5. EIA METHODOLOGY

5.1 Introduction

The purpose of the EIA process is to ensure that likely significant environmental impacts of the proposed development, both positive and negative, are assessed systematically, prior to a planning decision being made. The results of the EIA will be presented in an Environmental Statement (ES) and used to inform the decision-making process. The ES should identify, describe and assess the likely significant impacts of the development on the environment, both direct and indirect, with reference to:

- Human beings;
- Flora;
- Landscape;
- Soil;
- Air;
- Water; and
- Any interactions between the above.

Following the scoping stage, which is discussed in detail in Section 1.3, the EIA process, leading to the submission of relevant environmental information, involves the following key stages:

Baseline Studies: identification of existing environmental conditions through review of existing information and monitoring and field studies as required, to provide a datum against which to assess the likely significant impacts of the proposed development;

Potential impacts: identification of potential impacts specific to the development.

Assessment of Impacts: identification and assessment of likely significant impacts on the environment from the proposed development, with quantification of impacts where possible;

Mitigation: the identification of measures to avoid, reduce or compensate these impacts; and

Residual Impacts: identification of residual impacts after mitigation.

5.2 Assessment Terminology and Criteria

In order to evaluate environmental impacts and determine their significance, it is important that assessment criteria are identified. In most instances environmental standards and guidelines are available. The various methodologies that will be used within each specialist area will be identified within the appropriate section of the ES.

Where formal guidance is not available, the assessment of impact significance will rely on IEMA guidance and professional judgment that is based on a documented methodology for that assessment. While there may be some variation between topic areas, the assessment will generally take into account the following:

- The type of impact (i.e. positive, negative, direct, indirect);
- The probability of the impact occurring (i.e. certain, uncertain);
- The policy importance or sensitivity of the resource under consideration, in a geographical context (i.e. international, national, regional, district or local);
- The magnitude of the impact in relation to the resource that has been evaluated (quantified if possible or, if not, using the scale high, medium, or low); and
- Any potential cumulative impacts.

Where practicable, mitigation measures to avoid reduce or offset any adverse environmental impacts of the proposed development will be built into the overall scheme design. Other mitigation measures may include constraints on particular aspects of construction methodology or mode of operation. Therefore, the final assessment will take account of the mitigation measures and will only consider any predicted residual impacts.

With regard to potential cumulative impacts these will be discussed in relation to development impacts between different topic areas, (e.g. the cumulative impacts of noise and dust from the proposals) and also in terms of other developments in the local area which are already established. This will also include developments that are proposed and for which a planning application has been submitted, such that they are in the public domain. The EIA will rely to some extent on Shetland Island's Planning Authority with regard to understanding the potential cumulative impacts of proposed development and will seek consultation in order to agree the parameters of the study.

5.3 Topic Areas

At this stage, it is envisaged that the EIA will include assessments of the following topics:

- Geology and Soils;
- Water Environment;
- Coastal processes;
- Ecology;
- Noise (including Aquatic)
- Air quality;
- Landscape and Visual; and
- Archaeology and Cultural Heritage.

The approach to the assessment of each of these topic areas is outlined in the following sections with the inclusion of baseline data where available. The proposed decommissioning base has a land based and marine element therefore the EIA requires both terrestrial and marine assessment dependent upon the issue being assessed. The assessment will consider the environmental impacts related to both the construction and operation of the base.

6. GEOLOGY AND SOILS

6.1 Context

This section of the EIA would address the geological and soils environment at the proposed development site at Dales Voe.

The development proposals have the potential to impact, in particular, drift geology and soils and equally, any contamination present has the potential to affect the development proposals. It is therefore necessary to understand the geology and geo-morphology of the site in order to ensure that any potential environmental impacts are assessed and understood.

6.2 Baseline Situation

Soils, drift and solid geology, within the proposed development area, both terrestrial and marine, has been identified through desk based study and the following information sources:

- BGS maps solid and drift (http://maps.bgs.ac.uk/geologyviewer/);
- BGS published maps Central Shetland Sheet 128 Solid and Drift (1:50,000);
- Published Ordnance Survey Historical Maps obtained from www.centremapslive.co.uk;
- Published sources; BGS published mapping, Hydrogeological Map of Scotland;
- Royal Commission for Ancient and Historic Monuments of Scotland's online PASTMAP;
- Royal Commission for Ancient and Historic Monuments of Scotland's online PASTMAP;
- Coal Authority online gazetteer of mining areas; and
- Site walkovers and observations on local geology and hydrogeological conditions.

From the above information sources it is considered that sufficient understanding of the site character would be established to assess potential impacts. Information obtained from each of the above sources would be divided into the following categories to define baseline conditions:

- Geology and soils:
  - Bedrock geology;
  - Superficial (or drift) geology; and
  - Soils.
- Contaminated land (soils and waters).

The following sections provide a summary of the findings of the desk study and site walkover undertaken in order to inform the scoping process.

6.2.1 Designated Sites

There are no designated sites of geological importance at or near the site. Greater than 1km east of the site is a Site of Special Scientific Interest (SSSI) called Easter Rova Head (3.35Ha). This site has been designated because of its notified natural geological features. It has excellent exposures of very coarse conglomerates, which are non-marine Devonian rocks.

6.2.2 Solid Geology

The underlying bedrock geology comprises meta-limestone rocks of the Whiteness Division, which are late Devonian metamorphic rocks consisting of crystalline limestone and quartzite. These rocks have a very low productivity with flow being predominantly through fractures and/or fissures. There are no fault lines noted in close proximity to the site (See Photographic Record, Plate 2).

6.2.3 Drift Geology

Although it was shown on the drift geology map, no peat deposits were observed on site during the walkover. Shallow peat deposits were noted off-site, on the slope immediately to the south east of the site (<1m deep). The remaining drift deposits within the site consist of Glacial Till, mainly to the north east of the existing hardstanding area.

6.2.4 Baseline Soil Conditions

The soils that will be affected by the proposed development are contained with a narrow strip of land which runs along the coastline adjacent to Doo's Cove. At present the land is utilised for sheep grazing and is unlikely to be suitable for arable farming.

6.2.5 Site History

This section summarises information from available historical maps dating back to 1878.

Since before 1878 no land uses were noted on the site or the surrounding areas. The historical maps for this time record occasional lochs, sheepfolds and springs in the area and it is assumed that the vicinity of the site was just rough grazing and open land. Burn of Kebister discharges into the Voe (adjacent to the southern extremity of the existing site) and Loch of Kebister is approximately 900m south of the site. The 1900 historical map shows no changes on the site or within the vicinity of the site.

On the 2002 historical map, the site is shown as its current configuration with an area of re-claimed land forming a jetty. Two buildings are shown on the site, within an area likely to be underlain by hardstanding. An access road is noted to join the site. A tank is noted 550m northeast of the site, which is further along the access road. It is known that the site was first developed as an oil drilling rig inspection, maintenance and repair yard in 1986.

6.2.6 Site Walkover

A walkover of the site and the immediate surroundings was undertaken on 22 July 2010. A photographic record of the walkover is enclosed as Appendix 2. A number of activities were noted on the site. Removal of the rock to the rear of the warehouse buildings was on-going, with a number of plant in operation, including a crusher (See Photographic Record, Plate 3). These works are required to clear the area for the enlargement of available laydown area adjacent to the quayside. Extensive stockpiles of crushed aggregate were present adjacent to the warehouse buildings and covering the majority of the land up to the site's South-Western boundary. LPA's general storage items, including tyre fenders, were noted at this boundary.

Some vehicles were being stored in the southernmost warehouse building, with vehicle cleaning activities taking place. The existing sub-station on site was noted as being in reasonably good order, with no visible signs of leakage. Three 205 litre chemical drums, two marked 'Castrol', were noted as being stored on a wooden pallet to the rear of the warehouse building nearest to the Voe.

Two drainage ditches were noted draining into the Burn of Kebister to the west of the site, one was from above the quarry area and other appeared to emanate from within the site.

6.2.7 Contaminated Land

The potential for ground contamination at the site has been considered.

Concrete hardstanding is present within all areas of the current site. Such surfacing is considered sufficient to preclude the downward migration of any potential pollutants arising from the site. We understand , from discussions with LPA, that the infill material used to reclaim the existing car parking area was brought from inert sources therefore this is unlikely to be a contamination source, especially given the time elapsed since placement (i.e. 24 years). Although it is always possible that some localised contamination may exist at the site, based on the information available, the probability is low.

6.3 Key Issues and Scope of Environmental Statement

The potential impacts on geology (drift and solid), and soils that are considered include the following:

- Loss of features of significant geological interest, or designated features;
- Loss or removal of marine rocks and terrestrial soils; and
- Release/disturbance of contaminants.

It is proposed to increase the size and scale of the operations at the Dales Voe Base, thus the site footprint will be increased. The extension of the existing facility will include earthworks along the coastal front to increase the jetty area, with deposition of clean infill, rock armouring and new areas of concrete hardstanding.

During the construction of the new facility the surface soils will be removed, dredged seabed materials will be placed as coastline infill and there is likely to be a requirement for piling and rock armour construction. This will be part of the generation of a deep water berth at the site.

The nearest SSSI is more than 1km north east of the site and will not be directly affected by the proposed development.

In terms of the scope of the ES no key issues have been identified with regard to bedrock geology.

The natural marine deposits will be affected by dredging to generate navigational channels but beyond that will remain largely unchanged following development.

Therefore, it is considered that further assessment of impacts on geology (bedrock and terrestrial drift) is not warranted. The geological information will however be used to inform the baseline in other topic assessments such as ecology and water environment.

With regard to soils, limited areas of natural soils appear to be present on the landward area and no land of agricultural interest is noted as present. Therefore, further consideration of the loss of soil resource is not considered necessary.

In terms of contamination, there is no evidence to suggest that contamination will be present at the site, although it cannot be entirely ruled out; any contamination encountered can be managed during the construction process by applying pollution prevention best practice.

6.4 Assessment Methodology

As outlined above, a further assessment of the potential impact on the geology and soils, as described above, at Dales Voe is not considered within the scope of the ES.

7. WATER ENVIRONMENT

The water environment in this context is considered to encompass hydrology, hydrogeology, water quality, hydromorphology, the risk of coastal flooding as well as artificial drainage systems. This section of the EIA would therefore address all these subject areas.

7.1 Context

The project activities have the potential to cause changes to the baseline hydrological conditions on the land and the natural coastal processes within Dales Voe. Given the importance of the water environment as a valued resource, and the importance of ensuring sustainable development, an assessment of the potential effects is considered essential.

The assessment would identify sensitive issues within the proposed development site by establishing the current baseline and examining the proposed site design within this context.

7.2 Baseline Situation

An initial walkover of the site for the purpose of informing the scoping study was undertaken on 22nd July 2010.

The coastline at the site is mainly rocky and irregular, facing northwest and has been changed by the development of the pier and rock armoured revetment. The coastline out with the site consists of natural headland. Recent nearshore site investigation indicated a gradual sloping seabed that deepens to approximately -30mCD (Chart Datum) to the north, and the seabed is dominated by rock outcrop[1]. Wave data was recorded by a buoy for 7 months in 1985. The highest recorded wave was 2.19m. The site is located within the zone of coastal flooding as illustrated on the indicative flood map produced by SEPA[2].

The area of Dales Voe to the west of the site has been is designated as "Shellfish Water". A salmon farm is located less than 500m to southwest of the site.

The Burn of Kebister flows along the southwestern boundary of the site (See Photographic Record, Plate 4). A number of ditches have been excavated to the southeast and southwest of the site for interception of surface water runoff generated mainly up-gradient of the site. Three ditches were observed to discharge to the Burn of Kebister. The burn has been culverted over a short distance before discharging to Dales Voe. See Figure 7.1

No groundwater bodies were identified at the site. As described in the Section 6: Geology and Soils, the drift deposits at the site are very limited and, where present, consist of low permeability glacial till. Any shallow groundwater encountered within till deposits is likely to be localised and therefore of very low productivity. Bedrock underlying the site consists of

[1] Aspect Land & Hydrographic Surveys (2005) Nearshore analogue site investigation, Dales Voe, Shetland Isles. Final Report A3352_DV. February 2005.
[2] http://www.sepa.org.uk/flooding/

crystalline limestone and quartzite, which have a very low productivity with flow being predominantly through fractures and/or fissures.

Surface water runoff (i.e. storm water) on the existing site is collected by a drainage network and discharged at the western end of the pier.

7.3 Key Issues and Scope of Environmental Statement

The key hydrological issues or potential environmental impacts associated with the proposed decommissioning base have initially been identified as follows:

- Potential changes to run off and drainage patterns caused by extension of the slab, impermeable surfaces and drainage network;
- Potential changes to water chemistry and quality associated mainly with land-based construction and operation activities but also the dredge works;
- Potential changes in interactions between ecology and hydrology;
- Potential changes on the hydrodynamic flow current patterns within the environment; and
- Possible impacts of climate change on the proposed development.

The above impacts are all initially considered to be of potential significance and therefore require investigation and assessment.

No key issues have been identified with regard to hydrogeology as there is no groundwater bodies present at the site. It is therefore considered that hydrogeology does not warrant further assessment and therefore can be scoped out of the Environmental Statement.

7.4 Assessment Methodology

Assessment will be undertaken in accordance with current European and National Legislation, Guidance and Best Practice. The development design team will be consulted with regard to hydrological and hydrogeological data and it is expected that there will be collaboration between hydrologists, ecologists and engineers in order to develop an optimum outline design with regard to surface water management.

The components of the study are as follows:

- Desk based review of the design of the proposed development in relation to the local water environment;
- Consultation with key stakeholders including SEPA, Marine Scotland and Shetland Islands Council to obtain available information for the site area and surrounds to ensure their concerns are addressed within the study;
- General meteorological appraisal (rainfall data, runoff and evaporation data for catchments associated with the site including ancillary areas);
- Review of baseline hydrology including water quality conditions, water abstraction data, discharge data, catchment characteristics and wave and tide data;

- Review of baseline coastal processes including tidal streams and currents, bathymetry, wave action, surge and funnelling, bed sediment type and distribution, sediment transport, coastal erosion and any changes in beach/sea levels;
- Review topography and ground conditions in the site area and surrounds; and
- Reporting of existing baseline conditions to provide a basis for assessment of the potential impact of the proposal, including supporting plans.

The main components of the assessment will consist of:

- Description of existing baseline conditions;
- Identification of sensitive receptors and environmental constraints;
- Identification of potential impacts;
- Assessment of impact significance during:
  - Construction phase;
  - Operational phase; and
  - Decommission phase
- Identification and assessment of mitigation measures to reduce or avoid the potential impacts of the proposal development on the water environment; and
- Statement of Residual impacts.

During the assessment process, sensitive receptors including any nearby water abstractions, shellfish and fish farms, and designated areas will be identified.

Assessment of the potential for particulate and chemical contamination of water will be central to the assessment. The prevention of pollution during construction and operational phases will be a specific focus of the Environmental Statement and recommendations for the adoption of good working practices in line with SEPA guidance will be made.

Effects on coastal processes will be evaluated by comparison with the present situation. Potential impacts arising from the development will be predicted and evaluated by comparison with environmental quality standards, sediment quality standards and water and sediment quality objectives.

This will be undertaken using a staged approach whereby initially observed baseline data will be used along with expert opinion to qualitatively assess the impacts. Should this identify that there are impacts that require quantitative assessment; a numerical hydrodynamic flow model shall be developed to model and understand the changes.

The development proposals shall also be considered in light of the potential flood conditions at the site. Extreme still water level analysis will be undertaken to establish design return period including climate change allowance in accordance to the most recent information UKCP09 (UK climate programme 2009).

The assessment will be carried out with reference to the following regulatory controls and associated guidance:

- Water Framework Directive 2000 (WFD);
- Groundwater Directive 2006;
- Water Environment and Water Services Act 2003;
- Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR);

- Water Environment (Oil Storage) (Scotland) Regulations 2006;
- Flood Risk Management (Scotland) Act 2009
- Pollution Prevention and Control (Scotland) Regulations 2000;
- C532: Control of water pollution from constructions sites: guidance for consultants and contractors (CIRIA 2001);
- C697: The SuDS Manual (CIRIA 2007);
- Development of a groundwater vulnerability screening methodology for the Water Framework Directive (WFD28), SNIFFER (2004);
- Scottish Planning Policy (February 2010), paragraphs 196 – 211
- SEPA Pollution Prevention Guidelines 1 – 26 (as appropriate); and
- SEPA Engineering Good Practice Guidance 23, 25, 26 28, 29, 31, 32, 44 (as appropriate).
- SEPA Engineering in the Water Environment- Good practice guide to Sediment Management (June 2010) 1st Edition.

8. ECOLOGY (TERRESTRIAL AND MARINE)

8.1 Context

The proposed development proposals, consisting of land reclamation, dredging and hard engineering have the potential to impact upon the ecological systems of the area which may affect the terrestrial and marine habitats, the species and the links between them.

Ecological Legislation and Policy

There is a significant amount of legislation to be considered in relation to ecology. The key legislation and policy relevant to the Ecological Impact Assessment (EcIA) includes the following:

- Marine Scotland Act 2010;
- The Conservation (Natural Habitats, &c) Regulations 1994 (as amended), hereafter referred to as the Habitats Regulations;
- The Nature Conservation Act 2004 (as amended);
- The Wildlife and Habitats (Scotland) Act 1981 (as amended);
- National Planning Policy Guidance (NPPG) [14] Natural Heritage; and
- The Shetland Islands Biodiversity Action Plan.

The Marine Scotland Act (2010) provides a framework for development and protection of the marine environment which includes; marine planning, marine licensing; marine conservation, seal conservation and enforcement. The Habitat Regulations give rise to a schedule of species offered special protection across their natural ranges in Europe.

With cognisance of the legislative background, the following sections outline the existing situation and approach considered appropriate, to achieve a reliable assessment of potential impacts and identification of suitable mitigation.

8.2 Baseline Situation

To inform the scoping report a desk study was completed. The desk study involved a search for any statutory and non-statutory designated sites, notable habitats and species within a 5km radius from the site using the following sources:

- Shetland Islands Council[3];
- Scottish Natural Heritage (SNH) SiteLink[4] was searched for information on statutory designated sites;
- NBN Gateway[5] was reviewed for records of protected or notable flora and fauna i.e. BAP species;
- Shetland Biological Records Centre[6];
- Bird Atlas 2007 – 2011[7];

[3] http://www.shetland.gov.uk/splan/nat.htm
[4] SNH (2009). SiteLink Available from http://gateway.snh.gov.uk
[5] NBN Gateway (2009). Available from http://data.nbn.org.uk
[6] http://www.nature-shetland.co.uk/brc/index.htm

- Scottish biodiversity List[8];
- Scottish Blanket Bog Inventory[9];
- Shetland Anglers Association[10]; and
- UK BAP[11] and Shetland Islands LBAP[12].

A walkover of the site was undertaken on 22nd July 2010. The walkover aimed to identify existing ecological sensitivities and identify those requiring further field survey and assessment as part of the EIA process.

The findings of the site desk study are presented in following table.

Table 8.1: Desk Study Results

Source	Results
NBN Gateway	Marine mammals active in the waters around Dales Voe: • Common Seal • Grey Seal Land mammals active within 5km of Dales Voe: • Otter LBAP species occurring within 10km square covering Dales Voe: • Skylark • Merlin • Red throated diver • Common Eider • Oysterplant
Shetland Biological Records Centre	Mammals - Mountain Hare, Stoat, Hedgehog Amphibians – Common Frog located within 5km of Dales Voe
Bird Atlas 2007-11	Meadow Pipit breeding and wintering Woodcock wintering Red Grouse wintering Skylark breeding House sparrow wintering and breeding Oystercatcher wintering and breeding All within 5km of Dales Voe.

[7] http://blx1.bto.org/atlas-results/allocshet.html#ref
[8] http://www.biodiversityscotland.gov.uk/pageType2.php?id=35&type=2&navID=92
[9] http://www.snh.org.uk/sbbi/index.htm
[10] http://www.shetlandtrout.co.uk/index.html
[11] http://www.ukbap-reporting.org.uk/plans/lbap_species_habitat.asp
[12] http://www.livingshetland.org.uk/

Source	Results
Anglers Association	A healthy and completely wild population of brown trout and sea trout in most lochs. Lochs within 5km of Dales Voe: • Loch of Clickimin 1km south west • Sandy Loch 2km south west • Loch of Trebister 2.5 km south west. • Lochs of Beosetter 3km north east • Loch of Brough 5km east There are commercial shellfish interests in Dales Voe for the harvesting of mussels. The shellfish growing area is approximately 3kms, comprising most of the inner Voe.
Scottish Biodiversity List	Numerous marine molluscs listed in UK BAP found within 5km of Dales Voe and the wider landscape.
Scottish Blanket Bog Inventory	No blanket bog occurs in designated sites within 5km of Dales Voe. The British Geological survey identifies deep peat soils 5km to the North and to the East of Dales Voe.
Shetland LBAP (UKBAP species appear in bold)	**Skylark** Merlin Red throated diver **Red necked phalarope** **Arctic charr** Oyster plant **Harbour porpoise** Common eider
SNH Site Link	The South West Mainland is designated as a National Scenic Area for the outstanding scenic interest of the coastal landscape. This designation is on the 5km search boundary for Dales Voe. Lochs Tingwall and Asta, between 4km and 5.5km respectively to the South West are designated SSSI. They are two connected mesotrophic lochs which overlie a band of Crystalline limestone. They contain rich and varied aquatic flora including Shetland Pondweed. The Lochs are one of the most important sites for wintering and migrating wildfowl. Island of Noss, over 8km to the South East is designated an SSSI, SPA and NNR for its breeding sea bird population.
Shetland Island Council Structure Plan 2001 - 2016	Non statutory Marine Consultation areas do not occur within 5km of Lerwick.

Site Walkover

Habitats

The shoreline to the east and west of the site is characterised by rocky outcrops and shallow cliffs interspersed with small sandy bays. The cliffs are displaying localised signs of erosion that appear to be caused by sheep accessing the shoreline. A range of flora is present dominated by thrift and sheep's-bit scabious.

Acid heath mosaic comprising acid grassland, wet flushes and a neutral grassland element is found along the cliff tops. This habitat is being gradually influenced by the current sheep grazing regime such that species indicating nutrient enrichment are appearing in the sward (e.g. chickweed and common mouse-ear).

Information provided by Lerwick Port Authority[13] indicates that the inshore seabed comprises medium coarse grained sand and intertidal rocky platforms at Dales Voe Base. Intertidal mudflats and saltmarsh of local importance is found at the head of Dales Voe and within the Voe shingle bars of geomorphological interest are present.

To the south east, inland of the development site the land rises and dry heath characterised by mature heather stands dominates the habitat type. Numerous small drainage grips have been dug around the site boundary, which were holding water during the walkover and exposing a peat layer approx 0.4m deep.

Terrestrial Fauna

Otter are present within Dales Voe Base. Spraints (otter faeces) were located along the cliff top to the North East of the site and under the existing pier (See Photographic Record, Plate 5). Resting site opportunity is limited along the shoreline out with the proposed site. Areas with potential for resting sites are:

- Under the existing pier where the abutments join the land; and
- Along the freshwater burn (Burn of Kebister) to the West of the site.

Marine Fauna

No marine mammal observations were noted during the site walkover. There are no known existing records of marine mammals within 5km of the site with the exception of common and grey seal. Although these species are present in the waters around Dales Voe, no seal haul out or moult sites are present.

There are no known existing records of the benthic fauna that may be present on the seabed within or adjacent to the area that would be reclaimed as part of the proposals.

Birds

During the site visit a range of seabirds (including fulmar and common gull) were observed occupying cliff nests to the North East and South West of the existing site. Arctic tern was observed feeding adjacent to the car park at Dales Voe Base.

Information provided by Lerwick Port Authority relating to birds is summarised below:

[13] Lerwick Port Authority Oil Spill Contingency Plan, Sensitivity Maps, 15/02/06.

- Mouth of Dales Voe is important for wintering seabirds – oil pollution is considered by LPA as a risk between October to March; and
- Black Guillemot (aka Tystie) colony resident all year located approximately 800m to the north east of Dales Voe Base.

Consultation

It is suggested the following organisations are approached during the consultation phase of the EIA regarding ecological sensitivities and further ecological information:

- SNH;
- SEPA;
- SIC (Shetland Biodiversity Officer);
- Shetland Anglers Association;
- Shetland Biological Records Centre;
- Royal Society for the Protection of Birds (RSPB);
- Whale and Dolphin Conservation Society;
- Marine Conservation Society;
- Hjatland Sea Farms (operator of salmon farm in the Voe); and
- Shetland Fish Ltd (operator of mussel farm in the Voe).

8.3 Key Issues and Scope of Environmental Statement

The potential impacts of the proposed Dales Voe Base extension shall be identified for each aspect and stage of the development, thereafter an ecological impact assessment (EcIA) shall be carried out using quantitative and qualitative approaches.

The current understanding of the site and its ecological sensitivities allow us to predict that the EcIA will be based on the following broad themes:

- Direct habitat loss;
- Loss of foraging, roosting and breeding opportunities;
- Severance;
- Loss of life;
- Physical disturbance;
- Noise and vibration disturbance;
- Dust impacts; and
- Coastal processes and hydrological impacts on ecology (to be assessed in consultation with the water environment team).

Marine European Protected Species (EPS) are protected from disturbance by The Conservation Regulations 2007[14] legislation. Marine mammals are sensitive to noise and vibration as they use sound for communication, navigation, and the detection of prey. Sound is classed as one of the main factors with the potential to cause disturbance to marine protected species.

Activities that have the potential to cause acoustic disturbance to marine mammals include: construction works, dredging, rock dumping; e.g. installation of rock armour revetments and land reclamation, pile driving and vessel movements. The mitigation measures required to limit

[14] Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007

marine mammal disturbance from noise are well known and include soft start to operations (i.e. pile driving) integrated with marine mammal observations. The EcIA will establish whether Dales Voe is important habitat for marine mammals and hence the need and scope of any necessary mitigation.

The proposed development may have an opportunity to provide positive impacts on the site's ecology; positive impacts will therefore also be considered.

The EcIA will seek to evaluate site habitats and species, both marine and terrestrial and place them into context based consultation and published guidance. The characteristics of the impact will be identified and an assessment of the impact on sensitive or valued ecological receptors will be made in order to ascertain whether the impacts will be significant.

8.4 Assessment Methodology

The methodology used during the EcIA and for the subsequent ES topic chapter will be based on the IEEM Guidelines[15].

Further ecological survey to inform the EcIA and the overall EIA is considered necessary. The following surveys and assessments are advised:

- Phase 1 Habitat Survey;
- Otter Survey;
- Marine Benthic Survey;
- Cetacean Assessment; and
- Wintering Bird Survey.

Survey detail and requirement can be clarified and further defined once the scoping process has been completed.

It is feasible that ecological mitigation to reduce construction and operational impacts of the scheme may be required. Generic mitigation is provided below as a guide to the types of requirements that the proposed development may be required to employ in order to meet current wildlife legislation.

- The implementation of SEPA Pollution Prevention Guidelines (PPG's) as part of pollution control;
- Light pollution prevention measures (e.g. directing light onto the site only and preventing overspill onto the sea;
- European protected Species (EPS) licence application for otter may be required prior to works.

The EcIA shall be reported as a topic chapter within the ES.

[15] Institute of ecology and environmental management (2006). Guidelines for ecological Impact Assessment in the United Kingdom. IEEM, Winchester.

9. NOISE AND VIBRATION

9.1 Context

The proposed development and expansion of the Dales Voe Base has the potential to change the ambient noise environment which could impact local receptors (e.g. residents). The noise assessment will define the local ambient noise levels at the site and assess the significance of the impact from noise generated by construction activities and during operation of the proposed development.

9.2 Baseline Situation

The site is located in a remote rural location, with the main hub of industrial activity surrounding Lerwick to the South West of the site. In terms of human receptors, the nearest residential properties are to the North West, approximately 700m across the Voe. With no natural barrier to noise towards the North West it is possible that noise from the base may travel considerable distances with potential effects on residents, workers and visitors.

9.3 Key Issues and Scope of Environmental Statement

The proposed development includes land reclamation, construction of new quayside, and dredging to provide new berthing facilities. The potential for noise impacts during both construction and operational phase will be assessed. There is also the potential for vibration impacts associated with pile driving, however given the distance to the nearest residential receptor vibration impacts are not considered to merit further study. Given the proposed change in scale of activity at the base operational noise is anticipated to be a key issue.

There is the potential for noise impacts on marine mammals; this has been covered in Section 8: Ecology.

9.4 Assessment Methodology

An assessment of the potential noise impacts associated with the proposed development, during both the construction and operational phases, will be undertaken using the principles of BS 4142: 1997 and methodologies from BS 5228: 2009. The assessment would include baseline noise monitoring to determine ambient noise levels at the site and at identified sensitive receptors.

Baseline monitoring will be carried out during the following periods:

- Weekday day-time;
- Weekday night-time;
- Weekend day-time; and
- Weekend night-time.

Consultation will be undertaken with the appropriate authorities to confirm the assessment and monitoring methodologies prior to any field work taking place.

If a potential significant impact is identified, a mitigation strategy will be developed in consultation with the relevant authority. Mitigation would include avoidance, practical management of noise sources and noise attenuation where necessary.

10. AIR QUALITY

10.1 Context

Air Quality in Shetland is good. It is therefore essential to adopt best practice with regard to air quality and potential emissions from the proposed development. Information provided by AF Decom confirmed that approximately 98% of the material processed at Dales Voe will be transported from the site by shipping vessels. The use of road haulage will therefore be very limited.

10.2 Baseline Situation

As part of the baseline assessment the relevant air quality concentration maps have been downloaded from DEFRA's Local Air Quality Management website. These show that the current NO_2 concentration is approximately 8µg/m^3 and 10µg/m^3 for PM_{10}. These values are significantly below the Air Quality objective threshold levels of 40 µg/m^3 for NO_2 and 18 µg/m^3 for PM_{10}, showing good air quality for the area.

The site is in a remote marine location and, in terms of human receptors, there are none in the vicinity of the Base, on the eastern side of the Voe; the nearest being the residential properties to the North West, approximately 700m across the Voe.

Shetlands Islands Council have not declared an Air Quality Management Area (AQMA) following the results of a first round of Review and Assessment, as there are no areas of pollutants concentrations that exceed the Air Quality Standards. The first round review and assessment found:

- No road links with annual average traffic flow greater than 50,000 (current or projected);
- No Part A authorised processes with potential to emit significant quantities of SO_2, CO, Lead or NO_2 which are uncontrolled or exceed air quality standards;
- No Part B authorised processes with the potential to emit significant quantities of SO_2, Lead, Benzene, 1, 3-Butadiene, CO or NO_2; and
- No planned developments of the above that has the potential to significantly increase emissions. [16]

10.3 Key Issues and Scope of Environmental Statement

Fugitive dust emissions have the potential to be created both during construction and operation from vehicular and on-site activities. The impact that these emissions have on the surrounding environment will be largely influenced by the nature of the surfaces / roadways, the number of vehicle movements undertaken, the topography of the surrounding land and whether there is any natural screening in place.

---

[16] *Ref. Shetland Islands Council, LAQM – Updating and Screening Assessment, August 2003.*

It is considered that any vehicle emissions emitted from plant and machinery during operation will be negligible and controlled under correct maintenance of the equipment.

With only limited traffic flow from the base and the required construction traffic the potential for traffic emissions to impact on local air quality is considered to minimal. In this regard it is considered that emissions from vehicles will not need to be assessed as part of the ES, but that dust emissions warrant further impact assessment.

10.4 Assessment Methodology

A desk-based assessment of the potential for dust nuisance to occur will be undertaken based on construction and operational information. Dependent upon and subject to the results of the assessment, the requirement for mitigating actions will be defined.

Mitigation will include avoidance and adherence, by the contractor and operator, to an agreed environmental management plan. Recommendations will be included within the ES, although this topic will not be included as a full chapter, with relevant information included as technical appendices. The significance of any residual impacts after mitigation will be defined.