CNR International

NINIAN NORTHERN PLATFORM LATE LIFE & DECOMMISSIONING PROJECT

CNR Contract Number:	**P0005**
CNR Contract Description:	**Ninian Northern Platform Late Life & Decommissioning Project**
Contractor:	**BMT CORDAH**

BMT Cordah

Document Number:			
P0005-BMT-EN-REP-00001	B1		63
Contract-Originator-Discipline-Document Class-5-numeric sequence code	Rev	Sheet	Total Sheets
System:	**Tag Numbers:**		

Title:

Ninian Northern Platform EIA Scoping Report

REVISION	REVISION STATUS	DATE	ORIGINATOR	DISC. CHECK	DISC. APPROVAL	CNR APPROVAL
B1	Revised in Response to Comments	09.08.2016	J Ferris	G Jones	D Murrison	
A1	Issued for Review	03.06.2016	F McLellan	G Jones	J Ferris	
3.0	Final Report	14.08.2013	B Bryant	D Murrison	J Ferris	
2.0	Revised submittal	07.08.2013	D McCormack	B Bryant	J Ferris	
1.0	First Issue to client	14.06.2013	B Bryant	D Sell	J Ferris	

Intentionally blank page

Revision Record

Rev	Date	Revision Details
B1	09-August-16	Revised report in response to comments
A1	6-June-16	Issued for review

Table of Contents

List of Tables

List of Figures

ABBREVIATIONS AND ACRONYMS

Abbreviation	Full Meaning	Abbreviation	Full Meaning
AFDO	AF Decom Offshore UK Limited	MMO	Marine Mammal Observer
BAT	Best Available Technique	MoD	Ministry of Defence
BEP	Best Environmental Practice	MSF	Module Support Frame
BERR	Department for Business, Enterprise and Regulatory Reform (now known as DECC)	NLGP	Northern Leg Gas Pipeline
CH_4	Methane	N_2O	Nitrous Oxide
CNRI	Canadian Natural Resources International	NOx	Nitrogen Oxide
CoP	Cessation of Production	NSP	Ninian South Platform
CO_2	Carbon dioxide	OPEP	Oil Pollution Emergency Plan
CO	Carbon monoxide	OSPAR	Oslo Paris Convention
DETR	Department for Transport	PAM	Passive Acoustic Monitoring
DECC	Department of Energy and Climate Change	P&A	Plug and Abandon
DP	Dynamic Positioning	PTS	Permanent Threshold Shift
EDC	Engineering Down and Cleaning	ROV	Remotely Operated Vehicle
EIA	Environmental Impact Assessment	SAC	Special Area of Conservation
EoFL	End of Field Life	SHE	Safety, Health and Environment
ES	Environmental Statement	SSCV	Semi-Submersible Crane Vessel
EU	European Union	SSIV	Subsea Isolation Valve
HMC	Heerema Marine Contractors Nederland B.V.	THC	Total Hydrocarbon Concentration
HLV	Heavy Lift Vessel	TTS	Temporary Threshold Shift
ICES	International Council for the Exploration of the Seas	UK	United Kingdom
IMO	International Maritime Organisation	UKCS	United Kingdom Continental Shelf
JNCC	Joint Nature Conservation Committee	VOC	Volatile Organic Carbon
LAT	Lowest Astronomical Tide	WDR	Waste Disposal Register
MBES	Multi-beam Echo-Sounder	UKHO	United Kingdom Hydrographic Office
MCA	Maritime Coastguard Agency		

Intentionally blank page

1.0 BACKGROUND AND CONTEXT

The Ninian Field (UKCS Block 3/3 and 3/8a) was discovered in 1978, and has been producing oil since 1982 (CNRI, 2013). The field infrastructure includes the Ninian Northern, Central and Southern platforms. The field is now approaching the end of its economic life and CNRI are considering various options for the future of the Ninian Northern platform.

CNRI has commenced the pre-planning stages for field decommissioning. The purpose of this phase is to investigate feasible alternative uses and conduct comparative assessments for the key removal and disposal options for the platform's infrastructure.

An important aspect of this work is the assessment of the actual and potential environmental impacts that might arise as a result of decommissioning activities. These will be fully examined in an Environmental Impact Assessment (EIA) and reported in an Environmental Statement (ES).

1.1 Purpose of this Scoping Report

This scoping report has been prepared as part of the planning and consents process for the future decommissioning of the platform, and as a first stage in preparing the ES. The report:

- Describes the proposed options for the platform decommissioning project and its context;
- Describes the site of the project and its environmental sensitivities;
- Identifies the potential environmental risks associated with each decommissioning option;
- Identifies the potentially significant risks that will be examined in detail in the full EIA;
- Identifies mitigation measures for the significant risks;
- Describes the work being undertaken by the project to gather more information and to gain a greater understanding of the main environmental risks;
- Summarises the further programme of consultation that will be carried out by CNRI;
- Summarises views and concerns already expressed by stakeholders; and
- Seeks the views of interested stakeholders and members of the public.

This is intended to present a review of the main environmental issues as they are presently understood and to inform the consultation that will be carried out by CNRI.

1.2 Location of the Ninian Northern Platform

The Ninian Field is situated in UKCS Block 3/3 and 3/8a of the northern North Sea. The Ninian Northern platform is located at 60° 54' 21.83" north, 01° 25' 16.46" east, approximately 368 km NNE of Aberdeen and 23 km west of the UK/Norway median line (Figure 1.1)

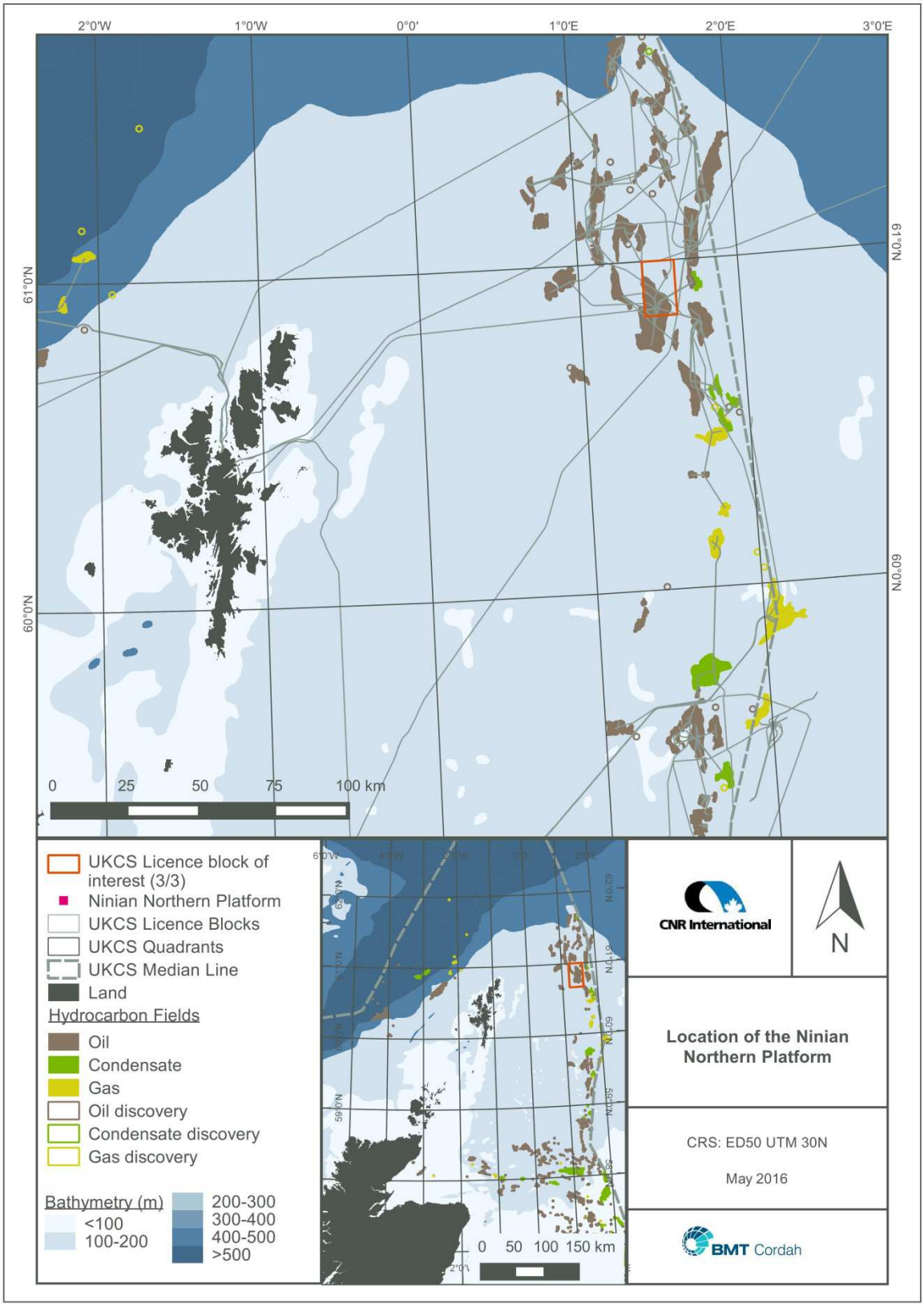
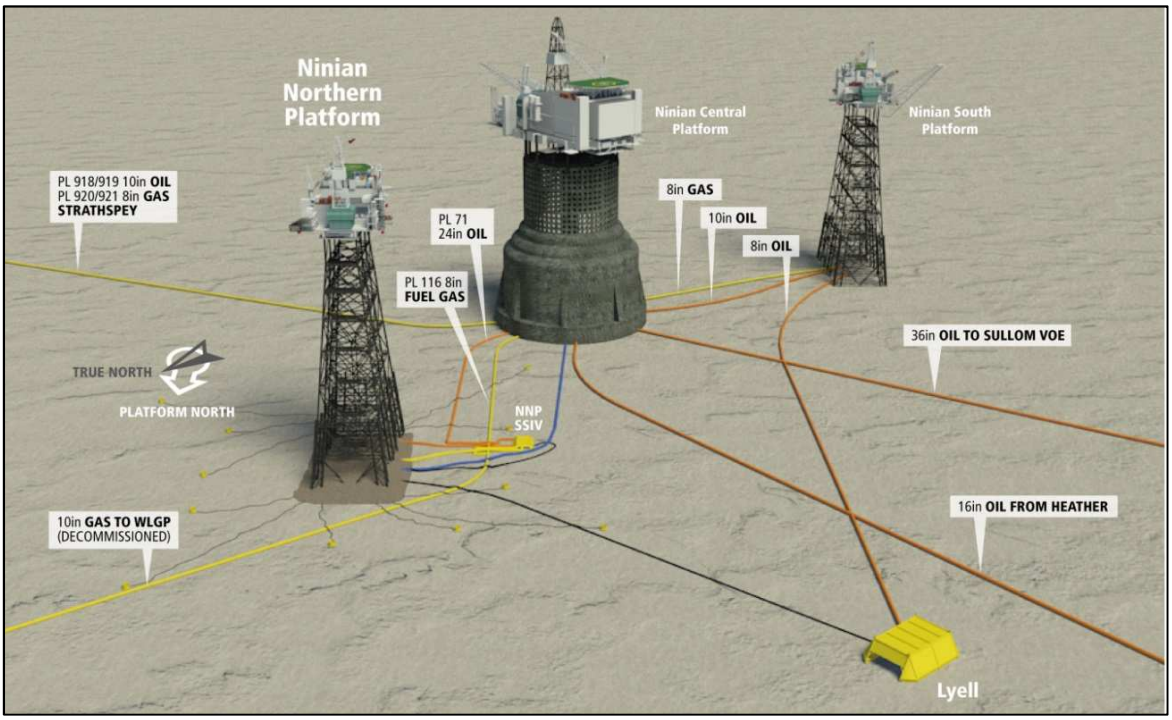


Figure 1.1: Location of the Ninian Northern Platform in the Northern North Sea

The platform stands in a 141 m water depth and comprises a drilling and production platform, supported by a steel jacket with eight legs (26 piles). Separation facilities on the platform remove water from produced oil and recover gas, which is subsequently used for fuel. Produced oil is transported via a 24 inch subsea pipeline to the Ninian Central Platform, located approximately 6.5 km south east. Fuel gas is supplemented by a supply from the Ninian Central Platform (Figure 1.2).

The scope of the Ninian Northern decommissioning programme includes the Ninian Northern Platform, jackets and topsides. Decommissioning of the remaining sub-sea assets associated with the Ninian Northern Platform, such as the pipelines and subsea isolation valve (SSIV) will be delayed until the decommissioning of the wider Ninian Field takes place



Source: CNRI, 2013

Figure 1.2: Layout of the Ninian Field

1.3 Regulatory Context

The decommissioning of offshore oil and gas infrastructure in the UKCS is principally governed by the Petroleum Act 1998, as amended by the Energy Act 2008. The Petroleum Act sets out the requirements for a formal Decommissioning Programme which must be approved by DECC before the owners of an offshore installation or pipeline may proceed with decommissioning.

At present there is no statutory requirement to undertake an EIA for decommissioning. However, under the DECC Guidance Notes on the Decommissioning of Offshore Oil and Gas Installations and Pipelines under the Petroleum Act 1998 (hereafter referred to as 'DECC Guidance Notes') the Decommissioning Programme must be supported by an EIA. In addition, DECC have advised the Industry that under the Marine and Coastal

Access Act 2009, Marine (Scotland) Act 2010, an EIA will be required for all licence applications relating to decommissioning operations.The DECC Guidance Notes state that an EIA should include an assessment of the following:

- All potential impacts on the marine environment, including exposure of biota to contaminants associated with the installation, other biological impacts arising from physical effects, conflicts with the conservation of species, with the protection of their habitats, or with mariculture, and interference with other legitimate uses of the sea are to be considered.
- Assessment of the potential impacts on other environmental compartments, including emissions to the atmosphere, leaching to groundwater, discharges to surface fresh water and effects on the soil.
- Analysis of the consumption of natural resources and energy associated with re-use and recycling.
- Other consequential effects on the physical environment which may be expected to result from the selected options.
- Potential impacts on amenities, the activities of communities and on future uses of the environment.

OSPAR Decision 98/3 sets out the UK's international obligations on the decommissioning of offshore installations. Decision 98/3 prohibits the dumping and leaving wholly or partly in place of offshore installations. The topsides of all installations must be returned to shore, and all installations with a jacket weight of less than 10,000 tonnes must be completely removed. However, the Decision recognises that there may be difficulty in removing large steel jackets weighing more than 10,000 tonnes and concrete gravity base structures.

As a result, the Decision provides a facility for derogation from the main rule of complete removal, such that the option of leaving the jacket footings or concrete structure in place may be considered. Exceptions will only be granted if a comparative assessment and consultation shows that there are significant reasons why an alternative disposal option is preferable to complete removal. Other environmental regulatory provisions and guidance relevant to the decommissioning of the platform can be seen in Table 1.1.

Table 1.1: Other regulatory drivers and guidance documents relevant to the Ninian Northern platform decommissioning project

Other Regulatory Drivers
1989 International Maritime Organization (IMO) Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf in the Economic Exclusion Zone
Coast Protection Act 1949
Controlled Waste Regulations 1992 (as amended)
Convention on International Trade in Endangered Species (CITES)
Convention on the Protection of the Marine Environment of the North East Atlantic 1992 (OSPAR Convention)
Council Directive on Hazardous Waste 91/689/EEC
EC Framework Directive 2008/98/EC on Waste
Environmental Protection Act 1990 (EPA) Part 2 Duty of Care
Environment Protection (Duty of Care) Regulations 1991
EU Directive on packaging waste (94/62/EC)
EU Directive on the landfill of waste (99/31/EC)
Hazardous Waste (England and Wales) Regulations 2005
Marine and Coastal Access Act 2009
Marine (Scotland) Act 2010
Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998
Merchant Shipping (Prevention of Pollution by Garbage) Regulations 1998.
Offshore Combustion Installations (Prevention and Control of Pollution) Regulations 2001
Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007
Offshore Marine Conservation (Natural Habitats &c.) (Amendment) Regulations 2009
Offshore Marine Conservation (Natural Habitats &c.) (Amendment) Regulations 2010
Radioactive Substances Act 1993
Revised Guidance Notes on the Decommissioning of Offshore Oil and Gas Installations and Pipelines (March 2011 version 6)
OSPAR Recommendation 2006/5 on a Management Scheme for Offshore Cuttings Piles
Special Waste Amendment (Scotland) Regulations 2004
The Greenhouse Gas Emissions Trading Scheme Regulations 2005 (as amended)
The Offshore Chemical Regulations 2002
The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001
The Offshore Petroleum Activities (Conservation of Habitats) (Amendment) Regulations 2007
The Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005
The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999
The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) (Amendment) Regulations 2007
The Trans-frontier Shipment of Radioactive Waste and Spent Fuel Regulations 2008
The Waste (Scotland) Regulations 2011

1.4 EIA Process

EIA is a systematic process (Table 1.2) that considers how a project will change existing environmental conditions, and assesses the consequence and significance of such changes. An EIA is an iterative process that is generally initiated at the project's inception, providing an aid to project decision-making throughout the various design phases so that, where practical, significant environmental effects can be mitigated at source. The process and outcomes from the EIA are documented in a formal report called an ES.

Table 1.2: Key stages of the EIA process for decommissioning

EIA Stage	Description
Scoping	Scoping of the EIA study allows the study to establish the key issues, data requirements, and impacts to be addressed in the EIA and the framework or boundary of the study
Consideration of Alternatives	Demonstrates that other feasible approaches, including alternative project locations, scales, processes, layouts, and operating conditions have been considered.
Description of project actions	Provides clarification of the purpose of the project and an understanding of its various characteristics – including stages of development, location and processes.
Description of environmental baseline	Establishes the current state of the environment on the basis of data from literature and field surveys, and may involve discussions with the authorities and other stakeholders.
Identification of key impacts and prediction of significance	Seeks to identify the nature and magnitude of identified change in the environment as a result of project activities and assesses the relative significance of the predicted impacts.
Impact mitigation and monitoring	Outlines the measures that will be employed to avoid, reduce, remedy or compensate for any significant impacts. Mitigation measures will be developed into a project environmental management plan. Aspects of the project which may give rise to significant impact which cannot be mitigated to an acceptable or tolerable level of impact may need to be redesigned. This stage will feed back into project development activities.
Presentation of the ES	Reporting of the EIA process, through the production of an ES, which clearly outlines the processes above. The ES provides a means to communicate the environmental considerations and environmental management plans associated with the project to the public and stakeholders.
Monitoring	Project impacts will be monitored during the operational phase of the project to verify that impact predictions are consistent with the subsequent outcomes.

1.5 EIA Scoping

Scoping is a two stage process comprising:

- An initial identification of potential impacts.
- A preliminary evaluation of their significance, based on available information.

The scoping process occurs at an early stage in the decommissioning planning process at a point when little project information is available and therefore only a high level assessment is conducted. This assessment identifies the types of potential impact rather than the detailed assessment of their severity. The studies listed in Table 1.3 will be available during the EIA process, therefore allowing the severity of the impact to be assessed.

Those impacts that are identified as likely to be significant will then be examined in more detail in the full EIA. Impacts which are identified as unlikely to be significant will be noted in the ES but will not be examined in detail unless information emerges which changes the evaluation.

For some impacts, it may not be possible to judge their likely significance at this stage. As further information becomes available, these impacts will be re-evaluated to determine whether they require more or less detailed examination. In practice, it is not unusual for there to be substantial areas of uncertainty at the scoping stage and other issues that have yet to be identified.

The scope of the assessment defined in this report will therefore be kept under review as work progresses and responses from stakeholders and consultations are undertaken, to ensure that the final assessment addresses all likely significant issues.

Table 1.3: List of decommissioning studies

Decommissioning Aspect	Study Title
Inventory	Asset Inventory
	Materials Inventory
	Hazardous Materials Study
Engineering	Review of New Technology
	Platform removals Technical Study – Flotels
	Shut down procedure
	Engineering and Clean Down Scope
Topsides	Topside Integrity
	Topside Piecemeal Removal
	Topside Reverse Lift Study
	Topside Separation scope
	Topside Weight Report
	Topsides Comparative Assessment
	Topsides Single Lift Removal
	Topsides Survey
	Topside 3d Survey
Jacket	Jacket Buoyancy Unit Removal Option
	Jacket Piecemeal Removal
	Jacket Single Lift Removal
	Jacket Integrity
	Jacket Comparative Assessment
	Jacket Long Term Monitoring Plan
	Jacket Life Assessment of Footings
Pipeline	Pipeline Studies
HSE	Pre-decommissioning Environmental Survey
	Fisheries Impact Study
	QRA of Decommissioning and Removal Options
Waste Management	Review of Potential Onshore Reception Sites
	Reuse and Recycle

2.0 DESCRIPTION OF THE DECOMMISSIONING PROJECT

During the initial planning stages of the platform decommissioning, CNRI has conducted a study to investigate the potential re-use of the associated infrastructure (CNRI, 2013). The following were discussed:

- Tie-back/service provision to other Fields.
- Re-use at alternative location.
- Offshore renewable energy generation (wind, wave or tidal).
- Carbon Capture and Storage (CCS).
- Offshore sub-station / hub.
- Non-energy sector alternatives:
    - marine research station
    - meteorology station
    - diver training centre
    - fish farm
    - communication and navigation centre
    - artificial reef.

Several factors including remote location, difficulty of access, extreme weather, high maintenance costs and design life all influence the technical and economic viability of re-use and alternative use for the platform (CNRI, 2013).

The study concluded that primarily re-use is unfeasible due to:

- Condition, size and age of the platform.
- No commercial reserves that can be accessed to extend the life of the platform.
- Capital outlays and annual operation costs outweigh the revenue available from the option of re-using the platform for renewable energy generation.
- The limited revenue available from the remaining options listed above would not be able to support the operating and maintenance costs at this remote location.

2.1 Scope of the Proposed Decommissioning Operations

The present scoping report for the platform focuses on the topsides, jacket, drill cuttings pile and the 24 platform wells. This report does not include the subsea pipelines and subsea isolation valves (SSIVs) which will be considered in a separate decommissioning programme (CNRI, 2013).

The main elements of the platform decommissioning project are:

- Well plug and abandonment.
- Engineering down and cleaning of the topside facilities.
- Removal and subsequent recovery to shore of the topsides and jacket.

2.2 Well Plug and Abandonment

Well abandonment will be the first major decommissioning task to commence on the platform and may be conducted in parallel with continuing platform production or

engineering down activities. Well plug and abandonment (P&A) will be a phased campaign, which is anticipated to be executed using the existing drilling derrick and facilities. The platform is equipped with a partially operational drilling rig, which may be fully refurbished to allow for reverse installation of tubing, casing and conductors using existing facilities.

The Ninian Northern area comprises 25 drilling slots (one of which is a spare) and 33 wells (including side-tracks) which are completed into the Brent reservoir. Currently, five of the wells are shut-in and may be considered for early abandonment.

2.3 Drill Cuttings Pile

The platform has a historic drill cuttings pile located more or less directly beneath the jacket, a result of the discharge and subsequent accumulation of drill cuttings and muds from 26 wells (cuttings from the remaining seven wells were skipped and shipped), 14 of which were drilled using oil based muds (ERT, 2008). The cuttings pile has a measured height of 11.93 m, an estimated coverage of 23,620 m2 and estimated volume of 33,144 m3 comprising both cuttings and drilling mud (Fugro ERT, 2012).

Under the OSPAR Recommendation 2006/5 ‘Management Regime for Offshore Cuttings Piles’ all cuttings piles must undergo a two stage assessment. Stage 1 comprises the initial screening of the cuttings pile to determine whether the pile meets the thresholds for rate of oil loss and persistence specified as:

i. The rate of oil loss assessed on the basis of the quantity of oil lost from the cuttings pile to the water column over time. The rate of loss is presented as tonnes per year (tonnes/yr).

ii. Persistence is assessed on the basis of the area of the seabed where the concentration of oil remains above 50 mg/kg and the duration that the contamination level will remain above this value. The result is expressed as square kilometre years (km2yrs).

Where results indicate that both the rate and persistence are below the thresholds, no further action is required and the cuttings pile may be left in situ to degrade naturally. If either the rate or the persistence is above the threshold, a Stage 2 assessment is required to determine the best environmental practice for the management of the pile.

In 2012, CNRI commissioned Genesis Oil & Gas Consultants to conduct modelling studies of the cuttings pile. The modelling studies were specifically designed to determine: (i) the rate of oil loss and (ii) the persistence over the area of seabed contaminated from the Ninian Northern drill cuttings pile, and compare the modelled values with the OSPAR Recommendation 2006/5 thresholds. This study determined that for the cuttings pile the current rate of loss of oil to the water column is 0.1 te/yr and area of persistence was less than 32 km2yrs (Genesis, 2013). Since both of these values were estimated to be below the OSPAR thresholds (10 te/yr and 500 km2yrs, respectively), it was concluded that no further action was required (Genesis 2013).

Full removal of the platform jacket would require displacement or removal of a large proportion of the drill cuttings pile, however if derogation for the jacket footings were granted, it would be possible to leave the cuttings pile in situ. To inform the comparative assessment of the jacket removal options, a full comparative assessment for

management of the drill cuttings pile will be undertaken. The comparative assessment of drill cuttings pile management options will consider the following actions:

- Option 1: Recovery of the whole pile to the platform or a vessel; separation, treatment and discharge of liquids offshore; and transportation and treatment of solids onshore.
- Option 2: Recovery of the whole pile to a vessel; transportation of slurry to shore separation and treatment of slurry onshore for disposal.
- Option 3: Recovery of the whole pile to the platform, offshore injection of slurry into part of the Ninian Northern rock formation.
- Option 4: Dispersion/redistribution offshore, in the area immediately adjacent to the Ninian Northern jacket.
- Option 5: Leave in situ for natural degradation.

2.4 Ninian Northern Platform Topsides Facilities

Figure 2.1 shows the general arrangement of the platform topsides, which comprise ten modules (M01 to M10), the cap truss (M25) and cellar deck structures (M11 to M13) and two platform cranes. These have an estimated combined weight of 12,453 tonnes.

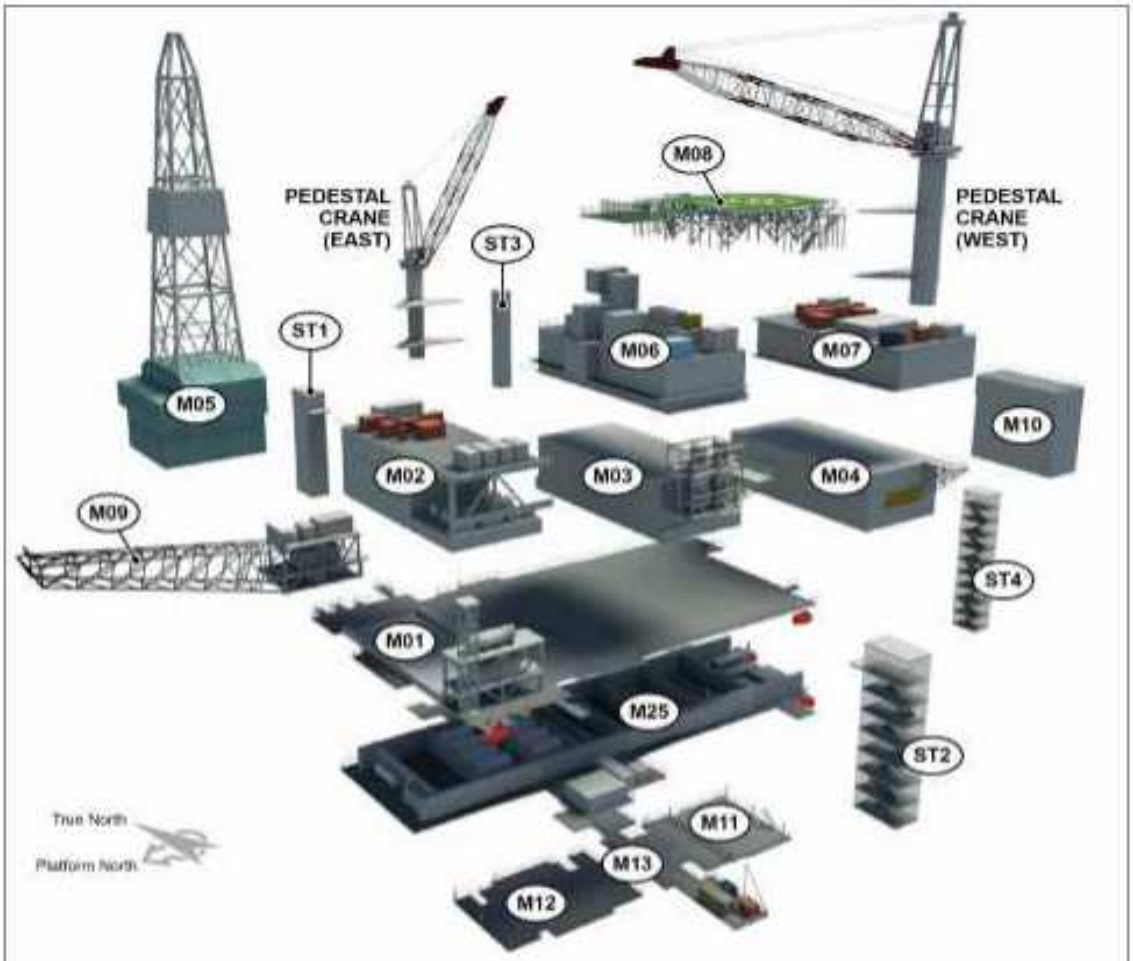
- The main topsides equipment and facilities are arranged as follows.
- The cellar deck beneath the cap truss contains offices, storage/laydown areas and diving facilities
- The cap truss deck contains bulk storage tanks for drilling, services, diesel fuel, fresh water storage and some utilities, including a standby generator and air compressors
- The lower deck contains wellhead, drilling and production module, utilities and control room, with the drilling derrick and water injection module at upper deck level
- Accommodation is located on two levels at the south end of the upper and lower decks
- The helideck is located above the living quarters.

2.5 Topsides Engineering Down and Cleaning

It is possible that some of the engineering down and cleaning (EDC) may take place at the same time as the well plug and abandonment campaign. It is anticipated that the process will be carried out over a 24 month period.

On completion of the well P&A and conductor recovery programme the topside production systems will be transferred to the EDC contractor. CNRI will flush the topside systems to ensure that minimal hydrocarbons remain in the system prior to EDC.

During engineering down, all of the systems will be progressively depressurised, purged and rendered safe for removal operations. Pipework and tanks may then be cleaned, or initially cleaned, to remove sources of potential spills of oils and other fluids. The modules will be prepared for separation by severing connecting pipework in a carefully planned programme of cutting and sealing pipes. Some EDC operations, which do not compromise the well P&A activities or interfere with the life support systems and facilities, may begin during the well P&A programme



MODULE	DESCRIPTION
M01	Wellhead Area
M02	Production and Drilling Equipment
M03	Water Services & Utilities
M04	Diesel Generators and Control Room
M05	Drilling Package
M06	Water Injection
M07	Accommodation

MODULE	DESCRIPTION
M08	Helideck
M09	Flare Boom
M10	Accommodation
M11	Cellar Deck Area 80 - Offices
M12	Cellar Deck Area 80 - Moonpool
M13	Cellar Deck Area 80 - Workshops
M25	Captruss

Source: CNRI (2013)

Figure 2.1: Arrangement of modules on the Ninian Northern platform topsides

2.6 Topsides Removal Options

The topsides will be removed and returned to shore for recycling and disposal. The removal options being considered by CNRI for the decommissioning of the topsides include (CNRI, 2013):

- Reverse installation;
- Piece small deconstruction offshore; and
- Single lift

2.6.1 Reverse installation

For reverse installation, modules would be separated by disconnecting the attachments of modules and removing them individually by a dedicated crane vessel. They would then be lifted on the deck of the crane vessel or to a cargo barge, and transported in batches to an onshore disposal yard. Individual modules would be offloaded either directly from the vessel to the quayside or via a cargo barge towed to the quayside. The modules may then be assigned for re-use or broken down for recycling or disposal.

2.6.2 Piece small offshore deconstruction

In the piece small option, modules and other facilities on the topside would be dismantled offshore using cranes and mechanical excavators equipped with cutting tools. Manual hot and cold cutting techniques would be used to breakdown the facilities into small manageable sections, which would then be sorted and loaded into containers for transportation to shore on supply vessels. The three main phases of this option would be:

- Phase 1 – Work in this phase would be supported by a team using the existing accommodation, life support and utility systems on the platform. All cables and hazardous waste would be removed from each module in turn. Module internals (vessels, pipes and secondary structures) would then be removed. The remaining module structures would then be cut into container sized sections.
- Phase 2 – This phase would be supported from an accommodation vessel located alongside the platform. This would allow the accommodation, life support and utility systems to be removed piece small.
- Phase 3 – Remove remaining modules by reverse installation, using a heavy lift vessel.

2.6.3 Single lift

In the single lift option, a Single Lift Vessel (SLV) capable of lifting the entire topsides in one lift would be utilised. Prior to this the topsides would be prepared for lifting by a combination of engineering down and cleaning; module sea fastening; structural strengthening and Module Support Frame (MSF) separation. The topsides would then be transported by the SLV to a sheltered location near the designated disposal yard where it would transfer the topsides to a specifically designed barge. The barge would then be towed to a quayside where the topsides would be dismantled.

During preparation work to dismantle the topsides modules, all hazardous waste, cables, and waste electrical and electronic equipment would be removed. Once materials had

been sorted into the relevant groups, they would be loaded into separate containers and shipped to an onshore disposal site.

2.7 Ninian Northern Platform Jacket Removal Options

The jacket comprises a welded, tubular steel, eight-legged jacket structure (Figure 2.2). The jacket has a stabbed-in module support frame surmounted by a plate girder captruss which supports the lower and upper decks upon which the production, drilling, utility and life support facilities are located. The structure is 170 m high to the top of the captruss and stands in 141 m of water.

All eight legs are through-piled with 1.2 m diameter piles and there are a further eighteen skirt piles of 1.5 m diameter. The piles are driven into the seabed to a depth of between 55.5 and 66.5 m. The upper sections of four legs were concrete filled from +2 to + 10.5 m above lowest astronomical tide (LAT) in 1979 to provide additional strength. The remaining sections of two legs, i.e. from the seabed to +2 m above LAT, were concreted in 1981 to further increase the strength. The steel jacket weighs approximately 15,560.

Since the total weight of the jacket in air, excluding conductors is >10,000 tonnes, it falls within the category of steel structures for which derogation may be sought from the general rule of 'complete removal' under OSPAR 98/3. In such circumstances, OSPAR suggests that partial removal, leaving the "footings" of the jacket on the seabed, may be acceptable if a comparative assessment indicates that this would provide significant safety or environmental benefits in comparison with total removal. The footings of piled steel jackets are defined under OSPAR 98/3 as those parts of a steel installation which:

i. Are below the highest point of the piles which connect the installation to the sea-bed; or

ii. Are so closely connected to the parts mentioned in paragraph (I) as to present major engineering problems in severing them from those parts.

Accordingly, the decommissioning options currently being considered by CNRI for the decommissioning of the jacket are:

- Full Removal
    - Cutting and Lifting
- Partial removal
    - Cutting and lifting

Removal options for the full and partial removal of the jacket use the same method, equipment and techniques and only differ in the height of cut, the number of lifts and the maximum weights of the lifted pieces.

Cutting and Lifting Removal Option

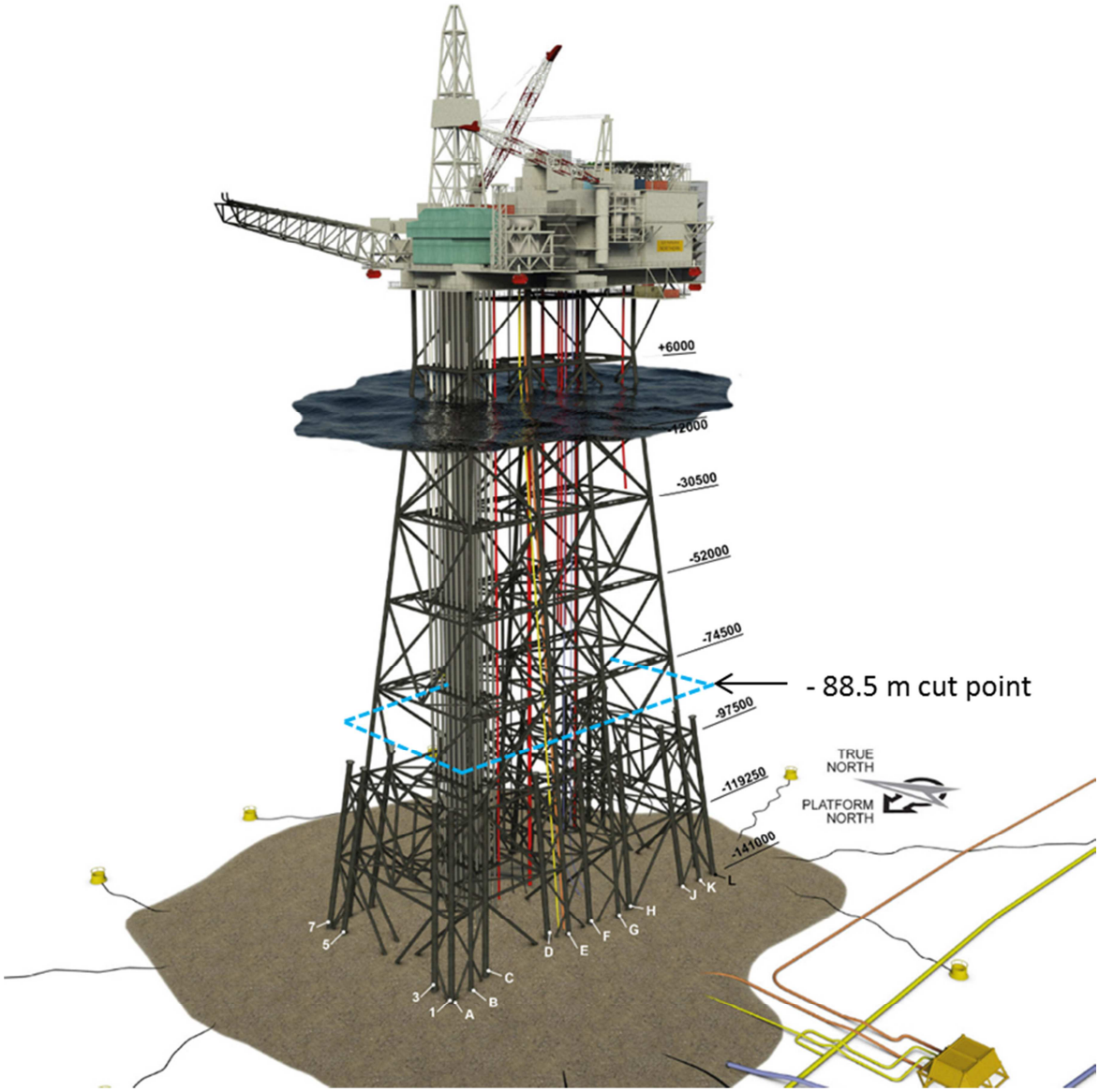
The jacket members would be cut into sections using a combination of diamond-wire cutting, abrasive water jetting and hydraulic shear (CNRI, 2013). Each jacket section would be held in place on the end of a lifting strop from a crane during cutting operations, and, after separation from the remainder of the jacket, would be lifted by an HLV. Once jacket sections had been separated and lifted to the surface, they would be sea-fastened and transported to an onshore disposal yard, either on dedicated transportation barges or on the HLV.

For both the full and partial removal options, the upper section of the jacket, above the jacket footings, would be removed at approximately -88.5m depth (Figure 2.2) in several sections. CNRI has determined that this is the closest height above the top of the piles where the necessary cutting equipment can safely be deployed and positioned. In the full removal option, the jacket footings would then be cut into sections and removed down to the seabed. The piles in the seabed would be cut at a depth of 3m below the seabed so that the seabed is left clear of obstructions (CNRI, 2013).

2.8 Decommissioning Schedule

The End of Field Life (EoFL) has yet to be determined for the platform and this will be dependent on future development opportunities and continuing production profiles. Based on the mean and late projections for the EoFL and CoP, CNRI as a responsible operator have initiated the pre-planning stage for the decommissioning of the platform.

.



Source: CNRI (2013)

Figure 2.2: Ninian Northern platform illustration showing the (-88.5 m) level at which the platform would be cut in a partial (derogation) removal scenario.

3.0 DESCRIPTION OF THE ENVIRONMENTAL SETTING

A brief description of the environmental setting is included here to identify those components of the physical, chemical and biological environments that might be sensitive to the potential impacts arising as a result of the proposed activities.

PHYSICAL AND CHEMICAL ENVIRONMENT

3.1 Meteorology, Oceanography and Hydrography

The platform is located in an area influenced by the northern North Sea water mass (NSTF, 1993). The maximum surface tidal current speeds are relatively weak (approximately 0.26 m/s to 0.39 m/s) and residual current speed ranges from 0.0 to 0.01 m/s (UKDMAP, 1998).

Mean sea surface temperature is approximately 13.5 °C in summer and 7 °C in winter. Mean bottom water temperature varies less, and is approximately 9 8 °C in summer and 7 °C in winter. The annual mean sea surface temperatures in Block 3/3 range from 7 to 13 °C, while the annual mean near seabed temperatures range from 6 to 8 °C (NMPI, 2016). The salinity of the water column is around 35 ppt throughout the year (UKDMAP, 1998). Winds in the Ninian area occur from all directions, although winds from the south-southwest and south are dominant (Meteorological Office, 1998).

3.2 Seabed Sediments

The Ninian Northern Platform lies in an area of the northern North Sea where sediment is composed of fines and coarse sand (Künitzer et al., 1992), constituting an approximate silt fraction of 5% and organic fraction of 3% (Basford et al., 1989; 1990). Sediment sampling as part of a pre-decommissioning environmental baseline survey around the platform was carried out in April 2011(Fugro ERT, 2012). Mean values of organic matter in the drill cuttings pile were 5.2% (Fugro ERT, 2012). In the wider area beyond the cuttings pile (within a 10 km radius of the platform) organic matter ranged from 0.9% to 3.8%. The higher organic content at the stations closest to the platform can be attributed to drilling activity (Fugro ERT, 2012).

BIOLOGICAL ENVIRONMENT

3.3 Conservation Areas

Table 3.1 lists Annex I habitats and Annex II species of the European Union Habitats Directive (92/43/EEC) that are considered for the identification of Special Area of Conservation (SAC) in UK offshore waters. There are no known Annex I habitats in the vicinity of the platform. The only Annex II species sighted within the area is the harbour porpoise, sighted in very high numbers in February and July and in low to moderate numbers during the rest of the year (Reid et al., 2003; UKDMAP, 1998).

Table 3.1: Annex I habitats and Annex II species known to occur in UK offshore waters

Annex I habitats considered for SAC selection in UK offshore waters	Species listed in Annex II known to occur in UK offshore waters
• **Sandbanks which are slightly covered by seawater all the time** • **Reefs (bedrock, biogenic and stony)** - Bedrock reefs – made from continuous outcroppings of bedrock which may be of various topographical shapes; - Stony reefs – these consist of aggregations of boulders and cobbles which may have some finer sediments in interstitial spaces; and - Biogenic reefs – formed by cold water corals (e.g. *Lophelia pertusa*) and *Sabellaria spinulosa*. • **Submarine structures made by leaking gases**	• Grey seal *(Halichoerus grypus*) • Harbour or common seal (*Phoca vitulina*) • Bottlenose dolphin (*Tursiops truncates*) • Harbour porpoise (*Phocoena phocoena*)

Source: JNCC (2016); Johnston et al., (2002)

3.4 Plankton

Phytoplanktonic organisms are the primary producers of the ocean and fix the energy of sunlight by means of photosynthesis. The most common phytoplankton groups are the diatoms, dinoflagellates and the smaller flagellates and together they are responsible for a majority of the primary production of the North Sea. In the northern North Sea, within which the platform is located, the dinoflagellate genus Ceratium dominates the phytoplankton community (DTI, 2001).

Phytoplankton is grazed by the secondary producers, including some of the zooplankton species. The most abundant group in the North Sea is the copepods, which are dominated by *Calanus* spp. (DTI, 2001; Johns & Reid, 2001). Other zooplanktonic organisms of the North Sea include: *Euphausiida* (krill); *Thaliacea* (salps and doliolids); Siphonophores, medusae (jellyfish) and the larval stages of starfish and sea urchins (echinoderms), crabs and lobsters (decapods) and fish (Johns & Reid, 2001). The zooplankton communities across the North Sea are broadly similar (DTI, 2001).

3.5 Seabed Fauna

Benthic fauna

The habitat of the platform area is classified as “fine sediment below 100 m depth in the northern North Sea” according to the model of Künitzer et al. (1992). This deep-water infaunal assemblage is typically characterised by the polychaetes *Prionospio cirrifera*, *Aricidea catherinae* and *Exogone verugera* and bivalve mollusc *Thyasira* spp. with high densities and species richness.

Benthic sampling was part of a pre-decommissioning environmental baseline survey of the platform area (Fugro ERT, 2012). Generally, macrofauna within the area were dominated by polychaetes (70.1% of taxa, and 72.4% of individual animals identified,

respectively), followed by molluscs (20.9% of taxa and 24.7% of individuals) and echinoderms (4.7% of taxa and 0.7% of individuals) (Fugro ERT, 2012).

Marine Growth

In general, the composition and cover of the marine growth observed on the submerged parts of the steel jacket of the platform is similar to that observed on other large steel platforms installed in the 1970's and 1980's in the northern North Sea.

The 2011 marine growth survey revealed that hard-bodied marine growth predominated on the shallowest and deepest parts of the jacket. Mussels were the largest contributing organism to both percentage cover and average thickness at depths from 0 to 26 m below LAT. The hard coral, *Lophelia pertusa*, was the most prolific form of marine growth from 75 to 141 m depth.

Soft growth predominated at intermediate depths between 27 m and 74 m, with anemones and soft corals contributing most to the cover and thickness of the marine growth. Anemones were found throughout the majority of the depth range on the jacket, with seaweeds being confined to shallow depth (0 m to 26 m). Hydroids were found predominantly near the deeper parts of the jacket, but their cover and thicknesses here were dwarfed by that of the *Lophelia* (Fugro ERT, 2012).

3.6 Finfish and Shellfish

The main fish species in the northern North Sea are whiting, cod, haddock, saithe, Norway pout, lemon sole, monkfish, herring and mackerel (DTI, 2001). The platform lies within spawning grounds for cod (*Gadus morhua*; January to April), haddock (*Melanogrammus aeglefinnus*; February to May), saithe (*Pollachius virens*; January to February), sandeels (*Ammodytes* spp.; November to February) and Norway pout (*Trisopterus esmarkii*; January to April) and nursery grounds throughout the year for haddock, Norway pout, sandeels, whiting (*Merlangius merlangus*), mackerel (*Scomber scombrus*), anglerfish (*Lophius piscaorius*), European hake (*Merluccius merluccius*), herring (*Clupea harengus*), ling (*Molva molva*), spurdog (*Squalus acanthias*) and blue whiting (*Micromesistius poutassou*) (Figures 3.1 and 3.2).

Fish were encountered in sporadically throughout the survey area, however there was a notable increase in abundance around and in between the jacket structure. Species included those from the gadoid family and flatfish (Furgro ERT, 2012).

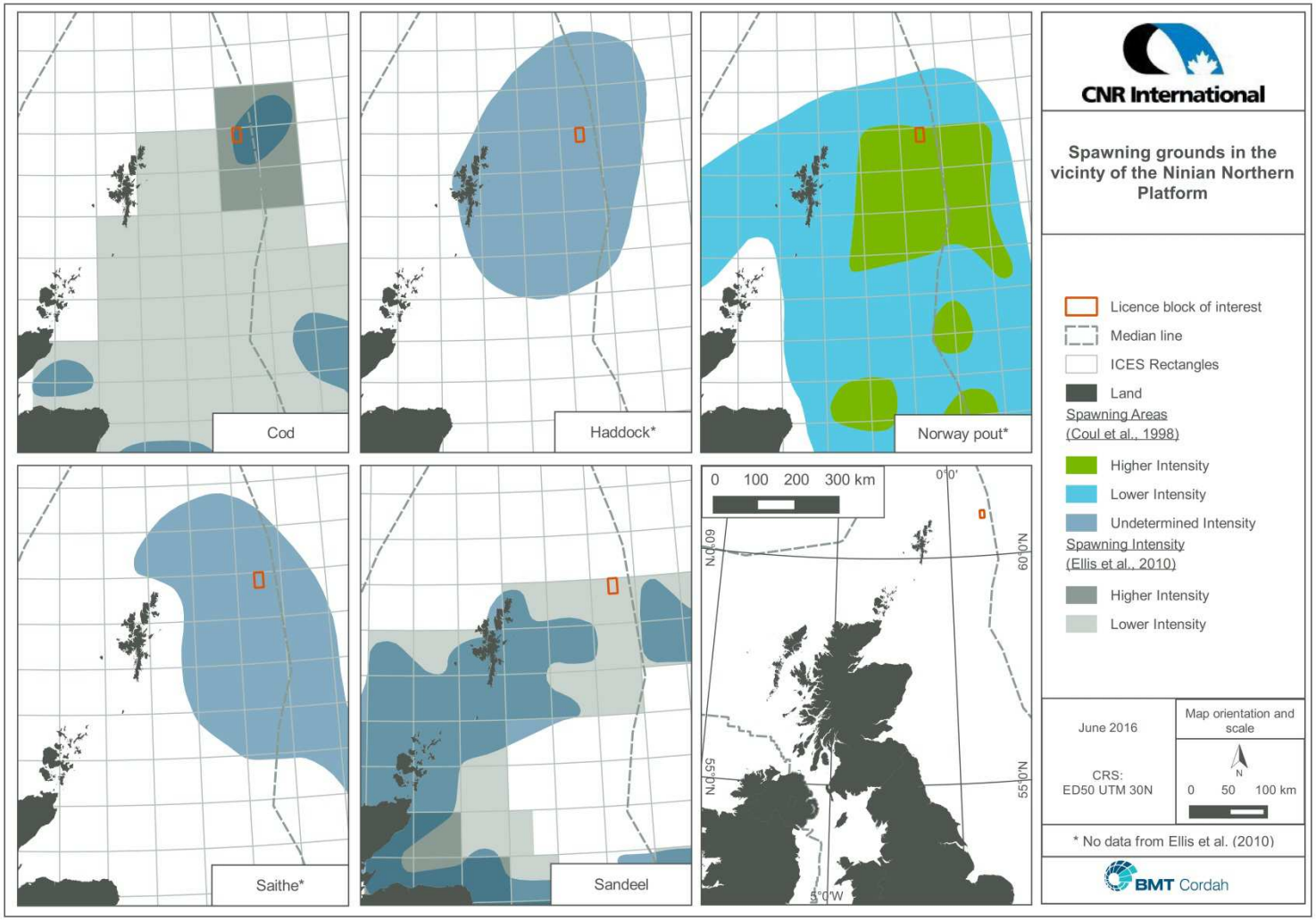


Figure 3.1: Fish spawning areas around the Ninian Northern platform.

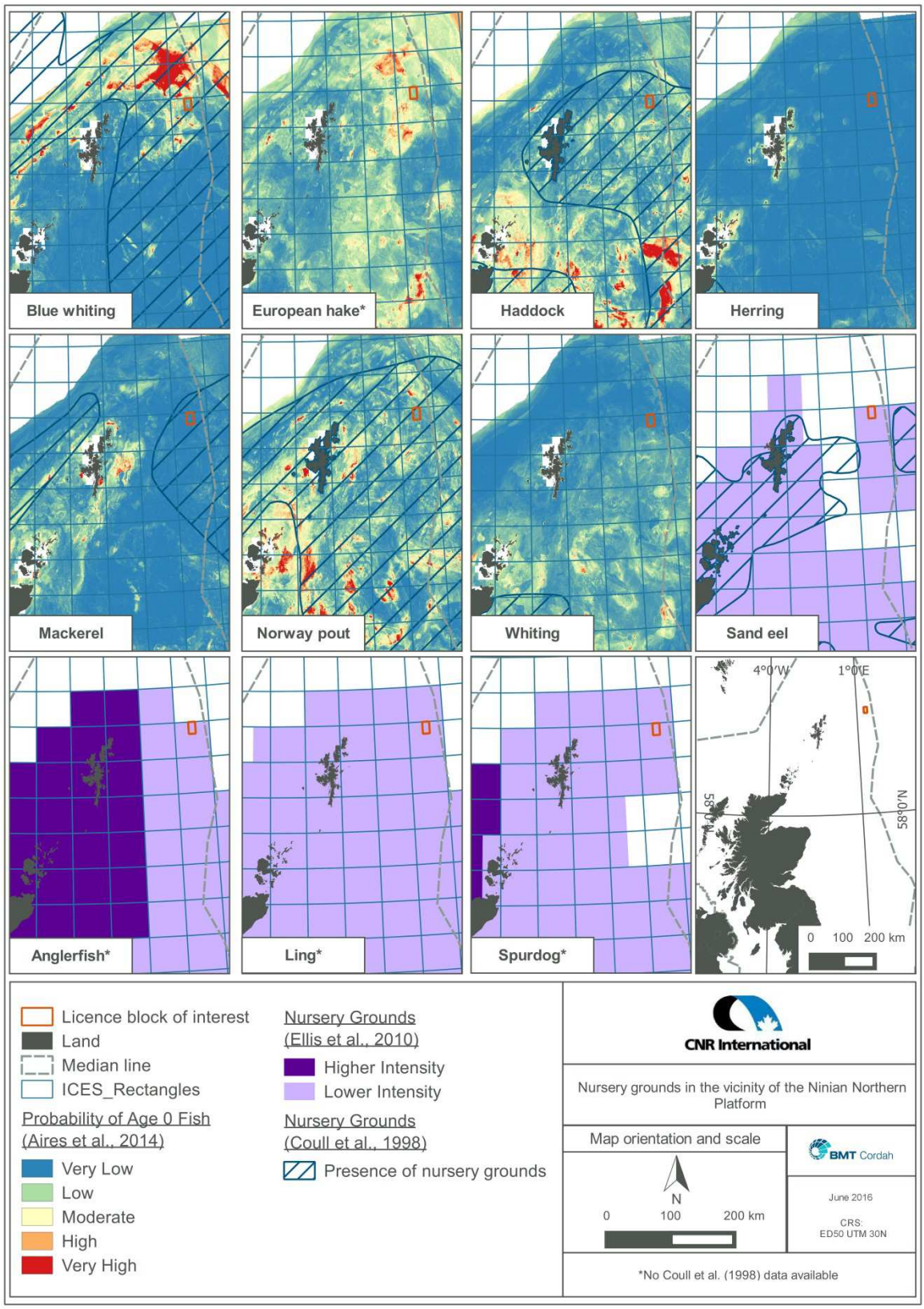


Figure 3.2: Fish nursery grounds around the Ninian Northern platform.

3.7 Marine Mammals

Cetaceans

The main cetacean (whale and dolphin) species occurring in the Ninian Northern Platform area are minke whale (*Balaenoptera acutorostrata*), long-finned pilot whale (Globicephala melas), killer whale (*Orcinus orca*), white-beaked dolphin (*Lagenorhynchus albirostris*) and harbour porpoise (*Phocoena phocoena*), with sightings occurring throughout the year (Table 3.2); Reid et al., 2003; UKDMAP, 1998). Table 3.2 provides a summary of the sightings of whales in dolphins in UKCS Quadrant 3 and surrounding quadrants.

Table 3.2 Seasonal cetacean sightings in the platform area.

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minke whale							L					
Long-finned pilot whale								M				
Killer whale					M							
White-beaked dolphin		M	M			L	L					
Harbour porpoise	L	VH		L	L	L	VH	M	L			L

KEY		
		No sightings / no data
	L	Low densities (0.01 to 0.09 animals/km)
	M	Moderate densities (0.10 to 0.19 animals/km)
	H	High densities (0.20 to 0.49 animals/km)
	VH	Very high densities (≥ 0.50 animals/km)
		Sightings within Quadrant 3
		Sightings within surrounding Quadrants

Source: UKDMAP (1998)

Pinnipeds

The grey seal (*Halichoerus grypus*) and the harbour or common seal (*Phoca vitul*ina), are both resident in UK waters and occur regularly over large parts of the North Sea (SCOS, 2009). However, as the platform is 120 km from the nearest coastline, it is unlikely that significant numbers of grey or common seals would be found in the vicinity.

3.8 Seabirds

Seabirds found in offshore North Sea waters include fulmars (*Fulmarus glacialis*), gannets (*Morus bassanus*), auks, gulls, and terns (DTI, 2001). In general, offshore areas of the North Sea contain peak numbers of seabirds following the breeding season and through winter, with birds tending to forage closer to coastal breeding colonies in spring and early summer (DTI, 2001).

Within UKCS Block 3/3a the overall seabird vulnerability to surface pollution is “low” (JNCC, 1999; Table 3.3). The most sensitive times of year are January, March, July and September to November when vulnerability to oil pollution is “high”. Vulnerability ranges from “moderate” to “low” for the remainder of the year.

Table 3.3: Seasonal seabird vulnerability to oil pollution in the Ninian Northern area.

Block	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Overall
211/27	3	3	2	4	4	4	2	4	3	2	3	4	4
211/28	3	3	2	4	4	4	2	4	3	2	2	4	4
211/29	3	3	4	4	4	4	2	4	3	3	2	4	4
3/2	2	3	2	3	4	4	2	4	2	2	3	4	4
3/3	**2**	**3**	**2**	**3**	**4**	**4**	**2**	**4**	**2**	**2**	**2**	**3**	**4**
3/4	3	3	4	3	4	4	2	4	3	3	2	3	4
3/7	2	3	2	2	4	4	2	4	2	3	3	3	4
3/8	2	3	2	2	4	4	2	4	2	3	2	3	4
3/9	3	3	3	3	4	4	2	4	3	3	2	3	4

KEY		
	1	Very high seabird vulnerability
	2	High seabird vulnerability
	3	Moderate seabird vulnerability
	4	Low seabird vulnerability

Source: JNCC (1999)

3.9 Socio-economic Environment

UK Fisheries

Commercial fishing effort (days spent fishing) in the area around the platform (International Council for the Exploration of the Seas (ICES) Statistical Rectangle 50F1) is low in comparison with other areas of the North Sea, with 278, 205 and 191 days effort in the years 2013, 2014 and 2015, respectively (Scottish Government, 2016).

The predominant gear used in ICES block 50F1 is trawl gear most notably. The first 6 months of the year (January to June) are more heavily fished for all gear types than the latter half of the year.

In terms of relative value, around £3,100,000 was made annually in 2015 for catch totals of around 3,800 tonnes. Mackerel was the most valuable fish with the highest received tonnage for 2013, 2014 and 2015 (Scottish Government, 2016).

Non-UK Fisheries

During the consultation with stakeholders it was noted that the UK fisheries statistics do not represent the true levels of foreign vessel activity, as values are only recorded if the foreign vessel lands at a UK port. Therefore, CNRI commissioned SFF Services Ltd. to undertake a socioeconomic study which assesses the contribution of non-UK fishing vessels relative to the UK fishing activity (SFF Services, 2012).

It was estimated that approximately 20% of the total fishing boats in the 50F1 area for the period 2001 to 2010 were non-UK registered and effort was dominated by vessels

from the Republic of Ireland, Denmark and Norway (SFF Services, 2012). The average effort of non-UK vessels in ICES 50F1, for the period from 2001 to 2010, was ten days, and was dominated by the use of mid-water otter and pair trawls and gillnets (SFF Services, 2012).

3.10 Oil and Gas Industry

Oil and gas development in this region of the North Sea is relatively intensive. There are several oil developments close to the Ninian Northern Platform (Figure 1.1). Those within 30 km radius include Ninian Central (UKCS Block 3/3), Ninian Southern (UKCS Block 3/8), Alwyn North NAA and NAB (UKCS Block 3/9), Brent A, B, C and D (UKCS Block 211/29), NW Hutton A (decommissioned, footing in place; UKCS Block 211/27), Cormorant A (UKCS Block 211/26) and Heather A (UKCS Block 2/5).

3.11 Shipping

Shipping density in the vicinity of the platform is considered to be moderate (DECC, 2014).

4.0 SCOPING METHODOLOGY

A desktop study to identify the potential impacts that may be associated with the decommissioning activities was undertaken by BMT Cordah based upon those identified for the Murchison decommissioning programme. CNRI conducted a scoping exercise to review the results from the Murchison impact assessment to identify whether there were any additional potential impacts and to validate the level of impact for the Ninian Northern platform. The results of the scoping exercise are detailed in Impact Assessment Tables presented in an Appendix A.

4.1 Impact Identification

The impacts that might arise during the decommissioning project were identified for this report by:

1. Examining the proposed options for decommissioning of the Ninian Northern Platform topsides, jacket and subsea infrastructure, and identifying the specific high level activities within these decommissioning phases which may give rise to an environmental impact. High level activities were identified as:
    - Use of vessels, and offshore transportation, during all types of offshore operations.
    - Handling, dismantling, treatment and disposal of materials at inshore and onshore sites.
    - Plugging and abandonment of wells.
    - Decommissioning of topsides offshore.
    - Decommissioning of the jacket.
    - Decommissioning of the drill cuttings pile.
2. Assessing the characteristics and sensitivities of the offshore environment in which the Ninian Northern Platform facilities are located. CNRI have identified the potential environmental receptors and other considerations which may be impacted by the proposed decommissioning operations. These receptors fall within four broad categories: physical environment, biological environment, human aspects and other considerations. The specific receptors are detailed in Figure 5.1.

Based on the high level activities identified above and the list of environmental considerations, the aspects of the project that could have an effect on any of the environmental receptors are discussed in the sections that follow.

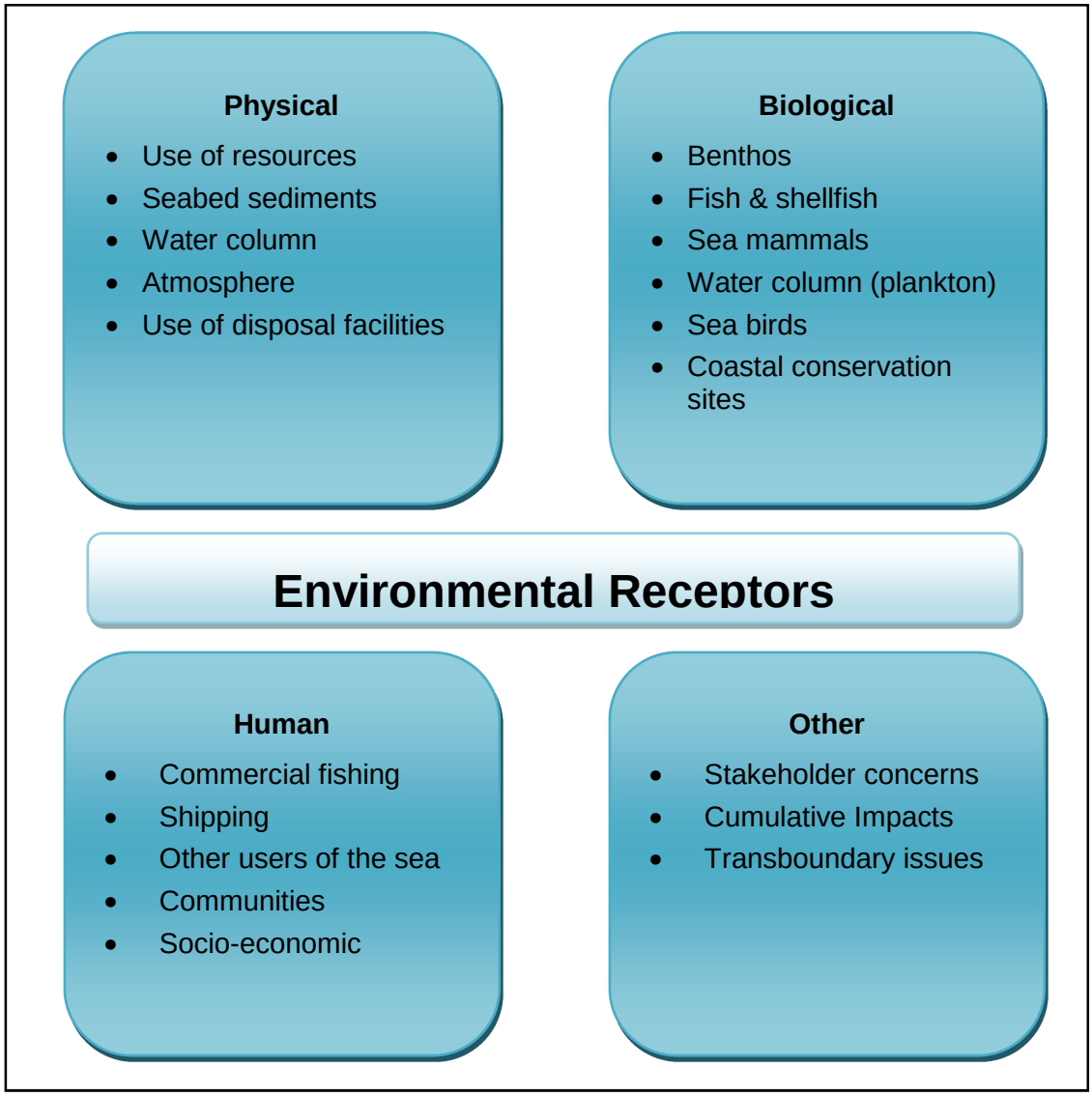


Figure 4.1: Potential environmental receptors.

4.2 Impact Evaluation

Potential impacts are evaluated by taking into account the sensitivity of the affected receptor and the magnitude of the impact, specifically the nature, and where possible scale and duration, of any resultant physical, chemical, biological or social/economic effects.

The evaluation of each impact's significance was based on the predefined significance criteria shown in Table 5.1 and are assessed as:

- Impacts that fell into the categories described as: "none", "negligible" and "minor" are assessed to be non-significant.
- Impacts that are classified as potentially being of "moderate", "major" or "severe" significance are highlighted as key issues that should be assessed in more detail in the full EIA.

Table 4.1: Criteria used to assess the significance of potential impacts.

Colour Code	Level of Environmental Impact	Definition
	Severe	• Change in ecosystem leading to long term (>10 years) damage and poor potential for recovery to a normal state. • Likely effect on human health. • Long term loss or change to users or public finance.
	Major	• Change in ecosystem or activity over a wide area leading to medium term (>2 years) damage but with a likelihood of recovery within 10 years. • Possible effect on human health. • Financial loss to users or public.
	Moderate	• Change in ecosystem or activity in a localised area for a short time (<2 years), with good recovery potential. Similar scale of effect to existing variability but may have cumulative implications. • Potential effect on health unlikely but may cause nuisance to some users.
	Minor	• Change which is within scope of existing variability but can be monitored and/or noticed. • May affect behaviour but not a nuisance to users or public.
	Negligible	• Changes which are unlikely to be noticed or measurable against background activities. • Negligible effects in terms of health or standard of living.
	None	• No interaction and hence no change expected.
	Beneficial	• Likely to cause some enhancement to ecosystem or activity within existing structure. • May help local population.

Source: UKOOA Offshore Environmental Statement Guidelines (1999)

5.0 POTENTIAL IMPACTS FROM THE NINIAN NORTHERN PLATFORM DECOMMISSIONING PROJECT

This section lists the main operations or events in each of the high-level activities/phases of the platform decommissioning project and identifies the potential impacts of these activities on the environmental receptors listed in Section 4. All of these potential impacts will be assessed in the EIA. Particular attention will be given to a thorough assessment of the "key issues" identified using the method statement described in Section 4.

5.1 Impacts of the Use of Vessels, and Offshore Transportation, During ALL Types of Offshore Operations

All phases of the platform decommissioning operations, including topsides removal, jacket decommissioning, and post-decommissioning surveys, will require intensive use of specialist vessels to dismantle the structures offshore and transport them to shore for processing and disposal. Table 5.1 summarises the potential impacts arising from these activities.

Table 5.1: Potential impacts associated with all vessel use.

Activity	Impacted receptor
Physical presence	Fishing, shipping
Anchoring on seabed	Sediments, benthos
Vessel discharges e.g. sewage	Water column
Vessel discharges e.g. ballast water	Water column, plankton, benthos, fish, stakeholders
Energy use and atmospheric emissions	Atmosphere, cumulative (global) impacts
Inshore / onshore noise	Communities
Vessel movement - underwater noise	Marine mammals and fish
Non routine events	
Loss of fluids from subsea tool	Water column
Vessel collision	Physical, biological, inshore conservation sites, socio-economic, stakeholder
Worst case vessel spill	
Accidental fuel spills	

5.2 Impacts of the Handling, Dismantling, Treatment and Disposal of Materials at Inshore and Onshore Sites

The majority of material generated from decommissioning the topsides, jacket, and subsea structures from the platform will comprise different metals with the major component being structural steel. It is expected that the steel will be brought back onshore, smelted and re-used, and other components such as wood, glass and plastics will be recycled. Where possible, plant equipment such as generators will be brought back onshore and reconditioned for reuse. The remaining material which cannot be reused or recycled will be treated, if required, and processed for disposal to landfill. Table 6.2 summarises the potential impacts arising from these activities.

Table 5.2: Potential impacts associated with disposal of materials near-shore/ onshore.

Activity	Impacted receptor
Dismantling structures inshore/near-shore – dust and noise generation	Atmosphere and communities
Dismantling structures onshore – dust and noise generation	Atmosphere and communities
Cleaning marine growth from jacket – emissions from use of equipment and odour from organic material decay	Atmosphere and communities
Transport of marine growth from dismantling yard to land fill site	Atmosphere and communities
Recycling / reprocessing	Atmosphere
Landfill disposal – reduced capacity, leachate and landfill gas	Use of resources, groundwater, atmosphere, use of disposal facilities, communities

5.3 Impacts of Plugging and Abandonment of Wells

Ninian Northern decommissioning will commence with a phased well P&A campaign. Well P&A activities may be executed using the existing drilling derrick and facilities and/or using rig-less abandonment and conductor recovery technology. Table 6.3 summarises the potential impacts arising from this activity.

Table 5.3: Potential impacts associated with the plugging and abandonment of wells.

Activity	Impacted receptor
Mechanical cutting of casing	Atmosphere and marine mammals

5.4 Impacts of Decommissioning the Topsides Offshore

The topside superstructure will be removed using either reverse installation, piece small deconstruction offshore or single lift. Topsides removal involves the cutting, separation, removal, transfer to shore, onshore dismantling and subsequent reuse of selected components, recycling of bulk steel and disposal of waste materials from the topsides modules. Table 6.4 summarises the potential impacts arising from these activities.

Table 5.4: Potential impacts associated with topsides decommissioning offshore.

Activity	Impacted receptor
Flushing and cleaning of topsides	Water column, fish, transboundary
Loss of minor items	Sediments, benthos, fishing
Preparation for removal (paint flakes PCB, hot cutting , welding etc)	Sediments, water column, benthos, fish, atmosphere
Non routine events	
Module loss during lifting and transportation	Sediments, benthos, fishing
Loss of residual fluids from topsides	Water column and fish

5.5 Impacts of Decommissioning the Jacket

The jacket is a tubular steel structure weighting approximately 17,570 tonnes and has a total height of 170 m. There are two options under consideration for the decommissioning of the jackets - full removal, and partial removal leaving the footings in place. Table 6.5 summarises the potential impacts arising from these activities.

Table 5.5: Potential impacts associated with jacket decommissioning.

Activity	Impacted receptor
Underwater noise	Marine mammals, fish
Drill cuttings disturbance	Sediments, water quality, benthos, mammals
Abrasive cutting	Water column
Potential impacts of leaving the footings in place	
Reef effect	Benthos, fish
Degradation of footings	Sediments, water column, benthos, fish
Manufacture new materials	Use of resources, atmosphere
Snagging risk	Commercial fishing, stakeholder
Loss of access	Commercial fishing, stakeholder
Non routine events	
Dropped object	Sediments, benthos, fishing

5.6 Impacts of Decommissioning of the Drill Cuttings Pile

Options that may be considered include: leave in situ; excavate the cuttings and recover to the surface for disposal to landfill, or move cuttings to another area of seabed. Table 6.6 summarises the potential impacts arising from these activities.

Table 5.6: Potential impacts associated with the cuttings pile management options.

Activity	Impacted receptor
Disturb drill cuttings	Sediments, water column, benthos, fish, stakeholder
Leaching of contaminants	Sediments, water column, benthos, fish, stakeholder, commercial fishing
Long-term pile and contaminant persistence	Sediments, water column, benthos, fish, stakeholder, commercial fishing
Re-suspension to disperse over adjacent seabed	Sediments, water column, benthos, fish, stakeholder, commercial fishing
Onshore disposal	Use of resources, groundwater, atmosphere, use of disposal facilities, communities
Covering pile	Sediments, water column, benthos, fish, stakeholder

The key issues identified in Table 6.1 to Table 6.6 have been grouped across the high level phases of the platform decommissioning project into specific potential causes of impact, i.e. underwater noise, such that all activities with the potential to give rise to this impact will be assessed together. The activities identified as having the potential to give rise to a significant environmental impact have been grouped into the following potential impacts:

1. Physical presence of vessels causing potential interference with other users of the sea.
2. Effects of seabed disturbance during decommissioning operations - vessel anchoring
3. Effects of drill cuttings disturbance.
4. Effects of energy use and atmospheric emissions.
5. Effects of underwater noise generated during decommissioning activities.
6. Effects associated with near-shore and onshore dismantling of structures – noise and dust.
7. Cleaning of marine growth from Ninian Northern jacket.
8. Landfill disposal and associated impacts.
9. Socio-economic impact to fishermen from the derogated footings.
10. Non-routine events – spillage of hydrocarbons and other fluids.
11. Effects associated with Ninian Northern cuttings pile management.

6.0 OVERVIEW OF POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE NINIAN NORTHERN DECOMMISSIONING PROJECT

This section of the scoping report provides a:

- Description of the decommissioning activity or operation that might give rise to potentially significant impacts;
- Description of how the impacts would be assessed in the EIA, with an assessment of the adequacy of existing knowledge and whether more information is required;
- Description of the mitigation that is in place, or will be incorporated in the design or operation of the project; and
- Description of the work being undertaken by the project to gather more information to understand the issue better

6.1 Physical Presence of Vessels Causing Potential Interference with Other Users of the Sea

Description of activity

Decommissioning of the platform will require a relatively intense programme of vessel activity in terms of both the number and size of vessels. Depending on the decommissioning option chosen, topsides and jacket components may be transported from the field back to the onshore disposal facilities in one or two trips by a large heavy lift vessel (HLV), or by more numerous trips by supply vessels and barges. This activity may result in local, temporary inconvenience or in the disruption of other users of the sea, such as fishermen and marine traffic.

Assessing the effect in the EIA

The platform is located in an area of moderate to low shipping activity. CNRI will assess the potential impacts to other users of the sea from increased vessel activity during decommissioning operations by predicting the potential vessel use and likely schedules, and comparing this information with current vessel traffic data for the Ninian Northern area and proposed onshore transportation routes. This will include commercial vessel traffic, fishing vessel and Ministry of Defence (MoD) activity.

Mitigation proposed

CNRI will apply for Consent to Locate under the Energy Act 2008. The presence and activity of vessels including anchoring (within the 500 m radius safety zone around the platform will also require notification). The relevant stakeholders will be informed through the Consent to Locate process. In addition, CNRI will establish communication with other sea users during the decommissioning process.

A mandatory 500 m safety zone will remain in place throughout the project with the majority of vessels associated with the project located within this zone, therefore effects on other sea users are likely to be minimal.

6.2 Effects of Seabed Disturbance during Decommissioning Operations

Description of activity

Disturbance to the seabed, (including the impacts of anchoring of the HLV, pipeline trenching, rock placement and potentially dropped objects), may result from activities associated with several of the platform decommissioning options under consideration. Certain types of vessels utilised during the decommissioning operations, such as the HLV, will be held in position by a series of anchors deployed to the seabed. The deployment and retrieval of anchors may result in direct impact on marine organisms living on and in the sediments, through physical disturbance to the sediments. Depending on the nature of the seabed, anchors and anchor chains lying on, and sweeping over, the sediments can create gouges and scour marks.

Assessing the effect in the EIA

In general, the seabed conditions and benthic communities of the northern North Sea are well understood. The characteristics and status of the benthic communities in and around the platform were assessed in the Fugro ERT (2012) survey (Section 3.5). The pre-decommissioning data will be used to inform the assessment of the potential significance of disturbance to the benthic communities. The extent of seabed that will potentially be disturbed will be estimated once the final decommissioning options for the platform have been agreed. An initial assessment, however, indicates that the area of disturbance will be minimal.

Mitigation proposed

Operations required to decommission the infrastructure will be carefully designed and executed so as to minimise the area of seabed disturbed. Recolonisation of the clean sediment by fauna typical of the surrounding area should begin as soon as decommissioning has been completed. If deposition of materials is required during decommissioning, CNRI will apply for a license under the MCAA.

CNRI will use recent bathymetric survey data to plan the locations for anchor deployment and minimise the number of anchor deployments. Where possible, CNRI will encourage their Contractors to utilise vessels that operate on Dynamic Positioning (DP) in preference to vessels that require anchor deployment.

Further studies commissioned

Further surveys may be commissioned depending on the future production life of the field.

6.3 Effects of Drill Cuttings Disturbance

Description of activity

The bulk of the drill cuttings pile is located within the footings of the jacket; it is estimated to have a volume of 33,144 m3 and cover an area of 23,620 m2 (Fugro ERT, 2012). The “effect footprint” of the cuttings pile, defined as the region within which hydrocarbon concentration is greater than 50 mg/kg, is estimated to be less than 0.09 km2 (Genesis 2013).

Removal of the jacket footings which are currently covered with cuttings deposited throughout the platform's drilling history would result in the re-suspension in the water column and subsequent re-settlement on the seabed of cuttings material and contaminated sediment.

The anchoring of vessels next to the platform during decommissioning operations may also result in disturbance of contaminated sediments surrounding the cuttings pile. It is possible that re-suspended sediments would likely contain a variety of contaminants including hydrocarbons and heavy metals. The proposed operations therefore have the potential to impact the local water quality, contaminate seabed sediments, and impact benthic fauna, fin-fish and shell-fish in the vicinity of the decommissioning activities.

Assessing the effect in the EIA

CNRI will use the results of the pre-decommissioning environmental survey data to establish the nature, magnitude and extent of contamination of the historic cuttings pile and surrounding sediments. This data will be used in conjunction with descriptions of feasible jacket footings removal methods, pipeline removal methods and proposed anchor locations to quantify and predict the potential environmental impacts that may arise from disturbing the cuttings pile during these decommissioning operations. CNRI will conduct cuttings pile dispersion modelling to predict the likely extent and levels of contamination levels arising from the cuttings disturbance.

Mitigation proposed

CNRI will conduct a comparative assessment to evaluate the proposed jacket decommissioning options to ensure that over a range of criteria the best available technique (BAT) for decommissioning the jacket is selected. All methods considered for the removal of the jacket footings and anchoring will be engineered to minimise disturbance to the surrounding cuttings pile.

Further studies commissioned

CNRI recognise that various activities conducted during the decommissioning operations may result in the disturbance and re-suspension of contaminated cuttings and sediments from the cuttings pile. It is believed that the survey data and cuttings pile modelling will assist in defining the potential impacts to the marine environment.

6.4 Effects of Energy Use and Atmospheric Emissions

Description of activity

Activities during all phases of the decommissioning project will use energy and give rise to atmospheric emissions, specifically from the following operations:

- Vessel use during dismantling and transporting the topsides modules back to shore.
- Vessel use during cutting, lifting and transporting the jacket to shore.
- Near-shore and onshore dismantling and processing of decommissioned structures.
- Vessel use during future monitoring surveys of the decommissioned field.

The main exhaust gas emitted by diesel-powered engines is CO2, together with small quantities of NOx, CO, SOx and trace quantities of VOCs, N2O and CH4. Emissions of these gases have the potential to impact local air quality and may result in transboundary

effects or contribute to regional/ global effects such as acid rain, low level ozone formation and global climate change.

Assessing the effect in the EIA

CNRI have commissioned independent engineering studies to determine the feasibility and practical methods for undertaking the various different decommissioning options described in Section 2. These studies will detail the number and types of vessel required to undertake each of the decommissioning options, which will be used to estimate the potential scale of energy use and gaseous emissions associated with each decommissioning option. The energy use and gaseous emissions of options will be compared, and presented in context with reference to relevant national and regional data.

Mitigation proposed

All engines, generators and combustion plants on the vessels would be well maintained and correctly operated to ensure that they are working as efficiently as possible to minimise energy use and gaseous emissions. CNRI will encourage their Contractors to use low sulphur fuel wherever possible.

Further studies commissioned

CNRI have conducted technical engineering studies to determine the type and number of vessels that will be required to support the decommissioning of the Ninian Field. This information was used in an energy and emissions assessment of the various decommissioning options (BMT Cordah, 2013a). The assessment, based on the Institute of Petroleum (IoP) guidelines, provides a framework for estimating the energy use and gaseous emissions from decommissioning different components. The method follows the fate of decommissioned material from well abandonment to onshore end-point, such as recycling or disposal in landfill. Conversion factors are used to estimate the energy used and associated gaseous emissions generated during each decommissioning activity, such as use of vessels offshore, transportation by road, dismantling of recovered materials and recycling. The estimated energy and emissions are then summed to provide a total figure. Within the bounds of uncertainty inherent in all energy and emission assessments, these figures will be used as an indicator of environmental performance and assist in selecting the most energy-efficient decommissioning methods.

6.5 Effects of Underwater Noise Generated During Decommissioning Activities

Description of activity

Underwater noise and vibrations generated during the platform decommissioning activities will arise from a number of different sources, including vessels, helicopters, abrasive and diamond wire cutting techniques used during jacket removal operations prior to recovery.

Noise from various sources may combine to produce a pattern of noise in the marine environment that is characterised by variations in frequency and noise level. Underwater noise levels are attenuated by distance (through dispersion in three directions) and by absorption by water, and therefore have the greatest potential impact within the vicinity of the activity.

Sound is important to marine mammals for navigation, communication and prey detection; and as a result marine mammals are the most sensitive marine receptor to underwater noise from offshore operations (Southall et al., 2007; Richardson et al., 1995). Animals moving into or through the area surrounding the platform may experience a growing level of noise as they approach the decommissioning activities. Typically, the impact of noise on marine mammals is classified into the following categories depending on the magnitude of the noise disturbance:

- Detection level (zone of audibility);
- Strong avoidance (zone of responsiveness);
- Masking level (noise level could mask species vocalisation);
- Temporary Threshold Shift (TTS – temporary change in hearing ability);
- Permanent Threshold Shift (PTS – permanent change in hearing ability); and
- Physical damage to organism's auditory system.

Underwater noise may therefore result in the exclusion of marine mammals from important habitats or the impedance of reproductive and feeding patterns (Richardson et al., 1995). There is also the potential for underwater noise to disturb prey species.

Assessing the effect in the EIA

CNRI will assess the potential zones of acoustic effect from the decommissioning operations and in particular for vessel operations.

For each activity associated with the proposed platform decommissioning, the likely sources of noise (e.g. vessels) will be identified and the typical level of noise generated by each source identified, where available, from published studies and reports.

The sources of noise associated with each activity will be summed to give a cumulative noise level for each activity and the propagation of noise away from the source for each activity will then be modelled using the underwater noise transmission equation given by Schulkin and Mercer (1985).

The likely impact of noise generated by the proposed decommissioning on marine mammals in and around the platform location will be assessed by comparing the received noise levels with the criteria for injury and disturbance to marine mammals given in the study by Southall et al. (2007).

A variety of marine mammals have been recorded within the vicinity of the platform including minke whale, long-finned pilot whale, killer whale, white-beaked dolphin, white-sided dolphin and harbour porpoise, with most sightings occurring in the summer months (Reid et al., 2003; UKDMAP, 1998). The density of marine mammals in the vicinity of the platform ranges from low to very high.

Mitigation proposed

If deemed necessary following consultation with JNCC, a trained Marine Mammal Observer (MMO) will be present on the vessels which have been identified as having the potential to generate noise levels that may pose a disturbance to marine mammals during operations. The MMO is trained to spot marine mammals within a zone of 500 m radius of the vessels (in daylight hours with good visibility, MMOs can see mammals up

to distances of 500 m). Operations will only commence if mammals are absent from the area of operations.

Further studies commissioned

CNRI have conducted technical studies to determine the methods for decommissioning the platform, which included an assessment of vessel requirements and cutting methods. These studies have been used to inform a noise modelling study (BMT Cordah, 2013b) to predict the levels and extent of noise impacts on marine mammals.

The underwater noise likely to be generated during the proposed Ninian Northern Platform decommissioning operations was analysed for the likely sources of sound including various types of vessels, helicopters, underwater tools (e.g. cutting and drilling tools), and survey equipment (e.g. side-scan sonar). The potential worst case sound levels generated over a range of frequencies and subsequently propagated into the surrounding environment were modelled and compared for each decommissioning method, together with an assessment of the likely impact on marine mammals in the Ninian Northern Platform area. The findings from the noise modelling will be included in the assessment of the potential environmental impacts for the various options.

6.6 Effects Associated with Near-shore and Onshore Dismantling of Structures

Description of activity

Near-shore and onshore operations to dismantle the topsides, jacket and associated structures may expose onshore personnel and local communities to excessive dust and fumes. Noise generated during these operations may also impact local communities in the vicinity of the onshore decommissioning yard.

Assessing the effect in the EIA

The dismantling location will be a port or other similar site at which commercial or industrial activity is already being undertaken. It is therefore likely that the effects of this aspect of the decommissioning project would be similar to those already experienced from time to time at the selected site. The characteristics of the onshore site will be obtained when a site has been selected. All the potential impacts will be fully evaluated in the EIA.

Mitigation proposed

The site selected for dismantling will be suitably equipped to handle the different components, and the vessels required to receive them from offshore. CNRI will make site visits to assess environmental issues associated with using a particular dismantling site. Activities at the site would be controlled by the existing regulations, practices, and emergency procedures, and would be subject to inspection by regulatory agencies.

Further studies commissioned

CNRI will identify suitable sites and make a selection based on several factors including capacity to deal with the components, accessibility, distance from the platform, management and technical capability, socio-economic benefits and commercial proposal.

6.7 Description of activity

One of the options for removal of encrusted marine growth on the jacket is to clean from the structure once it has been transported back to the onshore dismantling yard. This may cause a short-term deterioration in air quality as a result of the subsequent decay of organic material in the atmosphere.

Assessing the effect in the EIA

The marine growth on the jacket legs has been regularly monitored during recent years and therefore the types and quantities of marine growth expected to be recovered with the jacket legs can be predicted. CNRI will undertake a study of the likely impact of bringing this marine growth back to shore to the dismantling yard and assess any alternative disposal routes.

Mitigation proposed

If there are significant quantities of marine growth recovered on the jacket CNRI will discuss management options for the disposal of the marine growth with the selected onshore treatment and disposal yard. If necessary, CNRI would consider cleaning of the jacket sections offshore before they are brought on shore.

Further studies commissioned

CNRI have conducted recent marine growth surveys (BMT Cordah, 2013c) for the Ninian Northern Platform which will provide up-to-date data for the assessment. No further studies to cover this issue are proposed at present.

6.8 Landfill Disposal and Associated Impacts

Description of activity

Landfill facilities will be used for the long-term disposal onshore of solid decommissioning wastes that cannot justifiably be reused or recycled. Landfill space in the UK is limited by its very nature and therefore every addition of waste to a landfill site reduces its future capacity.

Assessing the effect in the EIA

CNRI will assess the potential for reuse and recycling of all of the materials recovered from the platform and make predictions regarding the potential reuse and recycling levels achievable.

Mitigation proposed

CNRI will manage waste arising from the platform decommissioning activities in compliance with the applicable regulatory framework and other obligations as required by CNRIs' SHE policy. A Waste Disposal Register will be used to track the type and volume of Controlled Waste resulting from decommissioning and how these wastes are being re-used, recycled or sent for treatment or disposal during the decommissioning process.

Through engaging with contractors, CNRI will aim to identify effective technical solutions that support waste minimisation, by, wherever possible, reusing or recycling material.

CNRI will conduct an initial review of the materials within the vicinity of the platform with the aim of minimising the quantity of Controlled Waste that requires treatment or

disposal. This review will involve close liaison with the oil and gas community so that equipment and large components (for example) can be re-used where it is possible to do so. The results of the review will be prepared in the form of a Forecast Inventory which identifies the predicted type and quantities of Controlled Waste that will be generated and how this is linked to key stages in the decommissioning process.

Further studies commissioned

CNRI have commissioned detailed materials and hazardous materials inventories of the platform and subsea infrastructure. These studies will be used to inform the development of a decommissioning waste management plan for the project.

6.9 Socio-economic Impact to Fishermen

Description of activity

If left in situ, the jacket footings may present a potential obstruction to demersal fishermen in the area and as a result fishermen may modify their fishing activities and fishing patterns to ensure that the area of the footings is avoided. This could result in negative effects on the commercial success of their fishing operations.

During the decommissioning project, there will also be a potential for navigational conflicts arising between fishing vessels and decommissioning vessels transiting to and from the site. This could include vessels with towed gear being required to alter their towing direction, or fouling of fixed gear markers. This interference by decommissioning vessels has the potential to impact more fishing vessels than just those operating in the immediate vicinity of the platform and its associated pipelines, depending upon the location of decommissioning port(s).

Assessing the effect in the EIA

CNRI commissioned a socio-economic assessment of the potential impacts of a loss of fishing grounds to the fishing industry if the footings were left in place. This assessment was based on the following data:

- Types and proportion of different fishing methods used in the vicinity of the platform in terms of catch per unit effort and catch by weight.
- Total monetary value of the demersal catch from the Ninian Northern area.
- Impact of the loss of fishing grounds in relation to the imposed EU fish quotas.

UK Commercial fishing effort (days spent fishing) in the area around the Ninian Field (ICES Rectangles 51F1 and 52F1) is very low in comparison with other areas of the North Sea (Scottish Government, 2016), with the catch by weight being dominated by pelagic species in 2015. Predominant gear types used over the past three years are trawls being favoured most by fishermen (see Section 3.9). All other non-UK vessels record considerably lower effort (SFF Services, 2012).

Mitigation proposed

On completion of the decommissioning operations for the platform, a post-decommissioning debris survey will be conducted to ensure that all debris that may present a hazard to fishermen has been removed from the field. This will minimise the

potential snagging risks to fishermen once the 500 m safety zone has been removed and will minimise the area around any derogated footings that fishermen will need to avoid.

6.10 Non-routine events – Hydrocarbon or other Fluid Spill

Description of activity

All offshore activities carry a potential risk, however small, of a hydrocarbon or chemical spill to sea. The impact that may be caused by a spill is dependent on the location of the spill, its size and the properties of the hydrocarbon, the prevailing weather and metocean conditions at the time of the spill, the environmental sensitivities that could be impacted by the spill, and the success of the contingency plans and response.

Potential sources of environmental risk that could occur from accidental spills and non-routine events during the platform decommissioning programme include:

- Sinking of a vessel due to collision;
- Worst case spill from a vessel;
- Loss of fluids from subsea or topsides; and
- Accidental fuel spillages during the routine re-fuelling.

Serious accidental events, such as vessel collisions, could cause a loss of vessel inventory, but accidents leading to total loss of vessel inventory are extremely rare. In the unlikely event of an accidental spill of diesel fuel from a vessel, a diesel slick would form on the sea surface. The slick would be localised and would disperse and degrade rapidly as a result of wave action, currents, evaporation, and microbial and photolytic action.

Much of the vessel activity associated with the platform decommissioning programme will involve bringing materials and structures back to shore, and if a vessel collision occurred close to land (the onshore reception yard is currently not known) the spill could impact sensitive coastal sites.

Assessing the effect in the EIA

Up to date data on shipping intensity will be obtained and used to assess the potential collision risks along the vessel routes.

CNRI will, where necessary, undertake oil spill modelling assessments for the potential worst case spill scenarios for the platform decommissioning operations to fully assess the potential impacts to local receptors, both inshore and offshore.

Mitigation proposed

Preparation of Oil Pollution Emergency Plans (OPEP) and response is standard practice for all offshore projects. The Ninian Northern Platform decommissioning project will follow this process, which begins with the preparation of interface procedures that specify the responsibilities, lines of communication and actions to be taken by the various parties involved in the project to minimise the risk of emergencies and provide an adequate response should an emergency occur.

Consultation will be conducted with the statutory authorities, conservation agencies, the coastguard, port authorities and fishermen. A systematic risk identification and assessment will then be followed by the development of emergency procedures, which include the project OPEPs.

All vessels will be equipped to deal with minor on-board spills and specialist oil spill contractors will be available if a response to a larger spill is required. All of the vessels will be equipped with satellite positioning equipment, navigational aids and communication technology. Vessels will follow pre-determined routing and towing plans, and pilots will be used where required.

Further studies commissioned

CNRI will, where necessary, undertake an oil spill modelling study to predict the extent and potential impact of a worst case loss of inventory following a vessel collision.

6.11 Impacts of Drill Cuttings Pile Management Options

Description of activity

In 2012, CNRI commissioned Genesis Oil & Gas Consultants to conduct modelling studies of the cuttings piles to determine: (i) the rate of oil loss and (ii) the persistence over the area of seabed contaminated from the Ninian Northern drill cuttings pile. As both of these values were estimated to be below the OSPAR thresholds (10 te/yr and 500 km2yrs, respectively), it was concluded that no further action was required (Genesis, 2013).

Assessing the effect in the EIA

Management options for the drill cuttings pile will be revisited in the EIA, depending on the preferred option for the removal of the jacket.

Mitigation proposed

In line with the guidance given in OSPAR 2006/5, the best option for such a pile would be to leave the contents to biodegrade naturally. This would be the result if derogation was granted and the platform jacket was only partially removed. Full removal of the platform jacket would require displacement/removal of a large proportion of the drill cuttings pile.

To inform the comparative assessment of the jacket removal options, a full comparative assessment for management of the drill cuttings pile will be undertaken by CNRI. Any impacts associated with the management options, including short term and long term impacts and energy and emissions will be assessed for each option.

Further studies commissioned

No further studies on the cuttings pile are anticipated.

7.0 CNRI ENVIRONMENTAL MANAGEMENT

CNRI's Safety, Health and Environmental (SHE) Management System (SHEMS) provides the means by which CNRI:

- Complies with SHE legislation and industry standards;
- Manages SHE risks in the business, and
- Delivers continuous improvements in SHE performance.

The SHE Policy is a public commitment to conducting CNRI's activities in a manner that protects the health and safety of people and preserves the integrity of the environment within which they operate. The policy also includes CNRI's commitment to "proactively identify, evaluate, minimise and mitigate the environmental impacts of its business throughout all aspects of its operations".

In the North Sea, the environmental management systems (EMS) for CNRI's directly managed platforms, including Ninian Northern, are certified to ISO14001:2004. The EMS provides a structured approach to the management and minimisation of environmental impacts arising from their activities. Key elements of the EMS include:

- Identification of relevant environmental legislation.
- Identification of significant environmental impacts from offshore oil and gas exploration and development activities, and associated onshore support.
- Setting goals for the planned measurement of progress towards minimising impacts.
- Documenting the necessary actions to manage and minimise any impacts.
- Ensuring and demonstrating legislative compliance, where necessary.
- Establishing the mechanisms for monitoring progress and compliance, such as audits.
- Identifying competency levels and training required.

The scope of CNRI's EMS is offshore oil and gas exploration and development activities, and associated onshore support. Environmental management of the platform decommissioning activities are governed by CNRI's EMS procedures. CNRI has expanded the scope of their EMS and ISO14001 certification to encompass their decommissioning activities and developed decommissioning-specific procedures. The changes include a PLANC (permits, licenses, actions, notifications and consents) register, a decommissioning waste management strategy and a decommissioning waste management plan.

8.0 CONSULTATION PROGRAMME

In accordance with the requirements of the DECC Guidance Notes, and following best practice, CNRI will be conducting a comprehensive consultation programme. CNRI are committed to consulting early, widely and transparently as part of a rigorous process that spans the planning, execution and post-decommissioning phases, so that it can propose the most appropriate decommissioning options for the platform. The purpose of this programme is to:

• gather views and issue of all stakeholders about the proposed decommissioning project;

• obtain further more detailed information about potential impacts from individuals and organisations with specialist or local knowledge, and take account of these data in the full EIA; and

• further refine the plans for the decommissioning project.

8.1 CNRI Stakeholder Engagement Strategy

CNRI will actively work with stakeholders in developing the decommissioning programme by:

- Communicating the various issues and factors raised by the decommissioning studies so that they are understood and considered by the stakeholders; and
- Gaining stakeholders' feedback and views on decommissioning scenarios.

CNRI is developing a decommissioning website (http://www.cnri-northsea-decom.com) to support the public consultation process, keep interested parties informed of the project's progress, and to provide an enquiry and response interface between stakeholders and the decommissioning team. CNRI's views of the importance of stakeholder engagement are as follows.

- Stakeholder feedback will provide important input into CNRI's decision-making process.
- Stakeholder feedback will complement but not replace the statutory approvals process or CNRI's own approvals process.
- CNRI will make available to stakeholders all information and data that can reasonably be provided and will treat all stakeholders equally.
- Stakeholder dialogue will be managed through a single contact point to ensure consistency and accuracy of messages and responses.
- Communications will be targeted and the dialogue performed on a low-key but proactive basis reflecting a 'business as usual' philosophy compatible with CNRI's normal approach.
- The process will be supported by a comprehensive stakeholder database which will store relevant details of stakeholders, record dialogue interactions and support communications delivery.

8.2 Stakeholder Consultations

CNRI has conducted preliminary targeted consultations with DECC and selected consultees relating to the collection of background environmental data which will be used

to inform the EIA process. Records of these preliminary consultations are summarised below in Table 14.

Table 8.1: Summary of preliminary consultations.

Stakeholder	Comment	Influence on EIA
DECC/ OGA	CNRI have regular progress meetings with DECC/ OGA to update on Decommissioning Plan which covers the progress of the EIA	Concerns/ issues from these meetings will be addressed in the EIA.
DECC, Marine Scotland and JNCC	CNRI have conducted a pre-decommissioning environmental baseline survey around the Ninian Northern Platform. CNRI consulted with DECC, Marine Scotland and JNCC on the proposed scope of work for this survey. All parties confirmed that the survey scope of work met their requirements.	N/A
JNCC	CNRI discussed the presence of *Lophelia* on the legs of the Ninian Northern Platform and requested advice from JNCC with regards to the definition of 'significant' growth that would trigger the requirement for an Appropriate Assessment. JNCC formally responded in writing (8th December 2010): JNCC recommend an assessment of the extent and distribution of *Lophelia* on the legs of the installation to be reported in the ES, to present an interpretation of the significance of the occurrence. JNCC advise that as *Lophelia* would not have occurred without the presence of the platform, mortality as a result of decommissioning operations would not be considered as an issue of significant concern for the EIA.	Regular assessments of the marine growth on the Ninian Northern Platform have been conducted during 2002, 2004, 2006 and 2010. The extent of *Lophelia* growth was recorded during each of the surveys and results will be reported and assessed in the decommissioning EIA.

9.0 CONCLUSIONS

A scoping report is an important tool used by CNRI for identification of potential impacts and a preliminary evaluation of their significance. This scoping study assimilates the environmental and project information at an early stage of the decommissioning planning process.

The marine environment where the Ninian Northern platform is located is typical of the northern North Sea. While recognising that there are certain times of the year when populations of seabirds, fish spawning and commercial fisheries are vulnerable to decommissioning activities, the conclusion is that the area is not particularly sensitive to the activities planned for the decommissioning of the platform, irrespective of the scheduling of this development.

Of the Annex I habitats identified in the EU Habitats Directive only ‘submarine structures made by leaking gases’ and ‘reefs’ are present in the northern North Sea. No evidence of MDAC, reef-like structures, or any other defining features of habitats protected under the Annex I of the EU Habitats Directive were identified in the area of the platform during the seabed survey commissioned by CNRI (Fugro ERT 2012).

Harbour porpoise were the only Annex II species of the Habitats Directive recorded within and around the proposed decommissioning area. Harbour porpoise are present in most of the North Sea throughout the year, with numbers occurring in the waters surrounding the platform being very high in February and July; and in low to moderate numbers for the remaining months.

Following the identification of the interactions between the proposed decommissioning activities of the platform and the local environment and the assessment of potentially significant environmental impacts, the key environmental concerns identified as requiring consideration for impact assessment and further reporting were:

- Physical presence of vessels causing potential interference with other users of the sea;
- Effects of seabed disturbance during decommissioning operations - vessel anchoring;
- Effects of drill cuttings disturbance;
- Effects associated with cuttings pile management;
- Effects of energy use and atmospheric emissions;
- Effects of underwater noise generated during decommissioning activities;
- Effects associated with near-shore and onshore dismantling of structures – noise and dust;
- Cleaning of marine growth from jacket;
- Landfill disposal and associated impacts;
- Socio-economic impact and safety risk to fishermen from derogated footings; and
- Effects associated with cuttings pile management.

Mitigation to avoid and reduce the above environmental concerns will align with industry best practice. CNRI has an established EMS, which will ensure that all proposed mitigation measures are implemented.

Although their probability of occurrence is very low, the following emergency events could potentially result in significant impacts:

- Non-routine events – spillage of hydrocarbons and other fluids.
- Dropped objects.

The preventative measures proposed by CNRI would be sufficient to minimise the risk of these unplanned events to a level that is as low as reasonably practicable (i.e. in line with industry best practice) and to control and mitigate the effects in the event of their occurrence. Preventative measures for emergency events are focused on the development and implementation of suitable procedures for fuel and chemical handling and transfer (to prevent a diesel/product spill).

The overall risk to the environment, from both routine and the unplanned/ emergency events is therefore considered to be low. The integrity of statutory conservation sites designated or likely to be designated under the Habitats Directive is not considered to be at risk.

10.0 CONTACTING CNRI

If you have any views, concerns, comments or questions about the Ninian Northern Platform Decommissioning Project, you can contact CNRI by email: **nnp.decom@cnrl.com**.

11.0 REFERENCES

Aker, 2011. Ninian Northern Jacket BTA Removal Study. NNPDECOM-AKER-ST-REP-00016

Basford, D. J., Eleftherious, A. and Raffaelli, D., 1989. The epifauna of the northern North Sea (56ºN - 61ºN). Journal of Marine Biology Association, UK. 69, 387-407.

Basford, D., Eleftheriou, A. and Raffaelli D., 1990. The infauna and epifauna of the northern North Sea. Netherlands Journal of Research. 25 (1/2), 165-173.

BMT Cordah, 2013a. Energy and Emissions Report for the Decommissioning of the Ninian Northern Platform. NNP-DECOM-BMT-EN-REP-00003

BMT Cordah, 2013b. Ninian Northern Platform Decommissioning Underwater Noise Impact Assessment. NNP-DECOM-BMT-EN-REP-00002

BMT Cordah., 2013c. Ninian Northern Platform Marine Growth and *Lophelia pertusa* Assessment. Ninian NNP-DECOM-BMT-EN-REP-00004

CNR International., 2013. Ninian Northern Platform Project Description. Doc. Number Ninian Northern Platform DECOM-CNR-PM-REP-00001

Coull, K.A., Johnstone, R. and Rogers S.I., 1998. Fisheries Sensitivity Maps in British Waters. UKOOA Ltd.

DECC, 2014. 28th Round information – Shipping Density. https://www.gov.uk/oil-and-gas-licensing-rounds.

DTI, 2001. Strategic Environmental Assessment of the Mature Areas of the Offshore North Sea - SEA 2. Report to the Department of Trade and Industry. Consultation Document, September 2001.

Ellis, J.R., Milligan, S., Readdy, L., South, A., Taylor, N. and Brown, M., 2010. Mapping the spawning and nursery grounds of selected fish for spatial planning. Report to the Department of Environment, Food and Rural Affairs from Cefas. Defra Contract No. MB5301.

ERT, 2008. Technical Review of Data from Around CNR's North Sea Assets with Regards to OSPAR Recommendation 2006/5. CNR079224.

Genesis, 2013. Ninian Northern Drill Cuttings Pile Long-Term Cuttings Pile Characteristics. NNPDECOM-GEN-EN-REP-00001.

Fugro ERT, 2012. Ninian Pre-Decommissioning Environmental Baseline Survey. April/May 2011. Project Number: J36037.

ISS, 2011. Ninian Pre-Decommissioning Environmental Seabed Survey. NINIAN NORTHERN PLATFORMDECOM-ERT-EN-REP-00033

Joint Nature Conservation Committee (JNCC), 1999. Seabird vulnerability in UK waters: Block specific vulnerability. Joint Nature Conservation Committee, Aberdeen.

JNCC, 2016. Annex I Habitats and Annex II Species Occurring in the UK. Internet: http://jncc.defra.gov.uk/page-1523. Accessed August 2016.

Johns, D.G. and Reid P.C., 2001. An Overview of Plankton Ecology in the North Sea. Technical report produced for Strategic Environmental Assessment – SEA2. Produced by SAHFOS, August 2001. Technical Report TR_005.

Johnston, C. M., Turnbull, C. G., & Tasker, M. L., 2002. Natura 2000 in UK Offshore Waters. JNCC Report 325

Künitzer, A., Basford, D., Craemeersch, J. A., Dewarumez, J. M., Dörjes, J., Duineveld, G. C. A., Eleftheriou, A., Heip, C., Herman, P., Kingston, P., Niermann, U., Rachor, E., Rumohr, H., and de Wilde, P.A.J., 1992. The benthic infauna of the North Sea:

species distribution and assemblages. ICES Journal of Marine Science, 49, 127-143.

Meteorological Office, 1998. Seasonal Wind Roses in the vicinity of the Ninian Northern development area (58ºN to 59ºN;0ºE to 1ºE)

NMPI (National Marine Interactive Planning Tool), 2016. Internet: http://marinescotland.atkinsgeospatial.com/nmpi/. Accessed August 2016.

North Sea Task Force (NSTF), 1993. North Sea Subregion 2b Assessment Report. Quality Status of the North Sea 1993. North Sea Task Force SOAFD.

Reid, J.B., Evans, P.G.H. and Northridge, S.P., 2003. Atlas of cetacean distribution in north-west European waters. JNCC, Peterborough.

Richardson W J, Greene, C R, Malme C I and Thompson D H. Marine mammals and noise. Academic Press Inc, San Diego, 1995.

Schulkin, M., & Mercer, J. A., 1985. Colossus revisited: A review and extension of the Marsh-Schulkin shallow water transmission loss model (1962). (No. APL-UW 8508).

Scottish Government, 2016. Fishing Effort and Quantity and Value of Landings by ICES Rectangle. Internet: http://www.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries/RectangleData. Accessed August 2016.

SFF Services Ltd. and Brown and May Marine, 2012. Commercial Fisheries – Socioeconomic Impact Study for Canadian Natural Resources International for the Ninian North Decommissioning BMM-NNDCNRCF from 14/02/12

Southall, B.L., Bowles, A.E., Ellison, W.T., Finneran, J.J., Gentry, R.L., Greene Jr., C.R, Kastak, D., Ketten, D.R, Miller, J.M, Nachtigall, P.E, Richardson, W.J, Thomas, J.A and Tyack, P.L, 2007. Marine mammal noise exposure criteria: initial scientific recommendations. Aquatic Mammals 33(4); Special Issue

Special Committee on Seals (SCOS), 2009. Scientific advice on matters related to the management of seals. SCOS Report 2009.

UKDMAP, 1998. United Kingdom Digital Marine Atlas – An atlas of the seas around the British Isles. Software third edition compiled by British Oceanographic Data Centre, Birkenhead.

UKOOA, 1999. A framework for risk related decision support - industry guidelines: UK Offshore Operators Association.

Štrok, M., Smodis, B. and Petrinec, B., 2010. Natural radionuclides in sediments and rocks from Adriatic Sea. Journal of Radioanalytical and Nuclear Chemistry, 286:303-308.

UKDMAP, 1998. United Kingdom Digital Marine Atlas – An atlas of the seas around the British Isles. Software third edition compiled by British Oceanographic Data Centre, Birkenhead.

UK Oil and Gas Data, 2016. UK Oil and Gas infrastructure shapefiles. Internet: https://www.ukoilandgasdata.com/dp/pages/apptab/ITabManager.jsp. Accessed May 2016.

UKOOA, 2001. An Analysis of UK Offshore Oil and Gas Environmental Surveys 1975-95. Internet: http://www.oilandgasuk.co.uk/. Accessed August 2016.

Williams, J.M., Tasker, M.L., Carter, I.C. and Webb, A., 1994. A method of assessing seabird vulnerability to surface pollutants. IBIS 137: S147-S152.

Wolfson, A., Van Blaricom, G., Davis, N. and Lewbel, G.S. 1979. The Marine Life of an Offshore Oil Platform. Marine Ecology Progress Series, 1: 81-89.

WWF (World Wildlife Fund), 2001. Now or Never. The Cost of Canada's Cod Collapse and Disturbing Parallels with the UK. A WWF (World Wildlife Fund) report, Malcolm MacGarvin.

12.0 APPENDIX A – IMPACT ASSESSMENT TABLES

A.1: Impact Assessment for Use of Vessels - All Decommissioning Activities

Phase and aspect of the decommissioning project	Physical Environment					Biological Environment						Human Environment					Other			Key Issue
	Use of resources	Seabed sediments	Water column	Atmosphere	Use of disposal facilities	Benthos	Fish & shellfish	Sea mammals	Water column (plankton)	Sea birds	Coastal conservation sites	Commercial fishing	Shipping	Other users of the sea	Communities	Socio-economic	Stakeholder concerns	Cumulative impacts	Trans boundary issues	Overall Significance
Use of Vessels - All Decommissioning Activities																				
O Physical presence																				✓
O Anchoring on seabed																				✓
O Drill cuttings disturbance																				✓
O Vessel discharges e.g. sewage																				
O Vessel discharges e.g. Ballast water																				
O Energy use and atmospheric emissions																				✓
O Inshore / onshore noise																				
O Underwater noise																				✓
Emergency and non routine events																				
O Loss of fluids from subsea tool																				✓
O Vessel collision																				✓
O Worst case vessel spill																				✓
O Accidental fuel spills																				✓

A.2: Impact Assessment for the Disposal of Materials Near-shore / Onshore

Phase and aspect of the decommissioning project	Physical Environment					Biological Environment						Human Environment					Other			Key Issue
	Use of resources	Seabed sediments	Ground water	Atmosphere	Use of disposal facilities	Benthos	Fish & shellfish	Sea mammals	Water column (plankton)	Sea birds	Coastal conservation sites	Commercial fishing	Shipping	Other users of the sea	Communities	Socio-economic	Stakeholder concerns	Cumulative Impacts	Trans boundary issues	Overall Significance
Potential impacts associated with disposal of materials near-shore / onshore																				
o Dismantling structures inshore/near-shore – dust and noise generation																				✓
o Dismantling structures onshore – dust and noise generation																				✓
o Cleaning marine growth from jacket – odour from organic material decay																				✓
o Recycling / reprocessing																				
o Landfill disposal – reduced capacity, leachate and landfill gas																				✓

A.3: Impact Assessment for the Plugging and Abandonment of Wells

Phase and aspect of the decommissioning project	Physical Environment					Biological Environment						Human Environment					Other			Key Issue
	Use of resources	Seabed sediments	Ground water	Atmosphere	Use of disposal facilities	Benthos	Fish & shellfish	Sea mammals	Water column (plankton)	Sea birds	Coastal conservation sites	Commercial fishing	Shipping	Other users of the sea	Communities	Socio-economic	Stakeholder concerns	Cumulative Impacts	Trans boundary issues	Overall Significance
Potential impacts associated with the plugging and abandonment of wells																				
O Mechanical cutting of casing																				

A.4: Impact Assessment for Topsides Decommissioning Offshore

Phase and aspect of the decommissioning project	Physical Environment					Biological Environment						Human Environment					Other			Key Issue
	Use of resources	Seabed sediments	Water column	Atmosphere	Use of disposal facilities	Benthos	Fish & shellfish	Sea mammals	Water column (plankton)	Sea birds	Coastal conservation sites	Commercial fishing	Shipping	Other users of the sea	Communities	Socio-economic	Stakeholder concerns	Cumulative Impacts	Trans boundary issues	Overall Significance
Potential impacts associated with topsides decommissioning offshore																				
O Flushing and cleaning of topsides																				
O Loss of minor items																				
O Preparation for removal (paint flakes PCB, hot cutting , welding etc)																				
Emergency and non routine events																				
O Module loss during lifting and transportation																				
O Loss of residual fluids from topsides																				

A.5: Impact Assessment for Jacket Decommissioning

Phase and aspect of the decommissioning project	Physical Environment					Biological Environment						Human Environment					Other			Key Issue
	Use of resources	Seabed sediments	Water column	Atmosphere	Use of disposal facilities	Benthos	Fish & shellfish	Sea mammals	Water column (plankton)	Sea birds	Coastal conservation sites	Commercial fishing	Shipping	Other users of the sea	Communities	Socio-economic	Stakeholder concerns	Cumulative Impacts	Trans boundary issues	Overall Significance
Potential impacts associated with jacket decommissioning																				
O Underwater noise																				✓
O Drill cuttings disturbance																				✓
O Abrasive cutting																				
Potential impacts of leaving the footings in place																				
O Reef effect																				
O Degradation of footings																				
O Manufacture new materials																				
O Snagging risk																				✓
O Loss of access																				✓
Emergency and non routine events																				
O Dropped objects																				

A.6: Impact Assessment for Cuttings Pile Management Options

Phase and aspect of the decommissioning project	Physical Environment					Biological Environment						Human Environment					Other			Key Issue
	Use of resources	Seabed sediments	Ground / Water column	Atmosphere	Use of disposal facilities	Benthos	Fish & shellfish	Sea mammals	Water column (plankton)	Sea birds	Coastal conservation sites	Commercial fishing	Shipping	Other users of the sea	Communities	Socio-economic	Stakeholder concerns	Cumulative Impacts	Trans boundary issues	Overall Significance
Potential impacts associated with the cuttings pile management options																				
o Disturb drill cuttings																				✓
o Leaching of contaminants																				✓
o Long-term pile and contaminant persistence																				✓
o Re-suspension to disperse over adjacent seabed																				✓
o Onshore disposal																				✓
o Covering pile																				