

**SUPPORTING INFORMATION FOR CUMULATIVE IMPACT ASSESSMENT**

**DECOMMISSIONING PROGRAMMES VDP1 & LDP1**

**COP-SNS-P-XX-X-HS-02-00001**

**Table A-1 Site Description North Norfolk Sandbanks and Saturn Reef SCI**

<b>Aspect</b>	<b>Details</b>
Site name	North Norfolk Sandbanks and Saturn Reef
Designation	SCI (Site of Community Importance) Special Areas of Conservation (SACs) are classified under the Habitats Directive and provide rare and vulnerable animals, plants and habitats with increased protection and management.
Geographical description	The sandbanks extend from about 40 km off the north-east coast of Norfolk out to approximately 100 km. The banks included are: Leman, Ower, Inner Well, Broken, Swarte, and four banks collectively referred to as the Indefatigables.  In 2003, the Saturn Reef covered an area approximately 750 m by 500 m just to the south of Swarte Bank, varying in density over this area (BMT Cordah, 2003).
Location and site area	53.37472222, 2.120833333 (Centre point) 3,603 km <sup>2</sup>
Qualifying interest (under EU Habitats Directive)	Sandbanks which are slightly covered by sea water all the time – the North Norfolk Sandbanks are the most extensive example of the offshore linear ridge sandbank type in UK waters.  Reef – the Saturn <i>Sabellaria spinulosa</i> biogenic reef consists of thousands of sand tubes created by polychaete worms. The structure qualifies as Annex I reef.
Figure showing extent of site	Figure A-1
Conservation Objectives	The <b>Conservation Objectives</b> for the North Norfolk Sandbanks and Saturn Reef SCI sandbanks and reefs, are:  <i>Subject to natural change, restore the ‘sandbanks which are slightly covered by seawater all the time’ and ‘reefs’ to favourable condition, such that:</i> <ul style="list-style-type: none"> <li>• <i>The natural environment quality, natural environmental processes and extent are maintained; and</i></li> <li>• <i>The physical structure, diversity, community structure and typical species, representative of ‘sandbanks which are slightly covered by seawater all the time’ and ‘reefs’ in the Southern North Sea are restored.</i></li> </ul>

**Table A-2 Site Description Southern North Sea cSAC**

Aspect	Details
Site name	Southern North Sea MPA
Designation	Candidate Special Area Conservation (cSAC)
Geographical description	<p>Located to the east of England, this site stretches from the central North Sea (north of Dogger Bank) to the Straits of Dover in the south. The majority of this site lies offshore, though it does extend into coastal areas of Norfolk and Suffolk crossing the 12 nautical mile boundary. A mix of habitats, such as sandbanks and gravel beds, are included in the site. The site overlaps with Dogger Bank cSAC/SCI, Haisborough, Hammond and Winterton cSAC/SCI, and North Norfolk Sandbanks and Saturn Reef cSAC/SCI.</p>
Area	36,951 km <sup>2</sup> .
Qualifying interest (under EU Habitats Directive)	Annex II Species - Harbour porpoise ( <i>Phocoena phocoena</i> )
Figure showing extent of site	Figure A-2
Conservation Objectives	<p><b>The conservation objectives</b> for the Southern North Sea cSAC are:</p> <p><i>To ensure that the integrity of the site is maintained and that it makes an appropriate contribution to maintaining Favorable Conservation Status (FCS) for harbour porpoise in UK waters.</i></p> <p><i>In the context of natural change, this will be achieved by ensuring that:</i></p> <ul style="list-style-type: none"> <li>• <i>Harbour porpoise is a viable component of the site;</i></li> <li>• <i>There is no significant disturbance of the species; and</i></li> <li>• <i>The condition of supporting habitats and processes, and the availability of prey is maintained.</i></li> </ul>

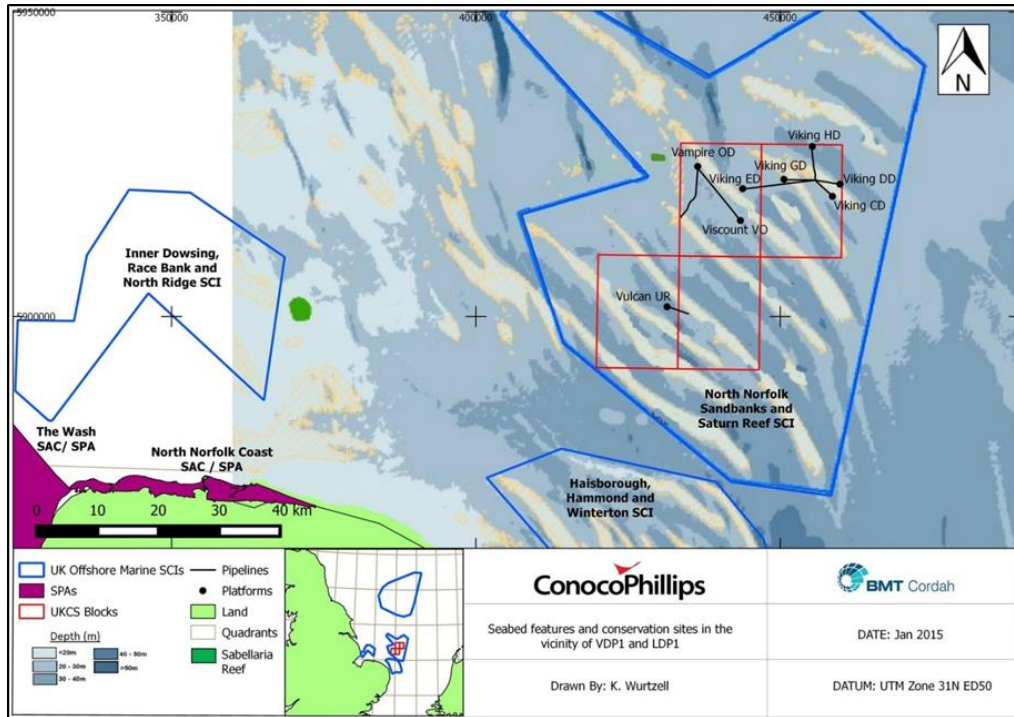


Figure A-1 Conservation areas associated with the VDP1 and LDP1 decommissioning programmes

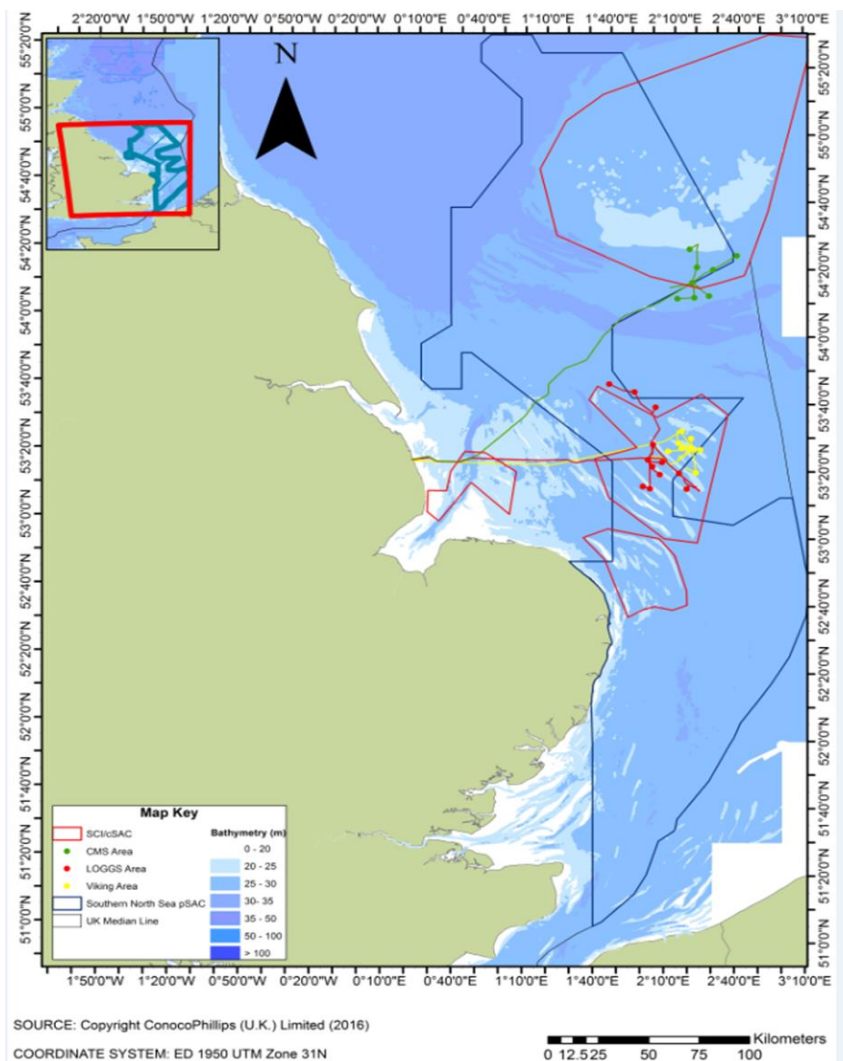


Figure A-2 Candidate Southern North Sea Site Special Area of Conservation for Harbour Porpoise and ConocoPhillips SNS Infrastructure

**Table A-3 Screening Assessment**

Screening Assessment Criteria	VDP1 & LDP1 Decommissioning Activities
<p>Brief description of project</p>	<p>ConocoPhillips have embarked on a programme of decommissioning infrastructure located within the Southern North Sea (SNS).</p> <p>The offshore decommissioning tasks shall involve as a minimum:</p> <ul style="list-style-type: none"> <li>• plug and abandonment of redundant wells;</li> <li>• removal of hydrocarbon product and chemicals from the pipelines and topsides;</li> <li>• flooding of pipelines with seawater;</li> <li>• subsea pipeline disconnects;</li> <li>• preparations for removal;</li> <li>• platform removal and shipment back to an onshore facility for dismantlement and disposal;</li> <li>• post decommissioning monitoring and surveys.</li> </ul> <p>The Viking decommissioning programme VDP1 and LOGGS decommissioning programme LDP1 infrastructure is to be decommissioned as part of a ten-year SNS decommissioning project within and around the SCI.</p> <p>VDP1 infrastructure comprises:</p> <ul style="list-style-type: none"> <li>• Five satellite platforms;</li> <li>• Ten infield subsea pipelines.</li> </ul> <p>LDP1 infrastructure comprises:</p> <ul style="list-style-type: none"> <li>• Three satellite platform installations;</li> <li>• Six infield subsea pipelines;</li> <li>• One subsea pipeline tee-structure.</li> </ul>
<p>Elements of the project likely to give rise to impacts on Natura 2000 site</p>	<p>Seabed disturbance:</p> <ul style="list-style-type: none"> <li>• locating of jack-up vessels (drill rig and accommodation work vessel (AWV));</li> <li>• seabed stabilisation for the safe locating of jack-up vessels;</li> <li>• well plug and abandonment (P&amp;A);</li> <li>• seabed excavation to access pipelines and jacket piles;</li> <li>• pipeline disconnects;</li> <li>• removal of infrastructure from the seabed: <ul style="list-style-type: none"> <li>○ conductors</li> <li>○ pipeline cut ends (minimum 4m section);</li> <li>○ platform jacket legs piles (-3m below seabed);</li> <li>○ pipeline tee-structure;</li> </ul> </li> <li>• seabed deposits over cut pipeline ends (maximum 25 Te per end);</li> <li>• anchoring of heavy lift vessel (HLV);</li> <li>• post decommissioning surveys (overtrawalability and grab sampling).</li> </ul> <p>Discharges to Sea:</p> <ul style="list-style-type: none"> <li>• pipeline contents with residual hydrocarbons; <ul style="list-style-type: none"> <li>○ production pipelines flushed to &lt;30mg/l oil in pipeline flush fluids.</li> </ul> </li> <li>• Release of pipeline degradation products.</li> </ul>

<p>Description of direct, indirect or secondary impacts of the project on the Natura 2000 site by virtue of:</p> <ul style="list-style-type: none"> <li>• size and scale;</li> </ul>	<p>VDP1 and LDP1 decommissioning activities comprise:</p> <ul style="list-style-type: none"> <li>• Locating of the AWV at 8 platform locations;</li> <li>• 15 subsea pipelines flushed and disconnected;</li> <li>• 8 pipeline seabed excavations;</li> <li>• 1 pipeline tee structure removed;</li> <li>• 8 pipeline end deposits made;</li> <li>• 8 surface installations removed (-3m below the seabed);</li> <li>• 54 piles cut (assumed external cutting of all piles);</li> <li>• Locating of the HLV at 8 platform locations;</li> <li>• post decommissioning surveys (overtrawalability and grab sampling).</li> <li>• Locating of the drill rig at 8 plus 1* platform locations - Well abandonment activity is not included within the associated decommissioning programmes</li> </ul> <p>* two rig moves occurred at the Vulcan UR installation to access all platform wells</p> <p>29 Wells to be plugged and abandoned and 31 conductors to pull. Well abandonment activity is not included within the associated decommissioning programmes, however the associated impact is included within the cumulative impact assessment.</p>
<ul style="list-style-type: none"> <li>• land-take;</li> </ul>	<p>None.</p>
<ul style="list-style-type: none"> <li>• distance from the Natura 2000 site or key features of the site;</li> </ul>	<p>The VDP1 and LDP1 activities are located within the North Norfolk Sandbanks and Saturn Reef SCI boundary.</p> <p>Site surveys undertaken in 2013 indicate no presence of biogenic reefs or other sensitive ecological features in the vicinity of the VDP1 and LDP1 infrastructure.</p> <p>The Viking DD and Viking CD installations border the Southern North Sea cSAC. For the purposes of the assessment, it is assumed that all VDP1 and LDP1 activities are located within the cSAC.</p>
<ul style="list-style-type: none"> <li>• resource requirements (water abstraction etc.);</li> </ul>	<p>None.</p>
<ul style="list-style-type: none"> <li>• emissions (disposal to land, water or air);</li> </ul>	<p>Instantaneous discharge of chemicals during well plug and abandonment. Eco-toxicological risk assessments determined no risk to the receiving environment.</p> <p>Instantaneous discharge to sea of chemicals and pipeline contents with residual hydrocarbons (flushed to &lt;30mg/l oil in flush fluids).</p> <p>Long-term release of residual contaminants in subsea pipelines, through pipeline degradation over time.</p> <p>Routine emissions to air from power generation (platform and vessels).</p>
<ul style="list-style-type: none"> <li>• excavation requirements;</li> </ul>	<p>29 wells / 31 conductors to be pulled from the seabed.</p> <p>6 pipeline seabed excavations to access the pipelines for the undertaking of subsea pipeline disconnect.</p> <p>54 piles to be cut. It is assumed external cutting will be undertaken on all platform piles. The base case however is to execute internal cutting where access for the placement of the cutting tool can be gained.</p>

<ul style="list-style-type: none"> <li>• transportation requirements;</li> </ul>	<p>All infrastructure removed from the SCI and cSAC during the decommissioning operations is to be transported to shore via HLV, dive support vessel (DSV) or platform supply vessel (PSV) for re-use, recycling or disposal. The transportation of infrastructure is not deemed to pose any impact to the SCI with minimal short term transient vessel noise within the cSAC.</p>
<ul style="list-style-type: none"> <li>• duration of construction, operation, decommissioning, etc;</li> </ul>	<p>The VDP1 and LDP1 infrastructure is to be decommissioned as part of a ten-year SNS decommissioning project.</p> <p>VDP1 and LDP1 operations commenced in 2014 with the well P&amp;A programme. The completion of the VDP1 and LDP1 activities is subject to schedule constraints and Regulatory approvals. Excluding the post decommissioning monitoring and surveys (scope and frequency to be agreed between BEIS and Company) SNS decommissioning activities are scheduled to be completed by the end of 2024.</p>
<p>Describe any likely changes to the site arising as a result of:</p> <ul style="list-style-type: none"> <li>• reduction of habitat area;</li> <li>• disturbance to key species, habitat or species fragmentation and reduction in species density.</li> </ul>	<p>Long term or permanent reduction of habitat area in the North Norfolk Sandbanks SCI as a result of the VDP1 and LDP1 activities associated with the seabed deposits and footprint of infrastructure to be decommissioned in situ. The proposed activities are estimated to impact an area of 0.055 km<sup>2</sup>. It is noted that all the infrastructure anticipated to be decommissioned in situ was installed prior to the site being designated as a SCI.</p> <p>The placement of rock deposits on the seabed for vessel stabilisation and pipeline burial will result in a modification of the substrate and habitat type. Survey evidence to date indicates that overtime the rock deposits become buried within the soft sand sediments.</p> <p>The area of impact is localised and represents a small area of the protected site which is not anticipated to impact the overall integrity of the SCI, or result in the overall fragmentation of species or habitats.</p> <p>All activities which interact with the seabed (excluding the seabed deposits) give rise to temporary, short duration, physical disturbance which is not anticipated to impact the overall integrity of the SCI, or result in the overall fragmentation of species or habitats, nor is a detectable reduction in species density anticipated. The worst case temporary disturbance associated with the VDP1 and LDP1 activities is estimated to impact an area of 0.048 km<sup>2</sup>.*</p> <p>*Excludes the area of impact associated with seabed debris clearance and overtrawlability surveys, scope to be defined.</p> <p>Localised excavation, placement of rock on the seabed or placement of infrastructure (spud-cans and anchors) will result in the direct mortality of sessile seabed organisms.</p> <p>Seabed disturbance will give rise to the resuspension of sediments and the potential smothering of sessile seabed organisms.</p> <p>The very nature of the decommissioning objectives in the SNS, are expected to counteract any fragmentation brought about by the presence of existing oil and gas infrastructure, and encourage the development of the site's conservation features by reducing the scour potential associated with platforms and subsea infrastructure.</p>

<p>Describe any likely impacts on the Natura 2000 site as a whole in terms of:</p> <ul style="list-style-type: none"> <li>• interference with the key relationships that define the structure of the site;</li> <li>• interference with key relationships that define the function of the site.</li> </ul>	<p>Out of all potential pressures from anthropogenic development of the SNS, <i>Sabellaria spinulosa</i> reefs exhibit highest vulnerability (albeit low) to damage in relation to physical disturbance. Sensitivity and exposure in relation to this pressure is considered to be moderate and low respectively.</p> <p>The impacts of the VDP1 and LDP1 operations on the North Norfolk Sandbanks and Saturn Reef SCI are predominantly associated with the temporary, low level disturbance to seabed communities. This is anticipated to be negligible overall due to the localised and brief nature of the impact and the high recovery of benthic populations. It will not result in any impacts to the overall seabed community structure.</p> <p>Ecosystem interactions between different ecological groups are not anticipated to change.</p> <p>It is considered that there will be negligible interference with the structure or function of the site and the key relationships within it.</p>
<p>Provide indicators of significance as a result of the identification of effects set out above in terms of loss, fragmentation, disruption, disturbance, change to key elements of the site (e.g. water quality etc.).</p>	<p>There are no anticipated routine significant impacts on the North Norfolk Sandbanks and Saturn Reef SCI associated with the VDP1 and LDP1 activities. The impact of the proposed operations is rated as negligible based on the short term, localised operations and the natural processes in place to assist recovery.</p> <p>Areas of dredging on sandbanks which are subject to naturally high sediment mobility may disappear within a few tidal cycles (Hill et al., 2011). Infrequent, high-energy (storm) conditions will also result in sediment suspension and redistribution. Published calculations of wave and tidal current-induced bed shear stress, clearly show that the large waves have the capability to mobilise seabed sediments, increasing sediment suspension particularly for those sizes of coarse sands and smaller (ABPmer, 2012).</p> <p>Upon completion of the subsea decommissioning activities, it is expected that the resettled sediment will be quickly recolonised by benthic fauna. This will occur as a result of natural settlement by larvae and plankton and through the migration of animals from adjacent undisturbed benthic communities (Dernie et al., 2003)</p> <p>The ten-year SNS decommissioning project to remove platform structures will assist to restore the area to as close to its natural state as possible pre-oil and gas activity through the removal of platform structures and resultant reduction in scour potential caused by the physical presence of platforms and other infrastructure.</p>
<p>Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale of magnitude of impacts is not known.</p>	<p>There are no anticipated routine significant impacts on the North Norfolk Sandbanks and Saturn Reef SCI associated with the VDP1 and LDP1 activities. The impact of the proposed operations is rated as negligible.</p>

**Table A-4 Implications of the VDP1 and LDP1 Activities for Conservation Objectives**

<b>Pressure Categories Which Lead to Disturbance or Degradation (JNCC, 2012)</b>	<b>Implication for Conservation Objectives</b>
<p>Direct Physical Loss</p>	<p>The sandbank habitat is moderately sensitive to seabed disturbance. North Norfolk Sandbank is an open shelf ridge sandbank, formed by strong tidal currents. It is therefore considered that the sandbank could be replenished and recover relatively rapidly between removal activities and thus sensitivity to removal is assessed as moderate (JNCC, 2012).</p> <p>Within the SCI, it is estimated up to 0.102 km<sup>2</sup> of sandy habitat may potentially be disturbed by the undertaking of the VDP1 and LDP1 activities, approximately 0.003 % of the total area of the SCI.</p> <p>Any construction on the sandbanks could lead to their obstruction. The natural development i.e. shift in location (and shape of a sandbank) may be prevented by any permanent infrastructure. This could also affect sandbank recovery through changes in the local hydrographic regime, caused by the obstruction. Sensitivity to obstruction is therefore considered high. Should this be the case, the presence of the existing VDP1 and LDP1 infrastructure and other SNS Infrastructure could have enacted such a change. However, the bathymetry and seabed feature data collected during the baseline environmental surveys show evidence of megaripples around the installations. The continuation of these megaripples in areas of platforms and pipelines suggests that small scale disturbance such as these are no barrier to sandbank maintenance or formation.</p> <p>The excavation and deposits in small areas immediately adjacent to the existing structures is considered unlikely to result in any real change to the existing sandbank structures. It is therefore considered that the loss of the very small area of seabed habitat from VDP1 and LDP1 operations will be minor.</p> <p>The very nature of the decommissioning objectives in the SNS and removal of the associated platforms, is expected to counteract any fragmentation or habitat loss brought about by the presence of existing oil and gas infrastructure. The removal of platform structures will reduce scour potential caused by the physical presence of platforms.</p> <p>Exposed sections of subsea pipelines to be decommissioned in situ are not anticipated to present an obstruction to the movement of sand waves within the area. A survey programme will monitor pipeline burial status and the presence of local pipeline induced scouring.</p>



<p>Indirect Physical Damage</p>	<p>During the VDP1 and LDP1 operations, it is expected that plumes of suspended sediment will be raised by the excavation and removal activities. Whilst the increase in suspended particulates may benefit filter feeders, many species are adversely affected by increases in suspended sediment (Hartnoll, 1998, in JNCC, 2012). Although, even on sandbanks, a shift from predominately sand and rock/gravel to finer sediments may result in a dramatic drop in species richness, abundance and biomass (Despr, 2000, in JNCC, 2012), sensitivity of sandbanks to changes in suspended sediment is assessed as low within this site due to the dynamic nature of the ambient environment (JNCC, 2012). Species are therefore likely to be well adapted to fluctuations in suspended sediment and the ecological communities on the sandbanks are sensitive to smothering only at a low level (JNCC, 2012). JNCC (2012) assesses sandbanks to be only moderately sensitive to physical disturbance and abrasion because there is a possibility of recovery.</p> <p>Bathymetry and seabed data collected during pre-decommissioning baseline environmental surveys show evidence of megaripples across each platform area. The continuation of these megaripples in areas containing a platform and pipelines suggests that small scale installations such as these do not present barriers to sandbank maintenance or formation. As such, it is not expected that the north-easterly elongation of the sandbanks that JNCC (2012) report to be occurring would be compromised by the proposed operations including deployment of low level rock berms.</p>
<p>Non-physical Disturbance</p>	<p>The operations will be short-term in nature and it is not anticipated that noise impacts associated with the pipeline flushing, disconnect and removals activities will result in any impact on the benthic conservation features of the SCI which are not assessed to be sensitive to noise disturbance.</p> <p>The primary source of noise predicted to impact on harbour porpoise arises from vessels supporting the proposed decommissioning activities. Although there is the potential for relatively localised behavioural response from vessel noise, the duration of the source is considered short and area localised.</p>
<p>Toxic Contamination – instantaneous discharges</p>	<p>Instantaneous discharges of chemicals during well P&amp;A. Eco-toxicological risk assessments determined no risk to the receiving environment prior to permitting chemical use.</p> <p>According to JNCC (2012), the sandbanks and <i>Sabellaria spinulosa</i> features of the North Norfolk Sandbanks and Saturn Reef SCI are assessed to be potentially sensitive to various types of chemical contamination; however, availability of direct evidence is limited.</p> <p>Due to the temporary and small nature of any discharges, it is predicted that recovery will be rapid and no significant impacts to the benthic conservation features of the North Norfolk Sandbanks and Saturn Reef SCI are anticipated.</p> <p><i>Sabellaria spinulosa</i> patches were recorded at Viking ED, however no significant accumulations of Sabellaria were detected and no reef formations which constitute Annex I habitat were found. However, it is possible for Sabellaria to establish in the area of the VDP1 and LDP1 infrastructure.</p> <p>Oil in water discharges from the disconnect of production pipelines will be 30mg/l or less; at this level of dispersed oil in water is the performance standard recommended by OSPAR Recommendation 2001/1 and set by The Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 (as amended). No measurable significant impacts are therefore anticipated.</p>

<p>Toxic Contamination – long term releases</p>	<p>Long-term release of residual contaminants, hydrocarbons, scale and sediments will be released gradually after through-wall corrosion occurs and the integrity of the pipelines progressively fails. Through-wall degradation is anticipated to begin to occur after many decades (i.e. 60 – 100 years). Pathways from the pipelines to the receptors would be via the interstitial spaces in seabed sediments, overlying rock placement where applicable and the water column. Release would therefore be gradual, prolonged and localised, such that the effects on the receiving marine environment are considered to be negligible.</p>
<p>Non-toxic Contamination</p>	<p>There will be a change in the turbidity of the immediate area during pipeline excavation activities and platform removals; however, this is short-term and any species displaced in the area, will return rapidly following recovery of the water column. JNCC (2012) state that the sandbanks are not regarded as sensitive to changes in turbidity because the habitat is not dependent on light penetration. Sediments that are redistributed and mobilised as a result of the proposed VDP1 and LDP1 decommissioning activities will be transported by the seabed currents before settling out over adjacent seabed areas. The dynamic marine environment in this area will result in suspended sediment, in particular, the fines being transported away from the source of the disturbance. The natural settling of the suspended sediments is such that the coarser material (sands) will primarily fall out of suspension with the finer material being the last to settle. This natural process will ensure that all the suspended sediment is not deposited in one location. Based on the mobility of the seabed in the area, the deposition resulting from the VDP1 and LDP1 decommissioning activities is likely to be comparable to the background sediment redistribution processes and as such present a low risk of smothering the reef habitat.</p>
<p>Biological disturbance</p>	<p>The banks support communities of invertebrates which are typical of sandy sediments in the SNS, including polychaete worms, isopods, crabs and starfish. Disturbance of these species is a possibility. However, it is likely that this will be temporary and any species displaced or disturbed are expected to return rapidly to the area following operations. Indeed, although these effects can lead to shifts in community structure (e.g. if predators are removed from the system) which then lead to indirect effects on the food web as a whole, JNCC (2012) consider sensitivity to be only moderate given the ability of sandy communities to recover with sufficient time.</p>
<p>In-combination impact</p>	<p>The combined activities are assessed with regard to cumulative environmental significant effect on the protected site and the competent authority assesses ‘in combination’ effect on the protected site under HRA requirements.</p> <p>The Department for Business, Energy and Industrial Strategy (BEIS) has commissioned a strategic habitats regulation assessment (SHRA) for the proposed ten-year decommissioning programme within the SCI.</p> <p>To support the SHRA, ConocoPhillips developed a ten-year activity matrix ConocoPhillips (2017), detailing all Company infrastructure within the SCI and potential decommissioning activities overlaid with assumptions of associated physical disturbance and loss of habitat.</p>

Cumulative impact	<p>The assessment of impacts considers the cumulative impacts of the following:</p> <ul style="list-style-type: none"> <li>• VDP1 and LDP1 activities</li> <li>• undertaking of the remaining well abandonment campaign;</li> <li>• activities associated with the decommissioning programmes termed VDP2 and VDP3 and LDP2, LDP3, LDP4 and LDP5 scheduled to be completed between the period of 2014-2024;</li> <li>• impacts of oil and gas operations within the area;</li> <li>• impacts of other activities within the area.</li> </ul> <p><b>Table A-5</b> presents the maximum seabed estimated disturbance associated with the planned ten-year decommissioning activities within the SCI. The duration of impact varies depending upon activity type. The impacts relate to both physical seabed disturbance (excavations and removals) and habitat loss (rock deposits). The area of impact is based on the impact assessments completed for the decommissioning programmes VDP1 and LDP1 and the forecast ten-year activities associated with the decommissioning programmes VDP2, VDP3 and LDP2 - LDP5. There are currently no formal proposals submitted to BEIS for the activities associated with VDP2, VDP3 and LDP2 - LDP5.</p> <p>The duration of the ten-year duration and geographical distribution of the activities within the SCI limits the presence of long term activities and sustained seabed disturbance within any one area.</p> <p>The assessment of impacts also includes the activities that could affect qualifying features of the Southern North Sea cSAC (harbour porpoise and prey) including sound arising from:</p> <ul style="list-style-type: none"> <li>• Physical injury or disturbance from vessel activities,</li> <li>• Physical injury or disturbance from cutting equipment.</li> </ul>
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**Table A-5 Estimated impact from decommissioning all existing ConocoPhillips infrastructure within the SCI**

		Total area of seabed impacted (km <sup>2</sup> )		
		VDP1 & LDP1		Additional 28 Installations
Activity	Impact	Forecast	Environmental statement	Forecast
<i>Decommissioning impacts</i>				
Accommodation vessel stabilisation	Loss of habitat	0.051	0.051	0.063
Drill rig stabilisation and scour	Loss of habitat	0.0032	N/A	0.007
Rock placement at pipeline ends	Loss of habitat	0.0002	0.0002	0.001
Rock placement along known free-spans	Loss of habitat	0.00021	N/A	0.0009
Heavy lift vessel anchors	Physical damage	0.012	0.0061	0.042
Drill rig anchor and chains	Physical damage	0.022	N/A	0.051
Cutting jacket piles, pipeline ends and T-pieces	Physical damage	0.009	0.008	0.023
Drill rig spud-cans	Physical damage	0.01	N/A	0.010
Conductor removal	Physical damage	0.00009	N/A	0.0002
<b>Total area of habitat loss</b>		<b>0.055</b>	<b>0.051</b>	<b>0.07</b>
<b>Total area of physical impact</b>		<b>0.048</b>	<b>0.014</b>	<b>0.13</b>
<b>Total</b>		<b>0.102</b>	<b>0.066</b>	<b>0.20</b>
<b>Combined total</b>		<b>0.300</b>		
<i>Existing impacts</i>				
Leave In situ existing pipelines	Loss of habitat	0.545	0.545	4.94
Leave in situ existing mattresses and grout bags	Loss of habitat	-	-	-
<b>Total area of habitat loss</b>		<b>0.545</b>	<b>0.545</b>	<b>4.94</b>

Cumulative impact

**Table A-5** presents the estimated impact from decommissioning all existing ConocoPhillips oil and gas infrastructure within the SCI.

The total area of seabed impact associated with the VDP1 and LDP1 activities is estimated to be 0.102 km<sup>2</sup> which represents 0.003 % of the total area of the SCI (area of the SCI 3,603 km<sup>2</sup>).

The total area of seabed impact associated with the ten-year decommissioning activities is estimated to be 0.300 km<sup>2</sup> which represents 0.008 % of the total area of the SCI.

**Table A-6: ConocoPhillips historic stabilisation works in the North Norfolk Sandbanks and Saturn Reef SCI having a potential cumulative impact on the seabed**

Block and Facility	Year of Installation	Seabed Stabilisation Laid	Total Area of Impact (km <sup>2</sup> )	Percentage of SCI Seabed Impacted
49/16: North Valiant 1 PD	2014	11,000 tonnes of rock/ gravel ranging in size from 11 to 22 mm	0.0033	0.00009
49/16: Vanguard QD	2013	8,000 tonnes of rock/ gravel ranging in size from 5 to 20 cm	0.0024	0.00007
49/21: South Valiant TD	2014	30,000 tonnes of rock/ gravel ranging in size from 11 to 22 mm	0.0052	0.00014
49/16: LOGGS PA and North Valiant 1 PD	2014	Seven frond mats laid to counteract scour	0.0126	0.00035
<b>Total area of impact the SCI</b>			<b>0.0235</b>	<b>0.00065</b>

Considering the stabilisation deposits made in the SCI during the locating of an accommodation work vessel in support of the SNS asset integrity rectification (AIR) programme, the total area of seabed impact (COP) associated with the activities completed to date and the estimated decommissioning activities associated with the ten-year programme is 0.096 km<sup>2</sup> which represents 0.0003 % of the total area of the SCI.

In addition to ConocoPhillips' operations occurring in the North Norfolk Sandbanks and Saturn Reef SCI, proposed and current deposit consent applications submitted to BEIS by other operators indicate further activities have or will be undertaken in the SCI. Information provided in **Table A-7** provides details of the level of other oil and gas activity currently within the SCI.

**Table A-7: Recent works by other operators in the North Norfolk Sandbanks and Saturn Reef SCI having a potential cumulative impact on the seabed**

Operator	Block	Information source/ BEIS Reference
Shell U.K. Limited	48/14	Drilling EIA Direction (Deposit Consent). DRA/172.
	48/8	Pipeline EIA Direction (Deposit Consent). PLA/88.
	49/14b	Marine Licence for Well Intervention. WIA/164
	49/14b	Production EIA Direction (Deposit Consent). PRA/166.
Shell U.K. Exploration and Production Limited	48/19	Production EIA Direction (Deposit Consent). PRA/85.
	49/26	Production EIA Direction (Deposit Consent). PRA/84.
Perenco UK Limited	48/7b	Drilling EIA Direction (Deposit Consent). DRA/142.
	49/28	Pipeline EIA Direction. PLA/145.
	49/23	Pipeline EIA Direction (Deposit Consent). PLA/138.
	49/27a	Production EIA Direction (Deposit Consent). PRA/30.
	49/28	Decommissioning Marine Licence. DCA/7.
Perenco Gas (UK) Limited	49/27	Pipeline EIA Direction (Deposit Consent). PLA/115.
	49/9b	Standalone Marine Licence. SA/263.
E.ON Exploration and Production Limited	48/02	Well Intervention Marine Licence. WIA/73.
Centrica Resources Limited	48/07c	Marine Licence and EIA Direction (Deposit Consent). WIA/30.
Centrica Production Nederland B.V	49/10c	Pipeline Marine Licence (Deposit consent) PLA/208
Tullow Oil SK Limited	49/26a	Pipeline Marine Licence (Deposit consent) PLA/163
	49/28	Pipeline Marine Licence (Deposit consent) PLA/167
	49/28	Pipeline Marine Licence (Deposit consent) PLA/168
Centrica North Sea Gas Limited	49/10c	Well intervention Marine Licence (Removal) Xmas Tree WIA/254

**Offshore Renewables:**

No wind farm licensed areas occur within the boundaries of the SCI.

The VDP1 infrastructure is located approximately (at their closest point) 32 km south of the Hornsea Wind farm zone and 42 km NW of the East Anglia Wind farm zone. The LDP1 infrastructure is located approximately 36 km east of the planned Dudgeon wind farm site. The Development Consent Order for the East Anglia ONE Offshore Wind farm was consented in June 2014. This development has been provided with a grid connection of 1,200 megawatts.

The Dudgeon wind farm site is currently owned by Statoil. It's anticipated that the wind farm will be fully commissioned by the end of 2017.

**Aggregate Extractions:**

Aggregate extraction sites 483 and 484 lie within the boundary of the SCI. Applications to undertake extraction at both sites were made in 2014 and consent given in March 2015 (MMO 2015b). There are no aggregate extraction zones within the blocks containing the VDP1 and LDP1 infrastructure, however, the Vampire/ Valkyrie platform sits within a prospecting area held by DEME Building materials UK Limited.

Three VDP1 platforms (Viking HD, GD and ED) and two LDP1 platforms (Vampire OD and Viscount VO) sit within the East Offshore Marine Plans protective area for marine aggregate resource.

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