 Key Issues

3.3.1 Proposed Development

The construction and operation of the proposed development would involve the following main features from the point of view of potential impacts on the water environment and coastal processes:

- Construction of caissons;
- Placement of sheet piles on the face of the existing quay;
- Infilling of gap between new and existing quay wall;
- Formation of concrete slab on quay wall;
- General construction works;
- Dredging of hammerhead quay berth and construction yard opening;
- Site drainage and discharge during construction and operation.

It is proposed to construct the caissons within the existing rock armoured sand bund. Therefore this activity does not have the potential to impact on the water environment or local coastal (sand) processes.

3.3.2 Sensitive Receptors

The sensitive receptors to potential impacts on the water environment and coastal processes have been identified as:

- Southannan Sands SSSI (coastal processes);
- EDF Hunterston cooling water intake (water quality); and
- Firth of Clyde (water quality).

3.3.3 Potential Impacts

This section identifies the potential environment impacts on the site drainage, water quality and coastal processes at and around the site during the construction and operation of the proposed works. The proposed works represent a relatively small-scale alteration to the existing infrastructure (see Figure 3.1), and the location and extents of the proposals are consistent with the existing permissions and operational plan. It is considered that the construction and installation of a caisson based dry-dock access represents a lower impact methodology than the previous dredge method.

Figure 3-1: Schematic of Caisson Location (approximately 75m length)

As the operational processes and impacts will remain as per the already consented use, it is considered that the only element of the proposed works to fall out with the envelope of the existing planning permission is the upgrade of the hammerhead quay berth and capital dredge. It is therefore proposed that these elements will form the focus of assessment.

The potential impacts from the proposed works are therefore considered to include:

- Contamination of coastal water and sediments by oil, fuels and suspended solids through spillages during construction, dredging and site drainage/discharge;
- Interactions between water environment impacts and ecology (see the Ecology section of this document).

- Changes to local tidal current velocities (local changes in flow current velocities and direction) and associated impact on sediment transport processes; and
- Flooding.

3.4 Scope of Assessment

Assessment of the potential for particulate and chemical contamination of water as a result of the proposed dredging and construction works will be central to the assessment. The prevention of pollution during construction and operational phases will be a specific focus, with recommendations made for the adoption of good working practices in line with appropriate guidance.

In relation to planned site drainage and associated discharge, Condition 2 of the existing planning permission (N/16/00268/PP) states that:

'Prior to the recommencement of development on the site the applicant shall obtain the written approval of North Ayrshire Council as Planning Authority regarding: c) the proposed arrangements for the treatment and disposal of effluents and waste products together with plans showing the proposed drainage system for the treatment and disposal of soil and surface water and arrangements for the control of flotsam arising from any work on the site and for preventative measures to avoid pollution of the foreshore'.

Drainage and discharge details, as requested within the condition above, will be provided at a later date once an operator is in place and prior to recommencement of development. Therefore it is proposed to scope out further assessment of operational site drainage and discharge at this stage.

Given the existing dredged character of the hammerhead quay berth and the armoured nature of the Marine Yard bunds, it is considered that any impact to tidal current velocities and wave climate would be minor, localised and insignificant. Therefore it is proposed to scope out further impact assessment of wave climate, and to provide further consideration of the impact on sediment transport processes in the form of a qualitative assessment utilising existing hydrodynamic modelling and data.

The proposed development will also be considered with respect to coastal flood risk (including wave overtopping).

4 ORNITHOLOGY

4.1 Context

This section provides a description of the known baseline conditions and highlights key issues of the proposed development on ornithology. The following baseline data has been extracted from the Hunterston Power Station Environmental Statement (ES) (APL, 2010), its subsequent Addendum document (APL, 2011), and from data collected as part of the National Offshore Wind Turbine Test Facility (NOWTTF) project (SSER, 2012- 2016).

4.2 Baseline

4.2.1 Designated Sites

The proposed site is located to and within 5km of a number of sites designated with relevance to ornithology, plus the Inner Clyde Special Protection Area, which is 32km north of the site. These are listed and described in the following section. It should be noted that, while at some distance from the Proposed Development, a potential exists for ecological impacts relating to the construction and operation of the dock facility to be more wide-spread.

Special Protection Areas (SPAs) are classified under the EC Directive on the Conservation of Wild Birds (79/409/EEC), the "Birds Directive". The Directive requires the Member States of the European Community to identify and classify the most suitable territories, in size and number, for certain rare or vulnerable species (listed in Annex I of the Directive) and for regularly occurring migratory species. SPAs are intended to safeguard the habitats of the species for which they are selected and to protect the birds from significant disturbance. Together with Special Areas of Conservation (SAC), which are designated under the Habitats Directive for habitats and non-bird species, SPAs form the Natura 2000 network of sites.

RAMSAR sites are wetlands of international importance designated under the Ramsar Convention (the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971) (JNCC, 2012i). The initial emphasis was on selecting sites of importance to waterbirds within the UK, and consequently many Ramsar sites are also SPAs classified under the Birds Directive.

Site of Special Scientific Interest (SSSI) refers to areas which have been provided UK statutory protection for being the best examples of the UK's flora, fauna, or geological or physiographical features. These sites are also used to underpin other national and international nature conservation designations. The SSSI designation may extend into intertidal areas, out to the jurisdictional limit of local authorities, Mean Low Water of Spring tides in Scotland. There is no provision for marine SSSIs beyond low water mark, although boundaries sometimes extend more widely within estuaries and other enclosed waters (JNCC, 2012ii).

Southannan Sands SSSI (formerly Portencross Coast SSSI) is of primary importance to this application, as the site is adjacent to the current designation boundary. The designation previously covered an area of 477.9ha and extends along the coastline, from Fairlie in the north to the pier at Portencross in the south, and extends to low water spring tide. However, with the re-designation of the SSSI area, "Portencross SSSI" now refers to the woodland to the south and a new "Southannan Sands SSSI" covering the intertidal sands.

Since it was originally designated as a SSSI, the land within the site has undergone a significant degree of change, through industrial reclamation and development, including construction of the Hunterston Coal Terminal, an oil rig construction yard and a nuclear power station. The site was therefore re-notified under the

Nature Conservation (Scotland) Act 2004, with an amended boundary in 2013, and SNH have undertaken studies of the site (see summary below) which facilitated the re-notification process.

SNH's recent study and review of the Portencross Coast SSSI assessed the following ornithological features:

- Aggregation of non-breeding birds - determined not to currently meet the SSSI selection criteria;
- Aggregation of breeding birds - determined not to currently meet the SSSI selection criteria; and
- Assemblage of breeding birds - determined not to currently meet the SSSI selection criteria.

The Dwarf eelgrass (*Zostera noltii*) beds which grow on the intertidal habitats are noted of national importance. Although no longer part of the designation, the congregation of waders and wildfowl supported by the area is noted as of regional importance, as it is only one of three areas supporting significant numbers of these species between Stranraer and Greenock. The transition zone in the southern portion of the site is noted for its flora including the locally uncommon Parsley Water Dropwort (*Oenthe lachenalii*) and a nationally scarce plant the Seaside Centaury (*Centaurium littorale*). Additionally, the cliffs at the southern end of the site are noted as supporting woodland of the Ash-Rowan-Dog's Mercury type.

Inner Clyde SPA/RAMSAR and SSSI is approximately 32km to the northeast of the proposed site; the closest point is at Greenock. Located to the west of Glasgow it covers an area of 1,826.02ha. Although heavily industrialised along its length, upstream of Gourock and Helensburgh there are very extensive sand and mud flats. These have an abundant invertebrate fauna, the species composition of which has been changing consequent to recent improvements in the quality of water within the estuary. The Inner Clyde estuary is important for a range of wintering wading and waterbirds, notably Redshank (*Tringa totanus*).

Renfrewshire Heights SPA and SSSI has been designated for regularly supporting a breeding population, of European importance, of the Annex 1 species Hen harrier (*Circus cyaneus*). It supported an average of 10 breeding females annually between 1998 and 2004, 2% of GB. The SPA covers 8,943 hectares and is located approximately 10km north east of the site. It comprises a large area of upland moorland south of Greenock. The area is mainly covered by blanket mire, wet heaths and rough grassland. Much of the heath and mire is dominated by dwarf shrubs, especially Ling heather (*Calluna vulgaris*). The boundaries of the SPA are coincident with those of the Renfrewshire Heights SSSI.

4.2.2 Breeding Birds

No internationally or nationally important breeding bird populations were recorded at the site and no Schedule 1 Bird Species were recorded as breeding within the study area. The 2008 and 2011 breeding bird surveys recorded a total of 39 species over the two survey visits, of which 25 were confirmed or suspected of breeding within the original power station study area; of these, nine species have been recorded as breeding on the Construction Yard and the causeway access were: Black-headed gull (*Chroicocephalus ridibundus*), Chaffinch (*Fringilla coelebs*), Greenfinch (*Carduelis chloris*), Lapwing (*Vanellus vanellus*), Meadow pipit (*Anthus pratensis*), Oystercatcher (*Haematopus ostralegus*), Ringed plover (*Charadrius hiaticula*), Starling (*Sturnus vulgaris*) and Wheatear (*Oenanthe oenanthe*). Mute swan (*Cygnus olor*) and Shelduck (*Tadorna tadorna*) were also noted to be using the Southannan and Hunterston sands.

Lapwing and Starling are included on the Red List of the national Birds of Conservation Concern (BoCC), as their populations have undergone a rapid decline (>50%) over the last twenty five years.

None of the breeding species were recorded at nationally important numbers (usually assessed as >1% of national population). This corresponds with SNH's assessment that the assemblage and aggregation of breeding birds within the Portencross SSSI does not meet SSSI selection criteria.

Since the surveys were undertaken, the Construction Yard has undergone change, with the demolition of all buildings on site and the erection of two wind turbines and associated infrastructure, further decreasing the suitability for breeding birds.

4.2.3 Wintering Birds

As part of the planning conditions for the NOWTTF, Through the Tide counts (TTT) have been undertaken between October and March at both Hunterston Sands and Southannan Sands (and a control site at Fairlie Sands) since October 2012. Survey methods were similar to those used since the 2008/09 and surveys for the Hunterston Power Station ES, with the exception being that since 2012, the locations of species have been mapped during each count. This was to establish if birds have changed feeding/roosting areas during, and since, the construction of the turbines on site.

Total numbers of species recorded over each winter period remain similar to historical records. Peak counts of individual wader species remain broadly similar to those historical records referenced in the 2011 ES Chapter, whereas peak counts of several species of waterfowl have shown a significant increase in numbers over the last decade, as shown in Table 4.1 below.

Table 4.1: Peak Overwintering Count of Selected Species at Hunterston Sands and Southannan Sands

Species	Peak Count at Hunterston Sands					Peak Count at Southannan Sands				
	2005/ 06	**2008/ 09**	**2013/ 14**	**2014/ 15**	**2015/ 16**	**2005/ 06**	**2008/ 09**	**2013/ 14**	**2014/ 15**	**2015/ 16**
Curlew	188	102	342	160	191	241	216	289	256	204
Oystercatcher	210	129	177	116	291	683	487	408	658	620
Redshank	89	23	44	47	25	66	18	77	101	157
Wigeon	33	11	1235	970	707	168	375	1519	1364	1193
Shelduck	72	48	63	58	43	185	69	158	80	66
Mallard	34	6	64	75	152	42	26	108	209	171

The results of the surveys indicate that the presence of the existing turbines on the construction yard has not resulted in a change in site use by any species of bird present or caused the abandonment of any traditional roost sites. These main feeding and roosting areas are not located adjacent to the proposed site. The main roosting site (north-east corner of Southannan Sands) for waders (predominately Oystercatcher and Curlew) is located 1.3km from the quay, with the closest Oystercatcher roost on the eastern shore of the Construction Yard located 550m from the quay (and not in direct line of site).

Drawing No 168612-003 shows the main roost sites at Hunterston.

None of the wintering species were recorded at nationally important numbers (usually assessed as >1% of national population). This also corresponds with SNH's assessment that the aggregation of non-breeding birds within the Portencross SSSI does not meet SSSI selection criteria.

4.2.4 Disturbance monitoring

As enabling works (including piling) and construction activity within the NOWTTF site continued into the winter (October – March), an ornithologist was present on site to undertake disturbance monitoring on the causeway leading to the former Construction Yard for the 2013/14 winter period (October 2013 to March 2014) and the 2014/15 winter period (October 2014 to March 2015).

The causeway stretches between Hunterston Sands and Southannan Sands, and all vehicular activity along the causeway was recorded with any obvious disturbance events being noted and assigned into the following categories (this included any disturbance as a result of enabling works eg. piling):

1. Minor disruption: birds walk or fly but return to the study area within 400m of the previous position.
2. Local displacement: birds take flight and return to a different position over 400m away but within the study area.
3. Major displacement: birds take flight and abandon the study area.

In 2013/14, there was a total of 130 disturbance events over the survey period:

- Category 1: 2 events;
- Category 2: 101 events; and
- Category 3: 27 events

Tables 4.2, 4.3 and 4.4 below show the activities that led to these disturbance events.

Table 4.2: Category 1 Disturbance Events 2013/14

Activity	Number of events	% of Total
Construction Works (including vehicles in and out of site)	1	50
Dog Walkers	1	50

Table 4.3: Category 2 Disturbance Events 2013/14

Activity	Number of Events	% of Total
Recreation (dog walkers, walkers, joggers, cyclists, horse riders)	55	54.4
Construction Works (including vehicles in and out of site)	27	26.7
Bait Diggers	5	4.9
Vehicles along main power station road	6	5.9
Birds of Prey/Corvids/Gulls	6	5.9
Other	2	1.9

Table 4.4: Category 3 Disturbance Events 2013/14

Activity	Number of Events	% of Total
Recreation (dog walkers, walkers, joggers, cyclists, horse riders)	8	29.6
Construction Works (including vehicles in and out of site)	4	14.8
Bait Diggers	7	25.9
Vehicles along main power station road	4	14.8
Birds of Prey/Corvids/Gulls	4	14.8

In 2014/15, there was a total of 101 disturbance events over the survey period:

- Category 1: 40 events;
- Category 2: 48 events; and
- Category 3: 13 events

Tables 4.5, 4.6 and 4.7 below show the activities that led to these disturbance events.

Table 4.5: Category 1 Disturbance Events 2014/15

Activity	Number of Events	% of Total
Recreation (dog walkers, walkers, joggers, cyclists, horse riders)	22	55
Construction Works (including vehicles in and out of site)	16	40
Bait Diggers	2	5

Table 4.6: Category 2 Disturbance Events 2014/15

Activity	Number of Events	% of Total
Recreation (dog walkers, walkers, joggers, cyclists, horse riders)	24	50
Construction Works (including vehicles in and out of site)	18	37.5
Bait Diggers	4	8.3
Birds of Prey/Corvids/Gulls	2	4.2

Table 4.7: Category 3 Disturbance Events 2014/15

Activity	Number of Events	% of Total
Recreation (dog walkers, walkers, joggers, cyclists, horse riders)	10	76.9
Construction Works (including vehicles in and out of site)	1	7.7
Vehicles along main power station road	1	7.7
Bait Diggers	1	7.7

Recreational activities (particularly dog walkers) are the main factors for disturbance on the site. It is considered that the works undertaken at the NOWTFF site during the monitoring period resulted in no significant change of behaviour in the birds utilising the site.

4.3 Key Issues

4.3.1 Proposed Development

The construction and operation of the proposed development would involve the following main features from the point of view of potential impacts on Ornithology:

- Construction of caissons;
- Placement of sheet piles on the face of the existing quay;
- Infilling of gap between new and existing quay wall;

- Formation of concrete slab on quay wall;
- General construction works;
- Dredging of hammerhead quay berth and construction yard opening;
- Site drainage and discharge during construction and operation.

4.3.2 Potential Impacts

This section identifies the potential environment impacts on Ornithology at and around the site during the construction and operation of the proposed works. The proposed works represent a relatively small-scale alteration to the existing infrastructure (see Figure 4.1), and the location and extents of the proposals are consistent with the existing permissions and operational plan.

The potential impacts from the proposed works are considered to include:

- Disturbance to roosting and feeding over-wintering birds during piling and dredging works; and
- Disturbance to breeding birds during proposed development works.

As outlined in preceding sections of this appraisal report there is existing planning permission (N/16/00268/PP) to use the site for '*the construction, repair and subsequent removal on completion of large marine related structures'*. It is considered that the proposed use for decommissioning of large marine related structures is directly comparable with the consented use, involving very similar operations and structures, and is therefore compatible with the existing permission. Therefore, operation is not considered a potential impact.

4.4 Scope of Assessment

Long term research undertaken in Cardiff Bay (Burton et al 2002 and 2002b) and the Humber Estuary (ERM 1996) indicate that noise from machinery etc on construction and industrial sites can disturb feeding or roosting waders. A study undertaken by Burton and Armitage (2005), found that the feeding population of waders on mudflats immediately adjacent to active construction sites was significantly lower than unaffected mudflats up to a distance of 200-300m. After this distance, numbers of waders appeared to be unaffected. Waders also avoided roosting near active construction sites.

Research by the Environment Agency (EA) for the Humber Estuary Tidal Defences Scheme concluded that a sudden noise in the region of 80dB appears to elicit a flight response in waders up to 250m from the noise source. They also found that levels of approximately 70dB caused flight or anxiety behaviour in some species. This is one of the few published findings on threshold noise levels for wader disturbance. Several studies have shown that waders are generally disturbed by sudden (abrupt) loud noises, known as "startling", but have the ability to habituate to long term, high noise levels.

Section 4.2.3 and Drawing No 168612-003 show the main roosting sites for waders at Southannan and Hunterston Sands. The closest roost is 550m from the proposed development areas. Drawing No 168612-003 also shows a 300m disturbance buffer around the proposed works. It should be noted that although the 300m buffer has been applied to take into account the construction of the caissons within the existing dock, it is anticipated that noise creation is likely to remain within the dock itself and not cause an impact to birds feeding at Hunterston Sands. The disturbance buffers do not fall within any of the roost sites at Southannan or Hunterston Sands.

The 300m disturbance buffer around the piling and dredging of the existing quay falls within a small area of intertidal habitat that could be used by feeding waders and waterfowl. However, the area within the disturbance buffer is not a main feeding site by birds, as highlighted by the through the tide counts undertaken between 2012 and 2016. At low tide, birds primarily tend to feed on the mussel bed areas and the eastern side

of Southannan Sands. In addition, by applying a soft-start approach to piling for the quay, it is likely that waders and wildfowl will become habituated to this short-term and temporary activity.

Speed restrictions are also in place along the access road to the construction yard, which aids in avoiding significant disturbance to birds.

There is the potential for construction works to impact on breeding birds, although this can be managed through pre-construction works such as pre-works surveys, putting measures in place to dissuade birds from nesting within construction zones (there is sufficient locally available habitat in the wider area of the Construction Yard to support nesting wader species such as Lapwing and Oystercatcher) and applying exclusion zones around nests to ensure disturbance does not occur.

Given the above, and through the surveys already undertaken on site, it considered that there would be a negligible impact on birds as a result of the proposed development and that further assessment is not required. A statement on ornithology would be included within the Ecology section.

5 TERRESTRIAL AND MARINE ECOLOGY

5.1 Context

This section provides a description of the known baseline conditions and highlights key issues of the proposed development on the ecology of the area. For the purposes of the assessment, the ecological interests are sub-divided into Terrestrial Habitats (including faunal interests) and Marine & Freshwater Aquatic Habitats (including faunal interests). The following baseline information has been extracted from the Hunterston Power Station Environmental Statement (ES) (APL, 2010), and its Addendum document (APL, 2011), and from further studies conducted for the Hunterston Quay upgrade.

5.2 Baseline

5.2.1 Site Description

The proposed development includes the extension and strengthening of the existing quay, creation of dock gates and shore based infrastructure within the Hunterston construction yard. The construction yard is bounded on the landward sides, to the south, east and north, by Southannan Sands SSSI. The site borders the Firth of Clyde with the Fairlie Roads flowing between the site and the Greater and Little Cumbrae Islands.

A full description of this area is provided in Section 2, Project Description.

The site where works are proposed is located, adjacent to and within 5km of a number of sites designated for nature conservation value. These are listed and described in the following section.

Site of Special Scientific Interest (SSSI) refers to areas which have been provided UK statutory protection for being the best examples of the UK's flora, fauna, or geological or physiographical features. The SSSI designation may extend into intertidal areas, out to the jurisdictional limit of local authorities, Mean Low Water of Spring tides in Scotland. There is no provision for marine SSSIs beyond low water mark, although boundaries sometimes extend more widely within estuaries and other enclosed waters (JNCC, 2012ii).

Due to significant changes in land use, industrial reclamation, and development in the area since 1971, it was deemed necessary to review the Portencross Coast SSSI under current nature conservation legislation. The site was renotified in 2013 as two separate sites - Southannan Sands SSSI and Portencross Woods SSSI. This change brought a net reduction of approximately 200ha in the area of designated land.

Southannan Sands SSSI is designated for sandflats. The site comprises a coastal section subdivided into three discrete areas - Southannan Sands, Fairlie Sands and Hunterston Sands. The subdivision of the site is created by the marine construction yard and the coal terminal conveyor. The proposed development site is bounded by Southannan Sands to the north and Hunterston Sands to the south. Together the sandflats extend over a 4km of coastline, and covers 255.68ha supporting one of the best examples of intertidal sandflat habitat within the coastal cell covering the entire Clyde Coastline. Extensive areas of nationally scarce dwarf eelgrass (*Zostera noltei)* are a biologically and structurally important component of the intertidal sediment flats at this site. As the proposed development is outwith the SSSI, direct impact is considered unlikely, although post-dredging siltation may settle within the SSSI for a short period.

Portencross Woods SSSI is designated for upland mixed ash woodland. The site lies approximately 2km south of the development site. It is highly unlikely that any development at Hunterston will affect this protected site.

Ballochmartin Bay SSSI is a less than 2km stretch of shore on the east of Great Cumbrae. The southern tip of the SSSI is approximately 3 km north-west of the proposed development. It was notified in 1978 and re-notified in May 1985. It is also designated Cumbrae Marine Consultation Area (MCA), see below. Ballochmartin Bay contains a number of habitat types and is the most varied section of coastline on Great Cumbrae. The flora and fauna of the inter-tidal and sub-littoral zone have been intensively surveyed. The beach is backed by herb-rich grassland and the road side verges support Slow Worm (*Anguis fragilis*). Carboniferous dykes are a characteristic of the island and the site is an important feeding area for waders and both common and grey seals are frequent in the area. It is highly unlikely that the proposed development will affect this protected site.

Kames Bay SSSI is located on the southern shore of Great Cumbrae, within Millport Bay. The SSSI is in a sheltered location, behind Farland Point, approximately 2.5km North West of the proposed development area. It was notified 1978 and re-notified May 1985. It also carries the designation Cumbrae Marine Consultation Area (MCA), see below. The coastland is unique and scientific work has been carried on there for over 100 years, since the Marine Station was established in 1896. Kames Bay is the only example on Great Cumbrae of a shore dominated by sands. These are fed with freshwater seepage and support a high faunal population. The principal factors affecting management are pollution, human impacts and the University Marine Biological Station. It is highly unlikely that the proposed development will affect this protected site.

Other designations of interest:

Cumbrae Marine Consultation Area (MCA) In 1990 Greater and Little Cumbrae were designated a Marine Consultation Area. This covers 2,823 ha. MCAs are identified and listed as deserving particular distinction in respect to the quality and sensitivity of their marine environment and where scientific information available fully substantiates their nature conservation importance. This is approximately 600m west of the site and considered in the Marine EcIA. It is highly unlikely that the proposed development will affect this protected site.

5.2.2 Terrestrial Habitat and Species

5.2.2.1 Habitats

The simple habitat mix of the Hunterston Construction Yard is based on surveys completed the upgrade to the hammerhead quay. (Refer to Drawing No 161511j-004).

A total of three Phase 1 Habitat types, including buildings and boundary features, were identified during the survey in the area proposed for use:

- J1.3 Ephemeral short perennial
- H8.4 Coastal grassland
- J4 Bare ground

The areas of bare ground and hardstanding within the vicinity of the application site have very limited value for wildlife.

Ephemeral/Short perennial (J1.3) habitat is found on relatively inhospitable substrate that is typically free draining and stony. This habitat type is typical of derelict urban and industrial sites and accounts for the majority of the land in the immediate vicinity of the proposed works. Typical species noted were Broad-leaved Willow-herb (*Epilobium montanum*), Colt's-foot (*Tussilago Farfara*), Common Mouse-ear (*Cerastium fontanum*), Creeping Buttercup (*Ranunculus repens*), Sea Plantain (*Plantago maritima*), Dandelion (*Taraxacum officinale*) and White Clover (*Trifolium repens*).

Coastal grassland (H8.4) is distinguished from other grassland types by the presence of distinctive maritime species and its development on substrates other than pure sand. It has developed along the shoreline in a single block south of the Construction Yard. It supports Common Scurvy Grass (*Cochlearia officinalis*), Sand Couch Grass (*Elytrigia juncea*), Sea-buckthorn (*Hippophae rhamnoides*), Seaside Centaury (*Centaurium*

littorale), Scentless Mayweed (*Tripleurospermum inodorum*), Sea Radish (*Raphanus raphanistrum* subsp. *Maritimus*) and Sea Plantain. Common native grassland species also contribute to this habitat.

5.2.2.2 Notable Flora

Seaside Centaury (*Centaurium littorale*)

The 2008 survey for a proposed redevelopment of the power station noted *C. littorale* colonies mainly on the access road to the Construction Yard, within the Construction Yard and also many of the grassland/ephemeral/short perennial habitats within the site.

The SNH commissioned Report: Nationally scarce plant survey and woodland National Vegetation Classification survey of Portencross SSSI, North Ayrshire D.H. Ecological Consultancy (2005) records the *C. littorale* population as representing a locally very significant population given the relative lack of suitable habitat for this species in North Ayrshire. The plant is classified as nationally scarce, as it was recorded in only 62 10km grid squares in the UK between 1987-1999 (Preston *et al*., 2002).

The areas of *C.littorale* are unlikely to be affected by the proposed development.

5.2.2.3 Notable Fauna

Otter

Otter has been recorded in the wider area, particularly using the Burn Gill, but no evidence has been recorded in the vicinity of the proposed development works, although riprap material is difficult to survey for signs of otter. As preferred habitats for resting sites and foraging can be found out with the area of proposed development, this species is unlikely to be affected.

5.2.3 Marine and Freshwater Aquatic Habitats

5.2.3.1 Habitats

As noted in the power station ES (APL, 2010), prior to 1974 the shore between Fairlie and Hunterston was a continuous area of sedimentary deposits, comprising medium sands with shell gravel, isolated mussel beds and significant cockle beds. The coal yard facility was constructed between 1974 and 1979, separating Fairlie Sands from Southannan and Hunterston Sands. Further development of the Hunterston Construction Yard separated Southannan Sands from Hunterston Sands (refer to Drawing No 105069/001 Rev A).

The shore between Hunterston Coal Terminal and start of the Construction Yard has a natural boundary comprising a thin strip of salt marsh and maritime grassland to the shoreward. Elsewhere the shore is backed by an armour stone revetment. The Burn Gill drains into Southannan Sands, south of the coal yard and fans out across the intertidal area.

5.2.3.2 Notable Flora

Eelgrass

Eelgrass beds are noted as being of particular interest at this site.

A targeted survey of common eelgrass (*Zostera marina*), dwarf eelgrass (*Zostera noltii*), and horse mussel (*Modiolus modiolus*) was completed for the upgrade to the hammerhead quay. In addition to this, previous studies of the wider area have also shown the presence of eelgrass, though only dwarf eelgrass was identified, on both Southannan and Hunterston sands. EnviroCentre mapped the dwarf eelgrass bed of the Southannan Sands in 2010.

The full survey is presented as Appendix B to this report. A series of transects were walked, using a glass-bottomed bucket to view the sea bed, or, where the water was too deep to wade, a grapnel was used to "trawl" for eelgrass presence.

The survey concluded that it was unlikely that the proposed development would directly impact eelgrass or horse mussel beds, although sediment from dredging activities may travel into areas where these species exist.

5.2.3.3 Notable Fauna

Large Pelagic Animals

Information obtained from the power station ES (APL, 2010) study was focused on the southern end of the Hunterston Channel, but information was also sought for the wider area of the Clyde, particularly around Little Cumbrae and Great Cumbrae. The 2011 Addendum (APL, 2011) included a review of the Seawatch Foundation and Hebridean Whale and Dolphin Trust databases of recent cetacean sightings (2010-11), to provide a more up-to-date assessment of the baseline conditions in the Inner Clyde, particularly around the Hunterston, Fairlie Channel and Largs Channel areas. Sightings as far as Troon (approximately 15km downstream of Hunterston) and Gourock (approximately 20km upstream) were included, as large pelagics are likely to move freely throughout the Firth of Clyde and the vicinity of the project area.

Species of large pelagic animals that are listed on the UK BAP and Scottish Biodiveristy List (SBL) most likely to be found in the study area are:

- Basking shark (*Cetorhinus maximus*);
- Harbour porpoise (*Phocoena phocoena*);
- Short-beaked common dolphin (*Delphinis delphinis*);
- Bottle-nosed dolphin (*Tursiops truncatus*);
- Grey seal (*Halichoerus grypus*); and
- Common seal (*Phoca vitulina*).

Both Grey seal and Common seal have been recorded in the vicinity of the development, although no breeding haul-out sites are located close by. As reported in the 2010 power station ES (APL, 2010), SNH indicates that the development area is not important for either species.

The commonest large pelagic animal in the Fairlie Roads is harbour porpoise, which is frequently seen in the area (anecdotal evidence from EnviroCentre field surveyors, 2008-2016). It is possible that during piling and dredging activities, there may be disturbance to these mammals.

Migratory Fish Species

As noted in the power station ES (APL, 2010), Atlantic salmon and sea trout are known to migrate into the Clyde estuary and coastal streams and rivers. On returning to spawn, salmonids follow the coast. Based on catch data, the Clyde Salmon Fishery Statistical District (District 45) is not highly significant in national terms. To the south, the nearest salmonid rivers on the same coastline, are the Irvine and Garnock, which both have significant and robust salmon and sea trout populations. To the north the Noddsdale Water and Gogo Water at Largs both have salmon and sea trout runs, although small and precarious. In the inner Clyde estuary there are several salmon rivers, including the Kelvin, Clyde and Leven with large salmon and sea trout runs.

It is highly unlikely that migratory fish will be impacted by the proposed development.

Non-Migratory Species

A range of common non-migratory fish and crustacean species will normally be associated both with the sands (e.g. flatfish, gobies; Brown shrimp, *Crangon crangon*) and the existing structures of the Hunterston Construction Yard (both riprap armouring and the current quay structure). Structures such as quays act as

nursery areas for juvenile fish (e.g. Saithe, *Pollachius virens*), as well as providing habitat for a range of generally more sessile fish species, such as Tompot blenny (*Parablennius gattorugine*) and Conger eel (*Conger conger*).

It is possible that disturbance from piling and dredging activities at the proposed development may impact on some non-migratory fish species.

Mussels

Horse mussel (*Modiolus modiolus*) was included in a study of the marine habitat adjacent to the Hunterston Construction Yard quay (see Appendix B for the full report).

Found off all UK coasts, extensive beds of horse mussel are most common on northern and western coasts, but absent south of the Irish Sea and Humber estuary. Once established, large reefs of Horse mussels can form, with the otherwise mobile substrates becoming more stable. Due to the number of other species that find shelter within the reef structure, a feeding habitat for juvenile fish subsequently develops (SNH, 2012).

Blue mussel is also present in the Firth of Clyde. This species generally attaches to hard surfaces in more exposed conditions: the sandy substrate, though with some cobble material present, is therefore less suitable for this species.

No evidence of either horse or blue mussel was noted along the area of sands surveyed, though they are both present in the wider area. The shore is moderately exposed, which suggests sub-optimum conditions: while requiring tidal streams for feeding, horse mussels need a degree of shelter to become established within soft (i.e. sands and silt) substrates.

It is highly unlikely that any mussel species will be impacted by the proposed development.

Marine Non-Native Invasive Species

Review of the Firth of Clyde Forum's *Firth of Clyde Biosecurity Plan 2012-2016* identifies a number of invasive species in the Clydeport area. Of these, only one, Japanese wireweed (*Sargassum muticum*), was identified by the power station ES Chapter 16 Marine Ecology (APL, 2010) as an issue for the development area. This species is noted as of "Medium Environmental Risk" within the Biosecurity Plan (FCF, 2012).

5.3 Key Issues

5.3.1 Proposed Development

The construction and operation of the proposed development would involve the following main features from the point of view of potential impacts on the ecology of the area:

- Construction of caissons;
- Placement of sheet piles on the face of the existing quay;
- Infilling of gap between new and existing quay wall;
- Formation of concrete slab on quay wall;
- General construction works;
- Dredging of hammerhead quay berth and construction yard opening;
- Site drainage and discharge during construction and operation.

5.3.2 Potential Impacts

The proposed works represent a relatively small-scale alteration to the existing infrastructure (refer to Figure 3-1), and the location and extents of the proposals are consistent with the existing permissions and operational plan. This section identifies the potential impacts on ecology at and around the site during the construction and operation of the proposed works.

The potential impacts from the proposed works are considered to include:

- Disturbance to marine mammals (in particular harbour porpoise) during piling and dredging works;
- Disturbance to terrestrial mammals (in particular otter) during the proposed development works;
- Loss of marine habitat adjacent to the works;
- Loss of terrestrial habitat on the Construction Yard; and
- Sediment blanketing of the sea bed during the dredging works (which may affect benthic communities and eelgrass beds).

The baseline disturbance to the faunal interests has to take into account the current industrial baseline of the area, with particular reference to the Hunterston Coal Terminal and the shipping currently operating in the Firth of Clyde.

As outlined in preceding sections of this appraisal report there is existing planning permission (N/16/00268/PP) to use the site for '*the construction, repair and subsequent removal on completion of large marine related structures*'. It is considered that the proposed use for decommissioning of large marine related structures is directly comparable with the consented use, involving very similar operations and structures, and is therefore compatible with the existing permission. Therefore, operation is not considered a potential impact.

5.4 Scope of Assessment

Given the amount of data already collected at the site it is considered that no further surveys are required in order to make an assessment of the proposed works on the terrestrial or marine ecology. A desk based assessment will however be carried out.

The desk-based review for the proposed development will include Technical Appendices covering the surveys completed for the Hunterston Power Station application, for the National Offshore Wind Turbine Test Facility (NOWTTF) project and previous work on improving the hammerhead quay in 2013. These documents are considered to provide sufficient information to assess most of the potential impacts on ecology.

The assessment will ultimately determine a range of mitigation measures to minimise any effects from the development works. These measures may include monitoring, employment of an Ecological Clerk of Works (ECoW), and limiting the magnitude, frequency and timing of sensitive works.

Aspects of the development which we do not consider requiring additional assessment or for which there will be proposals for specific mitigation are described below:

- Speed restrictions are currently in place along the access road to the Construction Yard, which helps avoid significant disturbance to otter (and birds), although a pre-construction survey is recommended to ascertain the level of any otter activity in the area at the time of development works commencing;
- No direct impacts on the SSSI are anticipated with dredging activity taking place out with the SSSI and resulting in stable slopes of the dredge pocket. The quantity of sand material released during dredging will be minimal as dredgings will be pumped ashore (refer to Section 2.5, design led mitigation), and

blanketing of sensitive benthic communities and the eelgrass beds within the SSSI (>1km away) is therefore considered to be highly unlikely; and

- Provision of an ECoW during periods of high development activity to ensure that any disturbance to, or impacts on, habitats or notable species is minimised.

It is therefore considered that an assessment will be required in relation to the following subject:

1. The potential noise levels of the piling activities and its potential to disturb harbour porpoise.

6 LANDSCAPE AND VISUAL

6.1 Context

Gillespies LLP have been appointed by EnviroCentre, on behalf of Peel Ports, to prepare a Landscape and Visual appraisal, for the Peel Ports Hunterston Marine Construction Yard – Marine Related Decommissioning, to support the planning application to obtain:

- Approval for variation of Condition No.1 of Planning Permission (N/16/00268/PP) from 'the construction, repair and subsequent removal on completion of large marine related structures' to include decommissioning/reverse engineering activity for such structures;
- Consent for improvements to the existing quay, creation of dock gates and shore based infrastructure.

Gillespies has undertaken a preliminary desktop Landscape and Visual Assessment (LVA) to inform this Report.

The primary purpose of this exercise is to undertake a sufficient level of assessment to identify any environmental effects of the project associated with landscape and visual resources of the site and surrounding area, which could be significant and which should, therefore, be taken forward for more detailed assessment.

6.2 Baseline

A description of the project site, the site history and the site conditions have been site out in Chapter 2.

In summary, the site is located within 1.5km to the north of the Hunterston B Nuclear Power Station, and west of the Hunterston Coal Terminal site. The nearest settlement is Fairlie, which is approximately 3km to the northeast on the coast.

The site currently consists of a large scale dry dock with associated pumping infrastructure, laydown area/operational land and a hammerhead quay on the northern part of the construction yard with associated dredging activity. There are also two 210m high turbines (from ground to blade tip), owned by SSE for the testing of offshore wind turbines, located adjacent to the site, one either side of the dry dock. A number of large-scale ancillary buildings, formerly associated with the dry dock no longer exist, having been demolished.

It is proposed to allow reverse engineering and decommissioning of marine structures, oil industry structures and obsolete vessels as well as the continuation of the construction activities that already can take place. In addition to the proposed concrete caisson, allowing access and egress to the dry dock, and the improvements to the quay structure, there is also expected to be shore-based infrastructure which will include office accommodation, workshops, welfare facilities, waste storage areas, laydown areas and ancillary infrastructure. The location of these shore-based structures will be within the redline boundary and are likely to be mainly situated in the northeast corner of the yard.

6.3 Landscape Impacts

The proposed development is located on the Ayrshire coast approximately 3km south of Fairlie and 1.5km north of Hunterston B Power Station and immediately to the east is Hunterston Coal Terminal. The island of Great Cumbrae is directly opposite the site with the nearest point being approximately 1.5km to the northwest and the island of Little Cumbrae lies just over 3km to the southwest.

The immediate character of the area, to the east and south is industrial in nature, with the site being accessed via Power Station Road off the A78 which runs north south along the coast. Running virtually parallel to the A78, is the Largs Branch Line which joins the Ayrshire Coast line, further north, at Kilwinning and has stops at Fairlie and West Kilbride. In contrast to the west, the Firth of Clyde is the dominant feature and character, back-dropped by Great Cumbrae and Little Cumbrae.

The site itself is the existing Marine Construction Yard, bounded to the north and south by intertidal sandflats. These are the Southannan SSSI.

The suggested 4km radial study area also includes part of the Clyde Muirshiel Regional Park, which is designated, within the North Ayrshire Council Local Development Plan, as a Special Landscape Area (SLA) as are Great Cumbrae and Little Cumbrae.

Following an initial review of the North Ayrshire Council Local Development Plan, the indication is that there are no other sensitive landscape designations.

The study area encompasses two landscape character types identified within the SNH Landscape Review 111, Ayrshire Landscape Assessment. These are Coastal Fringe with Agriculture and Raised Beach Coast. The site itself being located within the latter.

Any likely impacts arising from the proposed development would be associated with the new concrete caisson and works to the existing quay. However, the construction and operation works associated with these elements are within the existing footprint of the current operations on the site.

As such there would be no significant adverse effects to the landscape receptors.

Conclusion - Landscape Assessment

The proposed development is contained within the footprint of the existing Marine Yard and as such there will be no additional physical adverse impacts on the immediate landscape or the character areas within the study area. As the dredging to create the temporary bunds will no longer be required it could be argued that the resulting significance of effects to the adjacent landscape/seascape would be beneficial as there would not be the periodic large scale disturbance to the seabed.

The project neither affects directly or indirectly any designated landscapes.

The conclusion of the Scoping Study is that a full Landscape Assessment is unlikely to be required, given that there will be no additional physical changes and any intervisibility with adjacent landscape character types and designated landscapes will be negligible or none. The proposals are consistent with the activities that currently are permitted and the area in which the proposals are situated is industrial in nature.

6.4 Visual Impacts

It is the view of EnviroCentre that the significance of visual impacts hinges on the difference between the currently consented activities (construction) and the proposed decommissioning and associated permanent infrastructure changes (caisson gates and improvements to hammerhead quay). We do not envisage the visual impacts of the decommissioning activity to be any more visually intrusive than the previously undertaken construction activities. Therefore the visual changes proposed should relate solely to the new caisson gates and the improvements to the hammerhead quay.

The caisson gates are expected to be some 75m in width. This represents a small proportion of the northwest facing frontage of the existing construction yard. The gates are likely to be similar in height to the existing construction yard platform and therefore they are not expected to be visually intrusive to observers on the

Cumbraes. The extension and improvement to the existing hammerhead quay is also modest in scale, with the majority of works (piling and dredging) below the water.

The impact of the new infrastructure is therefore not considered significant.

The initial view of Gillespies in relation to the potential Visual Impacts is noted below:

'It is likely that the effects which will be more significant will be local to the site. However, even those visual receptors situated to the north, east and south would view the proposed development in the context of already industrial development. Any views experienced from the west would be at the closest, at a distance of 2-3km and therefore effects are not likely to be significant.

Although not all visual impacts and subsequent effects will be permanent; as the activities that will be undertaken on the site are temporary in duration, there could be occasions when the contracts run for extended periods of time, which would mean the inclusion of large structures, cranes, construction vehicles and task lighting within views.'

Taking account of Gillespies standpoint above we expect that some form of visual assessment or representative views of the site may be beneficial to assist the consenting authorities and general public in visualising the proposed development in operation. The scope of any such information shall be established through consultation.

7 OTHER ENVIRONMENTAL CONSIDERATIONS

Topics identified as having minimal potential to impact the local environment and thereby discounted from further assessment are:

- Air Quality;
- Noise and Vibration; and
- Archaeology and Cultural Heritage.

The reasons for discounting the above topics from further assessment are provided below.

7.1 Air Quality

In relation to Air Quality the site is located on the coast and is influenced by maritime weather. There are no Air Quality Management Area's located in the vicinity of the site which indicates air quality is relatively good with no pollutant concentrations at risk of breaching the relevant air quality objectives.

The main sources of pollutants in the vicinity of the site are from traffic emission on the A78 and some industrial sources from Hunterston Coal Terminal to the north and EDF Hunterston power stations to the south.

The closest residential property to the construction yard is circa 1km to the south (Hunterston House and surrounds) with the village of Fairlie circa 2km to the northeast of the yard.

During the construction phase for the caissons and the jetty dust emissions will be controlled through good management practises with a Construction Dust Management Plan being developed and agreed with the Council once the development proposals have been finalised and the contract for the work awarded.

As the site is already licensed to construct marine structures the decommissioning / reverse engineering activities are considered to be similar to that already consented. Condition 3 of the current planning consent requires that

> *"all processes and activities shall be carried out in such a way to minimise nuisance by way of noise, dust, smell, vibration or pollution of the sea. "*

There are no proposals to amend this condition therefore an operational management plan will be developed and agreed with the council by the Operators to ensure nuisance from dust is kept to a minimum. The plan will be reviewed on a regular basis taking cognisance of weather conditions and scheduling of operational activities. No significant traffic increases are envisaged from the development so vehicle emissions are not considered to have a significant impact on air quality and have also been discounted from further assessment.

7.2 Noise and Vibration

Hunterston Construction Yard is located within an industrial setting with Hunterston A and B power stations located to the south and Hunterston Coal Depot located to the north of the site. The closest residential receptor is located circa 1 km to the south of the yard.

Construction generated noise and vibration especially through piling activities has the potential to impact the local noise environment. Construction activities (caissons and quay) are considered to be temporary in nature with noise levels reverting to pre-existing levels once construction works are completed. Construction of marine structures is also already consented.

Condition 5 of the current planning consent requires

> *"that no blasting operations or pile driving by percussive means shall be carried out on the site between 10.00pm and 7.00am. Specific times for any blasting and/or pile driving by percussive means shall be agreed in writing by North Ayrshire Council as Planning Authority and it shall be the responsibility of the applicant to advertise the agreed arrangements in a newspaper circulating locally in the week prior to the agreed times."*

In terms of noise, while most operational activities for decommissioning are considered comparable to operational activities for construction, the movement and loading of scrap is acknowledged as a potentially noisy decommissioning activity if not well controlled. Assessment of potential effects and consideration of mitigation for such activities will be given in conjunction with any future operator prior to commencement of decommissioning. As the site is a significant distance from any residential receptors, and well shielded in many directions, we consider that practical mitigation can ensure that such activities do not result in noise nuisance to the surrounding residential receptors through actions such as:

- Selection of storage areas behind existing bunds;
- Control of the height of stockpiles;
- Use of matting or other such transfer pads to absorb noise;
- Awareness training for plant operators (not dropping steel); and
- Potentially temporary barriers.

Similarly to air quality mitigation, a noise management plan will be developed for both the construction phase and operation of the site taking into account Conditions 3 and 5 of the current planning consent. The construction noise management plan will be agreed with the Council once the development proposals have been finalised and the contract for the work awarded. Similarly the operational noise management plan will be agreed with the council and then reviewed on a regular basis to ensure noise nuisance is kept to a minimum.

In relation to the potential for construction noise and vibration to impact the marine environment, this is considered in the Ecology sections of this Environmental Review.

With regard to vibration the site is isolated from any potential receptors other than the existing turbines on the construction yard. Contractors shall account for potential vibration effects on these structures as part of their design process.

7.3 Archaeology and Cultural Heritage

Hunterston Construction Yard is located on reclaimed land with a history of industrial usage; as such it is considered there is little potential for any archaeology remains to be present. A desk based archaeology assessment (DBA) has been undertaken which in summary confirms that

> "*as a result of previous land reclamation works and construction of the existing yard, there is no risk of direct impacts upon known or unknown archaeological features as any such deposits that may have existed within the construction footprint are highly likely to have been removed*".

The DBA is included in Appendix C to this document.

8 CUMULATIVE IMPACTS

The proposal is to upgrade and extend an existing operational quay facility within Hunterston Construction Yard and construct a new entrance to the dock. The potential impacts relate primarily to water and ecological issues.

Therefore cumulative impacts would relate to other developments in the site surrounds that could also have a detrimental effect on water quality or ecological assets.

At the current time we are not aware of any other developments in the vicinity of the site on the Firth of Clyde and therefore do not anticipate cumulative impacts as a result of the development.

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APPENDICES

A DRAWINGS

Legend

Approximate Planning Boundary

Note: Approximate planning boundary derived from approved planning drawing 11 - 00230 PPM

Do not scale this map

Client
Peel Ports Group

Project
Hunterston Marine Yard

Title
Site Location

Status
Final

Drawing No.	Revision
168612-001	A

Scale		Date
1:25,000	A3	06 Feb 2017

Drawn	Checked	Approved
MN	EC	CGF

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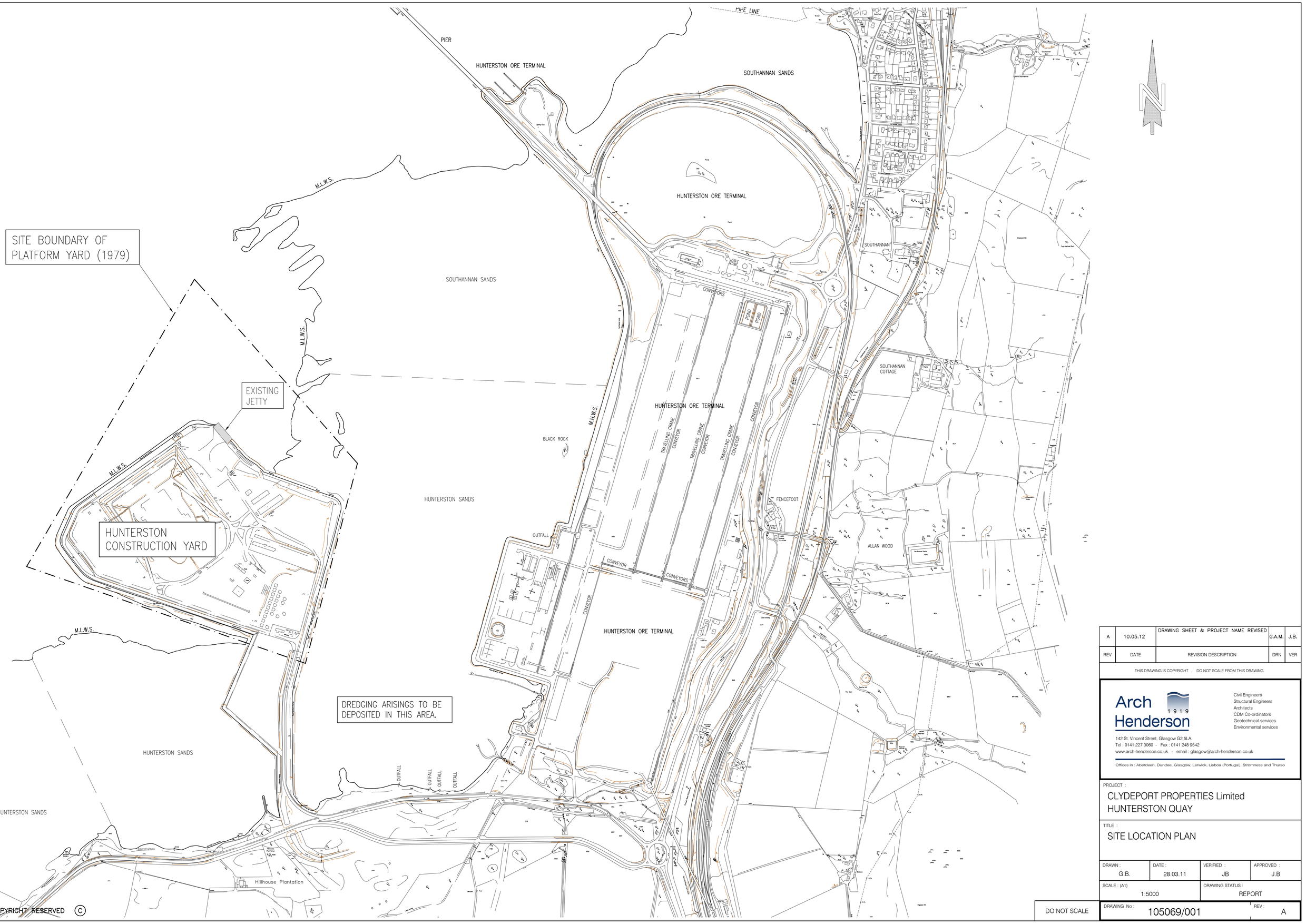

REV	DATE	REVISION DESCRIPTION	DRN	VER
A	10.05.12	DRAWING SHEET & PROJECT NAME REVISED	G.A.M.	J.B.

Arch Henderson 1919

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PROJECT :
CLYDEPORT PROPERTIES Limited
HUNTERSTON QUAY

TITLE :
SITE LOCATION PLAN

DRAWN :	DATE :	VERIFIED :	APPROVED :
G.B.	28.03.11	JB	J.B

SCALE : (A1)	DRAWING STATUS :
1:5000	REPORT

DO NOT SCALE

DRAWING No : 105069/001 REV : A

NOTES

1 FOR DETAILS OF NEW JETTY, REFER TO Drg. No. 105069/003.

SITE BOUNDARY OF PLATFORM YARD (1979)

SITE BOUNDARY OF PLATFORM YARD (1979)

AREA DREDGED TO −10M C.D

TOP OF DREDGE SLOPE

BOTTOM OF DREDGE SLOPE

1:6 DREDGE SLOPE

GENERAL CARGO 20,000t (dwt) L=166m, B=25m, D=10.0m

NEW JETTY

EXISTING JETTY ACCESS

1:2 ROCK ARMOUR SLOPE

BOTTOM OF ROCK ARMOUR

MLWS

MLWS

HUNTERSTON SANDS

Boulders

BH 202

BH 203

BH 204

−10.0m

−9.0m

−8.0m

−7.0m

−6.0m

−5.0m

−4.0m

−3.0m

−2.0m

−1.0m

0.0m

REV	DATE	REVISION DESCRIPTION	DRN	VER
A	10.05.12	M.H.W.S. LINE SHOWN ON NEW WORKS DRAWING SHEET & PROJECT NAME REVISED	G.A.M.	J.B.

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PROJECT :
CLYDEPORT PROPERTIES Limited
HUNTERSTON QUAY

TITLE :
SITE LAYOUT

DRAWN :	DATE :	VERIFIED :	APPROVED :
G.B.	11.04.11	JB	J.B

SCALE : (A1)	DRAWING STATUS :
1:1000	REPORT

DRAWING No : 105069/002 REV : A

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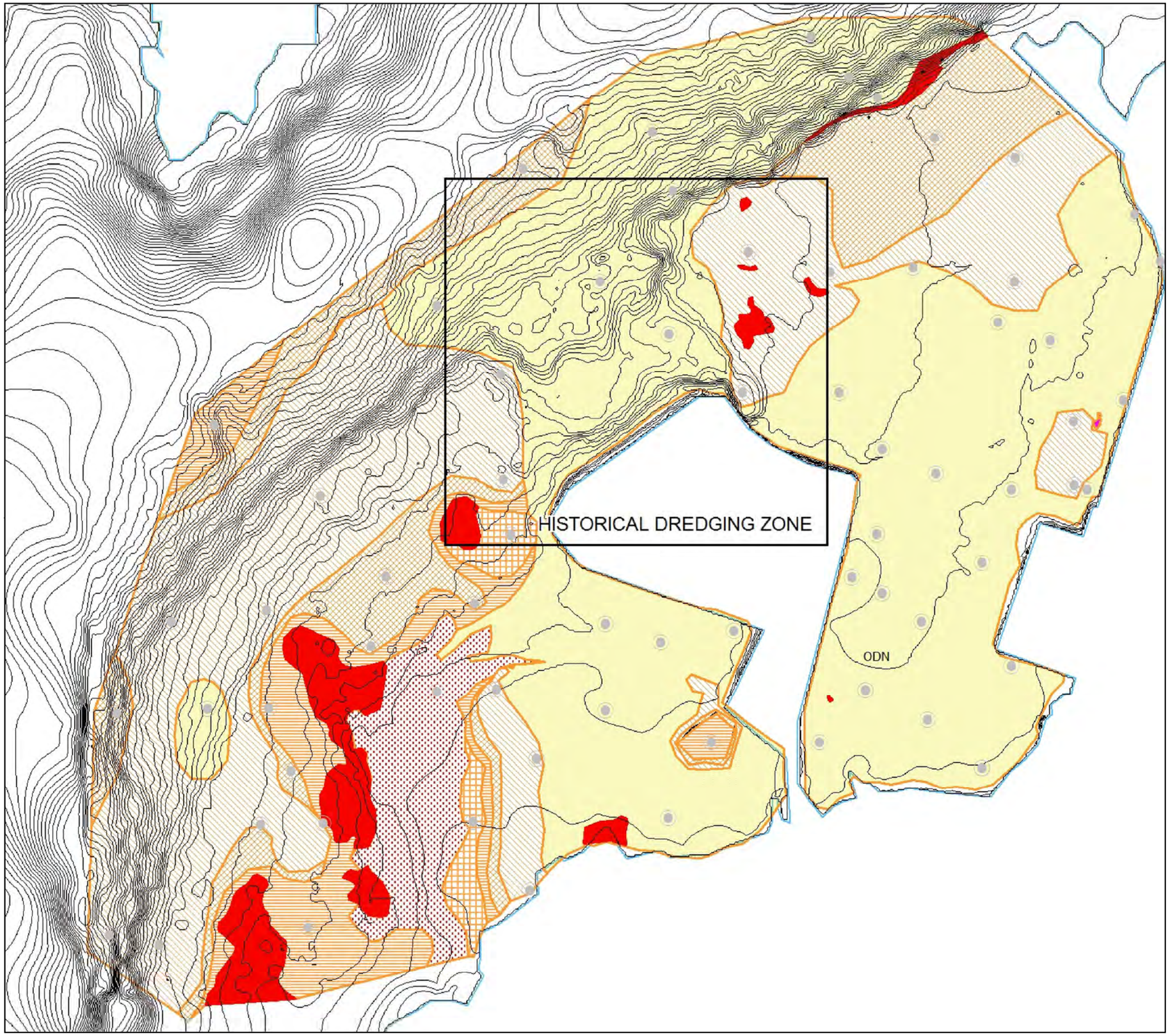

Legend

- <1% Gravel
- 1-5% Gravel
- 5-10% Gravel
- 10-25% Gravel
- 25-50% Gravel
- Boulder field in gravel/sand
- Boulders or dense gravel (lag deposit)

Do not scale this map

Client
Clydeport

Project
Hunterston Quay

Title
Gravel Deposits

Status
FINAL

Drawing No.
161511J-007

Revision

Scale
NTS

A3

Date
3 January 2013

Drawn	Checked	Approved
JS	MN	EC

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